



THINK BEYOND

**Intel International Science and Engineering Fair
2016 Program**

May 8 – 13, 2016
Phoenix, Arizona

Intel International Science and Engineering Fair



About the Intel ISEF

The Intel International Science and Engineering Fair (Intel ISEF), a program of Society for Science & the Public, is the world's largest international pre-college science competition. The Intel ISEF is the premier science competition in the world and provides a forum for more than 1,750 high school students from more than 75 countries, regions and territories to showcase their independent research annually. Each year, millions of students worldwide compete in local science fairs; winners go on to participate in Intel ISEF-affiliated regional, state and national fairs to earn the opportunity to attend the Intel ISEF. Uniting these top young scientific minds, the Intel ISEF provides the opportunity to finalists to display their talent on an international stage, while enabling them to submit their work for judging by doctoral-level scientists. The Intel ISEF provides awards of nearly \$4 million in prizes and scholarships annually.

Intel International Science and Engineering Fair 2016

Greetings	2
Title Sponsor	6
Gordon E. Moore Award	7
About Phoenix.....	8
Grand Awards	10
Education Outreach Program Sponsors.....	12
Special Award Organizations	14
Events and Office Hours	16
General Information	18
Map of Phoenix	20
Map of Phoenix Light Rail	22
Maps of Phoenix Convention Center	24
Schedule of Events	30
Symposium Schedule	38
Local Restaurants.....	46
Practical Guide and Local Information	48
Phoenix Local Arrangements Committee	50
Intel ISEF Committees	51
Additional Acknowledgements	52
About Intel	54
About Society for Science & the Public	55
Finalist Directory.....	57



Intel Corporation
President, Intel Foundation
Vice President, Human Resources and
Director, Corporate Affairs
Intel Corporation

To Intel ISEF Finalists, Educators, Families, and Fair Directors:

We have traveled far and wide to be here together for the 2016 Intel International Science and Engineering Fair, in Phoenix, Arizona, a city symbolizing both sun and renewal. On behalf of the Intel Foundation, I congratulate all of you for making it to this incredible milestone. We are all here because of our strong community, driven by a shared passion to solve real and challenging problems through science and engineering.

The Intel Foundation believes in the power of innovation to expand opportunities, and we invite you to challenge yourself through our theme of "Think Beyond."

1. **Beyond Barriers:** You will meet people from dozens of countries and cultures during this action-packed week. Look beyond your differences of language or appearance and find what brings you together. Whether you're a fair director from Peru, or a finalist from Indonesia, you have the opportunity to build relationships and foster community that will enrich your perspective.
2. **Beyond Yourself:** When you consider the finalists, judges, panelists, Nobel Laureates, and others walking the halls, there is no greater collection of brainpower in one place than Intel ISEF! So take advantage of this chance to listen and learn beyond your current focus areas. Remember, innovation doesn't happen in a vacuum.
3. **Beyond Doubt:** Our world faces fundamental challenges, and it's important to remember that the status quo defines only what hasn't been discovered yet. The ideas that the Intel ISEF community will bring into existence through hard work and collaboration will fundamentally change the world in ways that are impossible to imagine today. Think deeply about what impact your work can have on the planet, or just a single person. Believe in yourself.

When you leave Intel ISEF, you will return home to forge ahead with your life's work, but you will also be changed by your participation in this special event. This week of exploration, growth, and networking will stay with you for a lifetime.

Finally, I want to express my gratitude to you for helping create this amazing experience, and to the many dedicated families, supporters and volunteers who make the event possible.

Good luck, have fun, and THINK BEYOND.

A handwritten signature in dark ink, appearing to read "Rosalind Hudnell".

Rosalind Hudnell
President, Intel Foundation
Vice President, Human Resources and Director, Corporate Affairs
Intel Corporation

Society for Science & the Public

Maya Ajmera
President & CEO
Publisher, *Science News*



Welcome from the Society for Science & the Public

Welcome to the Intel International Science and Engineering Fair 2016!

Last year, I had the pleasure of attending my very first Intel ISEF, and it was an amazing experience. I have no doubt that this year will be even more impressive. I look forward to meeting you—the top young innovators from around the world. I am very excited to hear more about your ideas and research.

As a high school student that participated in science fairs, I know how important it is to spend time with your peers and experts in the field who are as interested in STEM as you are. You have a great opportunity to spend a week surrounded by other “science fair junkies.” I encourage you to take advantage of everything that Intel ISEF has to offer by learning from each other, making connections and developing lifelong friendships. Many Intel ISEF alumni stay in touch with one another, and may end up collaborating professionally later in life. And, of course, nearly \$4 million in awards is up for grabs!

On behalf of the Society, I congratulate you for being selected as Intel ISEF finalists. We look forward to getting to know you this week and keeping in touch as you move on to accomplish further educational and career goals.

We also want to thank Intel for their continued sponsorship, the many additional organizations that have provided support and awards, the volunteers from Phoenix and throughout the country who make this event possible, as well as the many people that helped you get here—such as educators, parents, and mentors.

I hope all of you have a wonderful time at Intel ISEF 2016!

Sincerely,

A handwritten signature in dark ink that reads "Maya Ajmera". The script is fluid and cursive.

Maya Ajmera
President & CEO
Society for Science & the Public
Publisher, *Science News*



State of Arizona

Doug Ducey
Governor



DOUGLAS A. DUCEY
GOVERNOR

STATE OF ARIZONA
OFFICE OF THE GOVERNOR

EXECUTIVE OFFICE

May 2016

Welcome!

As Governor of the State of Arizona, it is my pleasure to welcome you to the Grand Canyon State for the 2016 Intel International Science and Engineering Fair.

Whether in public or private sector, economic development and prosperity simply would not be possible without innovation. You all are here because you have demonstrated an exceptional determination and passion for exploring new solutions to the world's complex problems.

I also congratulate the many people—including parents, teachers, mentors and other supporters—who provide the encouragement, counsel, and guidance necessary to your success. We all celebrate your remarkable achievements.

Arizona is a place of opportunity for all as you can see. People from all over the world come to see this amazing oasis in the desert and I hope while you are here you can enjoy all that Arizona has to offer. Our landscapes are incredible with the Grand Canyon, the saguaro forests, and the majestic red rocks of Sedona to name a few. Old West and Native American heritages contribute to a unique blend of contemporary and traditional cultures, celebrating Arizona's past and present that are world renowned by art enthusiast.

Once again, welcome and congratulations on this well-earned accomplishment. Keep up the good work. I wish you an exciting competition and unforgettable stay in the Grand Canyon State.

Sincerely,

Douglas A. Ducey
Governor
State of Arizona

1700 WEST WASHINGTON STREET, PHOENIX, ARIZONA 85007
602-542-4331 • www.azgovernor.gov

City of Phoenix
Greg Stanton
Mayor



City of Phoenix

OFFICE OF THE MAYOR

May 8, 2016

Welcome to the Intel International Science and Engineering Fair 2016!

The City of Phoenix extends a warm welcome to all guests and participants of this world-class event.

Phoenix had the privilege of hosting Intel ISEF 2013, which was a great success, and we are excited to host again this year. Intel ISEF 2016 will bring together more than 1,750 high school students from more than 75 countries to share their research and celebrate their impressive achievements. Each student has their own inspiring story and represents the spirit of innovation and discovery that is so vital to our future.

During your visit to Phoenix, while you will still find relics of the Old West, you will also find that we are building an economy rooted in innovation – the kind you will see here today. Phoenix is poised to compete in the 21st century global economy through direct investments into the biosciences and our children's education.

I hope that you enjoy your time in Phoenix. Outside of Intel ISEF 2016, we have a bustling downtown with top-notch restaurants, nightlife and entertainment. And if you take the light rail up to Roosevelt Row, you can explore our nationally-recognized arts district.

I wish you all the best for Intel ISEF 2016 and congratulate you for all you have already accomplished.

Sincerely yours,

Greg Stanton
Mayor

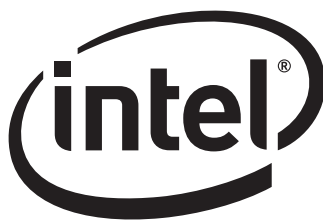
200 WEST WASHINGTON STREET, 11TH FLOOR, PHOENIX, ARIZONA 85003-1611
PHONE 602-262-7111 FAX 602-495-5583 TTY 602-534-5500
WWW.PHOENIX.GOV

Welcome from the Mayor of Phoenix

Society for Science & the Public
acknowledges with gratitude

Intel Corporation
and
Intel Foundation

for their support of the Intel ISEF 2016.



In the last decade, Intel has invested more than \$1 billion, and Intel employees have donated over four million volunteer hours, to improve education in more than 75 countries, regions and territories.

Intel is actively involved in education programs, advocacy and technology access to help tomorrow's innovators.

Intel is proud to serve as the title sponsor of the Intel International Science and Engineering Fair through 2019.



Gordon E. Moore Award

Gordon E. Moore co-founded Intel Corporation in 1968, serving as president and CEO as well as Chairman of the Board before his retirement in 1997. With degrees in chemistry and physics from University of California, Berkeley (B.S.) and Caltech (Ph.D.), Moore is widely known for “Moore’s Law,” the driving pulse of the semiconductor industry. He and his wife, Betty Moore, have created the Gordon & Betty Moore Foundation and are among the world’s most generous philanthropists. He is widely admired for his technical leadership and his role as one of the creators of today’s Silicon Valley, as well as for his ongoing philanthropic role supporting environmental efforts and science education and research.

The Gordon E. Moore Award recognizes the best of the Best of Category among the outstanding students from around the world who participate in the Intel International Science and Engineering Fair. The winning project is selected on the basis of outstanding and innovative research, as well as on the work’s potential in the winner’s field and on the world at large.

Intel Foundation is proud to present the Gordon E. Moore Award, as well as a prize of \$75,000, to the 2016 Intel International Science and Engineering Fair winner.

About Phoenix

Phoenix is the cosmopolitan heart of Arizona and the sunniest metropolis in America. It is home to one of the most sophisticated convention centers in the country, and its urban core has been revitalized by new hotels, an entertainment district and a light-rail transportation system.

Yet, amid the big-city bustle, you'll still find rugged mountains, quiet trails and the kind of cactus most people see only in cartoons.

Phoenix's famously sunny weather lends itself to outdoor fun. Visitors can spy on coyotes from the basket of a hot-air balloon, float past wild horses on the Salt River, stroll through a botanical garden dedicated to the desert plants of the world, or learn racing skills at school for high-performance driving.

The Phoenix Convention Center is located in the heart of downtown Phoenix, which is where you'll find indie restaurants, music halls and sports arenas. Downtown is home to buzz-worthy neighborhoods like Roosevelt Row and historical districts like Heritage Square. Billions of dollars of development—including a growing biomedical campus and Arizona State University's journalism and law schools—have lured hot chefs, young artists and independent retailers into downtown, burnishing Phoenix's reputation as one of the premier convention destinations in America.

THINK BEYOND



Congratulations to past winners of the Intel International Science and Engineering Fair (Intel ISEF), a Program of Society for Science and the Public. Finalists have gone on to do amazing things, start nonprofits around the world, win awards such as the MacArthur “Genius” award, start successful companies, and become professors at major universities.

Intel's commitment to education ranges from science competitions that encourage young thinkers, scientists, and entrepreneurs, to collaborative programs with educational and governmental organizations.

By empowering students around the world, Intel isn't just enabling them to succeed in the global economy—we're creating the next great wave of world-changing innovators.

See what's happening at Intel ISEF: [**intel.com/ISEF**](http://intel.com/ISEF)



As a result of their excellent performance at an Intel ISEF-affiliated fair at a local, regional or national level this year, more than 1,750 students earned finalist status at the Intel ISEF 2016 in Phoenix.

Finalists will compete for nearly \$4 million in awards and prizes, will be judged on their creative ability and scientific thought, as well as the thoroughness, skill and clarity shown in their projects.

2016 Grand Awards include:

Gordon E. Moore Award

Intel and Society for Science & the Public are pleased to present an award of \$75,000 to the top Best of Category project.

The Gordon E. Moore Award recognizes the Best of the Best among the outstanding students from around the world who participate in Intel ISEF. The winning project is selected on the basis of outstanding and innovative research, as well as on the potential impact of the work—in the field and on the world at large.

Intel Foundation Young Scientist Award

Intel and Society for Science & the Public will present \$50,000 to two Best of Category projects. These finalists will be selected for their commitment to innovation in tackling challenging scientific questions, using authentic research practices, and creating solutions to the problems of tomorrow.

Intel Foundation Cultural and Scientific Visit to China Award

The Intel Foundation is partnering with China Adolescents for Science and Technology (CAST) to award a trip to the Chinese cities of Beijing, Chengdu and Hong Kong. Winners will attend the CAST Innovation Contest, the largest national science competition in China, and have the opportunity to visit the Chengdu Panda Research base as well as other science education institutes, research centers, middle schools and universities in China. Winners will exchange ideas with Chinese scientists and like-minded peers.

Dudley R. Herschbach SIYSS Award

Three finalists will win an all-expense-paid trip to attend the Stockholm International Youth Science Seminar (SIYSS), which includes attendance at the Nobel Prize ceremonies, in Stockholm, Sweden. This award is named for Dudley R. Herschbach, Harvard Professor and 1986 Nobel Laureate in Chemistry. He is Board Chairman Emeritus of Society for Science & the Public.

Intel and Indo-US Science & Technology Forum Visit to India Award

In partnership with the Indo-U.S. Science and Technology Forum, Intel is pleased to award a scientific and cultural exchange visit to India. Winners will showcase their research projects at the National Fair of India – Initiative in Research and Innovation in Science (IRIS). In addition to participation at IRIS, the students will receive an opportunity to visit research institutions and universities and interact with the key scientific leadership in India.

European Union Contest for Young Scientists Award

An all-expense-paid trip enables attendance at the European Union Contest for Young Scientists to be held in Brussels, Belgium in 2016.

Innovation Exploration Award

Jet Propulsion Laboratory (JPL) was established in 1944 by Caltech, one of the world's premier scientific and technical universities whose mission is to expand human knowledge and benefit society through research integrated with education. Students will be a part of a behind-the-scenes visit to JPL in Pasadena, California, and visit world renowned California Institute of Technology (Caltech), meet with scientists, present their own work and see what is next in space exploration.

London International Youth Science Forum – Philip V. Streich Memorial Award

The Philip V. Streich Memorial Award offers an opportunity for student participation in the London International Youth Science Forum, an international event that attracts science students from around the world.

Massachusetts Institute of Technology – Lincoln Laboratory, Ceres Connection

The names of first and second place category award winners at Intel ISEF will be submitted to the International Astronomical Union (IAU) for a once in a lifetime naming of a minor planet. All minor planets in the Ceres Connection have been discovered by the Lincoln Near Earth Asteroid Research (LINEAR) program, operated by MIT's Lincoln Laboratory.

Intel ISEF Best of Category Award

Intel will present Best of Category project winners with \$5,000. Additionally, a \$1,000 grant will be given to the finalist's school and the Intel ISEF-affiliated fair they represent.

Intel ISEF Grand Award

Presented in each of the 22 Intel ISEF categories, Grand Awards are given for:

- 1st Place—\$3,000 cash award
- 2nd Place—\$1,500 cash award
- 3rd Place—\$1,000 cash award
- 4th Place—\$500 cash award

Monetary awards are allocated by project, not by number of finalists winning the award. For example, a three-person team project that wins first place will win \$3,000, to be split evenly among the team members.

Society for Science & the Public and Intel thank the following organizations for their generous support of the Intel ISEF 2016 Education Outreach Program to be attended by more than 2,000 local middle and high school students and their teachers.

Alcoa Foundation
Arizona Community Foundation
Avnet
Broadcom Foundation
Burton Family Foundation
CopperPoint
Freeport-McMoRan
GoDaddy
Helios Education Foundation
Ricoh USA, Inc.
SRP
Dr. Nelson Ying

The sponsors are proud to support students and hope their participation will inspire them and their teachers, parents, scientists and others.



you're the reason science is cool.

GoDaddy is a Proud Sponsor of
the Intel International Science
and Engineering Fair.



U.S. GLOBAL
DEVELOPMENT
LAB

The U.S. Global Development Lab of USAID is pleased to announce:

GLOBAL DEVELOPMENT INNOVATION AWARDS

at the 2016 Intel International Science and Engineering Fair

We will be offering four Innovation Awards of \$10,000 each in four broad categories:

- ✦ Alleviating Hunger and Providing Food Security Adaptation,
- ✦ Sustainability, and Resilience in the face of Global Climate Change
- ✦ Increasing Access to Energy
- ✦ Improving Global Health

Want to find out more?

Visit: <https://student.societyforscience.org/special-awards-organizations>

Contact: Michele L' Archeveque Jones, micjones@usaid.gov

Learn more about the U.S. Global Development Lab, <http://www.usaid.gov/GlobalDevLab>



Intel ISEF 2016 Special Award Organizations provide education scholarships, cash awards, summer internships, scientific field trips, and equipment grants. Intel and Society for Science & the Public thank the following organizations for their support of the Intel ISEF.

Acoustical Society of America
ADA Foundation
Alcoa Foundation
American Association of Pharmaceutical Scientists
American Chemical Society
American Committee for the Weizmann Institute of Science
American Geosciences Institute
American Intellectual Property Law Association
American Mathematical Society
American Meteorological Society
American Physiological Society
American Psychological Association
American Society for Horticultural Science
American Statistical Association
Arizona State University
Association for Computing Machinery
Association for the Advancement of Artificial Intelligence
Astronomical Society of the Pacific and
the American Astronomical Society
ASU Rob and Melani Walton Sustainability Solutions Initiatives
China Association for Science and Technology (CAST)
Coalition for Plasma Science (CPS)
Drexel University
European Organization for Nuclear Research-CERN
Florida Institute of Technology
Fondazione Bruno Kessler
GoDaddy
Google

IEEE Foundation
 Intel Foundation
 International Council on Systems Engineering - INCOSE
 K. Soumyanath Memorial Award
 K. T. Li Foundation Special Award
 King Abdul-Aziz & his Companions Foundation for
 Giftedness and Creativity
 Monsanto Company
 Mu Alpha Theta, National High School and Two-Year College
 Mathematics Honor Society
 National Aeronautics and Space Administration
 National Anti-Vivisection Society
 National Institute on Drug Abuse, National Institutes of Health
 and the Friends of NIDA
 NSA Research Directorate
 Office of Naval Research on behalf of the
 United States Navy and Marine Corps
 Oracle Academy
 Patent and Trademark Office Society
 Psi Chi, The International Honor Society in Psychology
 Qatar Foundation, Research & Development
 Ricoh USA, Inc.
 Sigma Xi, The Scientific Research Society
 Society for Experimental Mechanics, Inc.
 Society of Experimental Test Pilots
 SPIE, the international society for optics and photonics
 Synaptics, Inc.
 U.S. Agency for International Development
 United States Environmental Protection Agency
 United Technologies Corporation
 University of the Sciences in Philadelphia
 West Virginia University
 Wolfram Research, Inc.

All Intel ISEF 2016 events take place at the Phoenix Convention Center unless otherwise noted.

Event/Group	Location	Day
Adult Mixer	North Ballroom 120	5/11
Advisory Council Meeting	West 102 A/B/C	5/8–5/9, 5/11–5/12
AP Testing	Central High School 4525 N. Central Avenue	5/9–5/10
Excellence in Science and Technology Panel	North Halls A/B/C	5/11
Finalists' Mixer	North Halls A–E	5/10
Finalist Resource Center	North 126 A/B/C	5/8–5/10
Grand Awards Ceremony	North Halls A/B/C	5/13
Housing Information	Registration Complex (Lower Lobby outside Hall 2)	5/7–5/12
HUB (Center of Exhibit Hall)	North Halls 4/5	5/8–5/13
IB Testing	North 132 A/B	5/7–5/13
Intel Quad	West Hall 1	5/8–5/12
Intel ISEF 2016 EXPO	West Hall 2	5/9–5/12
Intel ISEF Variety Show	North Halls A/B/C	5/11
International/Volunteer Office	North 121 A/B/C	5/6–5/13
Locator Card Kiosk	Registration Complex	5/7–5/13
Lost and Found	HUB and Registration Complex	5/7–5/13
Official Party Registration	West Hall 2–Lower Level	5/7–5/13
Opening Dinner	North Ballroom 120	5/9
Opening Ceremony	North Halls A/B/C	5/9
Phoenix Information Booth	Lower Lobby	5/7–5/13
Press Room	North 129 A/B	5/8–5/13
Project Exhibits	North Halls 4/5	5/8–5/13
Public Visitation	North Halls 4/5	5/12
Retail Store	Lower Level across from North Halls 5/6	5/7–5/13
Scientific Review Committee (SRC)	North 127 A/B/C	5/8–5/9
Society for Science & the Public Office	Registration Complex	5/7–5/13
Special Awards Ceremony	North Halls A/B/C	5/12
Student Observer Caucus	Renaissance Hotel	5/11
Student Pin Exchange (Finalist and Student Observers Only)	Sheraton Hotel, Phoenix Ballroom	5/8
Symposia	West 101 A/B/C, 106 B, 106 C	5/9–5/12
Wednesday Night Dinner	North Ballroom 120	5/11

Visit student.societyforscience.org/attendees for schedule updates throughout the week.

Open Daily

Finalist Exhibit Hall and the HUB

Sunday (Project Set-up and D&S Inspections)	8:00 a.m.–8:00 p.m.~OFP
Monday (Project Set-up and D&S Inspections)	8:00 a.m.–6:00 p.m.~OFP
Tuesday	7:30 a.m.–9:00 a.m.~Finalists with Infractions only 9:00 a.m.–11:00 a.m.~Finalists only for Press/PR purposes
Wednesday	7:45 a.m.–11:45 a.m., 1:00 p.m.–4:00 p.m., 4:00 p.m.–5:00 p.m.~Finalists & Judges only
Thursday	9:00 a.m.–9:00 p.m.~Public Visitation Day
Friday	11:00 a.m.–2:00 p.m.~OFP

Finalist Resource Center

Sunday–Monday	8:00 a.m.–9:00 p.m.
Tuesday	8:00 a.m.–12:00 Noon

Intel Quad

Sunday	12:00 Noon–6:00 p.m.
Monday	8:00 a.m.–5:30 p.m.
Tuesday	8:00 a.m.–6:00 p.m.
Wednesday	12:00 Noon–6:00 p.m.
Thursday	10:00 a.m.–6:00 p.m.

Intel ISEF Expo 2016

Monday	2:00 p.m.–6:00 p.m.
Tuesday	9:00 a.m.–5:00 p.m.
Thursday	8:00 a.m.–5:00 p.m.

International/Volunteer Office

Friday	7:30 a.m.–5:00 p.m.
Saturday	7:30 a.m.–6:00 p.m.
Sunday	7:30 a.m.–9:00 p.m.
Monday–Tuesday	7:30 a.m.–10:00 p.m.
Wednesday	6:30 a.m.–7:00 p.m.
Thursday	7:00 a.m.–7:00 p.m.
Friday	7:00 a.m.–11:00 a.m.

Official Party Registration

Saturday	3:00 p.m.–6:00 p.m.
Sunday–Tuesday	8:00 a.m.–9:00 p.m.
Wednesday	7:00 a.m.–9:00 p.m.
Thursday	8:00 a.m.–7:00 p.m.
Friday	7:00 a.m.–9:00 a.m.

Phoenix Information Desk

Saturday–Friday	9:00 a.m.–5:00 p.m.
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Retail Store

Saturday	3:00 p.m.–6:00 p.m.
Sunday–Monday	8:00 a.m.–7:00 p.m.
Tuesday–Wednesday	8:00 a.m.–6:00 p.m.
Thursday	8:00 a.m.–7:00 p.m.
Friday	8:00 a.m.–2:00 p.m.

North Halls 4/5

North 126 A/B/C

West Hall 1

West Hall 2

North 121 A/B/C

Registration Complex Lower Level (outside West Hall 2)

Lower Level–West Hall

Concourse outside of North Hall 5

Auditorium Safety

Sticks and large flags are prohibited during the awards ceremonies and will be confiscated at the door. Please do not bring flags or state symbols on stage during the presentation of awards. Large bags are not permitted in the Ceremony Hall.

Event Security

Intel ISEF participants **MUST** wear their name badges to participate in fair activities and events. Those without badges will be turned away at the door.

Hotel Safety

- Do not answer the door in a hotel room without verifying who it is. If a person claims to be an employee, call the front desk and ask if someone from their staff is supposed to have access to your room and for what purpose.
- Always walk in groups.
- Always use your hotel's main entrance, especially late in the evening.
- Be observant, and look around before entering parking lots.
- Close the door securely whenever you are in your hotel room and use the locks.
- Do not needlessly display guest room keys or convention badges in public.
- Do not carry large amounts of cash or expensive jewelry. Store valuables in the hotel's safe deposit box.
- Do not invite strangers to your hotel room.
- Make sure sliding glass doors and any connecting room doors are locked.
- Report any suspicious activity to management.

Downtown Phoenix Partnership Ambassadors

Look for Ambassadors, who wear orange shirts and are stationed all around the downtown area, especially around the Convention Center, to help answer your questions about how to navigate Phoenix. They are on duty seven days a week from 8:00 a.m. until 11:00 p.m. and can help you find your way, give ideas about where to eat or where to find a drug store or a bank, and help you navigate public transportation.

About Phoenix

Phoenix is the capital of and largest city in Arizona, as well as the sixth most populous city in the United States.

Hotels

Address

Phone

Aloft Phoenix Airport	4450 E. Washington Street	602-275-6300
Fairfield Inn and Suites Phoenix	2520 N. Central Avenue	602-716-9900
Hampton Inn - Phoenix/Midtown	160 W. Catalina Drive	602-200-0990
Hilton Garden Inn Midtown	4000 N. Central Avenue	602-279-9811
Hilton Garden Inn Phoenix Downtown	15 E. Monroe Street	602-343-0006
Hilton Phoenix Suites	10 E. Thomas Road	602-222-1111
Holiday Inn Express - Ballpark	620 N. 6th Street	602-452-2020
Hotel Palomar Phoenix	2 E. Jefferson Street	602-253-6633
Hotel San Carlos	202 N. Central Avenue	602-253-4121
Hyatt Regency Phoenix	122 N. 2nd Street	602-252-1234
Renaissance Phoenix Downtown	50 E. Adams Street	602-333-5000
Sheraton Grand Phoenix	340 N. 3rd Street	602-262-2500
Springhill Suites by Marriott	802 E. Van Buren Street	602-307-9929
The Westin Phoenix Downtown Hotel	333 N. Central Avenue	602-429-3500
Wyndham Garden Phoenix Midtown	3600 N. 2nd Avenue	602-604-4900

About the Phoenix Convention Center

The Convention Center is a smoke-free environment. Outside food and beverages are prohibited in the Convention Center.

Visit the Intel ISEF 2016 EXPO Phoenix Convention Center West Hall 2



Join us at the Intel ISEF EXPO to interact and engage with industry, academic and community organizations.

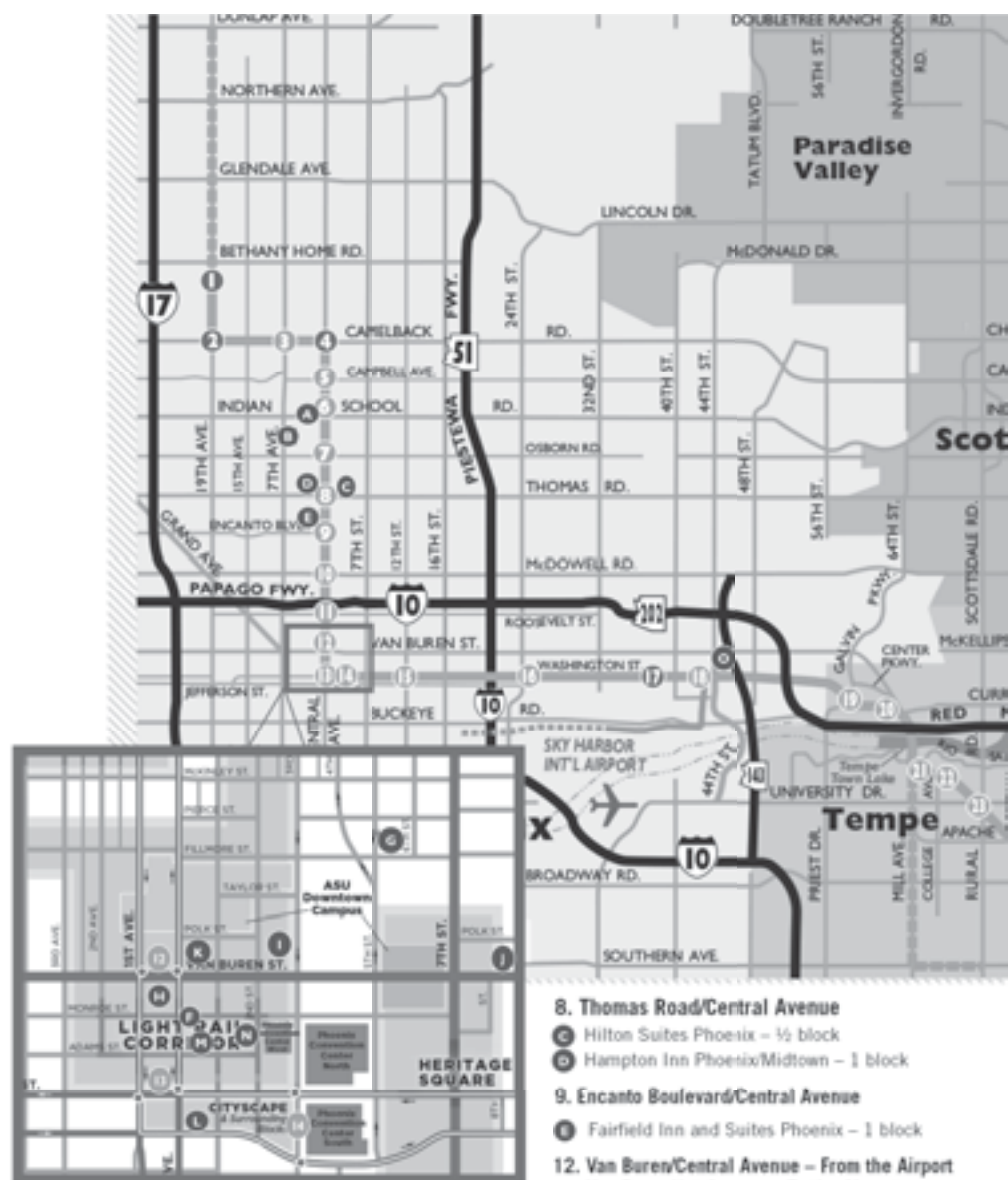
Hours are:

Monday, May 9	2:00 p.m. – 6:00 p.m.
Tuesday, May 10	9:00 a.m. – 5:00 p.m.
<i>Free refreshments served</i>	<i>9:00 a.m. – 11:00 a.m.</i>
Thursday, May 12	8:00 a.m. – 5:00 p.m.









6. Indian School Road/Central Avenue

- A Hilton Garden Inn Midtown – 3 blocks

7. Osborn Road/Central Avenue

- B Wyndham Garden Phoenix Midtown – 2 blocks

8. Thomas Road/Central Avenue

- C Hilton Suites Phoenix – ½ block
- D Hampton Inn Phoenix/Midtown – 1 block

9. Encanto Boulevard/Central Avenue

- E Fairfield Inn and Suites Phoenix – 1 block

12. Van Buren/Central Avenue – From the Airport Van Buren/1st Avenue – To the Airport

- F Hilton Garden Inn Downtown Phoenix – 1 block
- G Holiday Inn Express Phoenix Downtown – 7 blocks or
- H Hotel San Carlos – 1 block
- I Sheraton Grand Phoenix – 3 blocks
- J Springhill Suites by Marriott – 8 blocks or .8 miles
- K The Westin Phoenix Downtown – ½ block



- 1 Montebello Ave. / 15th Ave.
- 2 19th Ave. & Camelback Rd.
- 3 7th Ave. & Camelback Rd.
- 4 Central Ave. & Camelback Rd.
- 5 Campbell Ave. & Central Ave.
- 6 Indian School Rd. & Central Ave.
- 7 Osborn Rd. & Central Ave.
- 8 Thomas Rd. & Central Ave.
- 9 Encanto Blvd. & Central Ave.
- 10 McDowell Rd. & Central Ave.
- 11 Roosevelt St. & Central Ave.
- 12 Van Buren St. & Central Ave.
Van Buren St. & 1st Ave.
- 13 Washington St. & Central Ave.
Jefferson St. & 1st Ave.
- 14 3rd St. & Washington St.
3rd St. & Jefferson St.
- 15 12th St. & Washington St.
12th St. & Jefferson St.
- 16 24th St. & Washington St.
24th St. & Jefferson St.
- 17 38th St. & Washington St.
- 18 44th St. & Washington St.
- 19 Priest Dr. & Washington St.
- 20 Center Parkway & Washington St.
- 21 Mill Ave. & 3rd St.
- 22 Veterans Way & College Ave.
- 23 University Dr. & Rural Rd.
- 24 Dorsey Lane & Apache Blvd.
- 25 McClintock Dr. & Apache Blvd.
- 26 Martin Lane & Apache Blvd.
- 27 Loop 101 & Apache Blvd.
- 28 Sycamore & Main St.

13. Washington Street/Central Avenue – From the Airport Washington Street/ 1st Avenue – To the Airport

- 1 Hotel Palomar Phoenix – 1 block
- 2 Renaissance Phoenix Downtown Hotel – ½ block

14. 3rd Street/ Washington Street – From the Airport 3rd Street/Jefferson Street – To the Airport

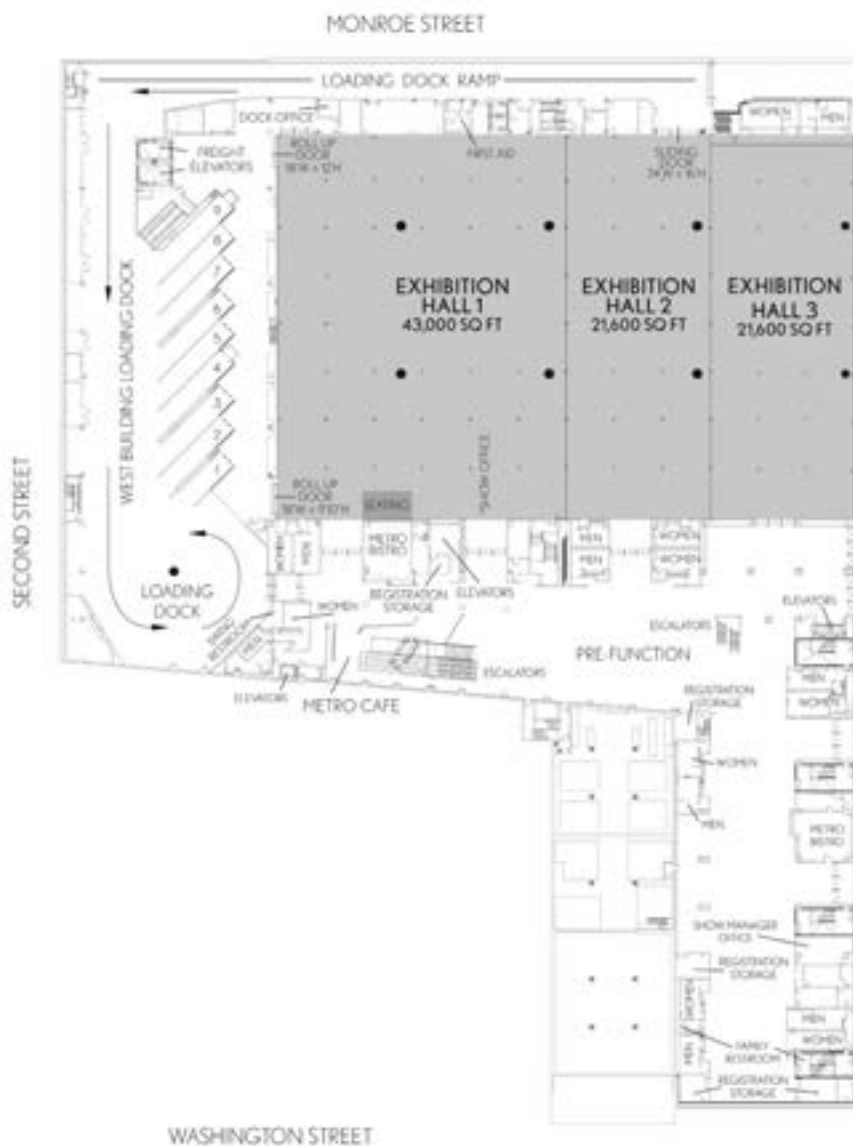
- 1 Phoenix Convention Center
- 2 Hyatt Regency Phoenix – 1 block

18. 44th Street/Washington Street

- 1 Aloft Phoenix Airport – ½ block

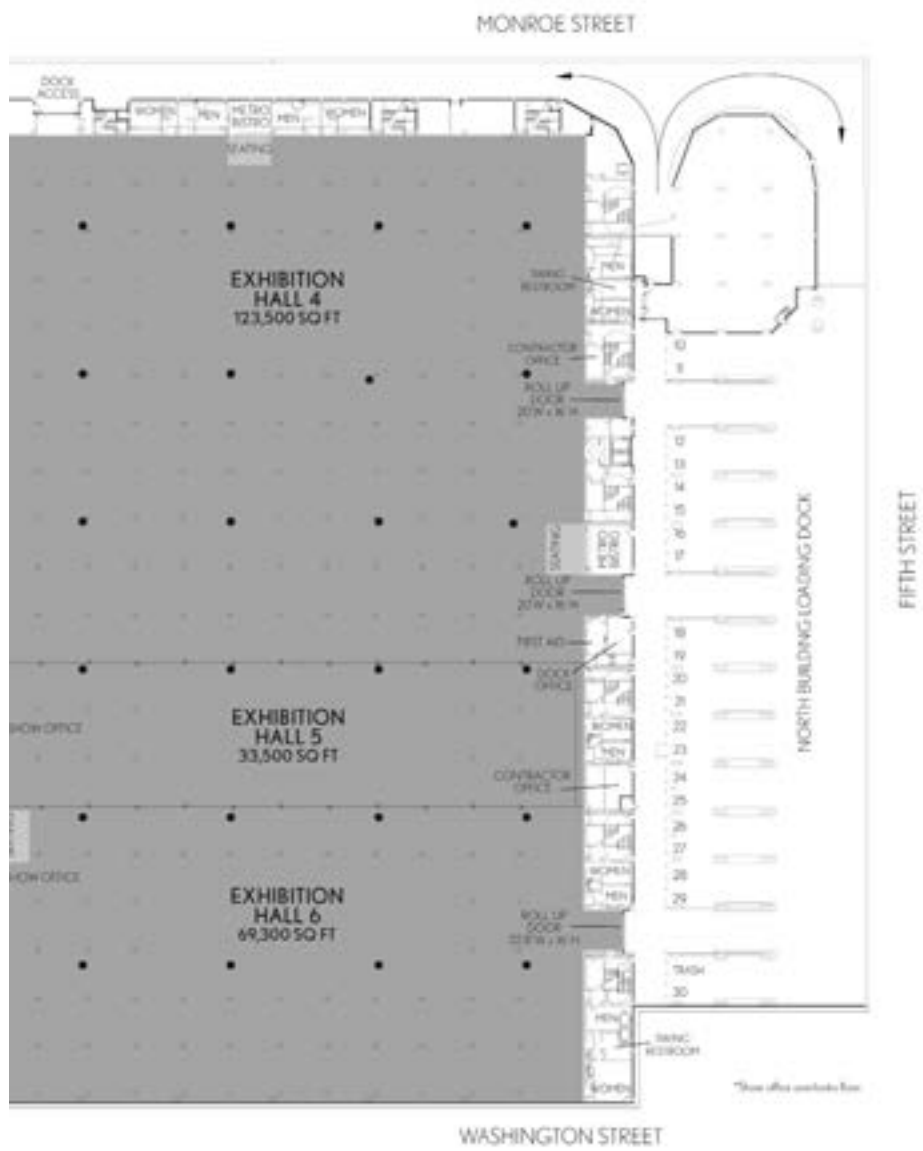
* Distance are approximates

West Building – Exhibition Halls Lower Level

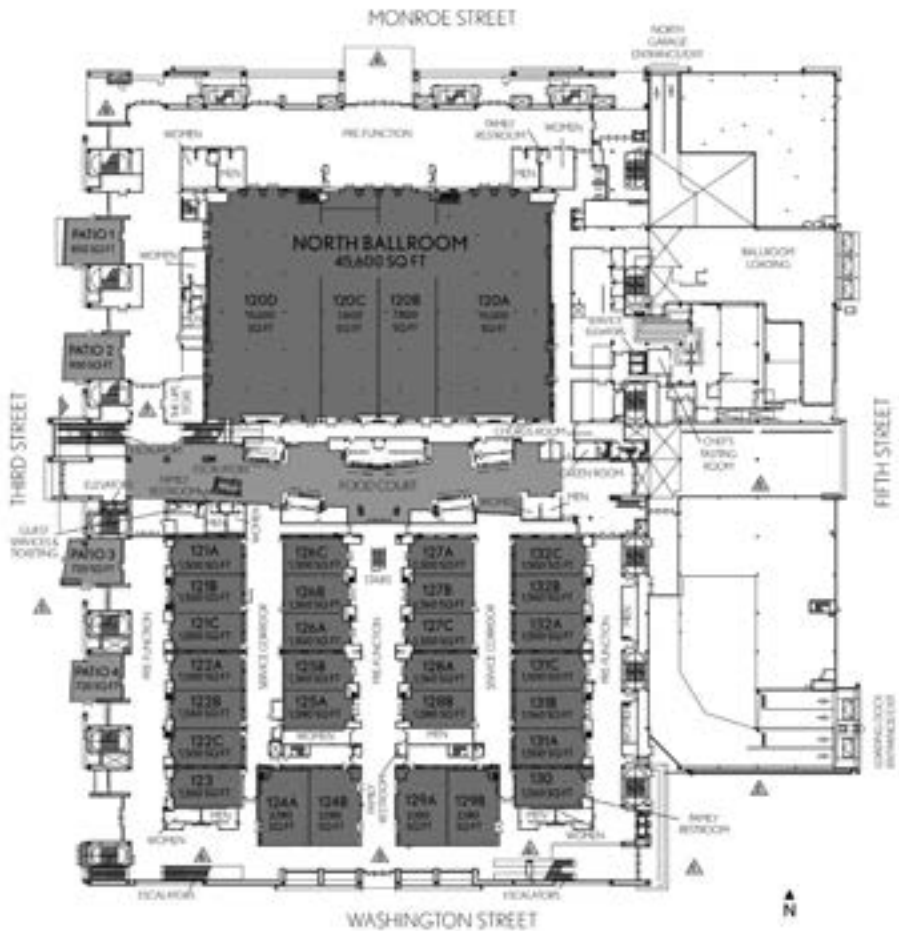


North Building – Exhibition Halls Lower Level

Map of Convention Center

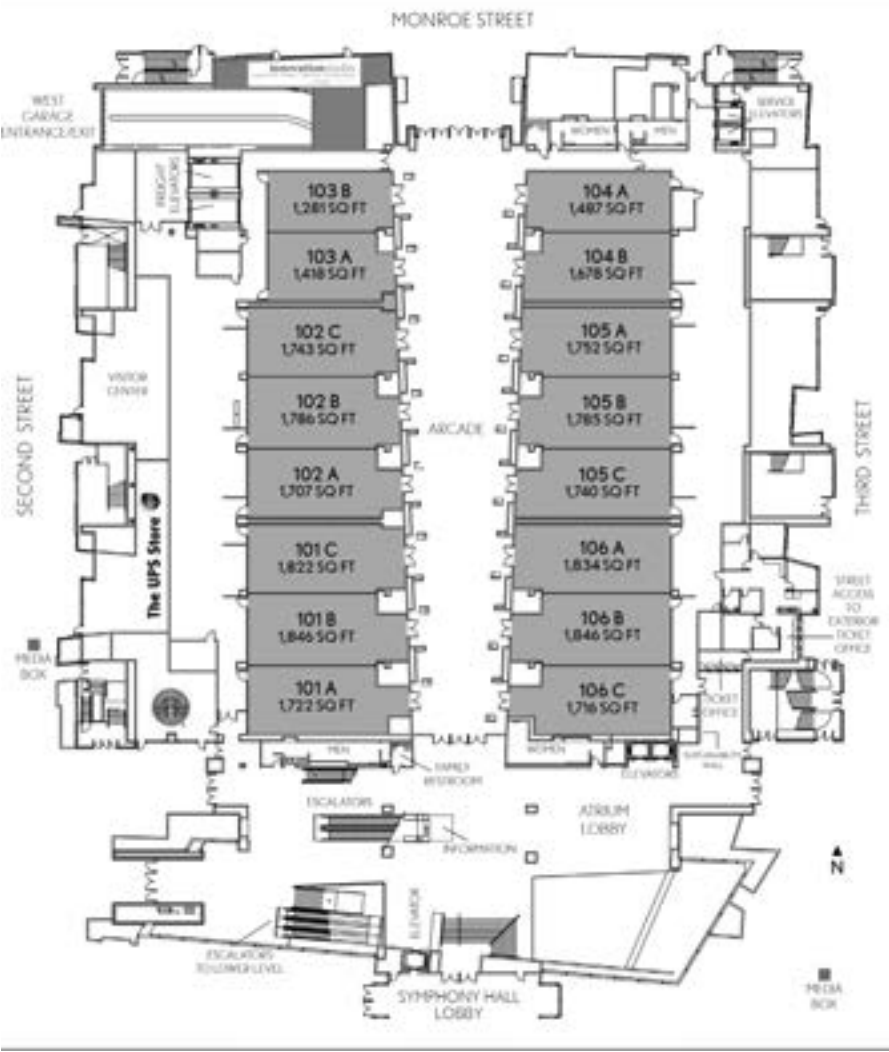


North Building – Meeting Rooms 100 Level



West Building – Meeting Rooms

100 Level



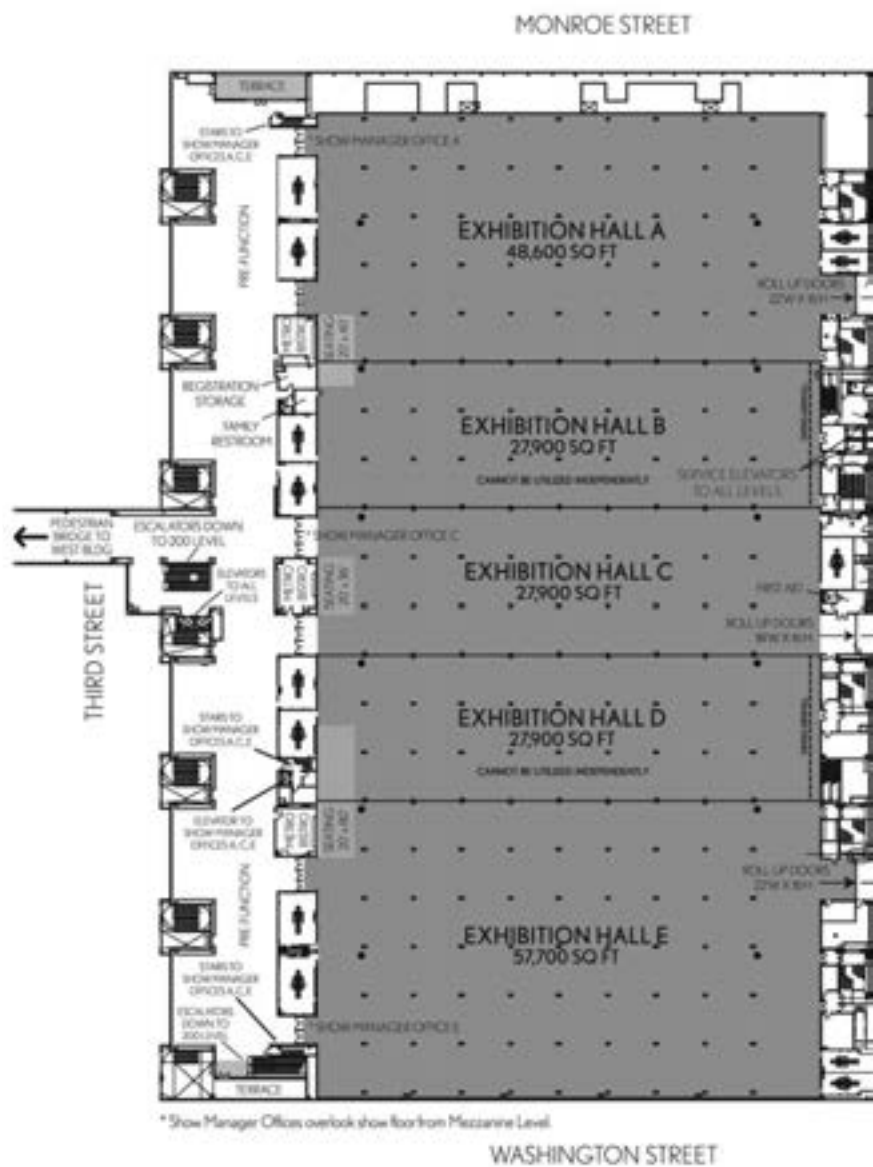
Map of Phoenix Convention Center

North Building – Meeting Rooms 200 Level



North Building – Exhibition Halls

300 Level



Map of Phoenix Convention Center

Sunday, May 8

See page 16–17 for hours and locations of daily recurring events and resources. All events take place in the Phoenix Convention Center unless otherwise noted.

8:00 a.m. – 5:00 p.m. (Afterwards by appt.)	Project Drop–Off Finalists transporting their own projects may unload them only if registered. Each item must be clearly marked with finalist's name, address, and fair ID number. Only Fair Officials are permitted on the floor before 8:00 a.m. Sunday.	Loading Dock North Halls 4/5
8:00 a.m. – 8:00 p.m.	Setup of Projects/ Display & Safety Inspections	North Halls 4/5
8:00 a.m. – 8:00 p.m.	Scientific Review Committee Interviews Projects must be reviewed and cleared by the Scientific Review Committee (SRC) before they may be set up. An SRC project infraction list will be posted Saturday, May 7 at student.societyforscience.org/intel-iseff/attendee .	North 127 A/C
12:00 p.m. – 6:00 p.m.	Intel Quad Spend some time this week in the Intel Quad. Enter the Drone Zone and learn how to fly an aerial drone (lessons at the top of every hour!). Tinker in our Maker Area and create your own light-up BFF badge or bracelet. Experience Intel® RealSense™ Technology with our featured games! Meet DJ Quantum and let your passion for music soar on Intel® Technology (lessons at the bottom of most hours!). And those are only a few of the latest Intel-powered activities waiting for you to experience. Or just relax, grab a seat and access the wireless internet or connect on a sleek Ultrabook™, inspired by Intel. Enjoy the open space for collaboration and meet your fellow finalists. Come and join in the fun!	West Hall 1
7:00 p.m. – 9:00 p.m.	Student Pin Exchange This icebreaker event is for finalists and student observers who are invited to trade pins and to meet new friends. There will be food, music, and good times for all.	Sheraton Hotel Phoenix Ballroom

Monday, May 9

8:00 a.m. – 12:00 Noon	Scientific Review Committee Interviews Only for finalists whose projects have not been cleared.	North 127 A/C
8:00 a.m. – 5:30 p.m.	Intel Quad	West Hall 1
8:00 a.m. – 6:00 p.m.	Setup of Projects/ Display & Safety Inspections Finalists transporting their own projects may unload them only if registered. Each item must be clearly marked with finalist's name, address and fair ID number.	North Halls 4/5
8:45 a.m.–4:15 p.m.	Symposia See full schedule on pages 38–44.	West 101 A/B/C, 106 B, 106 C

Opening Ceremony

Monday, May 9

Phoenix Convention Center

North Halls A/B/C



Tan Le

Founder and CEO

Emotiv Lifesciences

Your week at Intel ISEF 2016 kicks off with the Opening Ceremony. This high-energy event will be led by host Jonathan Lowe, award-winning multimedia journalist from CBS 5 Arizona. The keynote will be by Tan Le, Founder & CEO of Emotiv Lifesciences, a bio-informatics company focused on identifying biomarkers in the brain using electroencephalography (EEG), and pursuing the dream of widespread brain function screening.

Born in South Vietnam, Le migrated to Australia with her family in 1982. At 16 years old, Le began university studies majoring in law and commerce.

She has been recognized as Young Australian of the Year and as *Forbes'* 50 Names You Need to Know.

**Be part of
the show!**
**You are invited to
participate in the
keynote by tweeting
questions with
#IntelISEF.**

**Questions will be
selected and asked
after the keynote.**

**Start tweeting
now!**

2:00 p.m. – 6:00 p.m.	Intel ISEF 2016 EXPO All Intel ISEF 2016 participants are welcomed and encouraged to visit this year's exhibits. Organizations with a science and education focus, including educational institutions, agencies, corporations and other sponsors will be on-hand.	West Hall 2
3:30 p.m. – 6:30 p.m.	Opening Ceremony Dinner All registered attendees are welcome. Intel ISEF name badges are required to enter.	North Ballroom 120
6:30 p.m. – 7:00 p.m.	Opening Ceremony Pre-Show Casual Attire — Doors open at 6:00 p.m.	North Halls A/B/C
7:00 p.m. – 8:30 p.m.	Opening Ceremony Sponsored by Intel Corporation Keynote Speaker: Tan Le Opening Ceremony kicks off the week of events for 2016. This high-energy event will be led by master of ceremonies, Jonathan Lowe, award-winning multimedia journalist from CBS 5 Arizona. The keynote will be by Tan Le, Founder & CEO of Emotiv Lifesciences, a bio-informatics company focused on identifying biomarkers in the brain using electroencephalography (EEG), and pursuing the dream of widespread brain function screening. Students will have the opportunity to ask questions during the event through Twitter, so make sure you have your Twitter account set up and include #intelisef to tweet your questions.	North Halls A/B/C
8:00 p.m.	Final Project Infractions List Posted at Registration, outside of Exhibit Halls, and on student.societyforscience.org/intel-isef/attendee .	

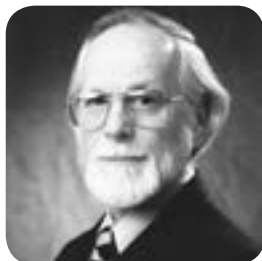
Tuesday, May 10

7:30 a.m. – 9:00 a.m.	Project Infraction Clearance Both the Scientific Review Committee and Display & Safety Committee will have conducted a final review of all projects by Monday afternoon. If any problems with a project are identified during review, the finalist's booth number will be posted outside the Exhibit Hall on Monday, May 9. Only those finalists with infractions will be permitted in the Exhibit Halls beginning at 7:30 a.m. A project cannot be judged unless it has been cleared by the SRC or D&S by 9:00 a.m., Tuesday, May 10.	Entrance, North Halls 4/5
8:00 a.m. – 6:00 p.m.	Intel Quad	West Hall 1
9:00 a.m. – 5:15 p.m.	Symposia See full schedule on pages 38–44.	West 101 A/B/C, 106 B, 106 C
9:00 a.m. – 5:00 p.m.	Intel ISEF 2016 EXPO <i>Free refreshments will be served from 9:00 a.m. – 11:00 a.m.</i>	West Hall 2

Don't miss the

Excellence in Science and Technology Discussion Panel

Tuesday, May 10, 2:00 p.m.
Phoenix Convention Center, North Halls A/B/C



J. Michael Bishop
University of California,
San Francisco
1989 Nobel Prize –
Physiology or Medicine



Martin Chalfie
Columbia University
2008 Nobel Prize –
Chemistry



Elissa Hallem
Hallem Lab, UCLA
2012 MacArthur Fellow –
Neurobiologist



Cato Laurencin
University of Connecticut
National Medal of Technology and
Innovation, 2016



Joe Palca
NPR Science Correspondent
Moderator

presented by
Intel Corporation

9:30 a.m.—11:00 a.m.	Press/Public Relations Time with Finalists All finalists have the opportunity to come the Exhibit Hall for scheduled press interviews, impromptu visits from sponsors and dignitaries and to check their booth area one last time before judging begins.	North Halls 4/5
2:00 p.m. – 4:00 p.m.	Excellence in Science and Technology Panel <i>Presented by Intel Corporation — Casual Attire</i> All attendees are invited to a conversation with Nobel Laureates and other scientific prize winners. Panelists are J. Michael Bishop, Martin Chalfie, Elissa Hallem and Cato Luarencin. The panel will be moderated by NPR Science Correspondent and Society Trustee Joe Palca.	North Halls A/B/C
7:00 p.m.—9:00 p.m.	Finalist Mixer Event –Club Intel ISEF DJ Quantum and Dinner Coffee House DJ Quantum will be mixing beats with visualizations on the big screen. For a quieter area, a coffee house will be featuring a guitarist and a barista. When you are ready to burn off energy, visit the High Energy Hub with activities and games. Food and beverage will be available throughout the evening.	North Halls A–E
7:00 p.m.—9:00 p.m.	Adult Mixer–Evening Luau Hawaiian themed food and beverage will be enjoyed with a Hawaiian three-piece band and hula dancers. The night will include a high energy performance with guest interaction – be ready to get your hula on!	North Ballroom
Wednesday, May 11		
8:15 a.m. – 1:00 p.m.	Student Observer Program For students registered as Student Observers with their Official Party and pre-registered for this event.	Renaissance Hotel
8:45 a.m. – 4:00 p.m.	Symposia See full schedule on pages 38–44.	West 101 A/B/C, 106 B, 106 C
9:00 a.m. – 11:45 a.m.	Exhibit Hall Open Finalists at Projects for Interviews — Professional Attire Finalists & Judges only	North Halls 4/5
11:45 a.m. – 1:00 p.m.	Lunch Break Concession stands and additional seating will be available. No outside food may be brought into the Convention Center.	
12:00 Noon – 6:00 p.m.	Intel Quad	West Hall 1
1:15 p.m. – 5:00 p.m.	Finalists at Projects for Interviews Finalists and Judges only—Professional Attire	North Halls 4/5

5:00 p.m. – 7:30 p.m. **Dinner** **North Ballroom 120**
All finalists and Official Party Members are invited to a dinner that will start just as judging ends. Feel free to stop by right away or go back and change prior to the start of the evening entertainment. This dinner will be served buffet style and will be a casual event.

7:30 – 9:00 p.m. **Intel ISEF Evening of Laughter and Spectacle** **North Halls A/B/C**
All finalists and Official Party Members are invited to this special variety show created exclusively for Intel ISEF. The show will be hosted by two members of the cast of Second City from Chicago.

Thursday, May 12

8:00 a.m. – 5:00 p.m. **Intel ISEF 2016 EXPO** **West Hall 2**

8:00 a.m. – 6:00 p.m. **Intel Quad** **West Hall 1**

9:00 a.m. – 3:30 p.m. **Symposia** **West 101 A/B/C, 106 B, 106 C**
See full schedule on pages 38–44.

9:00 a.m. – 9:00 p.m. **Public Visitation Day** **North Halls 4/5**
Finalists' exhibits are open to the public.

10:00 a.m. – 2:00 p.m. **All Finalists Required at Projects** **North Halls 4/5**
Meal vouchers for lunch will be placed at each finalist's booth. These vouchers may be used at Concession Stands inside of North Halls 4/5, in the concourse outside of North Halls 4/5, and in the Marché on the main level of the North Building. Please note that each voucher is time stamped. You may only use the voucher during this time on May 12. If you spend more than the value of the voucher, then you must pay the difference.



7:00 p.m. – 10:00 p.m. Special Awards Ceremony **North A/B/C**
 (Doors open at 6:30 p.m.) — Professional Attire
 Ceremony in which Special Award Organizations, academic institutions and government agencies give awards.

Friday, May 13

7:00 a.m. – 3:00 p.m. Bag Storage **121 A/B**
 Attendees who are leaving Phoenix immediately after the Awards Ceremony may store their bags/suitcases in 121 A/B. This service will be provided at no charge. Bags and suitcases are NOT permitted inside the Ceremony Hall or left in open areas in the Convention Center.

9:00 a.m. – 11:00 a.m. Grand Awards Ceremony **North Halls A/B/C**
 Sponsored by Intel
 (Doors open at 8:30 a.m.) — Professional Attire
 All students are to be seated by 8:45 a.m.
 Awards Ceremony where winners from each category as well as the top overall winners for Intel ISEF 2016 are announced.

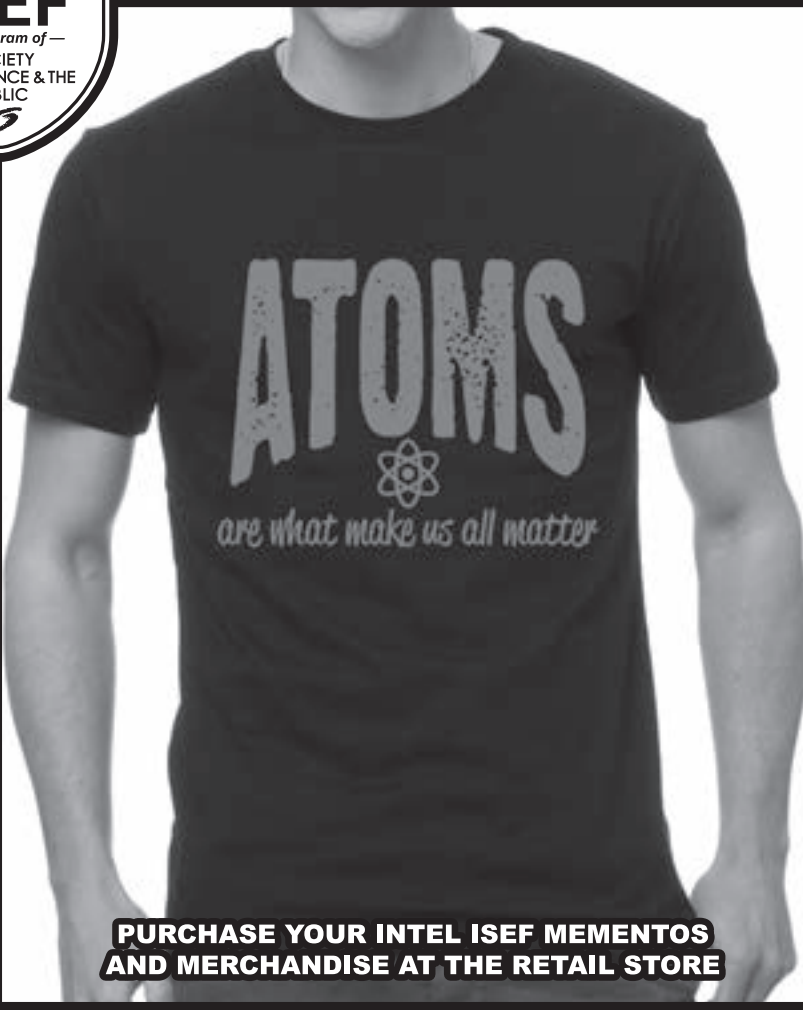
Close of Awards Ceremony – 2:00 p.m. Exhibit Halls Open for Project Teardown **North Halls 4/5**
 Finalists take down and pack projects for return home. Any stored packing material will be at finalists' project booths. Finalists transporting their own projects will load them upon completion of packing. Projects being shipped via UPS or GES/heavy freight must be packed and processed for shipping by 2:00 p.m.





2016 INTEL ISEF

PHOENIX, ARIZONA



**PURCHASE YOUR INTEL ISEF MEMENTOS
AND MERCHANDISE AT THE RETAIL STORE**

INTEL ISEF STORE HOURS:
SATURDAY: 3:00PM - 6:00PM
SUNDAY - MONDAY: 8:00AM - 7:00PM
TUESDAY - WEDNESDAY: 8:00AM - 6:00PM
THURSDAY: 8:00AM - 7:00PM
FRIDAY: 8:00AM - 2:00PM



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Symposia sessions are an opportunity to share information with students, parents, teachers and fair directors, and do not imply endorsement by Society for Science & the Public. No fees have been paid.

Monday, May 9

8:45 a.m. – 9:45 a.m.

West 106 B

Applying to Highly Selective Engineering Schools Outside of the United States

Michelle Beaton, Admissions, University of Toronto, Canada

Catherine Eames, Admissions, Imperial College London, United Kingdom

Advice for students considering their international post-secondary options from admission representatives at two of the most selective engineering schools in Canada and the United Kingdom.

Type: Presentation

Audience: Teachers, Students

8:45 a.m. – 9:45 a.m.

West 106 C

Sharing Best Practices for Student Research Projects

Tina Gibson, Intel ISEF Advisory Council, Lake Mary Preparatory School, Lake Mary, FL

Society for Science & the Public Advisory Council will host a panel discussion focusing on best practices from experienced educators as they guide students who embark on research projects conducted at home, school or through a research facility.

Type: Panel Discussion

Audience: Fair Directors, Teachers & Students

9:15 a.m. – 10:15 a.m.

West 101 A/B/C

Communicating Science

Eva Emerson, Editor in Chief, *Science News*, Society for Science & the Public, Washington, DC

Janet Raloff, Editor, *Science News for Students*, Society for Science & the Public, Washington, DC

Communicating science can be challenging. Attendees will go home with useful tips from some of the best science journalists in the business.

Type: Workshop

Audience: Students

10:00 a.m. – 10:30 a.m.

West 106 B

Capacitive Touchscreens and Touchpads

Dave Gillespie, R&D Fellow, Synaptics, Inc., San Jose, CA

Own a smartphone, tablet or laptop? You're likely using a capacitive touchscreen or touchpad. Learn how it works to enable effective interaction with your devices.

Type: Presentation

Audience: Fair Directors, Teachers & Students

10:00 a.m. – 11:00 a.m.

West 106 C

What Statistical Procedure is Best for My Project

Christopher J. Malone, Winona State University, Winona, MN

This presentation will help students, parents, and teachers identify which statistical procedures are best for middle and high school science fair projects.

Type: Workshop

Audience: Fair Directors, Teachers & Students

10:45 a.m. – 11:45 a.m.

West 101 A/B/C

Navigating Intel ISEF: What You Need to Know to Steer Your Way through the Week

Ingrid Weigand, Austin Science Education Foundation, Austin, TX

Weigand will present an overview of the Intel ISEF week for first time Fair Directors. Learn what to expect each day, deadlines for certain tasks, how to prepare students for judging, events to attend and available resources.

Type: Presentation

Audience: Fair Directors

10:45 a.m. – 11:45 a.m.

West 106 B

The Scientific Revolution: Paying Attention to Science & Technology in a Growing Clueless Society

Dr. Frederic Bertley, Sr. Vice President, The Franklin Institute, Philadelphia, PA

This presentation will discuss the progress of STEM and its impact on a scientific and technological revolution on our society. Cutting-edge innovations and discoveries that can solve the world's greatest challenges and provide hope for future generations will be showcased.

Type: Presentation

Audience: Fair Directors, Teachers & Students

11:15 a.m. – 11:45 a.m.

West 106 C

Fingerprint Sensors

Frank Schwab, System Architect, Synaptics, Inc., San Jose, CA

Shengmin Wen, Principal Development Engineer, Synaptics, Inc., San Jose, CA

What makes your fingerprints unique? Join us for a presentation on how fingerprint sensors can identify who you are with just a single touch.

Type: Presentation

Audience: Fair Directors, Teachers & Students

12:45 p.m. – 2:15 p.m.

West 101 A/B/C

Judging at the Intel ISEF

William and Lorna Glaunsinger, Judging Chairs, Intel ISEF 2016 Phoenix

Join us for a question-and-answer session about judging at the Intel ISEF. The presenters will explain their roles to aid students during judging and provide a brief overview of the judging process for those new to the Intel ISEF.

Type: Presentation

Audience: Fair Directors, Teachers & Students

2:15 p.m. – 3:15 p.m.

West 106 C

Protect Your Intellectual Property: Patents, Trademarks, Copyrights and Trade Secrets

Dr. Jorge L. Valdes and Tanaga Boozer, U.S. Patent and Trademark Office, Alexandria, VA

Learn how intellectual property tools (patents, trademarks, copyrights, trade secrets) can help protect your science and engineering projects and help you continue on the path to innovation. (Same session on Tuesday at 9:15 a.m.)

Type: Workshop

Audience: Fair Directors, Teachers & Students

3:15 p.m. – 4:15 p.m.

West 101 A/B/C

Intel ISEF "Telling Your Story"

Dana Watson and Carolyn Tiernan, North of Nine Communications, New York, NY and Boston, MA

Calling all Intel ISEF finalists! Want to feel more comfortable talking about your Intel ISEF project in simple terms to the general public and/or reporters? Join us for an interactive workshop, led by North of Nine Communications, which will help you develop and tell your Intel ISEF story. (Session will not include judging information.)

Type: Workshop

Audience: Students

3:15 p.m. – 4:15 p.m.

West 106 B

New Society for Science & the Public Initiatives – A Round Table Discussion for Teachers

Caitlin Sullivan, Director of Science Education Programs, Society for Science & the Public, Washington, DC

Learn about the Society's new programs – Society Advocate Grants, Society Research Teacher Conference and *Science News* in High Schools – and discuss other ideas for supporting teachers.

Type: Presentation

Audience: Fair Directors, Teachers

Tuesday, May 10

9:00 a.m. – 9:30 a.m.

West 106 B

Innovative Teaching and Learning – Classroom Technology

Linda Braun, Vice President, Printer Sales, Office Printer Business Group, Ricoh USA, Inc.

Kelli D'Amico, Senior Strategic Recruiter, Ricoh USA, Inc.

Interactive classrooms inspire paperless learning and are the future for learning.

This technology and innovation also bridges from the classroom to the conference room.

Type: Presentation

Audience: Fair Directors, Teachers & Students

9:15 a.m. – 10:15 a.m.

West 101 A/B/C

Life After Science Fair – Leveraging Your Science Fair Experience into Life SuccessMaya Ajmera, President & CEO, Society for Science & the Public and Publisher, *Science News*

Join us to learn how to leverage your Intel ISEF experience into academic and professional success in this panel discussion featuring Intel ISEF and science fair alumni.

Type: Panel Discussion

Audience: Fair Directors, Teachers & Students

9:15 a.m. – 10:15 a.m.

West 106 C

Protect Your Intellectual Property: Patents, Trademarks, Copyrights and Trade Secrets

Dr. Jorge L. Valdes and Tanaga Boozer, U.S. Patent and Trademark Office, Alexandria, VA

Learn how intellectual property tools (patents, trademarks, copyrights, trade secrets) can help protect your science and engineering projects and help you continue on the path to innovation.

Type: Workshop

Audience: Fair Directors, Teachers & Students

10:00 a.m. – 11:00 a.m.

West 106 B

Picturing a Better Project

Jim Lehman, MathScience Innovation Center, Richmond, VA

Learn how to use image processing and analysis to improve STEM projects. Special emphasis will be given to replacing qualitative data with quantitative data. (Bring your own Windows or Mac laptop to follow along during the demonstration portion of the session.)

Type: Presentation

Audience: Teachers, Students

10:45 a.m. – 11:45 a.m.

West 101 A/B/C

Intel ISEF “Telling Your Story”

Dana Watson and Carolyn Tiernan, North of Nine Communications, New York, NY and Boston, MA

Calling all Intel ISEF finalists! Want to feel more comfortable talking about your Intel ISEF project in simple terms to the general public and/or reporters? Join us for an interactive workshop, led by North of Nine Communications, which will help you develop and tell your Intel ISEF story.

Type: Workshop

Audience: Students

10:45 a.m. – 11:45 a.m.

West 106 C

Climate Change, Modeling, and Supercomputers

Mark R. Petersen, Los Alamos National Laboratory, Los Alamos, NM

Climate change research relies on high-resolution computer models to understand the complex, interdependent processes that affect the atmosphere, ocean, and land in the coming century. Join me on a tour of the state of climate change research, how an ocean model works, and how models are validated.

Type: Presentation

Audience: Students

11:15 a.m. – 11:45 a.m.

West 106 B

OSIRIS-REx: Returning a Sample from an Asteroid

Dathon Golish, Lunar and Planetary Laboratory, University of Arizona, Tucson, AZ
OSIRIS-REx is a NASA mission, launching in September, to collect a sample from the surface of asteroid Bennu and return it to Earth.

Type: Presentation

Audience: Fair Directors, Teachers & Students

12:45 p.m. – 1:45 p.m.

West 101 A/B/C

Central Intelligence Agency's (CIA's) Student Programs and Career Opportunities

Michael Cantu, CIA Student Outreach Program Manager, Washington, DC

Doris Johnson, Office of the Director of National Intelligence, Washington, DC

Miracle D. Kidd, CIA Student Outreach Program Coordinator, Washington, DC

Come and join us to learn about the CIA's Undergraduate and Graduate scholarships, Co-op, and Intern Programs and other exciting student opportunities at the CIA.

Type: Workshop

Audience: Teachers, Students

4:15 p.m. – 5:15 p.m.

West 106 C

The Scientific “Myth”od – Using the Science and Engineering Practices Effectively

Jen Gutierrez and Amy Gingell, Arizona Department of Education, Phoenix, AZ

Integrate the Science and Engineering Practices from A Framework for K – 12

Science Education to engage students in investigations and research while increasing science conceptual understanding.

Type: Presentation

Audience: Teachers

4:15 p.m. – 5:15 p.m.

West 106 B

Sustainability Science for the STEM Classroom

Erin Redman, Program Manager, National Sustainability Teachers' Academy, Arizona State University, Tempe, AZ

This symposium views STEM education through the lens of sustainability. Through examination of a sustainability problem, attendees learn about potential solutions, trade-offs and intervention points.

Type: Workshop

Audience: Teachers

Wednesday, May 11

8:45 a.m. – 9:45 a.m.

West 106 B

Rural Science and Engineering Fairs “Un-workshop”

Stefany Burrell, Maine State Science Fair, Augusta, ME

In this un-workshop, participants will choose the topics they want to discuss pertaining to their challenges and successes in running science fairs in rural areas.

Type: Workshop

Audience: Fair Directors, Teachers

10:00 a.m. – 11:00 a.m.

West 106 B

A Smorgasbord of Technology Tips and Tricks

Kris Clements, Intel ISEF Advisory Council Member, Caddo Parish Magnet High, Shreveport, LA

Many Google items that are useful for all interested will be illustrated, as well as a few other items that are helpful to teachers.

Type: Presentation

Audience: Fair Directors, Teachers & Students

10:00 a.m. – 11:30 a.m.

West 101 A/B/C

SRC – 2017 Rules and Guidelines

Chris Miller, Chair, Intel ISEF Scientific Review Committee

Meet with members of the Intel ISEF Scientific Review Committee to learn of changes in the 2017 International Rules and Guidelines. After the presentation, there will be a Q&A period.

Type: Presentation

Audience: Fair Directors, Teachers & SRC Members

11:15 a.m. – 11:45 a.m.

West 106 B

More Kids, Less Work (for teachers): Using a Scaled Standards based Curriculum to Embed and Increase Participation in and/or Introduce Science Fair to Students

Tim Guldán, 2002 and 2003 Intel ISEF Alumni, Educator, New Ulm, MN

A new approach to introduce and increase participation in a school science fair, while using a standards based grading structure and Google platforms.

Type: Workshop

Audience: Fair Directors, Teachers

1:15 p.m. – 2:15 p.m.

West 101 A/B/C

Intel ISEF Display & Safety Rules

Diane Hecht, Chair, Intel ISEF Display & Safety Committee

Come join the Display & Safety Committee to discuss infractions encountered this year as well as changes to the rules and guidelines for 2017. Bring your questions for the committee to answer.

Type: Panel Discussion

Audience: Fair Directors, Teachers

2:30 p.m. – 4:00 p.m.

West 106 B

Intel ISEF Scientific Review Committee – SRC Project Review

Chris Miller, Chair, Intel ISEF Scientific Review Committee

Meet with members of the Intel ISEF Scientific Review Committee to discuss project review by local and regional SRC's and to review “sample” projects. This session is limited to 25 participants who are members of local or regional SRC's. Online registration is required at <http://doodle.com/poll/6kdq64v6fb2vzqe9> before Wednesday to attend.

Type: Workshop

Audience: Local & Regional SRC members

Thursday, May 12

9:00 a.m. – 10:00 a.m.

West 106 C

Innovation and Patents

James P. Mitchell, P.E., LLC, STS and ISEF Alumnus, Cedar Rapids, IA
Jim Mitchell, P.E., Society for Science & the Public alumnus and LED TV inventor, will share how his innovation as a youth and his award-winning digital telephone voice answering system he developed while attending Iowa State University led him to his life-long career at Rockwell Collins and his expertise with writing patents.
Type: Presentation Audience: Fair Directors, Teachers & Students

9:00 a.m. – 11:00 a.m.

West 106 B

Intel ISEF SRC Office Hours

Chris Miller, Chair, Intel ISEF Scientific Review Committee
Sign up for a 15 minute one-on-one meeting to talk with the Intel ISEF SRC. Bring your specific fair questions and concerns and have the opportunity to address issues and find solutions that work for your fair. Must register online at <http://doodle.com/poll/hy58bemp6hngs32a> before Thursday morning. Limited number of appointments available.
Type: Individual Meeting Audience: Fair Directors, SRC/IRB Chairs & Teachers

10:30 a.m. – 11:00 a.m.

West 106 C

Too Young to Publish Science? Think Again!

Eman Ghanem, Director of Membership, Chapters and Programs, Sigma Xi, The Scientific Research Society, Raleigh, NC
Publishing scientific research is a challenging process. Learn how to convert your project into a manuscript and where to submit it for publication.
Type: Presentation Audience: Teachers, Students

11:15 a.m. – 11:45 a.m.

West 106 C

Digital Science Fairs for a Digital World

Andrea Krell, Madison County High School, Madison, FL
Overwhelmed with traditional presentation boards in your school fair? Make the switch to digital presentations! Learn how to manage a cloud-based, environmentally-friendly fair.
Type: Presentation Audience: Fair Directors, Teachers & Students

12:45 p.m. – 1:45 p.m.

West 106 B

Broadcom MASTERS: Society for Science & the Public's National Middle School STEM Competition

Allie Stifel, Program Manager, Broadcom MASTERS, Society for Science & the Public, Washington, DC
This symposium will provide an overview of the Broadcom MASTERS competition, tips for encouraging students to apply, Q&A with former Broadcom MASTERS top 30 finalists, and more!
Type: Presentation Audience: Fair Directors, Teachers & Students

12:45 p.m. – 1:45 p.m.

West 106 C

Nuts and Bolts on Intellectual Property Law

Kiran K. Patel, KramerAmado, P.C., Washington, DC
Ukeme Awakessien Jeter, McDonald Hopkins, Cleveland, OH
Explore the basic concepts of utilizing intellectual property through an overview of patents, trademarks and copyrights. Following will be a Q&A period for questions.
Type: Presentation Audience: Fair Directors, Teachers & Students

2:30 p.m. – 3:30 p.m.

West 106 B

Admit Me!

Jamilla Jamison, Associate Director of Admission, Harvey Mudd College, Claremont, CA

Chris Peterson, Assistant Director of Admission, Massachusetts Institute of Technology, Cambridge, MA

Admission Officers are commonly asked how students can capitalize on their research experience during the college search and admission process. Come find out from two highly experienced admission officers!

Type: Presentation

Audience: Fair Directors, Teachers & Students

2:30 p.m. – 3:30 p.m.

West 106 C

So, You Want to Be an Astronaut?

David Mackay, Chief Astronaut Test Pilot with Virgin Galactic

Col. (Ret.) Andre Gerner, session moderator, SETP, Colorado Springs, CO

David Mackay relates his flight test experiences leading up to his current position as Chief Astronaut Test Pilot of SpaceShipTwo with Virgin Galactic.

Type: Presentation

Audience: Fair Directors, Teachers & Students





Phoenix Restaurants**Arizona Center**

1130 The Restaurant	455 N. 3rd Street, #1130	(602) 368-3046
Boka Pizza	455 N. 3rd Street, #1030	(602) 281-6121
Canyon Café	455 N. 3rd Street, #114	(602) 252-3545
Corner Bakery	455 N. 3rd Street, #1065	(602) 252-1346
Cucina Cucina Modern Italian	455 N. 3rd Street, #108	(602) 651-1878
Hooters	455 N. 3rd Street, #190	(602) 495-1234
KoKoRo Sushi	455 N. 3rd Street, #1120	(602) 254-3366
Mi Amigo's Mexican Grill	455 N. 3rd Street, #150	(602) 256-7355
Powered Up Nutrition	455 N. 3rd Street, #1080	(480) 430-0703
Starbucks	455 N. 3rd Street	(602) 258-8472
Subway	455 N. 3rd Street, #1015	(602) 258-7560

CityScape

Arrogant Butcher	2 E. Jefferson Street, #150	(602) 324-8502
Blue Hound Kitchen & Cocktails	2 E. Jefferson Street	(602) 258-0231
Breakfast Club	2 E. Jefferson Street, #213	(602) 354-7284
Chipotle	11 W. Washington Street, #140	(602) 513-5751
Corner, The	50 W. Jefferson Street, #100	(602) 252-7600
Copper Blues Rock Pub & Kitchen	50 W. Jefferson Street, #200	(480) 719-5005
Five Guys	50 W. Jefferson Street, # 180	(602) 687-7575
Fractured Prune	50 W. Jefferson Street#100	(602) 795-3004
Grabbagreen	50 W. Jefferson Street, #120	(602) 734-9200
Jimmy John's	11 W. Washington Street, # 175	(602) 688-8170
Lucky Strike	50 W. Jefferson Street, #240	(602) 732-5490
Lustre Rooftop Bar	2 E. Jefferson Street (Hotel Palomar)	(480) 478-1765
Pizza Studio	11 W. Washington Street, #120	(602) 441-3311
Potbelly Sandwich Shop	1 E. Washington Street, #170	(312) 519-3679
Squid Ink Sushi Bar	2 E. Jefferson, # 108	(602) 258-0510
Starbucks	50 W. Jefferson, # 170	(602) 340-0455
Strand, The	2 E. Jefferson Street, #113	(602) 253-1600
Tilted Kilt	2 E. Jefferson Street, #27-217	(602) 293-3888
Yogurt Time	1 E. Washington Street, #180	(602) 258-0899

Downtown

Alice Cooper'stown Phoenix	101 E. Jackson Street	(602) 253-7337
Angels Trumpet Ale House	810 N. 2nd Street	(602) 252-2630
Bitter & Twisted Cocktail Parlour	1 W. Jefferson Street	(602) 340-1924
Bliss ReBAR	901 N. 4th Street	(602) 795-1792
Bowl of Greens	555 N. Central Avenue, #102	(602) 795-9710
Breadfruit and Rum Bar, The	108 E. Pierce Street	(602) 267-1266
Carly's Bistro	128 E. Roosevelt Street	(602) 262-2759
Chambers	705 N. 1st Street	(602) 296-5043
Coach's Corner Grill	333 E. Jefferson Street, #110	(602) 293-3332
Coney Island Grill	16 W. Adams Street	(602) 253-0292
Compass Arizona Grill	122 N. 2nd Street	(602) 440-3166
Counter, The	50 N. Central Avenue	(602) 466-3411
Crave Sandwich Café & Catering	541 E. Van Buren Street, #B3	(602) 257-1616
Crescent Ballroom	302 N. 2nd Avenue	(602) 716-2222
Desoto Central Market	915 N. Central Avenue	(602) 680-7747
District American Kitchen and Wine Bar	320 N. 3rd Street	(602) 817-5400
Downtown Pizza Lounge	144 E. Washington Street	(602) 254-1522
Duce, The	525 S. Central	(602) 866-3823
Einstein Bros Bagels	122 N. 2nd Street	(602) 440-3185

El Portal Mexican Grill	555 N. Central Avenue, #106	(602) 296-7029
Enjoy Sushi	2 N. Central Avenue	(602) 595-2880
Fired Pie	201 E. Washington Street, #111	(602) 374-3888
Focaccia Fiorentina	112 N. Central Avenue	(602) 252-0007
Forno 301	301 W. Roosevelt Street	(480) 787-5654
Hanny's	40 N. 1st Street	(602) 252-2285
Hard Rock Cafe Phoenix	3 S. 2nd Street, #117	(602) 261-7625
Hero Factory, The	114 W. Adams Street, #C102	(602) 254-6763
Hsin Café	120 E. Taylor Street, #150	(602) 254-6337
Icon Lounge	50 E. Adams Street	(602) 333-5111
Kettle Black Kitchen & Pub, The	1 N. 1st Street	(602) 651-1185
La Piazza PHX	1 N. 1st Street, #103	(602) 795-7116
Majerle's Sports Grill	24 N. 2nd Street	(602) 253-0118
Marston's Café	50 E. Adams Street	(602) 333-0000
Matt's Big Breakfast	825 N. 1st Street	(602) 254-1074
Moirá Sushi Bar & Kitchen	215 E. McKinley Street, #102	(602) 254-5085
Mornin' Moonshine	111 W. Monroe Street, #111	(602) 867-5309
Mother Bunch Brewing	825 N. 7th Street	(602) 368-3580
Networks Bar & Grill	122 N. 2nd Street	(602) 440-3198
Nobuo at Teeter House	622 E. Adams Street	(602) 254-0600
Nook Kitchen	15 E. Monroe Street	(602) 258-1037
Papa Christo's	2 N. Central Avenue, #117	(602) 261-7780
Phoenix Public Market Cafe	14 E. Pierce Street	(602) 253-2700
Pita Jungle	1001 N. 3rd Avenue	(602) 258-7482
Pizza Hut/Wing Stop	702 N. 1st Street	(602) 229-1133
Pizzeria Bianco	623 E. Adams Street	(602) 258-8300
Pomo Pizzeria Napoletana	705 N. 1st Street, #120	(602) 795-2555
Province Urban Kitchen & Bar	333 N. Central Avenue	(602) 429-3600
Rice Paper	202 N. Central Avenue	(602) 252-1223
Rose and Crown	628 E. Adams Street	(602) 256-0223
Seamus McCaffrey's Irish Pub & Restaurant	18 W. Monroe Street	(602) 253-6081
Sing High Chop Suey House	27 W. Madison Street	(602) 253-7848
SpoonZ Café	2 S. 2nd Street	(602) 252-2042
Starbucks	125 N. 2nd Street, #100	(602) 534-8901
Steve's Greenhouse Grill	139 E. Adams Street	(602) 252-2742
Subway on Central	144 N. Central Avenue	(602) 271-9866
Taylor Place Residential Restaurant	120 E. Taylor Street	(602) 496-6708
Thai Basil Signature Downtown	114 W. Adams Street, #C104	(602) 759-8737
Terrace Café	122 N. 2nd Street	(602) 440-3180
TGI Friday's Front Row Sports Grill	401 E. Jefferson Street	(602) 462-3506
Tom Yum Thai Restaurant	110 N. Central Avenue	(480) 420-8424
Tommy Pastrami New York Deli	201 E. Washington Street, #109	(602) 222-3354
Tom's Tavern & 1929 Grill	2 N. Central Avenue	(602) 257-1688
VIG Fillmore, The	606 N. 4th Avenue	(602) 254-2242
Vegan House	20 W. Adams Street	(602) 258-3426
Yasda Bento	18 W. Adams Street	(602) 254-7174
Z Pizza Downtown	111 W. Monroe Street, #130	(602) 254-4145
Zeez Grill	209 W. Jackson Street, #170	(602) 296-4661

Phoenix Attractions, Services, Medical Care, Entertainment

Banks

Bank of America	201 E. Washington Street	(602) 523-2371
Chase Bank	201 N. Central Avenue	(602) 221-4724
Midfirst Bank	2 N. Central Avenue	(602) 955-2306
US Bank	101 N. 1st Avenue, #110	(602) 257-5470
Wells Fargo	701 S. Central Avenue	(602) 528-7544

Copy and Mail Services

FedExOffice Print & Ship Center	201 E. Washington Street, #101	(602) 252-4055
FedEx (inside Sheraton Hotel)	340 N. 3rd Street	(602) 258-0266
O'Neil Printing	366 N. 2nd Avenue	(602) 258-7789
UPS	125 N. 2nd Street, #110	(602) 251-0135
UPS (inside Convention Center)	111 N. 3rd Street, A002	(602) 254-6900

Drugstores

CVS—CityScape Downtown	50 W. Jefferson Street, #140	(602) 296-7611
CVS	1525 N. Central Avenue	(602) 256-2124
Walgreens	705 E. McDowell Road	(602) 258-4865

Grocery Store – *Outside food cannot be brought into the Phoenix Convention Center*

Safeway	340 E. McDowell Road	(602) 252-4538
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Medical Hospitals

Banner Good Samaritan	1111 E. McDowell Road	(602) 239-2000
Carl T. Hayden VA Medical Center	650 E. Indian School Road	(602) 222-6550
Phoenix Memorial Hospital	1201 S. 7th Avenue	(602) 258-5111
St. Joseph's Hospital	350 W. Thomas Road	(602) 406-3000
St. Luke's Medical Center	1800 E. Van Buren Street	(602) 251-8100

Urgent Care

ASU Health Center	500 N. 3rd Street, Suite 155	(602) 496-0721
Express Urgent Care – Central Phoenix	333 W. Thomas Road, #100	(623) 322-5900

Dental Care

Downtown Phoenix Dental	111 W. Monroe Street, #131	(602) 626-7952
Western Dental Center	530 E. McDowell Road, #101	(602) 258-2371

Shopping/Entertainment/Miscellaneous Stores

For all attractions, go to www.visitphoenix.com/things-to-do/

Arizona Center	400 E. Van Buren Street, #450	(602) 271-4000
AMC Theaters	565 N. 3rd Street	(602) 307-5371
CityScape	1 E. Washington Street	(602) 772-3900
Lucky Strike (at CityScape)	50 W. Jefferson Street, #240	(602) 732-5490

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An * identifies non-competing projects

T: precedes the name of the Teacher-Sponsor of the Finalist

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AMERICAN SAMOA

Pago Pago, TEAS01, American Samoa Science Fair

BCHM027 Microbial Fuel Cell: From Your Toilet to Your Outlet

Aitulagi Wanda Lei Alofa, 14, Freshman, Manumalo Academy, Pago Pago, American Samoa, T: Miriam Parungo Mirasol

PLNT030 Plant Vaccination: Turmeric (*Curcuma longa* L.) Induced Self-Defense Priming in Chinese Cabbage (*Brassica rapa* L.)

Charu Joserose, 17, Senior, Tafuna High School, Pago Pago, American Samoa, T: Valasi Apulu

PLNT045 A Scientific Attempt to Decrease the Mortality Rate of *Solanum lycopersicum* Plants in Tropical and Subtropical Areas

Ambika Murali, 17, Senior, Leone High School, Pago Pago, American Samoa, T: Ian Gurr

ARGENTINA

Ciudad de Buenos Aires, ARG001, National Science Fair of Argentina

EBED003T IP Intercom

Nuria Rocio Orquin, 18, Senior; Jason Leonel Linares, 19, Senior, Escuela de Educacion Secundaria Tecnica Numero 1 "Republica del Paraguay," Ituzaingo, Argentina, T: Javier Dario Canete

AUSTRALIA

Melbourne, AUS003, BHP Billiton Science and Engineering Awards

BMED057 Caerin 1.9: A Possible Treatment for Alzheimer's Disease? Investigating the Effects of the Caerin 1.9 Peptide on Amyloid-beta Aggregation and Phagocytosis by Cultured Microglia

Hannah Jane Sutton, 16, Junior, St. Mary's College, Hobart, Australia, T: Heather Omant

EAEV055T Designing a Program to Investigate Correlation between Rising Sea Levels and Water Loss from Antarctica and Greenland

Terence Michael Johnson, 16, Junior; Lachlan Wilson, 16, Junior, Daramalan College, Canberra, Australia, T: Colin Price

EGPH022 No Strings Attached: An Investigation into Wireless Charging

Hayden James Goodwin, 18, Senior, Trinity Anglican School, Cairns, Australia, T: Brian Springell

ENBM028 Possideo Manus: Inexpensive Prosthesis for Those Who Truly Need Them

Hugh Langham McKay, 16, Sophomore, Rose Bay High School, Hobart, Australia, T: Nicole Green

TMED023 Dental Whitening and Enamel Loss

Madeleine Maloof, 16, Junior, Presbyterian Ladies' College Sydney, Sydney, Australia, T: Jo-Ann McGrouther

Sydney, AUS002, Young Scientist

EGPH023 The Solar System: A Green Power & Water Cleaning Invention for Improved Life Quality in Developing Communities

Macinley Neve Butson, 15, Sophomore, The Illawarra Grammar School, Mangerton, Australia, T: Fiona Neal

ENEV084 All in a Nutshell: Synthesis and Analysis of Novel Bioplastics Enhanced with Organic Wastes

Aniruddh Chennapragada, 15, Sophomore, James Ruse Agricultural High School, Sydney, Australia, T: Sheila Pooviah

- ENEV099** **Lemnoideae: A Sustainable Bioremediation Treatment Targeting Eutrophication**
Minh Nga Nguyen, 15, Sophomore, Sydney Girls High School, Sydney, Australia, T: Elizabeth O'Connor
- MATS045** **Leg-e-vator: An Answer for Lower Leg Edema, Immobility and Venous Insufficiency**
James Alexander Poyitt, 16, Junior, Redeemer Baptist School, North Parramatta, Australia, T: Stuart Garth
- PLNT043** **The Spread of Seeds through Cattle**
Jade Moxey, 16, Sophomore, Sapphire Coast Anglican College, Bega, Australia, T: Warwick Adams
- SOFT038** **Eye Connect: Using Computer Vision to Create Low-Cost Assistive Technology**
Samuel Kantor, 17, Junior, Moriah College, Sydney, Australia, T: Stephanie Schwarz

AUSTRIA

Vienna, AUT001, Vienna International Science and Engineering Fair

- ENEV096T** **Innovative CKD Treatment**
Lukas Maier, 18, Senior; Dominik Klotz, 19, Senior, HTL Dornbirn, Dornbirn, Austria, T: Rudolf Sams
- ROBO038** **Extraction of Symbolic Patterns from the Web**
Bernhard Geisberger, 19, Senior, H.T.B.L.A. Grieskirchen, Grieskirchen, Austria, T: Wolfgang Kaiser

AZERBAIJAN

Baku, AZR001, Azerbaijan Science and Engineering Fair

- ENEV075T** **Universal Biocomposition for the Enhancement of Oil Recovery from High-Temperature Oilfields (Case Study: Azerbaijan)**
Ayshan Aliyeva, 16, Sophomore; Ali Aliyev, 16, Sophomore, Lyceum Named after Academician Zarifa Aliyeva, Baku, Azerbaijan, T: Natalya Gurbanova
- MATS039T** **Development of a Stand-off Distance System for Detecting Hidden Hazardous Materials**
Madat Sardarli #, 16, Sophomore; Nigar Sardarli #, 17, Junior, Lyceum Named after Academician Zarifa Aliyeva, Baku, Azerbaijan, T: Aygun Azizova
- MATS040T** **Development of Materials for Optoelectronics: Understanding the Local Structure and Optical Properties of Ternary Chalcogenide Glasses**
Arzu Mammadova, 16, Junior; Narmin Aydarova, 17, Junior, Baku European Lyceum, Baku, Azerbaijan, T: Saadat Veysova

BANGLADESH

Dhaka, BGD001, Bangladesh Regional Science Fair

- ENEV109** **Consolidated Use of Waste Plastic Bricks for Regional Infrastructure**
Afra Nawar, 17, Junior, Bangladesh International School & College, Dhaka, Bangladesh, T: Animesh Samundh
- ROBO042T** **ANSME: Robot Learning 3 Dimensional Actions by Watching 2 Dimensional YouTube Video**
MD Shariful Islam Rafi, 17, Junior; Shaekh Mohammad Shithil, 17, Junior, Adamjee Cantonment School and College, Dhaka, Bangladesh; St. Joseph Higher Secondary School, Dhaka, Bangladesh, T: Sumon Pal, Mohammad Mizanur Rahman

BELARUS

Minsk, BLR001, BelISEF

- ENEV012** **Ecoash "Three Bears:" New Eco-Friendly Fire Retardant for Wildfires Prevention**
Darya Zaleskaya, 15, Freshman, Starobin High School, Starobin, Belarus, T: Natalya Grinko
- ENMC009** **Prop-plane**
Aliaksei Barysevich, 17, Junior, Minsk State Regional Lyceum, Minsk, Belarus, T: Mikhail Zharnasek

- MCRO004T** **Anti-Fire-Blight Effect of Bacteriophage phiEa2809**
Nastassia Vlasavets, 17, Junior; Ulyana Krauchanka, 17, Junior, Minsk State Regional Lyceum, Minsk, Belarus, T: Aliaksandr Lahanenka
- BRAZIL**
Novo Hamburgo, BRA001, International Fair of South America - MOSTRATEC
- BEHA001T** **Educational Virtual Reality**
Arthur Garcia Proenca, 17, Senior; Fernando Duarte Pascoal, 16, Junior, Colegio Coracao de Maria, Esteio, Brazil, T: Rinaldo Cesar de Oliveira Jesus
- BEHA002** **The Bare Bones of Brazilian Military Rule: Constructing a Population and Injury Profile of Skeletons Unearthed from a Clandestine Ditch and the Current Need for the Enforcement of the Rule of Law**
Julia Albergaria Guedes, 17, Senior, Escola Antonietta e Leon Feffer, Sao Paulo, Brazil, T: Rodrigo Andrade Cruz
- BMED001T** **Larvicidal Effects of the Major Essential Oil of Eugenia Uniflora (Myrtaceae) L. Against Aedes aegypti L.**
Danielle Errobidarte Matos, 17, Senior; Isabelle Errobidarte de Matos, 17, Senior, Colegio Status, Campo Grande, Brazil; Instituicao de Ensino Cultura e Pesquisa Cicero Fernandes Colegio ABC/CBA, Campo Grande, Brazil, T: Denis Souza Ferreira
- EAEV001T** **Alert System for Forests Fires**
Barbara da Silva Enderle, 19, Senior; Fernanda Schafer Tesch da Silva, 19, Senior, Fundacao Escola Tecnica Liberato Salzano Vieira da Cunha, Novo Hamburgo, Brazil, T: Luiz Fernando Guilhao Galbarino
- EAEV002** **Reusing of Coconut Fiber and Used Vegetable Oil and the Application of TiO₂ Nanotubes in Air Filter**
Pedro Victor Dias de Souza, 18, Senior, Governador Adauto Bezerra, Juazeiro do Norte, Brazil, T: Luiza Maria Valdevino Brito
- EBED001T** **Time-Domain Reflectometry Applied to Irrigation Control**
Fabiane Kuhn, 19, Senior; Guilherme de Oliveira Ramos, 18, Senior, Fundacao Escola Tecnica Liberato Salzano Vieira da Cunha, Novo Hamburgo, Brazil, T: Marco Cesar Sauer
- EBED002T** **Research Plan Virtual Keyboard**
Isabelli Pinto Gomes, 17, Senior; Christian Marques de Oliveira Silva, 18, Senior, Escola Tecnica Estadual Henrique Lage, Niteroi, Brazil, T: Altair Martins dos Santos
- ENMC001T** **Versatile Freeze Plug Extractor**
Alex de Oliveira Pertille, 18, Senior; Leandro Jose Steffen, 19, Senior; Robson Regra Koch, 18, Senior, Fundacao Escola Tecnica Liberato Salzano Vieira da Cunha, Novo Hamburgo, Brazil, T: Sandro Heleno Auler
- MATS001T** **The UV Protection Level of the Materials**
Sthefany Aline Dutra Falcao Silva, 16, Junior; Juliana Macedo Abilio, 18, Junior, Centro de Ensino Medio 02 do Gama, Gama, Brazil, T: Sebastiao Ivaldo Carneiro Portela
- Sao Paulo, BRA002, FEBRACE - Feira Brasileira de Ciencias e Engenharia*
- BMED049** **Allergy Prevention: Identifying Milk Antigens in Food**
Lorena Dal Collina Sangiuliano, 17, Senior, Colegio Dante Alighieri, Sao Paulo, Brazil, T: Carolina Lavini Ramos
- ENBM029T** **Venus: Vascular Locator**
Marcia Cunha dos Santos, 19, Senior; Carolina Rosa Kelsch, 19, Senior, Fundacao Escola Tecnica Liberato Salzano Vieira da Cunha, Novo Hamburgo, Brazil, T: Lucas Luis Gutkoski
- ENBM036** **Trapping Phantoms into Robots: A New Control Method and Design for Transradial Myoelectric Prostheses and Induced Penfield's Map Cortical Remapping for Tactile Feedback**
Luiz Fernando da Silva Borges, 17, Senior, Instituto Federal de Educacao, Ciencia e Tecnologia do Mato Grosso do Sul - Campus Aquidauana, Aquidauana, Brazil, T: Leandro de Jesus
- #**

- ENEV053T Water Quality Improvement and Development of Bakery Products with the Residue of *Jucara acai* Pulp**
Joao Vitor Kingeski Ferri, 18, Senior; Maria Eduarda Santos de Almeida, 17, Senior, Instituto Federal de Educacao, Ciencia e Tecnologia do Rio Grande do Sul - Campus Osorio, Osorio, Brazil, T: Flavia Santos Twardowski Pinto
- ENEV067 Easy Water: One New Easy Handling Physico-Chemical Treatment Unit, with Microbiological Action, Powered by Solar Energy**
Ygor Requenha Romano, 18, Senior, Escola Estadual de Ensino Fundamental Murilo Braga, Porto Velho, Brazil, T: Francisco das Chagas Silva
- PLNT025 Evaluation of the Use of Seed, Leaf and Bark Extracts from Sugar Apple (*Annona squamosa*) to Control *Aedes aegypti* and *Cryptotermes brevis***
Kevyn Danuway Oliveira Alves, 18, Senior, Escola Estadual 11 de Agosto, Umarizal, Brazil, T: Bruno Bezerra de Sousa
- SOFT018T Yarner: Study of Technologies Inside Classrooms Focusing on Literacy with the Development of a Digital Web and Mobile Application**
Rafael Eiki Matheus Imamura, 19, Senior; Laura Rubia Paixao Boscolo, 18, Senior, Colegio Tecnico de Campinas, Campinas, Brazil, T: Andreia Cristina de Souza
- TMED018T Formulation Development Containing Beta-Caryophyllene and Evaluation of Its Antitumoral Activity**
Fabricio Felipe dos Santos, 18, Junior; Daniel Barbosa de Castro, 19, Junior, Instituto Federal de Educacao, Ciencia e Tecnologia do Rio de Janeiro - Unidade Rio de Janeiro, Rio de Janeiro, Brazil, T: Vivian de Almeida Silva
- TMED020 Development of Beta-Galactosidase Reusable Micro-Capsules for Lactose Intolerant People**
Maria Vitoria Valoto, 15, Junior, Colegio Interativa, Londrina, Brazil, T: Fabio Luiz Ferreira Bruschi

BULGARIA

Sofia, BGR001, Bulgarian Science and Innovation Fair

- MATH001 On the Coverings of $\{0,1,2\}^n$ with Minimal Cardinality**
Dona-Maria Radoslavova Ivanova, 17, Junior, Baba Tonka High School of Mathematics, Ruse, Bulgaria, T: Evelina Mincheva
- MATH002 On the Size of Unions of Lines in F_n Obeying the Wolff Axiom**
Kristian G. Georgiev, 18, Senior, Model High School of Mathematics "Akademik Kiril Popov", Plovdiv, Bulgaria, T: Lalka Lilova
- MATH003 Simulation of an Ecosystem on a Toroidal Lattice with Three Species**
Paolina Stoyanova Gadjulova, 18, Junior, Model High School of Mathematics "Akademik Kiril Popov", Plovdiv, Bulgaria, T: Tsvetana Dimitrova

CANADA

Canada, CAN002, Youth Science Canada – Team Canada

- CELL057 Novel Cancer and Viral Infection Treatment via Antisense RNA-Guided Selective Protein Expression**
Matteo Bomben, 18, Senior, Holy Trinity School, Richmond Hill, Canada, T: Nina Dolgovkyh
- EAEV060 Geochemical Extraction of Ceratopsian Remains and Opal from Ironstone #**
Emily Grace Cross, 16, Sophomore, Hammarskjold High School, Thunder Bay, Canada, T: Rosemary McNabb
- EAEV067 NEW Low-Cost System Uses Novel Visual Aid to Improve the Quality and Accessibility of Water in Developing and 3rd World Countries**
Rachel Elizabeth Brouwer, 14, Freshman, Bedford Academy, Bedford, Canada, T: Nancy Wallace
- ENEV088 NOGOS: A Novel Nano-Oligosaccharide Doped Graphene Sand Composite Water Filter for Developing Countries**
Marcus Douglas Anthony Deans, 14, Freshman, Academie Ste. Cecile International School, Windsor, Canada, T: Martin Tang
- MCRO065 Boosting MFC Biocatalyst Performance: A Novel Gene Identification and Consortia Engineering Approach**
Han Jie (Austin) Wang, 18, Senior, David Thompson Secondary, Vancouver, Canada, T: Albert Chang

PLNT044	Comprehensive RNA Profiling Identifies Novel Blackleg Resistance Genes in Canola Dennis Adrian Drewnik, 17, Senior, Sisler High School, Winnipeg, Canada, T: Bill Warnick
SOFT051	Psychological Classification by Applying Deep Learning to Social Media Text Daniel Mogilny, 17, Senior, Holy Trinity School, Richmond Hill, Canada, T: Nina Dolgovykh
TMED044	pH-Dependent Colorimetric Assays for Biomarking Amino Acids Nathan William Kuehne, 18, Senior, Glenlyon Norfolk School, Victoria, Canada, T: Erin Dallin
<i>Hamilton, CAN001, Bay Area Science and Engineering Fair</i>	
ENBM063	TiC- Tongue Interface Communication: Assistive Technology for Severe Impairments Emma Marie Mogus, 17, Senior, White Oaks Secondary School, Oakville, Canada, T: George Gezcy
ENBM064	Synthesis of Thermoresponsive pNIPAM-b-HEA Block Co-Polymer Hydrogels for Drug Delivery Applications Radhika Khanna, 18, Senior, Westmount Secondary School, Hamilton, Canada, T: Ming Chong
MATS053	Surface Modification of Polycaprolactone and Hydroxyapatite Endosseous Implant Fixture Coatings Samna Tariq Aziz, 18, Senior, Westmount Secondary School, Hamilton, Canada, T: Ming Chong
<i>Montreal, CAN004, Montreal Regional Science and Technology Fair</i>	
BMED033	Stem Cell Expansion in Culture Jonathan St-Onge, 17, Junior, Laval Senior Academy, Laval, Canada, T: Heather Gean McPherson
ENBM022	Dialysave: Affordable Dialysis Designed for Developing Countries Anya Pogharian, 19, Senior, Marianopolis College, Westmount, Canada, T: Jill Ranger
ENEV040	HEXA Leaf: Designing a Biologically Inspired Artificial Leaf Capable of Capturing and Transforming Carbon Dioxide Emissions and Sequestering Airborne Pollutants via Photosynthetic Oxygen Evolution and Phytotransformation Wilfred Aldo Mason, 17, Junior, Holy Trinity School, Richmond Hill, Canada, T: Heather McPherson
ENEV079	SUPER-PLANT: A Multifunctional Sustainable Energy System for the Curbing and Mitigation of Greenhouse Gas Emissions Thomas Raimundo Ribeiro, 15, Sophomore, Laval Senior Academy, Laval, Canada, T: Heather Gean McPherson
CHILE <i>Santiago, CHL001, EXPLORA National Youth Science Conference</i>	
EAEO051T	Water Quality Evaluation of Rahue River in the City of Osorno, through the Use of Biological Indexes Ariel Queulo, 17, Sophomore; Eduardo Perez, 16, Sophomore, Colegio Emprender, Osorno, Chile, T: Ulises Mosqueira
SOFT030T	Seismic Alerter (Spanish: Alertador Sismico) Roxana Cuevas, 17, Sophomore; Claudia Poblete, 16, Sophomore, Liceo Polivalente Hnas Maestras de la Santa Cruz, Laja, Chile, T: Claudio Valenzuela
CHINA <i>China, CHN001, China Adolescents Science and Technology Invention Contest</i>	
CBIO027	The Prediction of Fluid Intelligence based on Human Connectome Data Using Deep Neural Networks Yuhan Jiang, 17, Senior, Beijing Number 4 High School, Beijing, China, T: Shuai Kang
CHEM017	A Novel Method of Fast Removal of Pollutants from Vehicle Emissions during Cold-start Ran Wang, 17, Junior, No. 2 High School of East China Normal University, Shanghai, China, T: Feng Qian

CHEM034	Developing the "Effective Electrons" Model to Improve the Calculation Method of Valence-shell Electron-pair Runchen Hong, 18, Senior, The No.1 Middle School of Tong'an, Xiamen Tong'an, China, T: Debing Luo
EBED014	Ubiquitous Intelligent Platform (ONRUN Platform) Chentian Li, 15, Sophomore, Zhuhai No.1 High School, Zhuhai, China, T: Shuanghai He
EBED015	A Passive and Wireless Water Sensor Chenzi Wang, 16, Junior, Jin Ling High School, Nanjing City, China, T: Qijun Zhang
ENBM023	A Feasible Solution to High Frequency Loss Based on Transposing Fundamental Frequency Yiwei Song, 18, Senior, High School Affiliated to Fudan University, Shanghai, China, T: Qiang Wu
ENEV027	Device for Odor Removal in Drinking Water: Treatment of Organic Micro-Polluted Drinking Water with Electro-Oxidation Enhanced by Microporous Aeration Zhi Chen, 17, Senior, Hangzhou No.2 High School of Zhejiang, Hangzhou, China, T: Yanlong Chen
ENEV041	A New Efficient Adsorption Device for Automobile Exhaust Particles Muzi Lin, 17, Sophomore, The No.3 Middle School of Fuzhou, Fuzhou, China, T: Lizhen Wei
ENEV054T	Microbial Fuel Cell: A Novel Device for Wastewater Purification and Heavy Metal Recycle Heying Shen, 14, Freshman; Muhua Jiang, 15, Freshman; Zixuan Zhu, 16, Sophomore, Guangdou Experimental High School, Guangzhou, China, T: Baishu Huang
ENMC008T	Auto Climbing Multi-Link Device Based on Gravity Zhengbang Tang, 17, Junior; Yuqiao Han, 17, Junior; Shuhan Zhang, 17, Junior, Liaoning Province Shiyuan High School, Liaoning, China, T: Biao Tang
ENMC028T	Electric Skateboard with Disk Brakes and Bluetooth Remote Control Ming Yan, 19, Senior; Weizhen Cai, 16, Junior, No. 6 High School, Xiamen, China, T: Zhoufeng Chen
ENMC029	Automatic Pencil Sharpener Tianru Lou, 14, Sophomore, Hangzhou No.2 School of Zhejiang Province, Hangzhou, China, T: Lin Huang
ENMC057T	Trajectory Reconstruction based on Inertial Navigation System Xiaojun Guo, 17, Junior; Huijie Shen, 16, Junior; Bin Wu, 17, Junior, Huayang High School, Chengdu, China, T: Xiaorong Zhan
MATH021	The Rolling Lamp Problem and Related Link Structure Qingxuan Jiang, 17, Junior, Shanghai High School, Shanghai, China, T: Mijia Lai
MATH022	The Secrets in the Coin Toss: Fairness Evaluation in the Binary Decision Based on Dynamics Shilun Li, 16, Sophomore, Guangdong Experimental High School, Guangzhou, China, T: Zhengyong Hu
MATS029	Reusable Paper Preparation and Printing Device Design Based on the Ultraviolet Photochromic Principle Guanchun Li, 17, Junior, Affiliated Middle School to Jilin University, Changchun, China, T: Jinhua Li
MCRO016	A Loop-Mediated Isothermal Amplification(LAMP)-Based Kit for Rapid Visual Detection of Colletotrichum gloeosporioides Ziyan Chen, 16, Sophomore, Fuzhou No.1 High School, Fuzhou, China, T: Qunlin Zhang
PHYS026	A Method of Magnetic Induction Line Mapping and Its Applications Based on Video Analysis Tianyu Kong, 17, Junior, High School Affiliated to Fudan University, Shanghai, China, T: Dayong Guan
SOFT005	Optical See-Through Smart Glasses Driven by Gesture Recognition Zichuan Wang, 18, Senior, The Experimental High School Attached to Beijing Normal University, Beijing, China, T: Jing Ma

SOFT006	Truffle–An Experimentation of Logic and Functional Programming Language for the Web: Design and Implementation Baqiao Liu, 17, Senior, Beijing No. 8 High School, Beijing, China, T: Ying Gao
SOFT024T	A Universal DNA Computing Method Senyuan Fan, 16, Junior; Yue Shi, 17, Junior; Chaoqun Tao, 17, Junior, High School Affiliated to Shanghai Jiao Tong University, Shanghai, China, T: Yu Peng
<i>Chengdu, CHN008, Sichuan Science Fair</i>	
ENBM024	Prognosis of Geometric Stenosis in Atherosclerosis Victoria Grace Yu, 17, Junior, International School of Beijing, Beijing, China, T: Debra Monroe
ENBM034	Electromyography: The Future of Robotic Prosthetics Aristomenes Tambakis, 15, Freshman, Quality Schools International Chengdu, Chengdu, China, T: Desiree Martin
ENMC030T	Developing a Novel Public Intra-city Small- to Medium-sized Cargo Distribution System for Cities of the Future Mark Tsz Chun Lau, 17, Junior; Hyun Seo Chung, 16, Junior; Ricky Tsun Yuen Ho, 16, Junior, Shanghai American School- Puxi Campus, Shanghai, China, T: Alan Bud Chan
ENMC031	Origami Transformer: Bridging Ancient Art with Modern Computer Sciences
#	Chin Yeoh, 16, Junior, ChengDu International School, Chengdu, China, T: Glen Walenda
ENMC061	Effect of Anti-Torque on Tire Grip Jun Oh Kim, 17, Sophomore, ChengDu International School, Chengdu, China, T: Kevin Bowden
CHINA, HONG KONG SPECIAL ADMINISTRATIVE REGION	
<i>Hong Kong, HKG001, Hong Kong Science and Technology Invention Contest</i>	
BMED051	Natural Antiperspirant: CKS Li Ying Shu, 17, Senior, Sacred Heart Canossian College, Hong Kong, China, Hong Kong Special Administrative Region, T: Elizabeth Yee Wai Choy
CBIO016	Identification of Parkinson's Disease-Associated SNP-SNP Interaction Using Interaction Analysis by Chi-Square (IAC) Sidney K. Chu, 16, Junior, Hong Kong International School, Hong Kong, China, Hong Kong Special Administrative Region, T: Nelson L.S. Tang
CBIO023	Mind FootPrint: Research on the Relationship between Brainwaves and Health Status; and the Development of a Centralized Brainwave Monitoring and Health Analyzing System Chung Pak Jack Wong, 17, Junior, Shun Tak Fraternal Association Yung Yau College, Hong Kong, China, Hong Kong Special Administrative Region, T: Man Lee Liu
CHEM027T	Superparamagnetic Iron(II,III) Oxide Silver Cysteine Complex Nanoparticles (SISCCN) in Metal Ions Adsorption and Chiral Recognition Kwun Wing Thomas Li, 16, Junior; Pak Hei Chu, 18, Senior; Tat Ngai Davis Chan, 17, Senior, King's College, Hong Kong, China, Hong Kong Special Administrative Region, T: Bob Lui
EGCH018T	Sencha Power Hei Man Fong, 16, Junior; Ching Man Felice Tang, 17, Junior; Nai To Chan, 16, Junior, The Chinese Foundation Secondary School, Hong Kong, China, Hong Kong Special Administrative Region, T: Chun Man Ho
ENMC040T	Visual Inspection Fasteners: Self-diagnostic Bolt, Nut & Washer Wenjin Zhu, 18, Junior; Man Yin Kan, 16, Junior; Mei Ho, Kay Ng, 16, Junior, Sheng Kung Hui Li Ping Secondary School, Hong Kong, China, Hong Kong Special Administrative Region; S.K.H Li Ping Secondary School, Hong Kong, China, Hong Kong Special Administrative Region, T: Kin Yip Ho

CHINA, MACAO SPECIAL ADMINISTRATIVE REGION

Macao, MAC001, Macao Region Science Fair

- ANIM037T** **Everyone Can Be a Fish-Gazer! A DIY 3D Fish-Monitoring System**
Wai Sam Lei, 18, Senior; Io Kei Kuok, 18, Senior, Keang Peng School-
Secondary Section, Macau, China, Macao Special Administrative Region,
T: Kai Heng Lam
- ENEV061T** **The Aqua Tells: An Extensible GPS Water Quality Robot with
Operating System**
Wei Ming Zhuang, 18, Senior; Weng Hin Lei, 17, Junior, Escola dos Moradores
de Macau, Macau, China, Macao Special Administrative Region, T: Kim Fei Lai
- ENMC033T** **Stair-Climbing Transport Robot**
LeTian Huang, 18, Junior; QiaoYing Tang, 18, Junior, Hou Kong Middle
School, Macau, China, Macao Special Administrative Region,
T: long Cheong Tam

CHINESE TAIPEI

Taipei, TWN001, Taiwan International Science Fair

- ANIM010** **Immune Reactions of Encapsulation in Cockroaches**
Chi-Yuen Wu, 17, Senior, Taipei Municipal Zhongshan Girls High School,
Taipei City, Taiwan, Chinese Taipei, T: Jen-Pu Tsai
- BCHM012T** **Misfolded α -synuclein: Assessment of Lactulose and Melibiose for
Parkinson's Disease**
Yu-Ting Huang, 17, Junior; Jia-Lan Lin, 17, Junior, Taipei First Girls High
School, Taipei, Taiwan, Chinese Taipei, T: Guey-Jen Lee-Chen
- BMED023T** **Inhibitory Effects of Omega-3 Fatty Acids-Based Fish Oil
on Cholangiocarcinoma**
Anin Luo, 17, Senior; Tsan-Mei Chu, 18, Senior, Taipei First Girls High School,
Taipei, Taiwan, Chinese Taipei, T: Yu-Chen Sun
- CHEM029** **UV-Light Sensitive Transparent Organic Solar Cells**
Cheng-Pei Lin, 17, Junior, Taipei First Girls High School, Taipei City, Taiwan,
T: Ken-Tsung Wong
- EAEV024T** **Experimental Simulation of Cellular Convection with Miso Soup**
Yu-Hung Chen, 18, Senior; Shih-Hao Chen, 18, Senior, The Affiliated Senior
High School of National Taiwan Normal University, Taipei, Taiwan, Chinese
Taipei, T: I-Wen Hung
- EGCH019T** **Palladium-Copper/Reduced Graphene Oxide Based Catalyst for Direct
Methanol Fuel Cells**
Peng-Jui Chen, 17, Junior; Pei-Shin Lu, 17, Junior, Taipei First Girls High
School, Taipei City, Taiwan, Chinese Taipei, T: Huan-Tsung Chang
- ENMC018** **Rotating Fluid in Paraboloidal Tank Tuned Liquid Damper as an Effective
Vibration Absorber**
Yen-Chen Chen, 16, Sophomore, National Tainan First Senior High School,
Tainan City, Chinese Taipei, T: Chii-Jau Tang
- MATH010** **Nested Eggs: Where Brianchon, Pascal and Poncelet Meet**
Pei-Hsuan Chang, 17, Senior, Taipei Municipal LiShan High School, Taipei
City, Chinese Taipei, T: Yung-Fa Lin
- PHYS038** **Nanobubble: Generation and Applications**
Bo-Han Lin, 17, Junior, Taipei Fuhshing Private School, Taipei, Chinese Taipei,
T: Ma-Hsuan Ma

COLOMBIA

Bogota, COL002, Feria Nacional de Ciencia Tecnologia e Innovacion

- PLNT028T** **Hidrolizas: Integration of Vegetable Crops and Cultivation of Tilapia
to Take Advantage of the Water through Technology and Elements of
Recycling at the Head Office of the Naranjal Educational Institution**
Miguel Angel Arias, 15, Freshman; Yeferson Montoya, 14, Freshman,
Institucion Educativa Naranjal, Quimbaya, Quindio, Colombia,
T: Jose Noe Sanchez Sierra

- ROBO017T Automatic Classification of Waste Using Artificial Vision and Programmed Electronic**
 Juan Felipe Lopez, 16, Sophomore; Johann Sebastian Ospina Arbelaez, 15, Sophomore, Institucion Educativa Andres Bello, Bello, Colombia,
 T: Juan Carlos Brinez de Leon
Medellin, COL001, Colombia Science and Engineering Fair
- ANIM029T Natural Feed to Improve the Production and Quality of Eggs in Egg Laying Hens**
 Jose Luis Mesa, 16, Junior; Jhon Esteban Acevedo, 16, Junior, Institucion Educativa Presbitero Bernardo Montoya Giraldo, Copacabana, Colombia,
 T: Mauricio Gomez Cadavid
- BMED022 How Does the Hard Water Affect Our Health?**
 Sofia Morales, 15, Junior, Institucion Educativa San Pedro de Uraba, San Pedro de Uraba, Colombia, T: Adriana Loaiza
- CHEM026T HERBITEX: Paper Based on Residual Grass**
 Daniela Montoya, 17, Junior; Maria Camila Ramirez, 17, Junior; Laura Ortega, 17, Junior, Institucion Educativa Colegio Loyola para la Ciencia e Innovacion, Medellin, Colombia, T: Angela Maria Garrido Caicedo
- ENMC032T Helios Car: Light and Small Solar Vehicle Developed for a Local Competition**
 Ana Maria Lopez, 17, Junior; Yuliano Giraldo Barco, 19, Sophomore; Yohan Estiven Castano, 16, Junior, Institucion Educativa Rural Presbitero Jesus Antonio Gomez, El Santuario, Colombia,
 T: Guillermo Adelkin Villegas Restrepo
- MATS015T Fibalto: Natural Fibers as a Reinforcing Material in the Manufacture of Flat Sheets of Fiber Cement**
 Milton Perez, 15, Junior; Daniela Canaveral Guisao, 16, Junior, Institucion Educativa Presbitero Antonio Jose Bernal, Medellin, Colombia,
 T: Diargys Isabel Fernandez Arango
- COSTA RICA**
San Jose, CRI002, National Engineering Expo
- EBED036 Gas Leakage Detection and Control System for Homeuse Gas Cylinders**
 Enmanuel Solano Brenes, 19, Senior, Colegio Vocacional de Artes y Oficios, Cartago, Costa Rica, T: Rigoberto Brenes Zuniga
- CZECH REPUBLIC**
Prague, CZE001, Students' Professional Activities (SPA)
- BCHM005 Rothmund-Thomson Syndrome Helicase and Its DNA Binding Preferences**
 Barbora Cechova, 19, Junior, Gymnazium Matyase Lercha, Brno, Czech Republic, T: Martin Krejci
- ENBM001T 3D Cultivation of Cancer Cells *in vitro***
 Matej Hlavac, 18, Junior; Jakub Cervinka, 19, Freshman, Gymnazium Tisnov, Tisnov, Czech Republic, T: Martina Havlatova
- ENEV001 Rethinking the Communist-era Suburb: A Way to Ecosocial Housing**
 Tereza Kadlecova, 19, Senior, Gymnazium Brno, Vídenska, Prispevkova Organizace, Brno, Czech Republic, T: Pavel Cech
Prague, CZE002, AMAVET Czech Republic Science Fair
- CHEM001 Preparation, Characterization and Use of Main Group Metal Amidinates**
 Lukas Janecky, 19, Junior, High School of Chemistry, Pardubice, Czech Republic, T: Marketa Tefrova
- ENBM003 Films from Hyaluronan: A View of their Preparation and Characterization**
 Katerina Valentova, 19, Senior, Gymnasium of Alois Jirasek, Litomysl, Czech Republic, T: Martina Kunderova
- PLNT001 Influence of Cytokinins on the Course of Artificial Senescence**
 Renata Staffova, 18, Senior, Gymnazium Moravska Trebova, Moravska Trebova, Czech Republic, T: Irena Staffova

DENMARK

Copenhagen, DNK001, Unge Forskere

- PHYS004** **An Optimazation of Breaststroke**
Anna Puggaard, 19, Senior, Herlev Gymnasium & HF, Herlev, Denmark,
T: Ulla Stampe Jakobsen

EGYPT

Alexandria, EGY002, BA Science and Engineering Fair

- BMED082** **Potential Therapeutic Effect of Novel Multivitamins and Minerals Combination for Alzheimer's: *In vitro* and *in vivo* Studies**
Ahmed Aly Sobhy, 16, Junior, Victoria College, Alexandria, Egypt,
T: Saad Rashed
- EAEV035T** **Superconductive Hybrid Desalination**
Samah Ayman Hamdy, 17, Junior; Maria Hany Hanna Shehata, 18, Junior,
Maadi STEM School for Girls, Cairo, Egypt, T: Manar Mostafa Hadaya
- EBED033T** **Safe Road with Losing Consciousness**
Moaz Nabil Abdallah ElMaatawy, 16, Sophomore; Youssef Mohy Eldin Ahmed Mohamed, 16, Sophomore, Shohadaa 25th of January, Alexandria, Egypt;
Victoria College, Alexandria, Egypt, T: El-Hassan Mohamed Fahmy Mahgob
- ENBM030** **The Ear Blind Seeing**
Mohamed Yasser Eltahan, 18, Senior, EL Nasr Boys School, Alexandria, Egypt,
T: Jaidaa Farouk Mekky
- ENEV017T** **Desalination by Pervaporation System**
Haya Ahmed Mohamed, 16, Junior; Mdouna Attaalla, 17, Junior, STEM
School for Girls, Benisuef, Egypt, T: Eslam Gomaa Ramadan
- Cairo, EGY001, Cairo Science and Engineering Fair*
- BMED004T** **The Solution Is the Blood**
Mohamed Mahmoud Abdalla Ahmed, 16, Junior; Mohamed Salah Eldin
Ali Abdrabbou, 17, Junior, Sohag Official Languages School, Suhag, Egypt,
T: Shrief Ahmed Oukasha
- EGCH004** **Modified Perovskite Solar Cell**
Kerolos Ehap Hanna, 17, Junior, STEM High School for Boys, Giza, Egypt,
T: Saif Soliman
- EGPH005T** **Solar and Wind Integrated Electric System**
Nada Osama Askar, 17, Senior; Marwa Magdy Eltaweel, 17, Senior,
STEM School for Girls, Cairo, Egypt, T: Heba Mohamed Mahmoud
- ENBM006T** **Biopsy-Implantable Chemical Sensor for Monitoring and Adjusting Cancer Treatments**
Hassan Sameh Elshanbary, 18, Senior; Ahmed Adel Eldemerdash, 17, Senior,
STEM High School for Boys, Giza, Egypt, T: Ahmed Towfeq
- ROBO002T** **Anti-Toxic Robot**
Ahmed Fawzy Hussein, 18, Senior; Toka Mohamed Elsayed, 18, Senior, Suez
Petrochemicals STEM School, Suez, Egypt, T: Mohamed Ibrahim Mohamed

ESTONIA

Tallinn, EST001, Estonian Young Scientist Contest

- CELL054** **Fluorescent Semliki Forest Virus Proteins: Construction, Expression and Location within Cells**
Rein Leetmaa, 18, Senior, Hugo Treffner Gymnasium, Tartu, Estonia,
T: Liis Karo-Astover
- ENMC062** **The Development and Building of an Inexpensive Filament Extrusion System**
Priit Norak, 18, Senior, Saue Gümnaasium, Saue, Estonia, T: Valmar Kaur

FINLAND

Helsinki, FIN001, Finland National Science and Engineering Fair

- CHEM045T** **Pretreating Stains with Various Detergents**
Emma Kanerva Jarvi, 16, Freshman; Ella Katariina Forsman, 15, Freshman,
Helsingin Suomalainen Yhteiskoulu, Helsinki, Finland, T: Katariina Yliheikkilä
- SOFT040T** **Urban Ecology: An Educational Game**
Kaisla Sirulotta Kaariainen, 17, Senior; Maisa Virtanen, 17, Senior,
Valkeakosken Tietotien Lukio, Valkeakoski, Finland, T: Merikki Lappi

FRANCE

Paris, FRA001, Olympiades de Physique

PHYS001T Essential Toolkit for Dancing Droplets

Gabriel Louis Moreau, 18, Senior; Benjamin Roman, 17, Senior; Benjamin Suzzoni, 17, Senior, Lycee Vauvenargues, Aix en Provence, France, T: Eric Mathieu

GEORGIA

Tbilisi, GEO001, Georgian Science Project Olympiad

SOFT054T Random Number Flow and Its Uses in Confidentiality and Encryption of Electronic Messages

Giorgi Meskhi, 15, Sophomore; Mariam Kanashvili, 15, Sophomore, Georgian-American School, Tbilisi, Georgia, T: La Mebonia

Tbilisi, GEO002, Leonardo da Vinci Fair

EBED004T Universal Multi-functional Module for Digital Electronics

Aleksandre Khokhiashvili, 15, Sophomore; Dimitri Korkotashvili, 15, Freshman; Giorgi Lomjaria, 15, Sophomore, No. 199 Vladimer Komarovi Tbilisi Physics and Mathematics Public School, Tbilisi, Georgia, T: Irakli Khokhiashvili

EGPH001T Portable Electric Generator "Follow Me"

Giorgi Shelegia, 14, Freshman; Amiran Aptsiauri, 15, Freshman, School-Lyceum "AIA GESS" Georgian-English-Spanish-School, Tbilisi, Georgia, T: Teimuraz Chichua

EGPH002T Innovative Technology of Increasing Solar Cells' Efficiency by Surface Modification with Lenticular Screen

Giorgi Margiani, 17, Junior; Vakhtang Kontridze, 17, Junior; Beqa Mikadze, 16, Junior, Akhali Liceumi AIA-GESS, Tbilisi, Georgia, T: Teimuraz Chichua

ENMC003T Use of Bi-Stable Carbon Membranes in Morphing Constructions

Ekaterine Dadiani, 17, Senior; Niko Giorgadze, 16, Junior; Tsotne Dadiani, 18, Senior, LPPL V.Komarovi Tbilisi Physics and Mathematics No. 199 Public School, Tbilisi, Georgia, T: Teimuraz Chichua

GERMANY

Ludwigshafen, DEU001, Jugend Forscht

CHEM004T Green Olefins from Renewable Materials: Prospects for the Post Oil Era

Levin Winzinger, 17, Senior; Felicitas Kaplar, 19, Senior; Larissa Roth, 18, Senior, Hanns-Seidel-Gymnasium Hosbach, Hosbach, Germany, T: Roland Full

CHEM005 Plasmatic Events during Electrolysis of Aqueous Solutions

Benedikt Pintat, 19, Senior, Walther-Rathenau-Gymnasium, Bitterfeld-Wolfen, Germany, T: Egbert Lange

EBED013T Eye-controlled Wheelchair: A Low-cost Open Source Hard- and Software System Allowing Independent Mobility for People with Severe Disabilities

Myriam Stoetzer, 15, Freshman; Paul Foltin, 16, Freshman, Franz-Haniel-Gymnasium, Duisburg, Germany, T: Sergei Stoetzer

EGCH003 Solar Heat Storage with Salt Hydrates Using Phase Change Effects: Materials, Analysis and Application

Maximilian Albers, 18, Senior, Max-von-Laue-Gymnasium, Koblenz, Germany, T: Horst Ordowski

ENEV016 Energy Management –Saving Money and the Climate: A Technological Approach and Device Generating Economic Incentives for Regenerative Energy Production

Birk Magnussen, 15, Senior, Schulerforschungszentrum Nordhessen, Kassel, Germany, T: Klaus-Peter Haupt

PHYS013 Deriving an Analytical Algorithm for the Localization of Signal Sources in Orb Webs and Other Net Geometries: A Novel Mathematical Approach to Positioning Systems

Sophie Atzpodien, 16, Sophomore, Gymnasium St. Mauritz, Munster, Germany, T: Thomas Altmeyer

PHYS014T Acoustic Microfluidics with Tiny Droplets

Adrian Lenkeit, 16, Junior; Jan Matthias Schafers, 17, Junior, St. Michael Gymnasium, Bad Munstereifel, Germany, T: Walter Stein

- PHYS015** **The Water Wheel: An Exploration of Deterministic Chaos**
Tobias Spanke, 18, Senior, Hans-Thoma-Gymnasium, Lorrach, Germany, T: Herrmann Klein
- PHYS016T** **The Sparkler Rotor**
Tim Konigl, 18, Senior; Dennis Zisselsberger, 18, Senior, Hans-Thoma-Gymnasium, Lorrach, Germany, T: Herrmann Klein
- PHYS018T** **Gravitational Influence on Planet Formation**
Patricia Asemann, 17, Senior; Robin Ole Heinemann, 17, Senior, Schulerforschungszentrum Nordhessen, Kassel, Germany, T: Klaus-Peter Haupt

GUAM

Mangilao, TEGU01, Guam Island-Wide Science Fair

- EAEO062** **Chemical Cues Mediate Preference for Native Tree Snails by an Invasive Predatory Flatworm**
Nicholas A. Camacho, 16, Sophomore, John F. Kennedy High School, Tamuning, Other, T: Sanjay Sharma

HUNGARY

Budapest, HUN001, Innovation Contest for Young Scientists

- ENBM026** **Building Blood Vessel-like Structures using Stem Cell Derived Endothelial Cells**
Szilvia Kiraly, 18, Senior, Varosmajori High School, Budapest, Hungary, T: Anna Janossyne Solt
- SOFT019** **ShopMap**
Karola Balint, 19, Senior, Csongradi Batsanyi Janos Gimnazium, Szakkepzó Iskola és Kollegium, Csongrad, Hungary, T: Tamas Gilicze

INDIA

New Delhi, IND001, Initiative in Research and Innovation in Science

- BMED084T** **Catechin: As an Effective Epigenetic Regulator against Drug Side-Effects**
Dhriti Gaur, 16, Sophomore; Pushkar Mandal, 16, Sophomore, Maharaja Agarsain Public School, New Delhi, India, T: Ritu Gupta
- CBIO007** **A New Method for Simulation-Aided Drug Discovery Using Machine Learning Algorithms**
Parvathi Ram, 16, Sophomore, National Public School, Indiranagar, Bangalore, India, T: Vibhuti Sharma
- ENBM062** **Cellphone Based Optometry Using Hybrid Images**
Shreyas Kapur, 17, Senior, Modern School Barakhamba Road, Delhi, India, T: Shalini Kapur
- MATH013** **A Deterministic Approach to the Location, Trajectory, and Collision Prediction of Particles in a Closed Environment**
Arvind Krishna Ranganathan, 17, Senior, Ecole Mondiale World School, Mumbai, India, T: Asha Sundararajan
- MATH032** **A Theory on the Study of Dimensions and Figures**
Abhimanyu Kumar, 16, Junior, Stepping Stones Senior Secondary School, Chandigarh, India, T: Gurpreet Singh
- MATS020** **Novel Nature Derived Green Materials for Laser Safety Glasses in Optoelectronics**
Aditya Bhargava, 17, Junior, Vidya Mandir School, Bangalore, India, T: Krithika Khulbe
- MCRO079T** **Mycobacterium Indicus pranii: A Novel Approach to Treat Asthma**
Harshit Jindal #, 15, Sophomore; Mahima Yadav, 16, Sophomore, Maharaja Agarsain Public School, Delhi, India, T: Ritu Gupta
- MCRO084T** **Antimicrobial Properties of Manjh, a Bioactive Compound from Cocos nucifera**
Naureen Taj, 18, Senior; Qabeera T.N, 17, Senior, Government Senior Secondary School, Lakshadweep, India, T: Habsa Bi M.K.

- PLNT020** **Acceleration of Germination and Growth of Wheat and Barley Using Ferro-fluids**
Prashaant Ranganathan, 16, Sophomore, Carmel Junior College, Jamshedpur, India, T: Chaitali Chatterjee
- PLNT032T** **Innovative Strategy using Endophytes for Effective Biocontrol of Insect Pests in Cotton**
Suhani Sachin Jain, 15, Sophomore; Divya Kranthi, 16, Sophomore, Centre Point School, Nagpur, India, T: Kirtee Nitin Bokare
- SOFT002** **AirTouch: A Gesture-Based Cross-Platform App that Enables Touch-Free Input for Human Computer Interaction**
Aditya Ketan Khant, 17, Senior, Dhirubhai Ambani International School, Mumbai, India, T: Anjali Khant
- TMED025** **A Novel Paper Sensor as a Diagnostic Test for Multiple Sclerosis**
Vasudev Malyan, 18, Senior, Maharaja Agarsain Public School, Delhi, India, T: Saral Baweja
- INDONESIA**
Jakarta, IDN002, Olimpiade Penelitian Siswa Indonesia
- ANIM009T** **Unravelling the Life of Javan Iapwing (*Vanellus macropterus*) in East Java, Indonesia**
Chabib Fachry Albab, 17, Senior; Millah Khoirul Mu'azzah, 18, Senior, SMA Negeri 2 Lamongan, Lamongan, Indonesia, T: Radi Bambang Priyanto
- EBED019T** **Money Detector Glasses for Helping Blind People in Recognizing Nominal Value of Money**
Quinita Maria Jose Noronha, 16, Junior; Sepvina Mutikasari, 16, Senior, SMA Negeri 3 Yogyakarta, D. I. Yogyakarta, Indonesia, T: Ichwan Aryana
- ENEV025T** **The Potency of Natural Mahogany Extract for Maintaining the Cleanliness of Rocks: A Case Study of Indonesian Temple Rocks**
Bagas Aditya, 18, Senior; Kartika Puspitasari, 18, Senior, SMA Negeri 6 Yogyakarta, Yogyakarta, Indonesia, T: Muhammad Rizal Afif
- Jakarta, IDN001, Youth Science Competition*
- BEHA034** **Power Relation and Its Threats to Sustainable Ecology**
Adhis Tessa, 17, Senior, State High School SMAN 11 Pinrang, Pinrang, Indonesia, T: Baharuddin Iskandar
- BEHA040T** **The Influence of Palm Oil Plantation on the Social Integration and Environment in Sumber Harapan Village, Jambi Province**
Nurkholidatul Maula, 18, Senior; Putri Rahayu Budiman, 18, Senior, MAN Insan Cendekia Jambi, Jambi, Indonesia, T: M. Bustanul Arifin
- CHEM032T** **Anti-Pollution Mask of *Sansevieria trifasciata* Extract**
Jerome Adriel Tjiptadi, 17, Junior; Edwin Julianto, 16, Junior, Santa Laurensia Senior High School, Tangerang Selatan, Indonesia, T: Maria Goretti Apriyani
- MATS028T** **The Development of High Corrosion Resistant Zn/Zn-PP Composite Coating**
Aristo Kevin Ardyaneira Pratama, 18, Senior; Maulana Imam Septyo Putro, 16, Senior, 3rd Semarang State Senior High School, Semarang, Indonesia, T: Soleh Amin
- MCRO042T** **Antibacterial Fractions from Marine Phytoplankton (*Melosira* sp., *Navicula* sp., *Nitzschia* sp.) Collected from Bali Strait**
Ni Putu Intan Apsari, 16, Junior; Cok Laksmi Pradna Paramita, 16, Junior, State High School SMAN 3 Denpasar, Bali, Indonesia, T: I. Wayan Ananta Wijaya
- IRAQ**
Erbil, IRQ001, INPO (Iraq National Project Olympiad)
- BCHM048T** **The Magical Cream**
Saya Omar Abdulrahman, 17, Junior; Ninya Rzgar Tofiq, 17, Junior, Schools Roonaki Salahaddin Ayyubi Colleges Girls' High School, Sulaimania, Iraq, T: Dilek Arslan

IRELAND

Dublin, IRL001, *BT Young Scientist & Technology Exhibition*

CBIO004T **A Mathematical Model of Coffee Rust**

Gabriel Barat, 18, Senior; Adrian Dawid Wolniak, 17, Senior, Synge Street CBS, Dublin, Ireland, T: Shane Freeman

Local, Regional and National (Dublin), IRL002, SciFest

PLNT002 **Bringing Genetics to the Masses: The Development of a Low Cost DNA Extraction and Profiling Kit**

Louis Oliver Madden, 16, Junior, Larcy College, Monaghan, Ireland, T: Sharon Mary Magennis

ISRAEL

Jerusalem, ISR001, *The Israeli Young Scientists Contest*

BMED069 **Transcription Factor VGLL4 as Breast Cancer Suppressor**

Rom Dan, 17, Senior, Israel Arts and Science Academy, Jerusalem, Israel, T: Anat Maoz

ENBM016T **RightLoad: Cast Load Monitoring System to Speed Up Recovery**

Shahar Ain-Kedem, 18, Senior; Bar Arama, 18, Senior, Ort Chaim Greenberg Comprehensive High School Kiryat-Tivon, Kiryat-Tivon, Israel; Ort Grinberg Kiryat Tivon, Kiryat Tivon, Israel, T: Oren Lamdan

MATH030 **Graph Rigidity in L1 and Kusner's Conjecture**

Roy Jacobson, 18, Senior, Israel Arts and Science Academy, Jerusalem, Israel, T: Chana Sharef

MATS044 **Flexible Sensors Based on Ligand-Capped Gold Nanoparticles: The Effect of Ligand Properties on Sensor Characteristics**

Yaniv Wolf, 18, Senior, The Hebrew Reali School, Haifa, Israel, T: Liraz Grupman

MCRO066 **Functional Characterization of the *Pseudomonas aeruginosa* ExoY Virulence Factor**

Liam Bernard Kimel, 18, Senior, Hakfar Hayarok Environmental Leadership High School, Ramat HaSharom, Israel, T: Charles S. Hoffman

ITALY

Milano, ITA001, *I Giovani e le Scienze*

EGCH011 **Studies about Ecological Batteries and Depolarizers**

Amine Bouchari, 19, Senior, Istituto Superiore Ascanio Sobrero, Casale Monferrato (AL), Italy, T: Elisabetta Gaita

EGPH004T **CONSERVAA**

Matteo Monni, 19, Senior; Emma Bordigoni, 18, Senior, Istituto Tecnico Industriale Statale Michele Giua, Cagliari, Italy, T: Antonello Zizi

MATS026T **NanoGLASS**

Marino Burba, 19, Senior; Michael Fortina, 19, Senior, Istituto d'Istruzione Superiore "L. Cobianchi", Verbania, Italy, T: Angelo Gulotta

Milan, EUB001, European Union Contest for Young Scientists (EUCYS)

BEHA006T **Alcohol Consumption—Does the Apple Fall Far from the Tree?: To Investigate the Relationship between Parental Attitudes and Alcohol Consumption and Adolescent Alcohol Consumption**

Eimear Frances Murphy, 17, Junior; Ian O. O'Sullivan, 18, Junior, Colaiste Treasa, Cork, Ireland, T: Derry O'Donovan

EGCH023T **Power to Gas: An Alternative Approach**

Jakob Dichgans, 18, Senior; Daniel Simon Riesterer, 19, Senior; Lumen Latus Haendler, 19, Senior, Gymnasium Überlingen, Überlingen, Germany; Freie Waldorfschule Überlingen, Überlingen, Germany, T: Lukas Locher

SOFT045 **Optimizing Mobile Blood Collection Logistics with a Computational Tool**

Petteri Timonen, 18, Junior, Valkeakosken Tietotien Lukio, Valkeakoski, Finland, T: Merikki Lappi

JAPAN

Tokyo, JPN001, *Japan Students Science Awards*

ANIM018 **Antibacterial Substances from Larvae of *Drosophila melanogaster***

Nanako Okabe, 17, Junior, Urawa Girls' Upper Secondary School, Saitama-City, Japan, T: Naoshi Yoshida

- ANIM019** **Hindwings Play a Critical Role in Takeoffs and Flight in Cicada (*Graptopsaltria nigrofuscata*)**
Taichi Yaguchi, 17, Junior, Mie Prefectural Ise High School, Ise City, Japan, T: Takeshi Oka
- CHEM013T** **Electrolysis Occurring at Unconnected Electrodes**
Shiho Ohbayashi, 17, Junior; Hisana Sugimoto, 18, Junior, Makuhari Senior High School, Chiba, Japan, T: Hisamichi Iwata
- PHYS022T** **"Dragged Wave" Generated by a Line Segment Source: Analyses and Experiments on the Wave Pattern Staying around a Line Segment Source**
Keiichiro Sato, 17, Junior; Ryuhei Fujimoto, 17, Junior, Hiroshima Prefectural Fuchu High School, Fuchu, Japan, T: Junpei Okamoto
- PHYS023** **A Study on Optimal Structure of "Uchiwa" Fan: Great Potential of Japanese Traditional Handheld Fan**
Yuki Hayakawa, 15, Sophomore, Kyoto Municipal Tohnan High School, Kyoto, Japan, T: Mitsuhiro Tsuji
- PLNT011T** **Structure and Function of the White Leaves of the Silvervine (*Actinidia polygama*)**
Madoka Sasaki, 18, Senior; Ai Meguro, 18, Senior, Akita Chuo High School, Akita, Japan, T: Tsukasa Takahashi
- PLNT012T** **"Marsilea" Leaf Opening Is Controlled by Cooperation of Two Blue Light Systems, Stomata Opening and Gene Expression**
Chonnae Kim, 18, Senior; Kaede Iwai, 18, Senior, Notre Dame Seishin Gakuen Seishin Girls' High School, Kurashiki, Japan, T: Fukuto Tanaka
- SOFT013** **Sonification of Software's Behavior and Its Application to Information Security**
Keisuke Nishimura, 17, Junior, Hiroshima Gakuin Senior High School, Hiroshima-City, Japan, T: Yoshinori Nakamura
Tokyo, JPN002, Japan Science and Engineering Challenge
- CELL019** **Silk-Gland-Derived Sericin as a Growth Promoter in Animal Cell Culture**
Tomoro Warashina, 18, Senior, Yokohama Science Frontier High School, Yokohama-City, Japan, T: Hanae Matsuo
- CHEM035T** **Mechanism of the Oscillating Chemiluminescence Reaction Using Luminol**
Erika Toki, 17, Junior; Misato Nakamura, 17, Junior; Shiori Osaki, 17, Junior, Ichikawa Gakuen Ichikawa Senior High School, Ichikawa-City, Japan, T: Tetsuto Nakashima
- EGCH013T** **Investigation and Development of a New Solid Polymer Electrolyte Using a Natural Membrane for Fuel Cell Devices**
Chizumi Maeta #, 18, Senior; Mei Yamamura, 17, Junior, Yonago National College of Technology, Yonago-City, Japan, T: Naoki Tanifuji
- ENEV030T** **Development of Nitrate-ion Battery to Realize a Sustainable Denitrification System**
Akiko Suzuki, 17, Junior; Shunsuke Sato, 17, Junior; Naoki Shibukawa, 17, Junior, Shizuoka Kita High School, Shizuoka-City, Japan, T: Yuji Takagi
- ENEV031T** **A Novel Technique for Urgent Remediation of Marine Pollutants Such as Microplastics and Oil Spills Using Water Jet**
Saki Takeuchi, 17, Junior; Naoki Matsumura, 17, Junior; Tetsumasa Takano, 17, Junior, Hiroshima Prefectural Hiroshima Kokutaiji Senior High School, Hiroshima-City, Japan, T: Yo Muneta
- ENMC023** **A Novel and Simple Power Saving Controller for Stepper Motors**
Takahiro Ichige, 18, Junior, Chiba Municipal Chiba High School, Chiba-City, Japan, T: Takanobu Yoneya
- MCRO024** **Expanding WA-WA-WA: Periodic Environmental Changes Trigger Concentric Ring Colony Formation**
Miyu Yamamoto, 18, Senior, Yokohama Science Frontier High School, Yokohama-City, Japan, T: Tatsuya Yamamoto
- SOFT014** **Algorithm for Calculating All Fifth-order Magic Square Arrangements**
Aito Tanaka, 16, Sophomore, Hiroshima University High School, Fukuyama, Fukuyama-City, Japan, T: Akiyoshi Kai

JORDAN

Amman, JOR001, *Science Fair of The Jordanian Ministry of Education*

- ANIM047** **The Effect of Frankincense Oil Derived from *Boswellia carteri* on the Expression of Telomerase in MCF-7 and K-562 Cancer Cells**
Zeena Bashir Hashem, 16, Junior, Al Ra'ed Al Arabi School, Amman, Jordan, T: Hassan Suliman Ezaldeen
- BEHA016T** **Deaf Alerter**
Tamara Naser Saif, 17, Junior; Waleed Yousef Hijazi, 16, Junior, The Modern Schools, Amman, Jordan, T: Ali Sulaiman Salameh
- BEHA021T** **The Hug Jacket**
Sadeel Riyad Abu Diab, 16, Junior; Safaa Bashir Alhinnawi, 16, Junior, Jubilee School, Amman, Jordan, T: Hazem Hamdan
- BEHA033** **Using EEG to Enable Locked-in Patients to Communicate**
Hanan Hazem Saad, 16, Junior, Dur Al-Manthur, Amman, Jordan, T: Manal Nimir Rashdan
- BMED026** **Editing of *ciz1* Gene Responsible for Small Cell Lung Cancer Growth Using CRISPR CAS Technology**
Shaima Lutfi Al-Sharif, 16, Junior, Dur Al-Manthur School, Amman, Jordan, T: Manal Rashdan
- CHEM007T** **Modifying Plastic by the Addition of Cellulose Acetate Derived from Cigarettes**
Alisar Ibrahim Qunibi, 17, Junior; Lina Abutaweeleh, 17, Junior, The International Academy-Amman, Amman, Jordan, T: Maha Al Haj Mohammad
- EBED041** **Automatic Lock System**
Noor Mohammad Khasawneh, 17, Junior, King Abdullah II School for Excellence, Irbid, Jordan, T: Mohammad Morshed
- EGPH009** **Generating Electricity from Vapor by Solar Generator**
Ibrahim Ismail Motawe, 17, Senior, Hunain Secondary School for Boys, Amman, Jordan, T: Ashraf Al-Jarery
- ENEV018** **Adsorption and Desorption of Oil Spills Using Jordanian Zeolitic Tuff**
Yara Muhannad Marei, 17, Junior, Jubilee School, Amman, Jordan, T: Sawsan Abu Jama'ah
- ENEV062T** **Smart Sponge Bob Container**
Ahmad Mamon Al Sabbah, 15, Freshman; Majd Ahmad Abu Dalo, 15, Freshman, Abed Alla Bn Um Maktoom, Amman, Jordan, T: Mahmoud Hammash
- ENMC019** **Sand Free Device**
Mosab Mohammad Khawaldeh, 17, Junior, Jubilee School, Amman, Jordan, T: Amer Al-belleh
- PHYS019** **Nuclear Radiation Auto-Detector**
Joseph Awni Abulail, 15, Sophomore, National Orthodox School, Amman, Jordan, T: Odeh Tawfeeq Hindaileh

KAZAKHSTAN

Astana, KAZ001, *DARYN National Junior Science Projects Competition*

- ENMC037** **Intellectual Small-Size Emergency Flotation Wristband**
Anuar Aryngazin, 16, Sophomore, High School No. 60, Astana, Kazakhstan, T: Kairat Soltanov
- ENMC068T** **Energy Management of the Air Flow in the Air Flow in the Wind Turbine**
Dauren Karambayev, 17, Junior; Daniyal Tashenov, 17, Junior, High School No. 3 for Gifted Boys, Pavlodar, Kazakhstan, T: Tatiyana Mikhailovna Bruss

KENYA

Nairobi, KEN001, *Kenya Science and Engineering Fair*

- ENBM057T** **Detection of *Salmonella enterica* Dt104 and *Vibrio cholera* O134 Using Polyclonal Antibodies Immobilized on Conducting Polyaniline Nanowires**
Rupal Dhanji Rabadiya, 17, Sophomore; Ramya Yanamandra, 15, Sophomore, Shree Cutchi Leva Patel Samaj School, Nairobi, Kenya, T: Indu Rani Jangra

ENEV100T ***Acacia xanthophloea* Characterization and Preservation Techniques of Sapwood (Plant Xylem) as a Low Cost Membrane Filtration Device for Arid and Semi-Arid Areas in Kenya**
Mansi Ajey Apte, 15, Sophomore; Vishal Hareshkumar Dhanji Vekaria, 15, Sophomore, Shree Cutchi Leva Patel Samaj School, Nairobi, Kenya, T: Laban Machooka Chweya

KUWAIT

Kuwait, KWT001, Kuwait Science and Engineering Fair

EGPH036T **Temperature Difference Equals Free Energy**
Ali Sabeeh Alwazzan, 18, Senior; Yousef Abdullah Altourah, 17, Senior, Hamed Essa Alrjeb, Kevan, Kuwait, T: Emad Zain Abdulhaleem Abdulmaj

EGPH037 **Solar Cell Pyramids**
Sulaiman Adel Sulaiman, 16, Junior, Yousef Ben Essa High School, Abdullah Al-Salem, Kuwait, T: Husam Aldeen Mohamaad Abduladheem

ENEV103 **The Scrap Tires (Lost Treasure)**
Abdulrahman Rashid Aljasem, 16, Junior, Hamad Ess Alrjab High School, Kevan, Kuwait, T: Emad Zain Abdulmjeed

MCRO080 **Microbial Contamination of Contact Lenses Care Solutions**
Zinab Ahmad Mesri, 16, Sophomore, Tahera High School, Abdullah Mubarak, Kuwait, T: Shareef Zakareya Alshathli

LUXEMBOURG

Luxembourg, LUX001, Concours Jeunes Scientifiques Luxembourg

ROBO025T **Human-Following Car**
Yann Bernard, 17, Junior; Oliver Christian Nick, 18, Junior, Lycee de Garcons de Luxembourg, Luxembourg, Luxembourg, T: Pascal Daman

MALAYSIA

Federal Territory Putrajaya, MYS001, National Schools Science Innovation and Engineering Competition

CHEM018T **Spixhaust**
Haney Karmila Kaswadi, 17, Senior; Nurhafizah Binti Ishak, 17, Senior, Tunku Kurshiah College, Negeri Sembilan, Malaysia, T: Norizan Binti Darawi

EAEV003T **Removal of *E. coli* and Total Coliform Count from Polluted Water Using Bio-waste**
Lee Zher Joel Jong, 15, Sophomore; Jun Wen Joyce Jong, 16, Junior; Jun Wei Sean Hii, 17, Junior, SMK Batu Lintang, Kuching, Malaysia, T: Yee Chuen Lim

ENEV004 ***Xanthophyllum amoenum* as an Eco-friendly Metal Polish**
Isaac De Wei Chung, 16, Sophomore, SMK Batu Lintang, Kuching, Malaysia, T: Yee Chuen Lim

ENEV092T **Taj Eco Board**
Fatin Nur Afiah Binti Mohd Yusri, 15, Junior; Mohamad Anas Safuan Bin Mohamad Zainu, 16, Junior; Muhammad Syamir Syazani Bin Shafie, 16, Junior, SMK Paya Kemunting, Jitra, Malaysia, T: Nuriyana Omar

MATS048T **PS-Thermo**
Dylan Lim Shu Zhe, 16, Junior; Nizar Bin Jalaludeen Rajagobar, 16, Junior; Derric Lim Shu Chuen, 16, Junior, Penang Free School, Georgetown, Malaysia, T: Linda Toh

Kuala Lumpur, MYS002, MRSM Young Scientist

EGCH007T **Fish Bones Synthesized as a Potential Electrochemical Supercapacitor**
Nur Alissa Ariff, 17, Junior; Nur Daliela Sofea Abdul Aziz, 16, Junior, Mara Junior Science College Tun Ghafar Baba, Jasin, Melaka, Malaysia, T: Noorzakiah Buang

MATS008 **A New Superhydrophobic Coating from Submicron Crystalline Cellulose and Submicron Calcium Carbonate**
Muhammad Faizadmesa Allim, 16, Junior, Mara Junior Science College Tun Ghafar Baba, Melaka, Malaysia, T: Noorzakiah Buang

MEXICO

Guadalajara, MEX002, Feria Nacional de Ciencias e Ingenierías–CONACYT

BEHA031 Listen to the Beat

Ian Martin Pena Alvarez, 15, Freshman, Colegio las Hayas, Coatepec, Mexico, T: Sandra Hernandez

EAEV043T Polymers to Care for the Environment

Jose Carlos Hernandez Garcia, 17, Junior; Aylin Diaz Alamilla, 17, Junior, Colegio de Bachilleres del Estado de Hidalgo, Actopan, Mexico, T: Freddy Hernandez Espinosa

EAEV080T Bees: The World's "Atlas"—Solution to the *Apis mellifera* Decrease, a Sonora State Case Study

Astrid Sofia Corona Palazuelos, 16, Junior; Abraham Alejandro Corona Palazuelos, 18, Junior, Colegio Regis, A.C., Hermosillo, Mexico, T: Gardenia Erendida Cano Rodriguez

EGCH025T Water as Raw Material for an Integral Process of Energy Production

Francisco Zuniga Casillas, 17, Senior; Jair Alejandro Madera Hurtado, 18, Senior, Preparatoria del Tecnológico de Monterrey, Campus Guadalajara, Zapopan, Mexico, T: Alma Delia Zamarripa

EGPH024T Generation of Electric Energy by Seebeck Effect

Jorge Alberto Nino Santos, 17, Senior; Alexis Gonzalez Garcia, 17, Senior, Centro de Bachillerato Tecnológico Industrial y de Servicios No. 90, Loma Bonita, Mexico, T: Carlos Musule Del Rivero

ENEV059 Polymer Solar Heater

Silvia Madai Aguilar Perez, 19, Senior, Colegio de Bachilleres del Estado de Puebla, Puebla, Mexico, T: Eli Ramirez Vazquez

ENEV063T Extruder Prototype Polymers in Combination with Keratin

Abigail Daniel Martinez Jimenez, 18, Senior; Octavio Didier Castaneda Sanchez, 17, Senior; Jesus Omar Dominguez Rojas, 18, Senior, Escuela Preparatoria Oficial No. 53, Zumpango de Ocampo, Mexico, T: Juan Miguel Robledo Espejel

ENMC041T Juggernaut

Edwin Miguel Hoil Majay, 18, Senior; Brandon Luis Puc-Oy, 17, Senior; Humberto David Chan de la Cruz, 18, Senior, Colegio de Bachilleres del Estado de Yucatan Plantel 10 Valladolid, Valladolid, Mexico, T: Celsa del Carmen Cupul-Cauich

MATS032T Synthesis of Nanocomposites Gold in Starch Matrix

Angel Jesus Contreras Reyes, 18, Junior; Mayra Josefina Salazar Garces, 18, Junior; David Oswaldo Salazar Molina, 18, Junior, Preparatoria 8 U.A.N.L., Guadalupe, Mexico, T: Ricardo Martínez

MCRO048T RENOVALACT: Anti-Acne Treatment

Oscar Ulises Villalpando Rodriguez, 17, Senior; Ilse Andrea Marcial Martinez, 18, Senior; Josué Francisco Ortiz Torres, 18, Senior, Colegio de Estudios Científicos y Tecnológicos Del Estado de Coahuila Plantel Laguna del Rey, Laguna Del Rey, Mexico, T: Guadalupe Torres Oviedo

PLNT034T Sasanil Plant for Biodegradable Glue

Gibran de Jesus Meza Castrejon, 17, Junior; Adrian Constantino Valencia Gonzalez, 18, Junior, Centro de Bachillerato Tecnológico Industrial y de Servicios No. 134 Nicolas Catalan, Chilpancingo de los Bravos, Mexico, T: Luz Patricia Avila Caballero

ROBO021T Robot Arm Complement

Jose Miguel Sauseno Eligio, 16, Junior; Jesus Manuel Olguin Guzman, 18, Senior, Colegio de Estudios Científicos y Tecnológicos del Estado de Queretaro, Pedro Escobedo, Mexico, T: J. Gilberto Luna Cuéllar

NETHERLANDS

Amsterdam, NLD001, INESPO: International Environmental and Sustainability Project Olympiad

ENEV107T The Wobble: A Sustainable Noise Barrier Consisting of Noise Absorbing Materials and a Revolutionary Shape

Marie-Anne Irene de Gier, 16, Sophomore; Bram Janssen, 15, Sophomore, Atheneum College Hageveld, Heemstede, Netherlands, T: Ronald Haak

NIGERIA

Benin City, NGA003, Genius National Science Expo

- BCHM031T Kill the Pest; Save the Environment**
Jesutomisin Oreoluwa Agbabiaka, 14, Junior; Oluwafemi Emmanuel Dosumu, 13, Sophomore, Doregos Private Academy, Lagos, Nigeria, T: Oluseyi Olaide Lawal
- EBED032T Caught on the Run**
Enoobong Oluwatobi Etukudo, 15, Junior; Oluwatofunmi Oluwuadumininu Oteju, 15, Junior, Doregos Private Academy, Lagos, Nigeria, T: Oluseyi Olaide Lawal
- ENBM051 Low Cost Brain Signal and Accelerometer Control System for the Physically Challenged**
Jesudamilola Abugewa Olugbemiga, 16, Junior, Calvary Arrows College, Gboko, Nigeria, T: Damilola Seun Olufolaji
- ENEV064T Smart Flood Management**
Gracia Eghonghon Adudu, 14, Junior; Zainab Oluwafeyisayo Badru, 13, Sophomore, Doregos Private Academy, Lagos, Nigeria, T: Oluseyi Olaide Lawal
- ENEV076T Flood Detector, Location and Warning System with Mobile Application (Flood Warning System)**
Matthew Sesinu Awhanjinu, 19, Senior; Felicia Abodunrin Akinbulejo, 16, Senior, Kankon Senior Secondary School, Badagry, Nigeria, T: Ibikunle Olusegun Ibitoye
- ROBO024T The Integrated Traffic Control System**
Oluwapelumi David Folarin, 14, Junior; Oluwagbemileke Jesulademi Lawal, 16, Junior, Doregos Private Academy, Lagos, Nigeria, T: Oluseyi Olaide Lawal

NORTHERN IRELAND

Belfast, NFK001, Sentinus Young Innovators

- CBIO001 A Rehabilitation Aid for the Treatment of 'Clenched Fist,' Condition in Multiple Sclerosis**
Lauren Ursula Murphy, 17, Junior, Loreto Balbriggan, Dublin, Ireland, T: Niamh McNally

NORWAY

Oslo, NOR001, Norwegian Contest for Young Scientists

- EGPH035 Investigation into Water Level, Volumetric Flow Rate and Economical Aspects and their Effect on the Optimum Capacity of a Hydropower Plant on the Nkusi River in Uganda**
Magnus Freyer, 19, Senior, International School of Stavanger, Stavanger, Norway, T: Simon Taylor
- PHYS055 Modelling Coupled Metronomes: An Application of the Kuramoto Model**
Peter Erdmann Dougherty, 19, Senior, Kristiansand Katedralskole Gimle, Kristiansand, Norway, T: Erlend Harbo

PAKISTAN

Islamabad, PAK001, Intel Science Fair

- ANIM048 Milkaumentar, an Organic Supplement to Increase Milk Yield in Livestock Animals**
Sarmad Saeed Nasir, 19, Senior, Engro Grammar School, Daharki, Pakistan, T: Saeed Ahmed Nasir
- CHEM038 Pollution Filter Masks**
Khasheaa Nadeem, 16, Junior, Aga Khan Higher Secondary School Karimabad, Karachi, Pakistan, T: Shama Shoukat Ali Gillani
- EGCH046T Solar Powered Hydrogen Vehicle with Current Inducing Shock Absorbers**
Muhammad Hashim Khan, 15, Sophomore; Ahmad Bin Abdur Rahman, 16, Sophomore, Divisional Public Secondary School for Boys, Lahore, Pakistan, T: Nisar Ali
- EGPH019T The Neodymium Wind Turbine**
Abdullah Khan, 17, Junior; Sameen Mehdi, 17, Junior; Minahil Mustafa, 17, Junior, Beaconhouse School System Valencia Town Campus, Lahore, Pakistan, T: Waqar Ahmad

EGPH034 A New Spin on Renewable Energy
Shahmir Khan Niazi, 15, Freshman, Beaconhouse School System Valencia Town Campus, Lahore, Pakistan, T: Hassaan Khan Niazi

PALESTINE

Ramallah, PSE001, Palestine Science and Technology Fair

ROBO043 Always with Me
Sima N.T. Saboh, 15, Sophomore, Talae' Al-Amal Secondary School, Nablus, Palestine, T: Majd M.S.A Abu-Kharma

ROBO049T The Smart E-Speaking Stick
Fatma Imad Zaghab, 16, Junior; Amal Ali Fhoud, 17, Junior, Jericho Girls Secondary School, Jericho, Palestine, T: Rola Youssef Alqaddi

SOFT047 Am Your Voice Speak I Hear You
Ola S.Z. Abdalsalam, 14, Freshman, Al Haja Rashda Secondary School for Girls, Nablus, Palestine, T: Kholoud K.A. Owda

SOFT053 Just on Time
Akram Sbaih, 15, Sophomore, Kafr Ra'i Secondary Boys' School, Jenin, Palestine, T: Ahmad Morrar

PANAMA

Panama City, PAN001, Feria Cientifica del Ingenio Juvenil

BMED014T Study of the Levels of Resistance to Organophosphate and Carbamate Insecticides in Two Populations of *Anopheles albimanus* (Diptera: Culicidae) of Panama
Ameth Abraham Yuil, 16, Junior; Raul Adolfo Rodriguez, 17, Junior, Instituto Fermin Naudeau, Panama, Panama, T: Lorenzo Caceres

ENEV019T Efficiency Evaluation of a Based Clinoptilolite Zeolite-Brine Natural Refrigerants in Refrigeration Systems
Madelaine Del Carmen Rodriguez, 16, Junior; Monica Espinosa, 16, Junior, Badi School, Panama, Panama, T: Jovanny Ariel Diaz

MCRO011 Isolation and Characterization of Microorganisms Isolated from Soil Treated with Atrazine
Ricardo Arturo Young, 17, Junior, Escuela Secundaria Pedro Pablo Sanchez, Panama, Panama, T: Francisco Rivas

Peru

Lima, PER001, Peru Science and Engineering Fair

ANIM001T Study of Combined Diets for the Optimal Farming of the Golden Apple Snail and Its Profit for Nutrition and for the Industry
Ruth Rodriguez Llanco, 19, Junior; Rosa Maria Huarcaya Navarro, 16, Sophomore, Nuestra Senora de las Mercedes, Chanchamayo, Peru, T: Liliana Latour Toro

BEHA003 Participation of Indigenous Guerrilla Groups from Pazos and Other Towns in Tayacaja in the War between Peru and Chile
Jennyfer Joselyn Castro Capcha, 15, Sophomore, Manuel Scorza Torres, Pampas - Tayacaja, Peru, T: Sandy Emma Pena Ortiz

ENEV003T Evaluation of the Biodegradable Effect of Limonene and the Awareness Campaign for Reduction of Polystyrene Waste
Janela Mayer Jimenez, 16, Sophomore; Carol Barrantes Alban, 15, Sophomore, Divina Pastora, Oxapampa, Peru, T: Irma Soledad Valdivia Mamani

PLNT003T Study of the Genetic Diversity of the Banana Passionfruit (*Passiflora mollisima*) through Molecular RAPD Markers and Determination of the Vitamin C Amount Based on the Different MASL Heights Where It Grows
Aron Engelhard Levy, 18, Junior; Joel Philippe Kirschbaum Chrem, 17, Junior, Leon Pinelo, Lima, Peru, T: Maria Luz Rojas Bonilla

PHILIPPINES

Pasig City, PHL001, Philippines Science Fair

- ANIM028** **Effects of Lemon Grass (*Cymbopogon citratus*), San Francisco (*Codiaeum variegatum*) and Tawa-tawa (*Euphorbia hirta*) on the Growth and Development of the Mosquito, *Aedes aegypti*, a Vector of Dengue Virus**
Jerouen Paul Daniel Lumabao, 17, Sophomore, Daniel R. Aguinaldo National High School, Davao, Philippines, T: Chito Raffles Napitan
- BMED042T** **Cytotoxic and Genotoxic Potentials of the Money Tree (*Pachira aquatica*) Stem and Leaf Extracts**
Jane Nicole Nagano Catacutan, 16, Sophomore; Melissa Candelaria Gaudario, 16, Sophomore; Maries Ann Ramos Silvestre, 15, Freshman, Juan R. Liwag Memorial High School, Gapan, Philippines, T: Mary Lorraine Figueroa Lorido
- PLNT023T** **Utilization of *Strelitzia reginae* (Birds of Paradise) Stalks and *Typha latifolia* (Cattail Plant) Leaves Mix as Substrate for the Production of *Pleurotus ostreatus* (Oyster Mushroom)**
Earl Humprey Monsale Bantug, 16, Sophomore; Mariam Lujain Jajurie Anwar Bahraq, 16, Sophomore; Ma. Feleesa Paclibar De las Penas, 16, Sophomore, Regional Science High School - Region IX, Zamboanga City, Philippines, T: Noreen Tano Catis
- TMED016** **A Study on the Anti-tumor Potential of *Moringa oleifera* (Lam.) Seed Extract Using the Chorioallantoic Membrane Assay**
Arianwen Ledesma Rollan, 17, Sophomore, Cebu City National Science High School, Cebu City, Philippines, T: Mary Ann Dumdum Bacalso

POLAND

Gdynia, PLD001, E(x)plory Science Fair

- ENBM041T** **Origami BioBandage: An Advanced Tool for Personalized Bone Fractures Treatment Based on Software Simulating Therapies Available on the Market through Modeling Bone Healing Process and Including Patient's Medical Case**
Joanna Michalina Jurek #, 19, Senior; Dominika Katarzyna Bakalarz, 19, Senior, Boleslaw Chrobry High School, Piotrkow Trybunalski, Poland; 3rd Maria Skłodowska-Curie High School with Bilingual Classes in Opole, Opole, Poland, T: Maciej Cytowski
- SOFT031** **Developing Operating System for High-Performance Computing with a Hardware Approach to the Transactional Memory Support**
Wojciech Krzysztof Rozowski, 17, Junior, Liceum Ogólnokształcące im. Tadeusza Kościuszki w Krzeszowicach, Krzeszowice, Poland, T: Alicja Milczarek

PORTUGAL

Lisboa, PRT001, Portuguese Contest for Young Scientists

- MATH024** **Semilattices of Groups in a Given Variety and Rectangular Bands**
Joao Pedro Araujo, 18, Senior, Colegio Planalto, Lisboa, Portugal, T: Fernando Pena
- PHYS043T** **Astrophysical Modeling of Wolf Rayet Stars Using Low Resolution Gratings**
Ivo Jose Goncalves, 17, Senior; Daniel Alexandre Diaz da Costa, 19, Senior; Mauro Barbosa Franqueira, 18, Senior, Escola Secundaria Dona Maria II, Braga, Portugal; Agrupamento de Escolas D.Maria II, Braga, Portugal; Escola Secundária Dona Maria II, Braga, Portugal, T: Joao Paulo de Carvalho Vieira

PUERTO RICO

Arecibo, TEPR02, Arecibo Regional Science Fair

- ENEV068** ***Musa paradisiaca* Peelings an Ingredient that Strengthens the Biodegradable Plastic**
Daniel Morales, 18, Senior, Domingo Aponte Collazo, Lares, Puerto Rico, T: Antonia Hernandez
- PLNT039** **The *Brachiaria humidicola* in the Soils of Puerto Rico and Its Contribution to the Environment**
Ana Victoria Zaragoza Torres, 15, Sophomore, Hogar Colegio La Milagrosa, Arecibo, Puerto Rico, T: Yadira Gonzalez

Bayamon, TEPR03, Bayamon Regional Science Fair I

EBED029 Kinetic Energy as an Alternative to Generate Electric Energy
Orlando Javier Marrero-Villamil, 17, Junior, Escuela Bilingue Especializada en Ciencias y Matematicas Papa Juan XXIII Secundaria, Bayamon, Puerto Rico, T: Laura H. Rivera-Ortiz

EGPH029 Self-Sustaining Streetlight Post
Karlos Lenniel Nicolas Miranda Garces, 16, Junior, Adela Rolon Fuentes, Toa Alta, Puerto Rico, T: Xavier Morales Cuadrado

Caguas, TEPR04, Caguas Regional Science Fair

BMED050T The Effect that Red Meat and Soursop Have in the Production of Cells in *Drosophila melanogaster*
Cristal Marie Rodriguez, 17, Senior; Christina Luz Lebron, 18, Senior, Specialized in Science and Mathematics Genaro Cautino Vazquez, Guayama, Puerto Rico, T: Haydee Minette Laporte

Humacao, TEPR05, Humacao Regional Science Fair

EGPH021 Water Purification Using Solar Energy
Sebastian Andres Rivera, 16, Junior, Centro Residencial de Oportunidades Educativas de Ceiba, Ceiba, Puerto Rico, T: Wilmayris Alvira

MCRO041 Climatic Change and Its Relationship with the Microbiological and Physical Parameters that Affect the Quality of Water in the Coastal Zones of Puerto Rico
William Antonio Delgado, 16, Senior, Ramon Quinones Medina, Yabucoa, Puerto Rico, T: Glendalis Morales Ramos

Mayaguez, TEPR08, Mayaguez Regional Science Fair

CBIO026 Simulating the Radioactive Decay Chain Utilizing a Mathematics Programming Language
Norman Ariel Toro Vega, 16, Junior, Dr. Carlos Gonzalez High School, Aguada, Puerto Rico, T: Milagros Tubens Mercado

ROBO020 SIRO Elektra, the Robotic Chair
Miguel Esteban Nieves-Chaves, 18, Senior, Juan Suarez Pelegrina High School, Aguadilla, Puerto Rico, T: Tania Anubis Montalvo

Mayaguez, TEPR10, SESO Regional Science Fair

EGPH003 Press Energy: Generating Electric Energy using Pressure Forces
Pablo Enrique Barillas, 16, Sophomore, Southwestern Educational Society, Mayaguez, Puerto Rico, T: Rose Saavedra

Ponce, TEPR06, Ponce Regional Science Fair

EAEV042 The Mixture of *Pimenta racemosa* and *Cinnamomum camphora* Extracts and the Effects on the Roots and Soil After Being Applied to *Cynodon dactylon*
Jerison Figueroa Ruiz, 18, Senior, Thomas Armstrong Toro, Ponce, Puerto Rico, T: Carmen Noble

MATS027 The Creation of an Annovative Nanofiber Capacitor of 75% of PVDF-TrFE Polymer Capable of Storing and Displacing Energy in a DC Series Circuit
Maybelline Caban, 18, Senior, Thomas Armstrong Toro, Ponce, Puerto Rico, T: Carmen Noble

San Juan, TEPR01, Puerto Rico Math Fair

MATH027T The Future of Energy: Spidronized Solar Cells
Osvaldo J. Pagan, 17, Senior; Dariannette Valentin, 17, Senior, Dr. Carlos Gonzalez High School, Aguada, Puerto Rico, T: Sylvia Hernandez

MATH028 Differential and Integral Analysis of the Torus
Alejandra Paola Flores Rivera, 16, Senior, Brigida Alvarez Rodriguez Mathematics and Science High School, Vega Baja, Puerto Rico, T: Hector Otano Vega

MATH034 Finding a Pure Mathematical Method for Galactic Classification
Orlando Johan Martell, 18, Senior, Centro Residencial de Oportunidades Educativas Mayaguez, Mayaguez, Puerto Rico, T: Edwin Benvenutti

PLNT047 Modeling Functions in the Conversion of Solar Light to Electricity in the Evergreen Perennial, *Musa acuminata*, Using as a Base Source of Energy Its Adenosine Triphosphate

Andrea Marie Albaladejo Quiles, 18, Senior, Brigida Alvarez Rodriguez Mathematics and Science High School, Vega Baja, Puerto Rico, T: Hector Otano Vega

San Juan, TEPR07, San Juan Archdiocesan Region Science Fair

- BMED020** **The Gut Microbiome: Potential Risk Factor for Colorectal Cancer**
Adriana Sofia Monzon, 16, Junior, Academia del Perpetuo Socorro, San Juan, Puerto Rico, T: Michele Angueira
- BMED021** **Antibacterial Properties of *Plantago major's* Leaves**
Isabel Cristina Brum, 15, Freshman, Colegio Marista, Guaynabo, Puerto Rico, T: Isabel Perez
- EAEV022** **The Potential of Plantain Wastes and Sargassum as Alternative Sources of Energy Production**
Francisco Antonio Alvarado, 17, Junior, Colegio San Ignacio de Loyola, San Juan, Puerto Rico, T: Wilma M. Giol
- PHYS017** **Use of the Magnetic Field to Levitate a Car**
Xavier Omar Espinosa, 15, Sophomore, Colegio Beato Carlos Manuel Rodriguez, Bayamon, Puerto Rico, T: Nilka Yahaira Mulero
- PLNT040T** **The Effect of Nutrition on Oranges Trees with Citrus Greening: The 21st Century Plant Crisis**
Sebastian David Redondo, 15, Freshman; Diego A. Redondo, 15, Freshman, Academia del Perpetuo Socorro, San Juan, Puerto Rico, T: Michele Angueira

San Juan, TEPR09, San Juan Regional Science Fair

- ENMC038** **Maglev Landing Aircraft: Reduction in Landing Accidents**
Felix Junior Morales, 16, Junior, Colegio Congregacion Mita, San Juan, Puerto Rico, T: Danna Esther Perez
- San Juan, TEPR12, Puerto Rico Metropolitan Science Fair
- ENBM011** **Smart Wearable System for Diabetes High Risk Group: Screening Tool by Subject's Electrochemical Skin Conductance and Heart Rate**
Angelik Laboy-Torres, 16, Junior, Escuela Secundaria Especilizada en Ciencias, Matematicas y Tecnologia, Caguas, Puerto Rico, T: Milagros Carire
- ENEV058T** **Study of the Use of *Cucurbita moschata's* (Green Pumpkin) and *Malus domestica's* (Green Apple) Waste as a Natural Filter Capable of Removing Toxic Heavy Metals from Water**
Gabriel Alejandro Burgos-Ortiz, 15, Freshman; Alberto Gabriel Melendez-Alvarez, 15, Freshman; Leonel Antonio Negrin-Rivera, 14, Freshman, Colegio Rosa-Bell, Guaynabo, Puerto Rico, T: Felix Marcel Torres-Alcala
- ENEV101T** **Development of a Mathematical Formula for the Calculation of the Optimal Water Distribution in a Territory**
Gustavo Xavier Santiago-Reyes, 16, Sophomore; Omar Alejandro Santiago-Reyes, 16, Sophomore, Escuela Secundaria Especilizada en Ciencias, Matematicas y Tecnologia, Caguas, Puerto Rico, T: Maytee Cruz
- ROBO005T** **The Future of Mechanical Prosthetics: Electromyogram Controlled Extremities**
Javier Antonio Ortiz - García, 18, Senior; Osvaldo Efraín Rivera-Valentín, 17, Senior; Luis Angel Ramirez-Torres, 17, Senior, Escuela Secundaria Especilizada en Ciencias, Matematicas y Tecnologia, Caguas, Puerto Rico, T: Milagros Carire

QATAR

Doha, QAT001, The National Student Research Fair

- BEHA048T** **Attitudes Towards Green Banking in Qatar**
Dhabya Mohammed Al-Habab, 16, Sophomore; Sara Mohammed Alkabb, 15, Sophomore, Qatar Banking Studies & Business Administration School for Girls, Doha, Qatar, T: Ghada Faisal Abou Nada
- BMED081T** **The Impact of Sport Jackets on Adjusting Backbone Vertebrae**
Sara Khalaf S. M. Al-Kubaisi # # #, 14, Freshman; Tamara Ismail Bashir # # #, 14, Freshman, Moza Bint Mohamad, Doha, Qatar, T: Hajer Jamil Turki
- CHEM049T** **Improving the Properties of Concrete Using Seawater with High Reactive Metakaoline and Sodium Mono Florophosphate**
Abdulrahman Abdulaziz Ali Mohammed, 18, Junior; Ahmed Salah Elhamamsi, 16, Junior, Ahmad Bin Hanbal Secondary School, Najma, Qatar, T: Zakareya Ahmed Hussein

- EAEV054T** **Effect of Seaweed on CO₂ Ratio from the Effluence of Power Plants in Qatar**
Mohammed Khalid Al-Sheebani, 16, Sophomore; Ahmed Rabie Mahmoud, 16, Sophomore, Abdulrahman bin Jassim, Al-Wakra, Qatar, T: Ahmed Attia Abdelrahim
- EGPH031T** **Viruses Produce Electricity by Movement**
Khaloud Khalid Al-Hajri, 16, Junior; Usra Abushara Elshaikh, 16, Junior, Alryyan Secondary School, Doha, Qatar, T: Wejdan Ahmed Alfokaha
- ENMC069T** **A Safe Swimming Pool Restores Life**
Mohammed Al-Marri, 17, Junior; Ehab Ayaman Etman, 17, Junior, Ahmad Bin Mohammad School, Doha, Qatar, T: Seif Shatnawi

REPUBLIC OF MOLDOVA

Chisinau, MDA001, *Moldova Science and Engineering Fair*

- ENEV024** **A Novel Method of Defusing Land Mines and Other Ordnance**
Butmalai Dan, 18, Junior, Liceul Academie de Stiinte a Moldovei, Chisinau, Republic of Moldova, T: Carlig Sergiu
- SOFT001T** **ByMySelf(BMS) Encryption Algorithm**
Diana Marusic #, 18, Senior; Emilia Savva, 16, Freshman, "Ion Creanga" Theoretical Lyceum, Chisinau, Republic of Moldova, T: Dumitru Savva

ROMANIA

Suceava, ROM001, *Romania Science and Engineering Fair*

- EBED010T** **Driving Assistant: Road System to Improve Driving Safety and Quality**
Raul Alexandru Hantascu #, 16, Sophomore; Tudor Andronic, 17, Sophomore, Colegiul National "Petru Rares" Suceava, Suceava, Romania, T: Sutac Victor
- EBED011T** **Using Electronic Devices to Help Visually Impaired Peoples to Detect Obstacles: Carmen Sylva Your Eyes (CSYE)**
Andreea Alina Petrisor #, 16, Sophomore; Paul Florin Paraschiv, 17, Sophomore; Razvan Ilie Badea-Armeanu, 17, Junior, Carmen Sylva High School, Eforie Sud, Romania, T: Florin Constantin Serbu
- ENBM008T** **Medical Rehabilitation: Sensors and Monitoring–Monitoring Devices**
Miruna Alexandra Ojoga, 16, Sophomore; Ana-Maria Tudorache, 16, Sophomore, International Computer High School of Bucharest, Bucharest, Romania, T: Mircea Ignat
- MATS007** **Elastomers and Applications**
Corbeanu Dan Andrei, 17, Junior, International Computer High School of Bucharest, Bucharest, Romania, T: Mircea Ignat
- MCRO007T** **Magnetic Bacteria: Experimental Study and Applications**
FengYuan Elena Yuan, 16, Sophomore; Cristian Ionut Costin, 16, Sophomore, International Computer High School of Bucharest, Bucharest, Romania, T: Mircea Ignat

RUSSIAN FEDERATION

Chernogolovka, RUS005, *Avangard*

- CHEM019** **Time and Atom Economy Method for the Synthesis of (1-6) Linked Glycosides**
Uliana Aladysheva, 17, Junior, State Budgetary Educational Institution of Moscow "Lyceum-Gymnasium Complex in the South East" Moscow Chemical Lyceum No1303, Moscow, Russian Federation, T: Vadim Krylov
- CHEM041T** **A Step Towards New, Cyclopropane-Based Reagents for Positron Emission Tomography**
Polina Rusina, 17, Senior; Angelina Bobrova, 17, Sophomore, Moscow Chemical Lyceum 1303, Moscow, Russian Federation, T: Sergey Semenov
- ROBO011** **The Creation of a Prototype Automated System for Modifying the Control of Humidity and Temperature in the Room**
Ilya Tudachkov, 16, Sophomore, Samara Regional Boarding School, Samara, Russian Federation, T: Danil Ezhov

Moscow, RUS002, Junior–I

- CHEM028** **New Method for the Synthesis of 1,1-Fluoronitroalkenes by Radical Substitution in Fluorobromostyrenes**
Vladimir Motornov, 17, Junior, Moscow Chemical Lyceum 1303, Moscow, Russian Federation, T: Andrey Tabolin
- CHEM046T** **Design of New Fluorescent Sensors based on Poly(oximinoalkyl)amines**
Klim Biriukov, 17, Junior; Innokentiy Nikitin, 17, Junior, Moscow Chemical Lyceum 1303, Moscow, Russian Federation, T: Sergey Semenov
- EBED038** **Personal Communicator for People Who Have Hard Problems with Moving Functions and Speech**
Aleksandr A. Sarantsev, 17, Junior, Center of Children's Technical Creativity, Zarechny, Russian Federation, T: Dmitriy Ilushin
- EBED046** **Obstacle Detecting Tactile Device for Assisting Spatial Orientation of the Visually Impaired and Blind People**
Ilya Andreevich Tuzhilin, 16, Freshman, School: Lyceum No.1502 Affiliated with the Moscow Power Energy Institute, Moscow, Russian Federation, T: Irina Anatolyevna Krasnova
- MATH039** **Higher Jacobi Identities**
Ilia S. Alekseev, 17, Junior, School 564, Saint Petersburg, Russian Federation, T: Sergei O. Ivanov
- PHYS049T** **The Orbital Synchrotron Detector of High-Energy Electrons and Positrons**
Georgii N. Sizov, 17, Junior; Stepan V. Chumakov, 17, Junior, Lyceum No. 1511 Affiliated with MEPhI, Moscow, Russian Federation, T: Vladimir Mikhailov

Moscow, Krasnoyarsk, RUS006, Scientists of the Future Fair

- EAEV041T** **Acid Rains: Indication of Acidity Based on Flowers Pigments**
Aleksandr Andreevich Chepovskii, 14, Freshman; Polina Sergeevna Vorzonina, 16, Sophomore, Gymnasium 11, Balashiha, Russian Federation; Autonomous Municipal Educational Institution "Krasnoyarsk University Gymnasium No 1, Krasnoyarsk, Russian Federation, T: Natalia Nikolaevna Maximova, Ludmila Vasilievna Stepanova
- EBED034** **The Braille Sleeve**
Vusal Khanlar Ogly Salmanov, 17, Junior, Municipal Budget Institution of General Education "Secondary School of General Education No. 1", Birobidzhan, Russian Federation, T: Ksenia Alexandrovna Gnitko
- MATH033** **The Center of One Geometric World**
Roman Krutovskiy, 18, Junior, Gymnasium No. 1514, Moscow, Russian Federation, T: Fyodor Alexeevich Ivlev
- MATH044** **Application of Greedy Evolutionary Algorithms for Solving Complex Problems of Selection, Location and Clustering**
Vladimir Lvovich Kazakovtsev, 17, Sophomore, Municipal Autonomous Institution of General Education Liceum No. 6 "Perspektiva", Krasnoyarsk, Russian Federation, T: Lev Kazakovtsev

Nizhny Novgorod, RUS001, ROST

- BMED002T** **A Rapid Method of Estimating Damage and Repair of DNA**
Irina Anatolyevna Gurianova, 17, Junior; Ekaterina Kulagina, 18, Junior, Municipal Lyceum No. 8, Nizhny Novgorod, Russian Federation, T: Irina Andreevna Chernigina
- MATH005** **Triangular Circle in a Square**
Ekaterina Lebedeva, 16, Sophomore, Municipal Lyceum No. 40, Nizhny Novgorod, Russian Federation, T: Yulia Kuznetsova
- MATS002T** **Superconductive Rings as a Way to Obtain High-Powered Magnetic Fields**
Klim Goldshtein, 17, Junior; Grigory Shutov, 18, Junior, Municipal Lyceum No. 40, Nizhniy Novgorod, Russian Federation, T: Sergey Churin
- St. Petersburg, RUS004, Intel Baltic Science and Engineering Fair
- ENMC070** **Electrochemical Machining of Microwire**
Kirill Kuznetsov, 18, Junior, Lyceum No. 77, Chelyabinsk, Russian Federation, T: Tatiana Puzanova
- MATH009** **Linear Response for Chaotic Maps of Small Regularity**
Evgenii Todorov, 18, Junior, School No. 564, Saint-Petersburg, Russian Federation, T: Dmitrii Todorov

- MATH025T** **Comparison of the Smoothness of an Outer Function and Its Modulus**
Ivan Fokin, 18, Junior; Daniil Plaksin, 18, Junior, School No. 564, Saint Petersburg, Russian Federation, T: Alexey Medvedev
- MATH026T** **The Group Commutator Length in Terms of Group Ring**
Pavel Solikov, 17, Junior; Maksim Vagner #, 17, Junior, School No. 564, Saint-Petersburg, Russian Federation, T: Anatoly Zaykovskiy
- ROBO026** **6-Axis Robot Manipulator for an Educational Process and for Automation of Small-Scale Enterprises**
Oleg Valerevich Zobov, 17, Junior, Lyceum 1502, Moscow, Russian Federation, T: Vladimir Alexandrovich Poyarkov
- SAUDI ARABIA**
Riyadh, SAU001, Mawhiba Science and Engineering Fair
- BEHA038** **Navigation Watch for People with Hemiplegia and Paraplegia**
Hanan Madallah Almatrafi, 15, Sophomore, Banat Al-Gad, Arar, Saudi Arabia, T: Reem Saud Al-Muqbil
- BEHA054T** **Hope: Augmentative and Alternative Communication Application for Children with Down Syndrome**
Manar Ibrahim Alolasi, 18, Senior; Marwah Ibrahim Alolasi, 18, Senior, The 10th High School, Madinah, Saudi Arabia, T: Zekra Omar Alahmadi
- BMED063** **Characterizing the Testicular Expression Pattern of DCAF Family Genes in Comparison to Other Organ Tissues**
Nawaf Abdullah Alhelal, 18, Senior, The Model Institute of the Capital, Riyadh, Saudi Arabia, T: Mohammed Almenier
- BMED065** **Investigating the Interplay Between PCNA and FEN-1 in Genome Maintenance at the Single Molecule Level**
Danah Hussein M. Alawami, 17, Senior, Dhahran Ahliyya Schools, Dhahran 34452, Saudi Arabia, T: Samir Hamdan
- CHEM039** **Heavy Reformate-to-Xylenes Conversion Over Novel Zeolite Catalyst: Eliminating the Addition of Toluene**
Yasmeen Zaki Alsaif, 16, Junior, Dhahran Ahliyya Schools, Dhahran, Saudi Arabia, T: Ahmad Jazzar
- EAEV049** **Assessment of Phthalate Esters (PAEs) and Bisphenol A (BPA) in Treated Wastewater Samples Collected in Saudi Arabia and their Potential Health Risk**
Hesham Abdulrahman Almeneif, 18, Senior, Manarat Al Riyadh School, Riyadh, Saudi Arabia, T: Osama Mohammed Fahmy
- EGCH033** **Organic Photovoltaics' Efficiency Enhancement using Reflective and Semitransparent Solution-Processed Silver**
Mohammed Bader Alhammadi, 18, Senior, Dhahran Ahliyya School, Dhahran, Saudi Arabia, T: Fayeg Alqaderi
- EGCH034** **Determining the Potential of Light Naphtha as Novel Alternative Fuel Using Predictive Kinetic Models**
Munyah Fahad Alamro, 18, Senior, Altarbiyah Alislamiyah School, Riyadh, Saudi Arabia, T: Hana Sahyun
- EGCH035** **Optimizing the Capacity of Sodium Ion Batteries**
Mansour Ali Aldabbagh, 18, Senior, Manarat Al Riyadh, Riyadh, Saudi Arabia, T: Alaa Almasri
- ENEV072** **New Record for the Most Effective Microalgae on the Removal of Phosphorus and Nitrogen for Wastewater Treatment**
Sara Adnan Alghamdi, 17, Senior, My Little House School, Jeddah, Saudi Arabia, T: Nawal Makawi
- ENEV073** **Green Wastewater Treatment: Using Graphene Oxide Produced from Date Pits to Degrade Organic Dyes via Novel Microwave Technique**
Abdulaziz Yahya Alshahrani, 16, Sophomore, Abha High School, Abha, Saudi Arabia, T: Nasser Sayed Awwad
- ENEV074** **Enhancing Photocatalytic Activity of the ZnO Nanoparticles Using Nanocomposites for Removal of Organic Pollutants**
Ahad Abdullah Alnemari, 16, Junior, Al-Hada Secondary School, Taif, Saudi Arabia, T: Ameerah ebad Alnemari

- ENMC053** **Investigating the Acoustic Flame Interaction with the Effects of Magnetic Field and Plasma**
Omar Abdulrahman Alhazzaa, 17, Senior, Najd Nationa School, Riyadh, Saudi Arabia, T: Deanna Lacoste
- MATH037** **Enhancement RSA Security Using Polynomials and Rabin Functions**
Shaden Naif Alshammari, 17, Senior, 19th High School, Hail, Saudi Arabia, T: Modi Abdulwahed Alshammari
- MATS037** **Using a Scalable Atmospheric-pressure Vapor Transport Strategy for the Growth of VOx Nanowires in Energy Efficient Commercial Applications**
Suliaman Nasser Aljubaily, 18, Senior, Manarat Al Riyadh School, Riyadh, Saudi Arabia, T: Haron Adel
- MATS038** **Developing a Novel Water Vapor Selective Composite Membrane by Adding a Thin Polymeric Layer**
Zahraa Hussain Alsaggaf, 18, Senior, Dar Al Fikr Girls School, Jeddah, Saudi Arabia, T: Klaus-Viktor Peinemann
- PLNT041** **Determining the Effect of the Novel CarL2 Strigolactone Analog on the Seed Germination of Parasitic Weeds**
Fatimah Abdulmonem Alshaikh, 18, Senior, AlFaisaliah Islamic Schools, Khobar, Saudi Arabia, T: Maha Alrayyes
- TMED032** **Understanding Modern Diagnoses with Unknown Gene Plays a Critical Role in Inherited Thrombophilia**
Abdullah Faisal Alzarroug, 16, Junior, Alkhndag, Madinah, Saudi Arabia, T: Taha Hamid Hegazy

SINGAPORE

Singapore, SGP001, Singapore Science and Engineering Fair

- CHEM022** **Immobilization of Glycans on Silicon Substrates for Diagnostic Microarrays**
ShuYi Jia, 19, Junior, National Junior College, Singapore, Singapore, T: Harman Augustus Johll
- CHEM023** **Nickel Oxy-hydroxide Thin Films as Efficient Electrocatalysts for Dye Wastewater Treatment**
Yuhang Wang, 19, Senior, National Junior College, Singapore, Singapore, T: Harman Johll
- EBED026** **Optically Illuminated Directional Sensing for Guidance and Alignment Systems**
Samuel Leong, 18, Senior, Hwa Chong Institution, Singapore, Singapore, T: Kelvin Tan
- ENBM017** **Early, Affordable and Rapid Viral Detection: Revolutionizing Home Diagnosis of Dengue and Zika through Lateral Flow Biosensing**
Yu Ki Sim, 17, Senior, National Junior College, Singapore, Singapore, T: Harman Johll
- ENEV051T** **A Novel Reactor with a Transparent Electrode to Improve UV-Mediated Electrochemical Wastewater Treatment**
Victor Huang, 18, Senior, Brandon Foong, 17, Senior, NUS High School of Mathematics and Science, Singapore, Singapore, T: Julien Jean Pierre Manury
- MATS024T** **Tailored Synthesis for Morphology Control of Hematite Nanoparticles**
Kit Mun Chow, 16, Junior; Clara Keng, 17, Junior, River Valley High School, Singapore, Singapore; Raffles Institution, Singapore, Singapore, T: Ban Hoe Chow, Guo Xian Tan

SLOVAKIA

Bratislava, SVK002, AMAVET-Slovak Association for Youth, Science & Technology

- MATS036** **The Influence of Coating on Properties of Iron-based Nanoparticles for Biomedical Applications**
Ivan Grega, 18, Junior, John Amos Comenius Lutheran Grammar School, Kosice, Slovakia, T: Monika Baronova

- PLNT057 Potential Use of Secondary Metabolite in Protection Against Plant Parasites**
Jana Cornakova, 17, Sophomore, Saint Nicholas Grammar School, Presov, Slovakia, T: Miriam Feretova
- SLOVENIA**
Ljubljana, SVN001, Slovenia Science and Engineering Fair
- MCRO070 The Effect of Selected Pesticides on Heterotrophic Soil Microorganisms**
Gabriela Stumberger, 17, Junior, Il. Gimnazija Maribor, Maribor, Slovenia, T: Katja Holnthaner Zorec

SOUTH AFRICA

Boksburg, ZAF001, Expo for Young Scientists–South Africa

- ANIM004 A Study of the Nocturnal Behaviour of the Greater Kudu**
Nomthuthuzeli Maeti Fuleni, 18, Senior, Tiger Kloof Combined, Vryburg, South Africa, T: Eddie Cilliers
- EAEV023 Human Disturbance of Blister Bush in Platteklip Gorge, Table Mountain**
Amber Genevieve Mariette De Decker, 15, Sophomore, Herschel Girls' School, Cape Town, South Africa, T: Michael Brasler
- EGCH001 Recycled and Organic Materials for Energy**
Aryan Suniel Mootheram, 17, Junior, Ladysmith High School, Ladysmith, South Africa, T: Jean Anderson
- ENEV006 Safe Disposal of Household Mercury Containing Compact Fluorescent Light Bulbs**
Marcolyn Arumugam, 17, Senior, Greenbury Secondary School, Durban, South Africa, T: Logan Pillay
- ENEV007 Concrete + Acid Mine Drainage = A Sustainable Solution**
Brynn Robert Cauldwell, 17, Junior, St Stithians Boy College, Johannesburg, South Africa, T: Ann Topp
- ENMC007 Electric Space Propulsion: An Exploration into Innovative Propellant Solutions Involving the Testing of an Electromagnetic Drive**
Paul Robert Stansell, 18, Senior, Sacred Heart College, Johannesburg, South Africa, T: Berndt Weissenbacher
- PHYS003 Superconductors and Magnetism**
Angus Guy Thring, 17, Junior, Diocesan College, Cape Town, South Africa, T: Olga Peel

SOUTH KOREA

Seoul, KOR001, Korea Olympiad in Informatics

- ENEV093 The Development of 3R Water Filter: Round Wave–Rusty Wire–for Rural Regions**
Jae hyeok Choi, 17, Junior, Myungduk High School, Seoul, South Korea, T: Sungdo Jee
- ROBO037 Direct Connection Technology between Disabled and Prosthetic Robot Hand**
Yun Kang, 16, Junior, Cheonan Jungang High School, Cheonan-Si, South Korea, T: Yeong Jae Han
- SOFT039 SManimator: A Keyframe-Based 2D Animation Creator**
Chan Sol Yang, 18, Senior, Gyeonggi Science High School for the Gifted, Suwon, South Korea, T: Jong Hye Kim
- SOFT046 Winklick: A Faster Algorithm for Detecting Eye Movement with Mobile Devices**
Auejin Ham, 17, Junior, Kwan-Ak High School, Seoul, South Korea, T: Jinwoo Lee
- SOFT049T Flex Language: A Program Language with New Paradigm to Unify the World of Programming**
Jeong Hwan Park, 17, Junior; Won Tae Jeong, 16, Sophomore, Daedeok Software Meister High School, Daejeon, South Korea, T: Ho Yeon Chon
- Seoul, KOR002, YSC (National Science Research Competition)*
- CHEM055T Can We Directly Measure Each Solute Concentration in Mixed Solution? A New Class of Polarimeter**
Seong Ho Lim, 18, Senior; Jihong Kim, 18, Senior; Seung Yoon Lee, 17, Senior, Gyeongnam Science High School, Jin Ju, South Korea, T: Gi Heun Lee

- EGCH047T Utilizing Metallic Sponges for Microbial Fuel Cell with Organic Molecules**
Ji Won Kim, 16, Junior; Hyo Ryeong Seo, 16, Junior; You Jin Jung, 17, Junior,
Puhung High School, Anyang, South Korea, T: Mi Jung Kim
- ENBM040T Fabrication of the Bacterial Attachment System of the Medical Microrobot with Enhanced Motility and Stability**
Seongwoo Lee, 17, Junior; Dain Yoo, 16, Junior; Jun Young An, 16, Junior,
Gyeonggibuk Science High School, Uijeongbu-Si, South Korea, T: Jin Hee Kim
- ENMC071T Black Ice Warning System through Optical Visualization of Road Condition for Unmanned Vehicle**
Yu Lim Kim, 16, Sophomore; Ha Young Lee, 15, Sophomore; So Yun Lee, 15,
Sophomore, Boyoung Girls' High School, Dongducheon-si, Gyeonggi-do,
South Korea, T: Seong Ho Song
- MCRO047T Exotic Plant Invasion Affects to Arbuscular Mycorrhizal Fungal Community**
Wooju Park, 17, Junior; Sangjun Jeon, 17, Junior; Yujin Jeon, 16, Junior,
Kangwon Science High School, Wonju-Si, Kangwon-Do, South Korea,
T: Hangseok Choi
- PHYS002T Photoelastic Analysis of the Mechanical Stress in Korean Traditional Joints**
Chae Yeon Yu, 18, Senior; Jeong In Cha, 17, Senior; Se In Lee, 17, Senior,
Yangji High School, Ansan-Si, Gyeonggi-Do, South Korea, T: Byung Hyun Oh
- PHYS063T Radio Meteor Observing: Employing Algorithm to Increase the Reliability of Meteor Counting**
Kyungmo Kim, 17, Senior; Taegi Kim, 17, Senior; Mingyu Cho, 17, Senior,
Korea Science Academy of KAIST, Busan, South Korea, T: Inok Song
- Seoul, KOR003, Korea Science Fair*
- EGCH030 Invention of Heron Cell to Maintain Constant Electromotive Force**
Wonjun Yoo, 17, Senior, Daegu Science High School, Daegu, South Korea,
T: Seok Jin Shin
- EGCH031T Ceria Supported Cu-Co Composite Catalyst for WGS Reaction**
Nayeong Kim, 17, Senior; Jongha Choi, 18, Senior, Korean Minjok Leadership
Academy, Hoengseong, South Korea, T: Seung Keun Shin
- MATH041 A New Upper Bound for the Steiner Ratio**
Woosung Jung, 17, Junior, Korea International School, Seongnam-Si,
South Korea, T: Vivian Robert-Nicoud
- MCRO051 Identification of Novel Cathelicidins with Potent Antimicrobial Effect from the Genome Analysis of *Python bivittatus***
Ju Yeon Lee, 17, Senior, Korean Minjok Leadership Academy, Hoengseong,
South Korea, T: Man-Wi Han
- PHYS039 Generation of Beat Sound of Korean Bell with a Bicycle Rim**
Kim Dae Hyun, 18, Senior, Pung Duck High School, Gyeonggi Province,
South Korea, T: Park Tae Hwan
- SOFT042T Statistical Analysis based Music Classifying Method and Tool**
SuHwan Jeong, 17, Senior; SeokHo Kim, 18, Senior; Hae Jun Park, 18, Senior,
Gyeongnam Science High School, JinJu, South Korea, T: Minsu Kim

SPAIN

Barcelona, SPN001, Exporecerca Jove

- ANIM033 Evaluation of Using Sniffing Dogs to Detect Red Palm Weevil Presence**
Monica Sagrera Cozar, 17, Senior, Col·legi Maristes Girona, Girona, Spain,
T: Guillermo De Mendoza Barbera
- ENBM037 Design of a Polymeric Replica of the Human Aortic Arch for *in vitro* Experimentation**
Maite Molins-i-Colomer, 17, Senior, Escola Vedruna Gracia, Barcelona, Spain,
T: Albert Cervera-Rucabado

SRI LANKA

Colombo, LKA001, Sri Lanka Science and Engineering Fair

- EBED005 Wearable Device to Translate American Sign Language (ASL) into English**
Abishek Stenush Gomes, 16, Junior, Belvoir College International, Colombo,
Sri Lanka

- ENMC004 Modified and Adjustable Crutches**
 Thanthrige Don Chamindu Jayasanka, 14, Sophomore, Rajasinghe Central College, Hanwella, Sri Lanka, T: Thanippuli Arachchilage Indrani Gunarathna
- TMED002 Anti Proliferative and Apoptotic Effects of Ellagic Acid Functionalized Iron Oxide Nano Particles on Endometrial Cancer (AN3CA) Cells**
 Parana Muhandiramge Lochana Piyumantha Fernando, 17, Senior, Senanayake National College, Madampe, Sri Lanka, T: Rathugamage Patima Nadee Fernando

SWEDEN

Stockholm, SWE001, Utställningen Unga Forskare

- EAEV070 Verifying the Chemical Characterization and Botanical Origin of Burmese Ambers by C13 NMR Spectroscopy**
 Jonna Maria Karlberg, 19, Senior, ProCivitas, Malmo, Sweden, T: Ann Linderöth

- ENMC074T Could NASA Be Wrong? A Study of Model Rocketry Using the DIMU-method**
 Simon Pettersson Fors, 19, Senior; Carl Erik Nord, 18, Senior, Aranasgymnasiet, Kungsbacka, Sweden, T: Carlo Ruberto

SWITZERLAND

Bern, CHE001, Swiss Youth in Science

- ENMC002T Waterrocket Launcher–Automated (WRL)**
 Joram Samuel Liebeskind, 21, ; Alexander Reto Luthard, 20, Senior, Mechatronik Schule Winterthur, Winterthur, Switzerland, T: Michael Scream

THAILAND

Bangkok, THA001, SST-NSM National Science Projects Competition

- ANIM049T A Silk Sheath Production Frame Developed from Negative Geotropic Spinning Behavior of Silkworms Resulted in Silk Sheath with High Homogeneity**
 Charuntorn Doungnga, 18, Junior; Runglawan Charpugdee, 17, Junior, Damrongratsongkroh School, Chiang Rai, Thailand, T: Kietisak Inrajsadon
- ENEV047T Ethanol Production Using Starting Material from Bacterial Cellulose and Cellulolytic Bacteria from Cow Dung**
 Sureeporn Triphetprapa, 16, Sophomore; Thidarat Phianchat, 16, Sophomore; Kanjana Komkla, 16, Sophomore, Suratpittaya School, Suratthani, Thailand, T: Suwaree Pongtheerawan
- MATH017T Relationships of Volumes between a Regular Prism and a Truncated Pyramid and Calculation of the Surface Area and Volume of k Balls Fitted Inside the Two Shapes from the Base Perimeter**
 Thanwarat Naruemon, 18, Junior; Thananan Thongsujaritkul, 17, Junior; Chetnarong Lowprukmanee, 17, Junior, Nakhonsawan School, Muang, Thailand; Educational Complex Gymnasia "Sykhyivska", Lviv, Ukraine, T: Samai Chanlueng
- MATS023T A New Clay Mixture for Production of Ceramic-like Wares at Low Temperature**
 Janjira Seelathorn, 18, Junior; Ketmanee Jai-Kla, 17, Junior; Auamporn Pangjit, 16, Junior, Assumption College Lampang, Muang, Thailand, T: Chutipapha Siangyen
- MATS030T A Shock Absorbing Pad Made from Stem of Thai Weed**
 Salilthip Kaewraksa, 17, Junior; Pilasak Pholyiam, 17, Junior; Julaluck Khamseana, 17, Junior, Buakhao School, Kalasin, Thailand, T: Somchana Pattala
- MCRO077T Ointment Made from Traditional Herbs Extract for Topical Treatment of Infection in Ornamental Fish**
 Salilthip Kumtue, 18, Senior; Kawisara Konsila, 18, Senior; Nattawadee Leekhammong, 18, Senior, Damrongratsongkroh School, Chiang Rai, Thailand, T: Sutipong Jaikaew

Bangkok, THA002, Young Scientists Competition

- ANIM046T** **Bubble Nesting Behavior Behind Local Wisdom of Rearing Siamese Fighting Fish by Utilizing Dry Leaves**
Puvanat Triamchanchai, 15, Freshman; Touchakorn Chintavalakorn, 15, Freshman, Bangkok Christian College, Bangkok, Thailand, T: Chanan Keatsirisart
- CHEM056T** **Paper-Based Sensor for Preliminary Screening of Lead in Industrial Wastewater**
Annop Tantayanon, 17, Junior; Thanayuth Assawawinyadet, 17, Junior, Mahidol Wittayanusorn School, Nakhon Pathom, Thailand; Mahidol Wittayanusorn School, Nakorn Pathom, Thailand, T: Usa Jeenjenkit
- ENEV089** **Development of Equipment Made from Biodegradable Waste for Treatment of Lead-Contaminated Wastewater**
Vongsagon Changniam, 17, Junior, Bunyawat Witthayalai School, Lampang, Thailand, T: Ratchanok Suwannajak
- MATH043T** **Some Algebraic Combinatorics on Prime Constrained Languages**
Supitchaya Settasopon, 17, Senior; Juthamas Charoenkhwan, 18, Senior, Mahidol Wittayanusorn School, Nakhon Pathom, Thailand, T: Thammanoon Puirod
- MATS060T** **Development of Wound Dressing Product from Giant Sensitive Plant (*Mimosa pigra*) and Fermented Tako Extract (*Diospyros rhodocalyx*)**
Navinthiti Jarupratai, 15, Freshman; Nattawat Chaibong, 15, Freshman; Kritichok Duangsri, 15, Freshman, Montfort College, ChiangMai, Thailand, T: Piya Chai-ai
- TUNISIA**
Tunis, TUN001, Tunisia Science and Engineering Fair
- EBED017** **Electronic Application for Hospital Visits**
Khaireddine Benjemaa, 16, Sophomore, Elmanara High School, Gabes South, Tunisia, T: Mohamed Ali Daymie
- ENEV014** **Self-Watering (SW)**
Ziad Ben Hadj Salem, 18, Senior, Pioneer High School, Sousse, Tunisia, T: Abdelfattah Latiri
- ROBO009** **No More Drowning! Preventing Drowning through a Robot Airplane**
Mohamed Firas Aguel, 15, Freshman, Pioneer High School of Gabes, Gabes, Tunisia, T: Mohamed Ali Daymi
- TURKEY**
Ankara, TUR002, Tubitak Fair
- CHEM060T** **Dyeing of Polyester with Natural and Disperse Dyes in Supercritical Carbon Dioxide**
Cemre Su Zuberi, 17, Senior; Orhun Arda Ozcan, 17, Senior, Mat-Fkb Ozel Gelisim Fen Lisesi, Eskisehir, Turkey, T: Munevver Arzu Harzadin
- EAEV081T** **Decreasing Carbon Dioxide Emission with Chlorococcales Microalgae Farm**
Misra Sengeldi, 16, Junior; Esra Yaman, 18, Junior, Turk Egitim Vakfi Inanc Turkes Ozel Lisesi, Kocaeli, Turkey, T: Evren Toy
- EGCH051** **Potential of Greenhouse Grown Tomato Wastes Transformed to Hydrogen and Biofuel**
Esma Nur Okudan, 17, Senior, Adana Ugur High School, Cukurova, Adana, Turkey, T: Osman Gulnaz
- ENMC072** **Magnetic Stove**
Cagatay Soylu, 16, Junior, Kuleli Military High School, Istanbul, Turkey, T: Melike Pektas
- MATH049T** **Break It, Stick It Together, Make a Triangle**
Yusuf Erdem Nacar, 16, Sophomore; Kudret Rana Mavili, 16, Sophomore, Kayseri Cetin Sen Bilim ve Sanat Merkezi, Kayseri, Turkey, T: Zehra Cicek Akkuzu
- MATH050T** **Calculation of the Polygon's Area with Generalized Delta Technique**
Oguz Komur, 16, Junior; Mehmet Bahri Derin, 17, Junior, Kuleli Military High School, Istanbul, Turkey, T: Ugur Dilki

- MATS061T** **Science Overcomes Drug Addiction: A New Approach on Monitoring the Receptors Overexpress on Brain Cells**
Ece Derin Aydın, 16, Junior; Begum Kinay, 17, Junior, Takev Science High School, Izmir, Turkey, T: Aysegul Terzi
- MATS062T** **Characterization of Blue Fluorescent OLED and Seven Segment Display Application**
Ilke Adaloglu, 17, Senior; Cemil Gorkem Tamer, 17, Senior, Takev Science High School, Izmir, Turkey; Takev Science Fair, Izmir, Turkey, T: Ruhsah Erduygun
- ROBO048** **VoxelCode (3D Barcode)**
Necati Kaan Inel, 19, Senior, Canik IMKB Anadolu Lisesi, Samsun, Turkey, T: Meral Rizelioglu
- TMED056T** **The Evaluation of Eggplant Leaves as a Potential Anti-Alzheimer Activity**
Idil Alptuzun, 17, Senior; Hazal Aras, 17, Senior, Takev Science High School, Izmir, Turkey, T: Fulya Aras Usta
- Izmir, TUR004, DOESEF (Doganata Education Science Energy Engineering Fair)*
- BCHM041T** **Development of a Bioconjugate for Reducing Serum Uric Acid in Gout Disease**
Ezgi Balkir, 15, Sophomore; Seray Ugur, 15, Sophomore, Izmir Private Fatih Science High School, Izmir, Turkey, T: Umit Karademir
- BMED096** **Epigenetic Investigation of Antibiotic-Tolerant Persister Wake-up Chronic Infection Mimicking Conditions**
Can Goksal, 16, Junior, Vehbi Koc Vakfi Ozel Lisesi, Istanbul, Turkey, T: Talha Kilic
- CELL051T** **Investigation of Antiapoptotic Effect of Pioglitazone in MPP+ - Induced Parkinson's Disease Model**
Feride Idil Acikalin, 15, Sophomore; Buse Hulya Gengor, 15, Sophomore, Izmir Ozel Fatih Fen Lisesi, Izmir, Turkey, T: Cansu Ilke Kuru
- ENBM058T** **Molecules in the Focus of Next Generation Biology: Short and Long Non-Coding RNAs (ncRNAs)**
Ogul Yazicioglu, 15, Sophomore; Ege Atay, 14, Freshman, Izmir Private Fatih High School, Izmir, Turkey, T: Viki Calderon
- MATS054T** **Lithium Ion Battery Production Using New Generation Nanomaterials by Electrospinning Method**
Guler Selin Sunar, 15, Sophomore; Gulce Afacan, 16, Sophomore, Izmir Private Fatih Science High School, Izmir, Turkey, T: Alper Bayram
- MATS065T** **Reflectionloss Properties of TiO_2 and Fe_3O_4 Composite Bulks**
Erol Ata Albayrak, 18, Junior; Alkin Ozyapici, 16, Junior, Takev Anadolu ve Fen Lisesi, Izmir, Turkey, T: Ayse Ruhsah Erduygun
- PHYS064** **Gas Sensor Application with Photonic Crystal Fiber and Carbon Dioxide Sensor Design**
Serra Doganata, 17, Junior, Izmir Private Fatih Science High School, Izmir, Turkey, T: Meltem Gonulol Celikoglu
- PHYS065T** **Development and Characterization of OPD - OLED Hybrid Device System**
Irfan Guven Comezoglu, 16, Sophomore; Ozgur Ulker, 16, Junior, Izmir Ozel Fatih Hazirlikli Anadolu Lisesi, Izmir, Turkey; Kuleli Military High School, Istanbul, Turkey, T: Alper Bayram
- UKRAINE**
Kyiv, UKR001, Intel – TechnoUkraine
- MATH020** **Towards Common Algorithm for Computation of Polygonal Numbers**
Phuong Anh Tran, 16, Junior, Cherkasy Physics and Mathematics Lyceum, Cherkasy, Ukraine, T: Serhiy Babenko
- PHYS032** **Study of Five Newly Discovered Eclipsing Binary Stars**
Maryna Halunka, 17, Sophomore, Odessa Mariinsky Gymnasium, Odessa, Ukraine, T: Natalia Virnina
- SOFT017** **"Whitestorm JS:" A Web Browser 3D Framework**
Oleksandr Buzin, 16, Sophomore, Liceum "Holosiivskiy" No. 241, Kiev, Ukraine, T: Larisa Katerinich

Kyiv, UKR002, Intel–EcoUkraine

CELL020 Method of Visualization and Evaluation of Proliferative Activity of K562 Cell Line with Fluorescent Carbon Nanodots

Yevgen Butenko, 16, Sophomore, Kyiv School No. 9, Kiev, Ukraine,
T: Kuchuk Svitlana

ENEV036 Autonomous Sewage Cleaning Mechanism

Yelyzaveta Podkopaieva, 17, Junior, Lviv Technological Lyceum, Lviv, Ukraine,
T: Victor Koldun

MATS021 New Biocompatible Carbon Nanoparticles: Synthesis, Properties, Biomedical and Ecological Application

Denys Holovan, 17, Junior, Kyiv School No. 201, Kyiv, Ukraine,
T: Volodymyr Nazarenko

MCRO072 Cluster of Genes of Sulfate Assimilation

Andrii Rabets, 17, Junior, Educational Complex Gymnasia "Sykhivska,"
Lviv, Ukraine, T: Kateryna Stanchak

UNITED ARAB EMIRATES

Abu Dhabi, ARE002, Think Science Competition

CHEM062T Removal of Cadmium Ions from Industrial Waste Water by Low Cost Adsorbents

Khalifa Saad Alqemzi, 15, Sophomore; Ahmed Rashed Alhemeiri, 16,
Sophomore, Sweihan School, Al Ain, United Arab Emirates,
T: Abdeltawab Mohamed Ali

EGCH052T Invisible Helios Power

Maryam Fuad Bukhash #, 17, Senior; Amna Mohammad Alhashmi #, 17,
Senior, Al Ittihad Private School - Jumeirah, Dubai, United Arab Emirates,
T: Abeer Charab

EGPH041 Eco-Friendly Vehicle

Mohamed Talib Alblooshi, 17, Senior, New World American Private School,
Sharjah, United Arab Emirates, T: Samiksha Chaturvedi

ENMC073T Firefighter UAV

Khalfan Obaid Hableel, 16, Junior; Abdalla Obaid Hableel, 18, Senior, Al
Khaleej National School, Dubai, United Arab Emirates, T: Ghaleb Awad Wahbi

MATS063T Smart Asphalt

Alia Adil Falaknaz, 15, Sophomore; Fatma Abduljalil Alasmawi, 15,
Sophomore; Hessa Humaid Alghandi, 15, Sophomore, Al Ittihad Private
School - Jumeirah, Dubai, United Arab Emirates, T: Lara Chouman

MATS064T Incombustible Wood Foam

Shahad Abdulaziz Alhoot, 16, Junior; Ayesha Essa Alzarooni, 16, Junior; Mira
Abdulahman Alhashimi, 16, Junior, Al Ittihad Private School–Jumeirah,
Dubai, United Arab Emirates, T: Abeer Charab

UNITED KINGDOM

Liphook, GBR003, Young Engineers for Britain

EAEV083 Biomimetic Vortex Dredger

Bradley Stalker, 17, Senior, Energy Coast UTC, Workington, United Kingdom,
T: Johnathan Chapman

ENMC063 Thermometer Calibration System

Sudhakar Sivanewaran, 18, Senior, Sutton Grammar School, Surrey,
United Kingdom, T: Jamie Costello

UNITED STATES OF AMERICA

ALABAMA

Auburn, USAL01, Greater East Alabama Regional Science and Engineering Fair

ENMC016 Dual Purpose Muffler

Edmond Bruce Strickland, 18, Senior, South Montgomery County Academy,
Grady, Alabama, T: John Bowman Johnson

ENMC017 Prognostication of Flexible Batteries in Wearable Electronics

Rahul Lall, 16, Junior, Auburn High School, Auburn, Alabama,
T: Jacque Middleton

Birmingham, USAL02, Central Alabama Regional Science and Engineering Fair

CELL034 **An Epigenetic Factor, CHD7, Inhibits Migration of Metastatic Breast Cancer Cells**

Kenneth Jiao, 16, Sophomore, Indian Springs School, Pelham, Alabama, T: Lisa Balazs

EGPH006T **Renewable Power Trekking Pole**

Travis Wayne Gunn, 18, Senior; Elijah Noah Greene, 17, Senior, Hewitt Trussville High School, Trussville, Alabama, T: Chris Bond

PLNT035T **Asian Lady Beetles...Infestation or Curation? A Novel Study to Evaluate the Efficacy of *Harmonia axyridis* Hemolymph as a Pesticide to Control *Diaphorina citri* (Asian Citrus Psyllid), and as an Antibiotic against the Huanglongbing Disease Causing *Liberibacter*!**

Rowan Said ElQishawi, 17, Senior; Rozan Said ElQishawi, 16, Sophomore, Hoover High School, Hoover, Alabama, T: Tariq Hamid, Janet Ort

SOFT027 **Creating a Multi-functional Algorithm for Audio Steganography**

DeMarcus Emmanuel Campbell, 18, Senior, Alabama School of Fine Arts, Birmingham, Alabama, T: Carol Yarbrough

Huntsville, USAL03, North Alabama Regional Science and Engineering Fair

CHEM020 **The Wetting Properties of Metallic Substrates Modified with Organic Self-Assembling Monolayers**

Daniel Vogler, 17, Junior, James Clemens High School, Madison, Alabama, T: Carol Bohatch

EBED024 **Development and Systems Integration of a Modular Power Factor Corrected Pre-regulator, LiFePO4 Battery Charger, DC Motor Controller, and Battery Monitoring System**

Drew Prevost, 18, Senior, Covenant Christian Academy, Huntsville, Alabama, T: Rhonda Lisaukis

PHYS021 **Ultrasonic Levitation**

Connor Michael Reed, 17, Junior, St. John Paul II Catholic High School, Huntsville, Alabama, T: Bria Finzel

Huntsville, USAL50, Alabama Science and Engineering Fair

BCHM042 **Assessment of Macro and Micro-Nutrients in a Recycled Supplement for Canines**

Alexis Jones, 16, Sophomore, Auburn High School, Auburn, Alabama, T: Mark T. Jones

CELL039 **Cellular and Molecular Analysis of Allicin's Effect on Leukemia Cells**

Jamie Lim, 15, Sophomore, Murphy High School, Mobile, Alabama, T: Julie Prerost

TMED033 **The Effects of a Natural Extract on Lymphocyte Activation**

Hannah Jordan James, 18, Senior, Wetumpka High School, Wetumpka, Alabama, T: Virginia Vilardi

TMED037 **Apoptotic Effects of Niclosamide and Chemotherapies, with Potential to Overcome Drug Resistance in Triple Negative Breast Cancers**

Arjun Lakhanpal, 17, Junior, The Altamont School, Birmingham, Alabama, T: Maureen Frye

Livingston, USAL05, West Alabama Regional Science Fair

ENMC012 **Highly Effective Hybrids**

Danika Louw, 16, Junior, Holy Spirit Catholic High School, Tuscaloosa, Alabama, T: Debbie Samaniego

Mobile, USAL04, Mobile Regional Science Fair

ANIM053 **Lethal versus Nonlethal Methods of Aging *Lutjanus campechanus***

Sarah Nina Bowman, 18, Senior, Murphy High School, Mobile, Alabama, T: Julie Prerost

BCHM046 **The Effects of Catalysts in the Depolymerization of Chitin Using Ionic Liquids**

Davina Vu Ho, 16, Junior, Murphy High School, Mobile, Alabama, T: Julie Prerost

ALASKA

Anchorage, USAK50, Alaska Science and Engineering Fair

EAEO082 Radiation Monitoring in Prince William Sound, Alaska, Year Three of a Four Year Study
Jedediah Emmet Dean, 17, Junior, Colony High School, Palmer, Alaska,
T: Dorrie Dean

MCRO078 East Meets West: An Analysis of Avian Influenza in Alaska Interior
David Dawei Chen, 17, Junior, West Valley High School, Fairbanks, Alaska,
T: Gregory Kahoe

Juneau, USAK01, Southeast Alaska Regional Science Fair

ANIM011 Exploration of Depth Differentiation of Two Closely Related Rockfish Species Identified through Genetic Analysis
Tristan Alexander Walker-Andrews, 15, Sophomore, Juneau-Douglas High School, Juneau, Alaska, T: Jonathan Smith

CBIO008 Creating & Analyzing Models of Parathyroid Hormone Bone Turnover Networks
Ina Henna Klasner, 15, Freshman, Gustavus School, Gustavus, Alaska,
T: Dianne Sullivan

ARIZONA

Phoenix, USAZ50, Arizona Science and Engineering Fair

BEHA047T Cognitive and Brain Measures in Middle-Aged Autistic Spectrum Disorder Individuals: Where Are the Differences?
Divya Vatsa, 17, Junior; Emily Wood, 17, Junior, BASIS Scottsdale, Scottsdale, Arizona; Xavier College Preparatory, Phoenix, Arizona, T: Lauren Cooney, Jennifer Weiland

BMED083T The Reduction of Alzheimer's Disease through the Activation of Sirtuin 1 by Resveratrol
Komal Agrawal, 18, Senior; Kiera Taylor Blawn, 17, Senior, Hamilton High School, Chandler, Arizona, T: Debbie Nipar

CBIO039 Observations of Drug Synergy Mechanisms to Target Intrinsically Disordered Proteins in Viruses
Ritika Bharati, 17, Junior, Hamilton High School, Chandler, Arizona,
T: Raxha Bhagdev

CBIO040 Applying Viral Nanoparticles in a Treatment Vector for Alzheimer's Disease Using Molecular Dynamics Simulations
Akshata Nagaraja Rudrapatna, 18, Senior, Hamilton High School, Chandler, Arizona, T: Debbie Nipar

CELL048 Polymer Mediated Transgene Delivery of TRAIL Protein: Comparison of Aminoglycoside Polymers and Lipopolymers for Transgene Delivery of TRAIL Protein into UMUC-3 Bladder Cancer Cells
Vedik Navale, 16, Sophomore, Hamilton High School, Chandler, Arizona,
T: Debbie Nipar

CHEM048 Versatile, Efficient, and Facile Functionalization of Poly(p-phenylene oxide) via Azide-Alkyne "Click" Chemistry
Kailash Raman, 16, Junior, Sandra Day O'Connor High School, Phoenix, Arizona, T: Saroj Jagernauth

EAEO073T Removal of Hazardous Sulfur Dioxide from the Polluted Atmosphere Using Anthocyanins, Pyruvate, and Glucose
Claire Jeanne Thai # #, 16, Sophomore; Josiah Benjamin Panneck, 17, Sophomore, Thai Homeschool, Tucson, Arizona; Quest for Education and Arts, Tucson, Arizona, T: Rebecca Thai

EBED045 A Low-Cost Flying, Life-Detection System for the Recovery of Victims after Earthquakes
Sachin Ganesh Konan, 15, Sophomore, Hamilton High School, Chandler, Arizona, T: Debbie Nipar

EGCH048 The Effect of the Type of Extraction Method on the Amount of Crude Algal Lipids Recovered for Economically Feasible Biofuel Production
McKenna Kristin Loop, 17, Junior, Arizona College Preparatory- Erie, Chandler, Arizona, T: Kristi Glassmeyer

EGPH038 #	Using an Isolated Gain System to Heat a Traditional Home Kelly Charley, 17, Junior, Navajo Preparatory School, Farmington, New Mexico, T: Yolanda Flores
ENEV097 #	Analyzing the Mechanism and Efficiency for Filtering Pb Using Fresh Water Algae, Phase Three Amanda Minke, 17, Junior, Immaculate Heart High School, Oro Valley, Arizona, T: Danielle Abrames
MCRO081 #	Investigating Novel Bacteriophage Solutions as a Preventative Measure for Biofilm Formation in Medically Relevant Settings Aryasp Seyed Nejat, 16, Junior, Hamilton High School, Chandler, Arizona, T: Debbie Nipar
PHYS060	Holistic Flare Prediction using Aggregated Solar Cycle 23-24 Magnetograms and Intensitygrams Zhengdong Wang, 17, Junior, Hamilton High School, Chandler, Arizona, T: Debbie Nipar
PLNT052T	How Does Phloem Sap Composition Impact the Rate of Asian Citrus Psyllid Infestation and HLB Infection? Michael Andrew Koury, 18, Senior; Benjamin LeRoy, 18, Senior, Basha High School, Chandler, Arizona, T: Michael McKelvy
SOFT044	A Novel Algorithm for Detection of <i>Plasmodium falciparum</i> Parasites in Digitized Blood Samples Rahul Ramesh, 16, Junior, Hamilton High School, Chandler, Arizona, T: Deborah Nipar
<i>Sierra Vista, USAZ02, SSVEC's Youth Engineering and Science Fair</i>	
ENMC013 #	Concentrated Solar Thermal Noah Samuel Bell, 17, Junior, Veritas Christian Community School, Sierra Vista, Arizona, T: Angela Massa
PHYS068	The Sonic Fire Extinguisher Shawnee Nicole Wright, 17, Junior, Veritas Christian Community School, Sierra Vista, Arizona, T: Angela Massa
<i>Tucson, USAZ03, Southern Arizona Research, Science and Engineering Fair</i>	
BMED034	The Effects of Fetal Troponin T on the Cardiac Remodeling of Hypertrophic Transgenic Hearts Jenna Chase Allardice, 16, Junior, Academy of Tucson High School, Tucson, Arizona, T: Kathleen Rita Friedman
CELL009	Regulation of Insulin Pathway Signaling in a <i>Drosophila</i> Model of ALS Sanne Marie Casello, 17, Senior, Empire High School, Tucson, Arizona, T: Hillary Ward
EAEV014 #	Classification of Warm-adapted El Golfo, Mexico Equid Specimens and Evaluation of Size Differences in Accordance with Bergmann's Rule Zeeshan Jawaid, 16, Senior, Carpe Diem Collegiate Middle and High School, Yuma, Arizona, T: Katherine Rogge
EBED008 # #	Security at the Speed of Light: Countering Cyberattacks via Novel On-Chip Protocols Jeremiah Pate, 17, Junior, BASIS Oro Valley, Oro Valley, Arizona, T: Tommaso Cioni
ENMC020	The Power of Eta in Propulsive Engineering Edwin Collier Moody V., 17, Senior, Moody Homeschool, Tucson, Arizona, T: Keira Erynn Moody
MCRO012	The Biodegradation of Styrofoam through the Use of Superworm Gastrointestinal Flora Joseph Galasso, 15, Sophomore, Galasso Homeschool, Tucson, Arizona, T: Sandra Galasso
PHYS009	Creation of Additional Signal Regions to Increase Signal Sensitivity in the Search for Vector-Like Quarks at the LHC Sloan Wayne Kanaski, 18, Senior, University High School, Tucson, Arizona, T: Pamela Tautz

ARKANSAS

Conway, USAR50, Arkansas State Science Fair

CBIO044 **Developing an Artificial Neural Network for Dynamic Cardiovascular Disease Prediction**

Sanjit Kalapatapu, 18,, Pulaski Academy, Little Rock, Arkansas,
T: Annice Steadman

EAEV058 **Testing the Water Quality of Karst Outflows in the Ozarks**

Mandolin Harris, 18, Senior, Arkansas School for Mathematics, Sciences and the Arts, Hot Springs, Arkansas, T: Lindsey Waddell

ROBO033 **Analyzing the Effectiveness of Hoeken's Linkage in Legged Locomotion**

Andrew C. Hemund, 18, Senior, Arkansas School for Mathematics, Sciences and the Arts, Hot Springs, Arkansas, T: Nick Seward

TMED036 **Resveratrol: A New Anti-Coronavirus Drug**

Jennifer Michelle Zhang, 14, Freshman, Little Rock Central High School, Little Rock, Arkansas, T: Patrick Foley

Fayetteville, USAR03, Northwest Arkansas Regional Science and Engineering Fair

ANIM012 **Dead in Their Tracks, Phase III**

Cole McBride Balkman, 18, Senior, Alma High School, Alma, Arkansas,
T: Jeana Parker

BMED067 **The Healing Rate of Lumbricus terrestris with Various Medicinal Applications, Part Two**

Phillip Frisbie Crook, 17, Senior, Alma High School, Alma, Arkansas,
T: Tiffany Scrivner

SOFT007 **Detecting Plagiarism, Phase II**

Caleb Joseph Fritz, 18, Senior, Alma High School, Alma, Arkansas,
T: Tiffany Scrivner

Hot Springs, USAR07, West Central Regional Science Fair

CELL003 **Untangling the Mystery: The Link between Variations in the Oxytocin Receptor Gene and Trichotillomania**

Mikayla Katherine Hammers, 18, Senior, Arkansas School for Mathematics, Sciences and the Arts, Hot Springs, Arkansas, T: Patrycja Anna Krakowiak

EGCH005 **Synthesis of Biodiesel from Hydrolyzed Rice By-Products Fermented with Engineered B. subtilis**

Taryn Renee Imamura, 18, Senior, Arkansas School for Mathematics, Sciences and the Arts, Hot Springs, Arkansas, T: Brian Monson

MCRO003 **Terminating Caner: Engineering the Taxol Biosynthesis Pathway in E. coli**

Samia Almas Ismail, 18, Senior, Arkansas School for Mathematics, Sciences and the Arts, Hot Springs, Arkansas, T: Patrycja Anna Krakowiak

Jonesboro, USAR04, Northeast Arkansas Regional Science Fair

EAEV032 **Is Your Soap a Killer?**

Chassitty Parker, 16, Junior, Nettleton High School, Jonesboro, Arkansas,
T: Karen Ladd

ENEV046 **Application and Testing of an Irrigation Advance System Sensor Unit for Water Management**

Darrin Andrew McFall, 17, Junior, Buffalo Island Central High School, Monette, Arkansas, T: Amanda Beth McFall

SOFT016 **Random Lab Rules**

Ryan Stephen Callicott, 15, Sophomore, Cross County High School, Cherry Valley, Arkansas, T: Teresa Kay Fuller

Little Rock, USAR05, Central Arkansas Regional Science and Engineering Fair

BCHM009 **Antioxidants, Nicotine, Skin Injury**

Miriam Hauer-Jensen, 17, Junior, Little Rock Central High School, Little Rock, Arkansas, T: Patrick Foley

ENMC027 **The Effects of Tuned Mass Dampers on a Structure's Earthquake Resistance**

Anika Dinesh Moorjani, 16, Sophomore, Little Rock Central High School, Little Rock, Arkansas, T: Patrick Foley

MATS031 **Evaluating Thermoelectric Properties of Graphite/Polyaniline Composites**

Nikoo Karbassi, 17, Junior, Little Rock Central High School, Little Rock, Arkansas, T: Patrick Foley

CALIFORNIA

Contra Costa County, USCA08, Contra Costa County Science and Engineering Fair

CBIO019 Predicting Future Body Mass Index with an Artificial Neural Network
Alexander Zlokapa, 16, Junior, Golden Hills Academy (Homeschool), Danville, California, T: Mary Jane Zlokapa

CBIO029 Variations of Zeaxanthin epoxidase and Phosphoglucomutase in *Landoltia punctata*

Jasmine Alexis Yvette Mack, 17, Senior, Dougherty Valley High School, San Ramon, California, T: Katherine Huang

EBED027 Personal Devices for Prevention and Preliminary Diagnostic of Skin Cancer Based on Local Ultraviolet Reflectivity and Spectrum Analysis of Skin

Vasily Antonovich Tremsin, 16, Sophomore, Campolindo High School, Moraga, California, T: Roxanna Jackman

ENBM033 HeadSentry: An Innovative Real Time System for Preventing Second Impact Syndrome (SIS) from an Overlooked Concussion in Aquatic Sports

Julianne Isabelle Sauer, 16, Junior, Dougherty Valley High School, San Ramon, California, T: Cyndi Oji-Marchese

Costa Mesa, USCA01, Orange County Science and Engineering Fair

BEHA032 Closing the Achievement Gap in STEM: The Influence of Prior Knowledge on the Guidance Effects in Technology-Based Guided Student-Centered Learning

Anna Lou, 16, Junior, Oxford Academy, Cypress, California, T: Susanne Jaeggi

BMED071 Examining the Coding and Non-Coding Regions of Enhancer Landscapes in Vascular Smooth Muscle Cells (VSMCs) Stimulated with Angiotensin II
Varun Mandi, 18, Senior, Troy High School, Fullerton, California, T: James Kirkpatrick

CBIO024 Determining the Protein Structure from Ant Colony Optimization Using Energy Minimization Derived from the Ising Model

Michelle Chushan Xu, 15, Sophomore, Arnold O. Beckman High School, Irvine, California, T: Charles Beilin

SOFT026 Efficient Blockchain-Driven Multiparty Computation Markets at Scale
Charles Noyes, 17, Junior, Villa Park High School, Villa Park, California, T: Judy Fusco

Fresno, USCA03, Central California Regional Science, Mathematics and Engineering Fair

CHEM037 Sustainable Transformation of Brewed Coffee and Tea Grounds to Useful Mesoporous Carbon Membranes

Seung Hye (Beatrice) Choi, 17, Senior, University High School, Fresno, California, T: Brenda Royce

EGCH037 Enhancing the Rate Capability of the Ni-Co-O System Electrode Using NH3 Treatment

Anchit Narain, 17, Senior, Clovis North High School, Fresno, California, T: Jonathan Bowns

ENMC034 Project Maverick: An Omni-Directional Robotic Mobility System

Alex Cristian Tacescu, 17, Senior, Clovis North High School, Fresno, California, T: Jonathan Bowns

ROBO022 Safecopter: Developing a Collision Avoidance System Based on an Array of Time-of-Flight 3D Cameras

Robert Gabriel Tacescu, 16, Sophomore, Clovis North High School, Fresno, California, T: Jonathan Bowns

Los Angeles, USCA02, Los Angeles County Science and Engineering Fair

MATH029 The Algebra and Geometry of Quasicategories

Sanath Kumar Devalapurkar, 16, Sophomore, West High School, Torrance, California, T: Marcy Robertson

MCRO040 A Novel Treatment for *Candida glabrata* Infection

Elan Eng Filler, 17, Senior, Palos Verdes High School, Palos Verdes Estates, California, T: Julie Munoz

Palos Verdes Peninsula, USCA10, Palos Verdes Peninsula Unified School District Science and Engineering Fair

ENEV055 **Separating Carbon Dioxide from the Atmosphere to Help Minimize Global Warming, Year One**
Christopher Dan Isozaki, 16, Sophomore, Palos Verdes High School, Palos Verdes Estates, California, T: Julie Munoz

PHYS042 **Deformable Body Analysis through Gauge Kinematics**
Huws Yoshito Landsberger, 18, Senior, Palos Verdes Peninsula High School, Rolling Hills Estates, California, T: Peter Starodub

Pleasanton, USCA09, Synopsys Alameda County Science and Engineering Fair co-sponsored by Lawrence Livermore National Laboratory

BMED054 **Machine Learning Tool for Early Detection of Small Cell Lung Cancer Using Novel Nuclear Factor I/B Expression: Drastically Increase Patient Survival in 1 Minute for 1 Dollar**
Jessica Baral, 16, Junior, Mission San Jose High School, Fremont, California, T: Julien Sage

CBIO031 **A Machine Learning Approach for Predicting Drug Efficacy**
Sonia Sachar, 18, Senior, Irvington High School, Fremont, California, T: Wai-Pan Chan

MCRO030 **Inhibition of Bacterial Mutagenesis through Polyubiquitination: A Solution to Antibiotic Drug Resistance**
Abheer Singh, 16, Sophomore, American High School, Fremont, California, T: Marianne Perhach

PLNT022 **Mutants of Leucine Rich Receptor Like Kinase Proteins Show Increased Biomass: A Proteomic Study**
Sandhya Kalavacherla, 16, Junior, Amador Valley High School, Pleasanton, California, T: Renee Weizbauer

ROBO015 **Using Optical Flow Modeling Methods and Sensor Fusion to Create a Low-Cost, Competent Autonomous Emergency First Responder**
Venkat Vinayak Krishnan, 15, Sophomore, American High School, Fremont, California, T: Evan Winiger

Sacramento, USCA04, Sacramento Regional Science and Engineering Fair

BEHA051 **Assessing the Effectiveness of Virtual Psychotherapies for OCD by Developing a Novel Software Application**
Henry Low, 17, Junior, Western Sierra Collegiate Academy, Rocklin, California, T: Andrea Adams

PLNT054 **Drought Impact on Soilborne Fungal Pathogen of Tomato**
Teevyah Yuva Raju, 15, Sophomore, Mira Loma High School, Sacramento, California, T: Rochelle Jacks

ROBO044T **Using Artificial Intelligence Systems for Autonomous Visual Comprehension and Handwriting Generation**
Daniel Bolya, 17, Senior; Dylan McLeod, 17, Junior, Folsom High School, Folsom, California, T: Eric Wright

San Diego, USCA05, Greater San Diego Science and Engineering Fair

ANIM030 **Inheritable Longevity Programming: First Epigenetic Mechanism and Proof-of-Concept for Transgenerational Therapies to Prevent Multiple Aging-Related Diseases with Single Molecules**

Brian Xia, 16, Junior, Canyon Crest Academy, San Diego, California, T: Ariel Haas

ENBM019 **Combating Antibiotic Resistant Bacteria Using Tissue Adhesive Hydrogel with Cell-Membrane Coated Nanotherapeutics**
Maggie Shin-Young Chen, 16, Sophomore, Canyon Crest Academy, San Diego, California, T: Ariel Haas

ENBM049 **The Other Side of Me: An Arduino Based Game for Bilateral Integration in Autism Spectrum Disorder**
Samuel Ferguson, 17, Junior, Christian Unified High School, El Cajon, California, T: Kimberley Ferguson

MCRO029 **Effect of Novel Shock Inhibition on Efflux Pump Inhibitor NMP**
Liana Noor Merk, 17, Junior, Canyon Crest Academy, San Diego, California, T: Ariel Haas

MCRO037	Conjugative Transfer of Cytotoxic Genes for Targeted Cell Elimination Anthony Kyuwon Kang, 17, Junior, Canyon Crest Academy, San Diego, California, T: Ariel Haas
ROBO032	Shape-Shifting Origami Robotics Francisca Vasconcelos, 18, Senior, Torrey Pines High School, San Diego, California, T: Julia Newman
<i>San Francisco, USCA06, San Francisco Bay Area Science Fair, Inc.</i>	
BMED048	Metalloprotease Inhibitors as Lead Candidate Drugs to Treat Lymphatic Filariasis and Other Roundworm Infections Matthew Moser, 17, Senior, Redwood High School, Larkspur, California, T: Todd Samet
ENMC025	Stabilizing a High-Power Quadcopter Patrick David Kao, 15, Sophomore, Menlo-Atherton High School, Atherton, California, T: Joseph Vanderway
<i>San Jose, USCA07, Synopsys Silicon Valley Science and Technology Championship presented by the Santa Clara Valley Science and Engineering Fair Association</i>	
BMED094	Accelerating Cancer Immunotherapy: Optimization of an EGFRVIII-Based Cancer Vaccine via Computationally-aided Analysis of Proteasome Processing for Improved Glioblastoma Prognosis Anin Sayana, 17, Senior, Bellarmine College Preparatory, San Jose, California, T: Debjani Roy
CBIO035	Genomics-Based Cancer Drug Response Prediction through the Adaptive Elastic Net Jonathan Ma, 17, Senior, The Harker School, San Jose, California, T: Christopher Spenner
CBIO045	Application of EMDomics to Identify Age-Associated Expression and Treatments in Cancer Sadhika S. Malladi, 18, Senior, The Harker School, San Jose, California, T: Chris Spenner
CBIO046	Self Driving Pharma: A Novel Cognitive Knowledge Harvesting Approach to Train a Self-Learning System For Drug Predictive Models through Multi-Dimensional Bio-Entity Feature-Vector Based Topological Data Analyses Tanisha Joshi, 17, Junior, Evergreen Valley High School, San Jose, California, T: Rebecca Taylor
CBIO047	A Machine Learning Framework for Multi-Omics Discovery and Characterization of Gene Co-Alterations Impacting Disease Swetha Revanur, 17, Senior, Evergreen Valley High School, San Jose, California, T: Scott Lubbs
CHEM057	Preventing Urushiol (Poison Oak) Induced Dermatitis by Deactivating the Allergen Amy Dunphy, 15, Sophomore, The Harker School, San Jose, California, T: Chris Spenner
CHEM059	Combating Viral Outbreaks: Rapid and Selective Detection of Viruses Using Inexpensive Polymer Films Anjini Karthik, 17, Senior, Saint Francis High School, Mountain View, California, T: Jennifer Thomas
PHYS069T	A Search and Exploration of Multi-Exoplanet Systems Using Novel Photometric and TTV Algorithms for the K2 Mission Shishir Dholakia #, 17, Junior; Shashank Dholakia #, 17, Junior, Adrian C. Wilcox High School, Santa Clara, California, T: David Iverson
ROBO045	Using Machine Learning to Detect Computer Network Security Threats Anushka Prasad Jogalekar, 15, Sophomore, Evergreen Valley High School, San Jose, California, T: Doug Miller
TMED035T	Automated Diagnosis of Diabetic Retinopathy Severity in Color Fundus Images Using a Novel Synthesis of Biological and Data Driven Approaches Manan Ajay Shah, 16, Junior; Rishab Gargeya, 17, Junior, The Harker School, San Jose, California, T: Chris Spenner
<i>Santa Cruz, USCA11, Santa Cruz County Science and Engineering Fair</i>	
ENMC050	Project ARROW: Autonomous Rocket Return on Wings Benjamin Kolland, 17, Junior, Alternative Family Education (A.F.E.), Santa Cruz, California, T: Jasmin Gerer

Seaside, USCA12, Monterey County Science and Engineering Fair

ANIM032T Sweet Potato Whitefly Infestation in the Agricultural Industry: Examining the Effects of Nitrogen Fertilizer on Whitefly Fecundity

Edhel Marie Alvarez Joseph, 18, Junior; Nahomy Pinedo, 17, Junior, Salinas High School, Salinas, California, T: Shahida Merchant

BMED017 Cold vs. Allergy: Use of Nasal Cytology to Determine if High School Students Can Accurately Predict Their Own Diagnosis

Camryn Leigh More, 15, Freshman, Salinas High School, Salinas, California, T: Kacee Fujinami

MCRO013 Does Silica Depletion Affect the Growth and Production of Domoic Acid in *Pseudo-nitzschia australis*?

Christopher John Paghasian, 17, Senior, York School, Monterey, California, T: Pamela Andrea Durkee

COLORADO

Alamosa, USCO01, San Luis Valley Regional Science Fair, Inc.

EBED028 Life Saving Locating: Developing Autonomous Avalanche Rescue, Part Two

Leighton Rhys Burt, 17, Junior, Sargent High School, Monte Vista, Colorado, T: Rafe Jordan Paulson

SOFT011 Python Cubed

Molly Megan Nehring, 15, Freshman, Monte Vista High School, Monte Vista, Colorado, T: Loree Ann Harvey

Boulder, USCO09, Corden Pharma Colorado Regional Science Fair

ANIM003 Statistical Analysis of Cliff Swallow Population Dynamics

Lillie Bahrami, 17, Senior, Boulder High School, Boulder, Colorado, T: Ryan O'Block

CHEM006T The Effect of Carbon on Iron Nickel Bimetallic Nanoparticle Degradation of Orange G

Kathryn Anna Lawrence, 17, Senior; Katherine Afton Younglove, 18, Senior, Fairview High School, Boulder, Colorado, T: Paul Strode

PHYS008 Buffer Gas Cooling in Molecular Spectroscopy

Matthew Radzihovsky, 17, Senior, Boulder High School, Boulder, Colorado, T: Ryan O'Block

Brush, USCO03, Morgan-Washington Bi-County Science Fair

EAEV008T Washing Away Vital Elements of Our Environment: A Bio-Assay Investigation with Daphnia, Comparing the Effect of Water Quality and Stream Pollution using "Green Detergent" vs. "Conventional Detergent"

Kaitlin Renae Wells, 15, Sophomore; Kaybree Loren Keating, 14, Freshman, Fort Morgan High School, Fort Morgan, Colorado; Weldon Valley High School, Weldona, Colorado, T: Krista M. Wells

PHYS005T A Toast to Murphy's Law

Kamille Christine Sweenie, 18, Senior; Merritt Lynn Singley #, 18, Senior, Brush High School, Brush, Colorado, T: David L. Miner

Colorado Springs, USCO04, Pikes Peak Regional Science Fair

EAEV064 Neoproterozoic Fault-Bounded Sandstone Injectites in Plutonic Basement Host Rock: An Investigation of Sedimentological Characteristics, Depositional Environment, and Geohazard Potential

Jenna Marie Salvat, 15, Freshman, Coronado High School, Colorado Springs, Colorado, T: Lynne Williams

ENMC014 Reflected Laser Communications for Small Satellites

Matthew Hileman, 18, Senior, The Classical Academy: College Pathways, Colorado Springs, Colorado, T: Jon Thompson

MCRO010 Biodetoxification Spectrum of the Cigarette Beetle Endosymbiont, *Symbiotaphrina kochii*, on Carcinogens Found in Cigarette Smoke

Katelynn Rynne Salmon, 15, Freshman, Palmer Ridge High School, Monument, Colorado, T: Thomas Shane Salmon

Denver, USCO10, Denver Metropolitan Regional Science and Engineering Fair

BCHM004 Mechanisms of How PI3K p110a Isoform Inhibits Antibody Class Switch through AID Expression

Eileen Xia, 16, Junior, Cherry Creek High School, Greenwood Village, Colorado, T: Stephen J. Smith

- BMED003** **The Effect of Bruxism on Mercury Leakage from Amalgam Restorations**
Edwin Christopher Bodoni, 15, Freshman, Cherry Creek High School, Greenwood Village, Colorado, T: Keith Harrison
- CBIO003** **The Effect of Epigenetics on CD8 T-Cell Function**
Sirey Hu Zhang, 17, Senior, Cherry Creek High School, Greenwood Village, Colorado, T: Keith Harrison
- Durango, USCO02, San Juan Basin Regional Science Fair*
- EAEV071** **Lead Remediation: Applications of Algae in Fresh Water**
Wyeth Rossi, 17, Junior, Home School, Durango, Colorado, T: Karin Rossi
- Fort Collins, USCO50, Colorado Science and Engineering Fair*
- BMED080** **Studying the Effects of the Missing X Chromosome on the Liver**
Isani Singh, 16, Sophomore, Cherry Creek High School, Greenwood Village, Colorado, T: Ethan Dusto
- CBIO037** **Predictive Modeling of Optimal Cancer Therapies**
Joyce Xu, 17, Junior, Fairview High School, Boulder, Colorado, T: Paul Strode
- ENMC022** **A Wing of the Future, Part III**
Trevor Michael Jordan, 18, Senior, Animas High School, Durango, Colorado, T: Michael Jordan
- MCRO014** **GASPI: Growth Advantage in Stationary Phase in *Acinetobacter baylyi***
Rebecca Bloomfield, 17, Junior, William J. Palmer High School, Colorado Springs, Colorado, T: Reed Carlson
- Grand Junction, USCO05, Western Colorado Regional Science Fair*
- BEHA010** **Peer Pressure Persuasion**
Silas Almgren, 15, Freshman, West Grand High School, Kremmling, Colorado, T: Emmylou Harmon
- Greeley, USCO06, Longs Peak Science and Engineering Fair*
- MCRO087** **Farm Fresh Eggs...A Backyard Bacterial Source?**
Kaitlyn Marie Carson, 17, Junior, Windsor High School, Windsor, Colorado, T: Denise Bolte
- La Junta, USCO07, Arkansas Valley Regional Science Fair*
- EAEV009** **Strength Exerted by Montmorillonite Clay**
Wyatt Ward Wiening, 16, Sophomore, Trinidad High School, Trinidad, Colorado, T: Eric Kohlbrand
- Sterling, USCO08, Northeast Colorado Regional Science Fair*
- EAEV015** **Water Hazard: The Effect of *Paracoccus denitrificans*-Based Remediation Techniques on the Levels of Nitrate and Oxygen in Freshwater Environments**
Casey John Shaw, 15, Sophomore, Liberty High School, Joes, Colorado, T: Linda Niccoli
- CONNECTICUT**
- Hamden, USCT50, Connecticut Science and Engineering Fair*
- BMED053** **CRISPR Based Gene Editing Confers Resistance to Human Immunodeficiency Virus (HIV)**
Aakshi Agarwal, 17, Junior, Hamden High School, Hamden, Connecticut, T: Priti Kumar
- CELL028** **The Optimization of Nanoparticle-Based Drug Delivery of Melittin in a Colloidal Suspension as a Selective Method to Target HIV Structural Antigen p24**
Sanjeev-Kumar Mamalaparam Sathish, 16, Junior, Greenwich High School, Greenwich, Connecticut, T: Andrew John Bramante
- EGCH016** **Increased Charge Rate and Capacity for Olivine Li-Ion Batteries via Efficient, Upcycled Nanoscale Electrodes**
Christopher Craig Popham, 16, Junior, Greenwich High School, Greenwich, Connecticut, T: Andrew Bramante
- EGCH027** **Novel Glycerol-Free Biodiesel Production using Enzyme Catalysis**
Martha Haddad, 16, Junior, Immaculate High School, Danbury, Connecticut, T: Bridget Henry

- ENBM032** **Development of a Portable, Tattoo-Based Biosensor for the Non-Invasive, Low-Cost Diagnosis of Atherosclerosis via Iontophoresis of Macrophage-Targeting Silver Nanoparticles**
 # William Yin, 16, Junior, Greenwich High School, Greenwich, Connecticut, T: Andrew Bramante
- ENBM048** **Polyetherketoneketone (PEKK), 3D Printed, Bipartite Surgical Implant: An Alternative and Supportive Cure for Internal Coxa Saltans in Female Adolescents**
 Sophie Elizabeth Edelstein, 15, Freshman, Wilbur Cross High School, New Haven, Connecticut, T: Andrew Crouch
- ENEV060** **Exploring Conditions for Struvite Precipitation with Sustainable Goals in Wastewater Management**
 Maya N. Geradi, 15, Sophomore, Wilbur Cross High School, New Haven, Connecticut, T: Caroline Dahm

DISTRICT OF COLUMBIA

Washington, USDC01, District of Columbia STEM Fair

- ANIM024** **Examining Turtle Ants' (*C. varians*) Preference for Different Types of Pollen**
 Sylvia Marie Gisler, 17, Senior, School Without Walls, Washington, District of Columbia, T: Sydney Bergman
- CELL025** **The Effect of Targeted Inhibitors on Melanoma Tumor Immunity**
 Langley Grace Wallace, 17, Junior, Sidwell Friends School, Washington, District of Columbia, T: Melanie Fields
- ENMC035** **Does the Use of Pyrolytic Graphite and Phase Change Material Improve Stirling Engine Performance?**
 Sam Lossef, 14, Freshman, School Without Walls, Washington, District of Columbia, T: Sydney Bergman

FLORIDA

Avon Park, USFL01, Heartland Regional Science and Engineering Fair

- ENEV044** **Can a Process Developed Using FeCl₂ and CMC Treated Brazilian Pepper Wood Fibers to Sequester Phosphate also Sequester Nitrates?**
 # Johnathan Forrest Fox, 18, Senior, Okeechobee High School, Okeechobee, Florida, T: Wendy Reister
- MCRO025** **What Is the Antibiotic Effect on Gram Positive and Gram Negative Bacteria in a Magnetic Field?**
 Zackary D. Durastanti, 15, Freshman, Hardee Senior High School, Wauchula, Florida, T: Robert Beatty

Bartow, USFL12, Polk Region Science and Engineering Fair

- CHEM054** **Optimization of Hollow Gold Nanoparticles for Photothermal Ablation of Cancer**
 Jasper Lin Montgomery, 15, Freshman, International Baccalaureate at Bartow High School, Bartow, Florida, T: Debbie Kennon
- MATS003** **Sound and Triboluminescent Correlation of Manganese Doped Zinc Sulfide Doped Resin Beams**
 Christopher M. Campbell, 18, Senior, International Baccalaureate at Bartow High School, Bartow, Florida, T: Debbie Kennon
- PLNT024** **Weed Warfare: Investigating Allelopathy, Year Six**
 # Julia Grace Canady, 17, Junior, Lakeland Christian School, Lakeland, Florida, T: Jennifer Canady

Bradenton, USFL02, Lockheed Martin Manatee Regional Science and Engineering Fair

- ENEV070** **The Removal of Aqueous Heavy Metals by Hyperaccumulating Plants**
 # Jason L. Edelkind, 15, Sophomore, Manatee High School, Bradenton, Florida, T: Christine Laurie
- SOFT050** **A Method of Encoding and Decoding Information in DNA Sequences that Includes Error Correction**
 Anna M. Zimmerman, 16, Junior, Braden River High School, Bradenton, Florida, T: Marybeth Witham

Bushnell, USFL18, Sumter County Regional Science Fair

BCHM006 **Particles with Tunable Size in Relation to Fiber Length**

Kyle Alexander Coady, 17, Senior, South Sumter High School, Bushnell, Florida, T: Emily Keeler

BMED013 **The Effect of Naringin on Oct-1 Deficient Cells: The Fabulous Flavonoid, Year Two**

Kendall Reed Clark, 18, Senior, South Sumter High School, Bushnell, Florida, T: Emily Keeler

CELL006 **A Neuronal Cell Study Probing Tau Hyperphosphorylation as a Model for Chronic Traumatic Encephalopathy (CTE)**

Isabel Maria Torres, 18, Senior, The Villages High School, The Villages, Florida, T: Monica Vinas

EAEV027 **Analysis of the Relationship between Climate and *Pinus elliottii* Ring Chronologies, Year Two**

Charlie Taylor, 16, Junior, The Villages High School, The Villages, Florida, T: Monica Vinas

TMED005 **Can MRI Be Used as a Novel Technique to Diagnose Human Bacterial Blood Infections?**

Tiffany Liu, 16, Sophomore, The Villages High School, The Villages, Florida, T: Monica Vinas

Clermont, USFL34, Lake Regional Science and Engineering Fair

EGPH007 **The Concentration Combination, Year III**

Rishi A. Basdeo, 17, Junior, East Ridge High School, Clermont, Florida, T: Dennis Doherty

Fort Myers, USFL05, Thomas Alva Edison Kiwanis Science and Engineering Fair

BEHA004 **The Effect of Human Pheromones on an Observer's Perception of Beauty and Success**

Emily Elizabeth Schwartz, 16, Junior, Canterbury School, Fort Myers, Florida, T: Kelly Mahan

CELL016 **Moving Towards the Cure: The Effect of Neuroinflammation and Microglial Activity on Alzheimer's Pathology and the Development of Therapeutics for Their Mitigation in the TG4510 Mouse Model (A Third Year Study)**

Jay Chandar, 16, Junior, Canterbury School, Fort Myers, Florida, T: Kelly Mahan

EAEV047 **Arthropod Diversity in Golf Courses and Preserves**

Lizzie Anne Swiersz, 14, Freshman, Southwest Florida Christian Academy, Fort Meyers, Florida, T: Matthew David Croxton

ENEV011 **A Comparative Analysis of Tissue-Specific Silver Hyper-Accumulation in *Myriophyllum aquaticum***

Sean Patrick O'Connor, 16, Sophomore, Canterbury School, Fort Myers, Florida, T: Kelly Mahan

Fort Pierce, USFL06, St. Lucie County Regional Science and Engineering Fair

BMED091 **Targeting Mistranslation in Cancer and Neurodegenerative Disease Therapies**

Koushal Rao, 18, Senior, Lincoln Park Academy, Fort Pierce, Florida, T: Lisa Hevner

EAEV005 **A Cost Efficient Solution to Citrus Root Destruction: Developing a Defensive Barrier against Citrus Weevils and Other Pests Using a Methylxanthine Agent**

Shreya Reddy, 14, Freshman, Lincoln Park Academy, Fort Pierce, Florida, T: Lisa Hevner

PLNT006 **Can Anaerobic Soil Disinfestation Create a Disease-Suppressive Soil to *Phytophthora capsici* and *Fusarium oxysporum f.sp. lycopersici*?**

Haniya Shareef, 15, Sophomore, Lincoln Park Academy, Fort Pierce, Florida, T: Lisa Hevner

Fort Walton Beach, USFL07, Panhandle Regional Science and Engineering Fair

BMED025T **Crumb Rubber for Artificial Turf: The Leaching of Heavy Metals into Blood Systems**

Chase T. Cleveland #, 17, Junior; Connor N. Cleveland, 16, Sophomore, Fort Walton Beach High School, Fort Walton Beach, Florida, T: Devon Stewart

EGCH008	Black Silicon Inflatable Hybrid Solar Power, a 3rd Year Study Camille Alden Miles, 16, Sophomore, Niceville High School, Niceville, Florida, T: Gina Emery
ENMC010	Go with the Flow: Manipulating the Components of a Tesla Turbine in Order to Better Apply Them to Certain Situations Daniel Craig Bobbitt, 16, Sophomore, Niceville High School, Niceville, Florida, T: Neely Calhoun
PLNT018	Evaluating the Potential of Micro Algae as an Inoculant for Pulses: Ideal Conditions for Indoor Farming, Year Four of an Ongoing Project Lauren Juliette Matthews, 16, Junior, Niceville High School, Niceville, Florida, T: Gina Emery
<i>Ft Lauderdale, USFL09, Broward County Science Fair</i>	
ENMC065	A Portable Low-Cost Device Employing Recycled Synchronous Electric Motors to Generate Renewable Electricity Jubin Gorji, 17, Junior, Pine Crest School, Fort Lauderdale, Florida, T: Jennifer Gordinier
MATH038	Patterns in the Continued Fraction Expansion of Various Infinite Series Jared Matthew Geller, 17, Junior, Pine Crest School, Fort Lauderdale, Florida, T: Jennifer Gordinier
PLNT048	Optimizing Cellulase RS and Macerozyme R-10 Ratios to Maximize Viable Protoplast Yield from <i>Oryza sativa</i>: Improving the Process of Creating Genetically Modified Plants
#	Nithya Kasarla, 15, Sophomore, American Heritage School Plantation, Plantation, Florida, T: Leya Mathew Joykuty
TMED038	Leveraging the Antimicrobial Properties of <i>Jatropha curcas</i> in Suture Engineering Lauren Kathryn Enten, 17, Junior, Saint Thomas Aquinas High School, Fort Lauderdale, Florida, T: Laura Shearer
<i>Gainesville, USFL08, Alachua Region Science and Engineering Fair</i>	
BMED075	The Effects of Alcohol, Caffeine, and Fructose on Liver Cell Growth and Death Joanna Song, 17, Junior, F. W. Buchholz High School, Gainesville, Florida, T: Diane McDilda
PHYS047	The Race against Instabilities: Gravity vs. Carbopol – Who Will Win? Sidhika Balanchandar, 16, Sophomore, F. W. Buchholz High School, Gainesville, Florida, T: Diane McDilda
<i>Green Cove Springs, USFL35, Clay Rotary Regional Science and Engineering Fair</i>	
ENMC075	Measuring the Efficiency of Rapid Prototyping Using a 3D Printer
#	Nathan Roy Martus, 18, Senior, School: Oakleaf High School, Orange Park, Florida, T: Dusty Skorich
MATH051	An Analysis of the Gravitational Energy of Galactic Mass and Its Application to Dark Matter and Dark Energy Zachary Barken, 16, Sophomore, School: Clay High School, Green Cove Springs, Florida, T: Nancy Watson
<i>Jacksonville, USFL10, Northeast Florida Regional Science and Engineering Fair</i>	
ANIM002	Spotted Wing <i>Drosophila</i>, Baiting and Trapping Hannah Nicole Lee, 16, Sophomore, The Bolles School, Jacksonville, Florida, T: Kathryn Halloran
BCHM002	In vitro Validation of ROS Nanosensors in Renal Cancer Cells
#	Yebin Choi, 18, Senior, Episcopal School of Jacksonville, Jacksonville, Florida, T: Marion Zeiner
BMED005	The Effects of E-Cigarette Vapor on <i>Drosophila melanogaster</i> Lindsay Sophia Poulos, 15, Sophomore, Episcopal School of Jacksonville, Jacksonville, Florida, T: Marion Zeiner
CBIO002T	Modeling Gene Transfer and Its Impact on Antibiotic Resistance Victoria Ge, 17, Junior; Madison Lee, 18, Senior, Stanton College Preparatory School, Jacksonville, Florida, T: Rajasekhar Narisetty

- Lake City, USFL11, Suwannee Valley Regional Science and Engineering Fair*
ENBM005 Thermoelectric Generation: Preventing Diabetic Foot Ulcers with the Seebeck Effect
 Drew S. French, 16, Sophomore, Madison County High School, Madison, Florida, T: Andrea A. Krell
- Lakeland, USFL50, State Science and Engineering Fair of Florida–Ying Scholars*
BEHA035 CRANIOMETRIX: Developing Innovative Cognitive Tests to Diagnose Alzheimer's Early, Year Four
 # Nikhil Sanjay Patel, 16, Junior, Oviedo High School, Oviedo, Florida, T: Kathy Savage
- CELL036 Ribosomal Ribonucleic Acid Targeting using Small Ribonucleic Acid as a Potential Antimicrobial**
 Tess Ann Marvin, 17, Junior, Paul J. Hagerty High School, Oviedo, Florida, T: Sarah Anne Evans
- EGCH043 The Effects of Gibberellic Acid and Temperature on Macroalgal Lipid Content**
 # # Daniella Deanna Bernadel, 18, Senior, Palm Bay Magnet High School, Melbourne, Florida, T: Michael O'Donnell
- ENBM043 Determining the Effect of Extracellular Matrix on the Differentiation and Functionality of Stem Cells for Bioengineering Organs**
 Lindsay Kathryn Placius, 18, Senior, Palm Beach Central High School, Wellington, Florida, T: William Bartenslager
- ENEV085 Functionalizing Biochar with Layered Double Hydroxides for Phosphate Removal from Aqueous Solutions**
 Stefan Wan, 16, Junior, A.W. Dreyfoos School of the Arts, West Palm Beach, Florida, T: Michael Rathe
- ENMC006 Orbital Recognition System for Space Debris Tracking Using Artificial Neural Networks: A Journey from Inner-Brain GPS to Outer-Space GPS**
 Amber Zoe Yang, 17, Junior, Trinity Preparatory School, Winter Park, Florida, T: Michael Arney
- MCRO005 The Presence, Species Composition, Antibiotic Resistance, and Virulence Potential of Vibrio Bacteria from Commercially Purchased Florida Brown Shrimp, *Farfantepenaeus aztecus***
 Ceili Erin Masterson, 18, Senior, Palm Bay Magnet High School, Melbourne, Florida, T: Michael O'Donnell
- SOFT032 Using Data-Driven Frequency Analysis Techniques to Detect Seizures and Falls**
 # Amir Helmy, 15, Sophomore, Eastside High School, Gainesville, Florida, T: Maureen Shankman
- Melbourne, USFL13, South Brevard Science and Engineering Fair*
CBIO009 The Development of a Program Capable of the Detection of Mild Cognitive Impairment and Alzheimer's Disease Using PET Scans
 Brendan Aidan Scott Harcourt, 14, Freshman, Palm Bay Magnet High School, Melbourne, Florida, T: Michael O'Donnell
- ENMC052 Time to Bust the Mars Dust**
 Abbey Joan Havel, 16, Sophomore, Satellite High School, Satellite Beach, Florida, T: Joseph Scott
- Merritt Island, USFL14, Brevard Intracoastal Regional Science and Engineering Fair*
CELL007 Effects of Endocrine Disrupting Compounds on Embryonic Growth
 # Summer Leigh Van Orman, 18, Senior, Edgewood Junior Senior High School, Merritt Island, Florida, T: Robert Ryan Cilsick
- EAEV007 Wetland Preservation and Mosquito Control: An Integrated Approach**
 Kendall Karcher, 18, Senior, Satellite High School, Satellite Beach, Florida, T: Joesph Scott
- Merritt Island, USFL28, Brevard Mainland Regional Science and Engineering Fair*
ANIM006 Shining a Light on the Blind: Evolutionary Regression and Adaptive Progression in the Micro-vertebrate *Ramphotyphlops braminus*, a Model for Understanding Brain Organization and Complex Neurological Disorders
 # River Grace, 16, Junior, West Shore Junior/Senior High School, Melbourne, Florida, T: Mary Anderson

CELL004	"Let There Be Light!" rAAV Mediated Delivery of shRNA in a Canine Model of Autosomal-dominant Retinitis pigmentosa
#	Margarita Cruz-Sanchez, 17, Senior, West Shore Junior/Senior High School, Melbourne, Florida, T: Mary C. Anderson
MATH006	Stochastic Analysis in Biomedical Engineering: Identifying Acute Myocardial Infarction
#	Muhammad Ugur oglu Abdulla, 16, Sophomore, West Shore Junior/Senior High School, Melbourne, Florida, T: Paula Ladd
<i>Miami, USFL15, South Florida Science and Engineering Fair</i>	
BMED006	Accuracy of Non-Invasive Continuous Glucose Nanosensor for ex vivo Artificial Pancreas
#	Maya Miriam Levy, 16, Junior, Dr. Michael M. Krop Senior High School, Miami, Florida, T: David Buncher
CELL001	Comparative Analysis and Effects of Oscillatory and Steady Shear Stress on Bone Marrow Derived Mesenchymal Stem Cells (BMMSC)
	Smita Bhattacharjee, 17, Junior, John A. Ferguson Senior High School, Miami, Florida, T: Michael Weiss
EBED012	Two Transistor Ternary Random Access Memory
	Simon Peter Tsoussis, 18, Senior, Christopher Columbus High School, Miami, Florida, T: Alina Sanchez
ENBM012	The Effects of Conditioned Medium from Dental Stem Cells on Gene Expressions of Interleukin IL-1β Treated Chondrocytes
	Said Bilani, 18, Senior, North Miami Beach Senior High School, North Miami Beach, Florida, T: Vania Boeva
ENMC005	A Novel Prosthetic Design Utilizing a Unique, Integrated Sensory Control Platform, Brushless Motor Drive System, and Worm Gear Mechanism through Rapid Prototyping
#	Megan Rose Erdozain, 17, Junior, Medical Academy for Science and Technology, Homestead, Florida, T: Sarah Cabrera
MATS009	Development of a Simulation Driven Algorithm to Calculate Gold Nanorod Length Using Dynamic Light Scattering
#	Bo You, 18, Senior, Miami Palmetto Senior High School, Pinecrest, Florida, T: Pamela J. Shlachtmann
<i>New Port Richey, USFL30, Pasco Regional Science and Engineering Fair</i>	
CBIO033	Mathematical Modeling of Metastatic Prostate Cancer
# #	Pranav Ishaan Warman, 17, Senior, Academy at the Lakes, Land O' Lakes, Florida, T: Colleen McCormick
EAEV013	Using Alum Synthesized from Recycled Scrap Aluminum to Investigate a Purification Method for Phosphate-Enriched Freshwater Ecosystems
#	Viraj S. Patel, 17, Junior, J. W. Mitchell High School, New Port Richey, Florida, T: Ed Braddy
<i>Ocala, USFL16, Big Springs Regional Science Fair</i>	
ANIM020	Feeding a Hungry World: The Role of Macrocyclic Lactones
	Harrell Henry Phillips III, 17, Junior, Vanguard High School, Ocala, Florida, T: John P. Hare
BCHM003	A Novel Method to Correlate Weight Gain and Increased Risk of Metallosis in Metal-On-Metal Hip and Knee Implant Patients
	Sai Aditya Sriram, 17, Junior, Vanguard High School, Ocala, Florida, T: John P. Hare
CHEM002	The Effect of Varying Temperatures on the Release of Antimony within Polyethylene Terephthalate Plastic Beverage Bottles
	Kranti Rumalla, 15, Freshman, West Port High School, Ocala, Florida, T: Judith Dominguez
<i>Orlando, USFL17, Dr. Nelson Ying-Orange County Science Exposition</i>	
BMED007T	Platelet Estimation: Semi-Quantitative Method Using the Miller Disc, Year II
	Alexa-Rae Wheeler, 17, Senior; Stephany Bustamante, 18, Senior, Lake Highland Preparatory School, Orlando, Florida, T: Nicole Justice
CELL008	An Analysis of Ectopic Expression of MicroRNAs Targeting the Androgen Receptor on the Viability of Prostate Cancer Cells
	Millie Chokshi, 18, Senior, Lake Highland Preparatory School, Orlando, Florida, T: Nicole Justice

- EAEV004** **Global Warming and El Niño-Southern Oscillation Cycles Effect on Sea Turtles**
 Cathleen Teresa Mestre, 18, Senior, Lake Highland Preparatory School, Orlando, Florida, T: Nicole Justice
- PHYS040** **Breakage of SET Nanowires and Determination of the Resistivity Constant for Multilayer Graphene**
 Parker Jean Coye, 17, Junior, Lake Highland Preparatory School, Orlando, Florida, T: Nicole Justice
- Panama City, USFL19, Florida Three Rivers Regional Science and Engineering Fair*
- ENEV008** **Clathrate-Assisted Freezing/Melting Seawater Desalination**
 Shixuan Justin Li, 18, Senior, Rutherford High School, Panama City, Florida, T: Victoria Steele
- Pensacola, USFL20, West Panhandle Regional Science and Engineering Fair*
- BEHA005T** **To What Extent Does the Cross Race Effect and Education Level Impact the Accuracy of Eyewitness Testimony, Year II**
 Patricia Kay McAuley #, 17, Junior; Lauren Alison Beall #, 17, Junior; Holley J. Meaney #, 17, Junior, Pensacola High School, Pensacola, Florida, T: Cherie Stephens
- ENBM002** **Monitoring Your Brainwaves at Home with EEG**
 Alexander Pope, 14, Freshman, Pensacola High School, Pensacola, Florida, T: Cherie Stephens
- Saint Augustine, USFL21, St. Johns County Science Fair*
- ENBM004** **Visualizing the Adeno-Associated Virus Vector through Modification of the Viral Protein 2**
 Adam Benjamin Snowden, 17, Junior, Ponte Vedra High School, Ponte Vedra, Florida, T: Steve Lyons
- ROBO001** **Logical Levitation: Achieving Magnetic Levitation via Computational Feedback Loop**
 Brighton Ancelin, 18, Senior, Creekside High School, Saint Johns, Florida, T: Marna Fox
- Sanford, USFL23, Seminole County Regional Science, Mathematics and Engineering Fair*
- BEHA012** **MeEmo: An Autism Destroying Avatar, Year Two**
 Sapna K. Patel, 15, Sophomore, Oviedo High School, Oviedo, Florida, T: Kathy Savage
- CELL035** **A Study of the Percent Transmission and Electrical Resistance of Reflectin as a Function of Temperature**
 Rafi Mir Ali Hessami, 16, Senior, Lake Mary Preparatory School, Lake Mary, Florida, T: Tina Marie Gibson
- ROBO003** **Early Skin Cancer Detection Using Macroscopic Images and Convolutional Neural Networks**
 Mitchell Alexander Hammack, 17, Junior, Oviedo High School, Oviedo, Florida, T: Kathy Savage
- Sarasota, USFL32, Sarasota Regional Science, Engineering and Technology Fair*
- BEHA050** **Testing the Effects of the BET Inhibitor JQ1 on the Memory of *Dardanus calidus***
 Kiana Knuth, 15, Sophomore, Sarasota High School, Sarasota, Florida, T: Andrew Raymond Harshman
- CELL047** **Effects of Mild Traumatic Brain Injury on the Visual System in Mice**
 Aubrey G. Kilduff, 17, Junior, Sarasota High School, Sarasota, Florida, T: Andrew Raymond Harshman
- Stuart, USFL25, Martin County Regional Science and Engineering Fair*
- ANIM034** **Novel Mosquito Control: A Chemical-free, Low-Cost Approach for *Aedes aegypti* Reduction via Specific Range Frequency Sweep**
 Shantanu Jakhete, 16, Junior, South Fork High School, Stuart, Florida, T: Lauren Case
- Tampa, USFL27, Hillsborough Regional Science Fair*
- BMED016** **Using Modified S100A9 Monoclonal-Antibody-Infused Field Effect Transistors to Accurately Detect the Presence of Early Stage Renal Cell Carcinoma**
 Mark Laurie, 16, Junior, Joe E. Newsome High School, Lithia, Florida, T: Charles Rhode

EAEV016	Optimization and Field Testing of a Low-cost Portable Enterococci Test (PET) Kit
# #	Margaret Katherine Parrish, 17, Senior, Chamberlain High School, Tampa, Florida, T: Michael Zanatian
<i>Vero Beach, USFL31, Indian River Regional Science and Engineering Fair</i>	
PHYS007T	Capability of Modern Technology to Detect Exoplanets Orbiting Black Holes
	Brian Anthony Mills, 17, Senior; Spencer James Toll, 17, Junior, Vero Beach High School, Vero Beach, Florida, T: Heather Holden
<i>West Palm Beach, USFL29, Palm Beach Regional Science and Engineering Fair</i>	
ANIM039	The Effects of Potassium Chloride and Experimental Temperature on Florida Apple Snail Development and Exhibition of Predatory Avoidance Behavior
	Jessica E. Young, 17, Junior, Palm Beach Central High School, Wellington, Florida, T: William R. Bartenslager
BEHA036	Is Stress the New Drug? An Analysis on Meditation's Effects on the Addicted Brain, Stress Perception, and Prefrontal Cognitive Function
#	Lila Mish, 17, Junior, American Heritage School of Boca Delray, Delray Beach, Florida, T: Brian Ramos
EAEV044	H₂O₂ No: Pharmaceuticals Contaminate Groundwater! Sulfamethazine Adsorption onto Hypercrosslinked Polymer MN250 with Dissolved Humic Acid
# # #	Maria Elena Grimmer, 17, Senior, Oxbridge Academy of the Palm Beaches, West Palm Beach, Florida, T: Hui Li
EGPH025	Bringing Electricity Access to Countries through Ocean Energy: BEACON—Combatting Energy Poverty through the Development of a Novel Ocean Energy Probe
	Hannah D. Herbst, 15, Freshman, Florida Atlantic University High School, Boca Raton, Florida, T: Robin Barkes
ENEV081	Soil Remediation through the Use of Nutrient-Based Nanocomposite Hydrogels
	Celinie Nguyen, 16, Junior, Palm Beach Central High School, Wellington, Florida, T: William Bartenslager
ENMC054	Dynamics of 3D Printing: Reactor3D
	Jason Kaufmann, 16, Junior, Suncoast Community High School, Riviera Beach, Florida, T: Jeffrey Laufer
ROBO029	Formulating Different Detection Algorithms to Identify Invasive Red Lionfish in South Florida and the Bahamas
	Alexis Marie Base, 15, Freshman, Florida Atlantic University High School, Boca Raton, Florida, T: Robin Barkes
GEORGIA	
<i>Albany, USGA01, Darton College/Merck Regional Science Fair</i>	
MCRO009	Effect of Silver Nanoparticles on <i>Escherichia coli</i>
	Michelle Zhang, 18, Senior, Colquitt County High School, Norman Park, Georgia, T: Vance Hurst
<i>Athens, USGA50, Georgia State Science and Engineering Fair</i>	
BCHM045	Optical Activation of Enzymatic Cascades with PNIPAM-coated Gold Nanorod Actuators
#	Jeffery Chen Yang, 18, Senior, Gwinnett School of Mathematics, Science, and Technology, Lawrenceville, Georgia, T: Susan Kramer
CELL044	Nutrient Starvation-Induced Cancer Cell Death in Acute Myeloid Leukemia Cells
	Eric Wang, 17, Junior, Chattahoochee High School, Johns Creek, Georgia, T: Kenny Marbry
ENMC067	Recycling Aluminum in Resource Scarce Regions
	Zoe Crisp, 18, Senior, Marietta High School, Marietta, Georgia, T: Leon Grant
MATH047	Break Divisors as Canonical Representatives for Divisor Classes on Complete Graphs: Applications to the Internet of Things
	Agni Kumar, 18, Senior, Milton High School, Milton, Georgia, T: Eric Hogya

Atlanta, USGA03, Atlanta City Science and Engineering Fair

BMED015 **Analysis of Pro-Inflammatory Microenvironment around Intracortical Electrodes in Response to Imantinib**

Alexus Clark, 18, Senior, Coretta Scott King Young Women's Leadership Academy, Atlanta, Georgia, T: Nicole Chapman

CBIO010 **Application of a Machine Learning Logistic Regression Algorithm in a Classification Model to Predict Epileptic Seizures**

Christine Joy Liu, 16, Junior, The Westminster Schools, Atlanta, Georgia, T: Chanley Small

EGPH039T **Effects of Polarized Light on Solar Cell Yield**

Isabelle Madeline Carson, 17, Senior; Sajjad Ali, 17, Senior, Henry W. Grady High School, Atlanta, Georgia, T: Ben Sellers

MATS006 **Regenerating Articular Cartilage with Heparin Sulfate Hydrogels Using Human Bone Marrow Mesenchymal Stem Cells**

Qwantayvious Artez Stiggers, 18, Senior, The B.E.S.T. Academy at Benjamin S. Carson, Atlanta, Georgia, T: William Bagot

Atlanta, USGA13, Fulton County Regional Science and Engineering Fair

ROBO006 **Deriving Unsupervised Fluid Intelligence from Schema-Less Polymorphic Unstructured Data**

Animesh Koratana, 17, Junior, Northview High School, Johns Creek, Georgia, T: Rebecca Bingham

Conyers, USGA12, Rockdale Regional Science and Engineering Fair

BMED011 **Engineering a Novel Oleocanthal-Based Nanocarrier for Drug Delivery**

Mai Thanh Nguyen, 18, Senior, Rockdale Magnet School for Science and Technology, Conyers, Georgia, T: JoDi Lynn Osborn

CBIO018T **The Genetic Analysis of Appetite Regulation and the Gut Brain Axis**

McKenna Anne Commiskey, 16, Junior; Kya Danielle Wideman, 17, Junior, Rockdale Magnet School for Science and Technology, Conyers, Georgia, T: Scott Bolen, John Hendrix

CELL012 **Characterization of Thymic Signaling Cascades in Transgenic Mice**

Isabella Alexis Castronova, 17, Senior, Rockdale Magnet School for Science and Technology, Conyers, Georgia, T: JoDi Lynn Osborn

Duluth, USGA11, Gwinnett Regional Fair

CBIO005 **Novel Machine Learning Algorithms for Early Diagnosis of Melanoma**

Simran Modi, 17, Senior, The Gwinnett School of Math, Science, and Technology, Lawrenceville, Georgia, T: Susan Kramer

MATS004 **Peptide Nanotubes: Redesigning Amyloid- β as a Metalloprotein**

Ryan Sung Han, 17, Junior, The Gwinnett School of Math, Science, and Technology, Lawrenceville, Georgia, T: Jennifer Berry

PHYS006 **Ring Formation of 10199 Chariklo through the Accretion of a Debris Disk**

Matthew Jongwon Kim, 15, Sophomore, Mountain View High School, Lawrenceville, Georgia, T: Billy Jones

Griffin, USGA09, Griffin RESA Regional Science Fair

MCRO006 **Testing the Validity of Pau D'arco as an Antimicrobial Agent**

Luke A. Campbell, 16, Junior, Alcovy High School, Covington, Georgia, T: Shanna Urbanawiz Aten

MCRO039T **The Effects of Diluted Hydrogen Peroxide and Preservatives on Mold Growth**

Dorothy Lai, 15, Freshman; Kylie Irene Dickinson, 14, Freshman, McIntosh High School, Peachtree City, Georgia, T: Stephanie Sisk

McDonough, USGA06, Henry County Science and Engineering Fair

BCHM007 **Characterizing Effect of Glutamine Position on A β Fiber Structure**

Andrea Augustine, 16, Junior, Eagle's Landing High School, McDonough, Georgia, T: Jennie Borders

EAEV011T **An Enzymatic Approach to Treating Colony Collapse Disorder in Pollinating Bee Populations as a Result of Neonicotinoid Pesticides**

Jessica Moore #, 16, Junior; Katie Lauren Gwaltney #, 17, Junior, Union Grove High School, McDonough, Georgia, T: Melissa Davis, Keron Cain Gwaltney

- MATH004T** **Ice! Ice! Savings! The Effect of Ice Shape on Restaurant Profitability**
Corban Anderson, 14, Freshman; Caleb Anderson, 14, Freshman, Union Grove High School, McDonough, Georgia, T: Melissa Davis
- MCRO008T** **Testing the Effectiveness of Natural Remedies versus Synthetic Antibiotics against *Salmonella choleraesuis***
Brooke Nicole Worley, 15, Sophomore; Sydney Grace Keller, 15, Sophomore, Luella High School, Locust Grove, Georgia, T: Jody Barfield, Jody Barfield Milledgeville, USGA07, Georgia College & State University Regional Science and Engineering Fair
- TMED047T** **Surveying Sickle Cell Allele Frequency**
Aneah Nay'ana Moore, 17, Senior; Austin Shane Norwood, 18, Senior; Brianna Wynn Nicholson, 18, Senior, Jasper County High School, Monticello, Georgia, T: Margret Elizabeth Proctor
Savannah, USGA08, Savannah Regional Science and Engineering Fair
- MATS043** **Extreme Exposure Requires a Coat**
Jessie Duree Barre, 15, Sophomore, Herschel Jenkins High School, Savannah, Georgia, T: Michelle C. Thompson
Stone Mountain, USGA04, Dekalb Science and Engineering Fair
- BMED060** **Identification of Cystic Fibrosis Newborn Neutrophils through Flow Cytometry**
Aomeng Cui, 17, Senior, Chamblee Charter High School, Chamblee, Georgia, T: Marie Cabrices
- CELL053T** **The Impact of Ultraviolet Radiation on DNA Repair-Deficient Yeast**
Izegboya Ayo Oyakhire, 16, Junior; Hanna Mekonnen, 17, Junior, Arabia Mountain High School, Lithonia, Georgia, T: Fred Okoh
- MCRO058** **Increased *in vivo* Activation of Mucosal Immune Cells by Orally Administered Yogurt-Based *L. lactis* Vaccine Vector**
Krishna Pucha, 17, Junior, Chamblee Charter High School, Chamblee, Georgia, T: DeAnn Peterson
Warner Robins, USGA10, Houston Regional Science and Engineering Fair
- CHEM021** **The Degradation of Optical Brighteners when Exposed to Ultraviolet Light**
Luke Isaac Foster, 17, Junior, Veterans High School, Kathleen, Georgia, T: Jennifer Douglass
- ROBO035** **The Design and Formation of a Sign Language Robot for Student Education**
Ashley Bishop, 17, Junior, Veterans High School, Kathleen, Georgia, T: Jennifer Douglass
- HAWAII**
Hilo, USHI05, Hawaii District Science and Engineering Fair
- CELL010** **Modulation of THP-1 Macrophage Cytokine Expression by Kava Metabolites**
Keanu Dean Pinner, 18, Senior, Hilo High School, Hilo, Hawaii, T: Pascale Creek Pinner
- TMED008** **Investigating the SPF, Antioxidant and Anticancer Potential of Organic Turmeric (*Curcuma longa*) and Ginger (*Zingiber officinale*) Combinations on HTB67 & HTB69 Melanoma Cancer Cells**
Moana Lily Pinner, 16, Junior, Hilo High School, Hilo, Hawaii, T: Pascale Creek Pinner
Honolulu, USHI01, Hawaii Association of Independent Schools Science and Engineering Fair
- BMED035** **Evaluating the Phenotype of Macrophages in the Pathology of Endometriosis**
Shaylin Yoko Marn, 18, Senior, Kamehameha Schools Kapalama Campus, Honolulu, Hawaii, T: Gail Ishimoto
- ENEV043T** **Novel Utilizations of Globally Invasive Algal Species: Environmental and Economical Implementations of Fermented Macroalgae**
Ariana Kim # #, 18, Senior; Sreelakshmi Kutty #, 18, Senior, Saint Andrew's Priory School, Honolulu, Hawaii, T: Jay Hamura, Ai Hirasuna

Honolulu, USHI07, Central Oahu District Science and Engineering Fair

EGCH040 The Effect of Bacterial Metabolism on the Redox-Potential of Microbial Fuel Cells

Shakson Kyoh Isaac, 15, Freshman, Mililani High School, Mililani, Hawaii,
T: Christopher Johnson

MATS012 Grip Don't Slip

Krystle Imamura, 18, Senior, Mililani High School, Mililani, Hawaii,
T: Vanessa Humphreys

Honolulu, USHI08, Honolulu District Science and Engineering Fair

BEHA008 Biochemical Characterization and Imaging of Arc: Insights into Neurodegeneration and Alzheimer's Development

Rajeev Jha, 18, Senior, President Theodore Roosevelt High School, Honolulu, Hawaii, T: Jennifer Williams

CELL005 Nanoimage Characterization of Fibroblast Growth Factor Receptor 3 Signaling in Bladder Cancer Development

Roshani Jha, 16, Junior, President Theodore Roosevelt High School, Honolulu, Hawaii, T: Jennifer Williams

Honolulu, USHI50, Hawaii State Science and Engineering Fair

ENEV105 Developing a pH Sensor Using a Raspberry Pi to Monitor Ocean Acidification

Evelyn Haase, 15, Freshman, Molokai High School, Hoolehua, Hawaii,
T: Emilio Macalalad

MCRO055 Isolation of a Novel Marine Microorganism Capable of Aromatic Hydrocarbon Degradation in East Hawai'i

Felix Cheng Peng, 16, Junior, Waiakea High School, Hilo, Hawaii,
T: Whitney Aragaki

PHYS050 Runaway Stars: Looking for Variability in Hypervelocity Star Candidates

Celeste Maida Jongeneelen, 16, Sophomore, Home School—Maui, Kula, Hawaii, T: Norbert Jongeneelen

PLNT050 Tissue Culture of the Hawaiian Papaya

Kacie Kajihara, 17, Junior, Kalani High School, Honolulu, Hawaii,
T: Kenneth Okawa

SOFT037 Image Processing and EDS Analysis Using ImageJ

Sarah Mumbert, 17, Senior, Kealahoe High School, Kailua-Kona, Hawaii,
T: Justin Brown

Kaneohe, USHI06, Windward District Science and Engineering Fair

BEHA044 Bias, Suggestibility, and the Creation of False Memories

Ben Weiss, 15, Freshman, Kalaheo High School, Kailua, Hawaii,
T: Crystal Stafford

CHEM058 Rapid Determination of Bacterial Growth via Calorimetry

Samuel Marin Scott, 16, Sophomore, Kahuku High and Intermediate School, Kahuku, Hawaii, T: Brett Kweish

Lihue, USHI04, Kauai Regional Science and Engineering Fair

CELL011 Fungicidal Properties of *Pseudomonas aeruginosa*

Matthew Yukio Nishimoto, 18, Senior, Kauai High School, Lihue, Hawaii,
T: Kevin Johnson

EGCH009 The Effects of Silica on *Nitzschia sp.*'s Lipid Production and Nutraceutical Contents

Jacky Lin, 16, Junior, Kauai High School, Lihue, Hawaii, T: Kevin Johnson

Wailuku, USHI03, Maui Schools Science and Engineering Fair

EAEV017 Sea Level Rise and March of the Molokai Mangrove: The Socioeconomic and Environmental Impacts of Sea Level Rise and Introduced Red Mangrove (*Rhizophora mangle*) on Molokai, Hawaiian Islands

Lily Nalulani Jenkins, 16, Junior, Molokai High School, Hoolehua, Hawaii,
T: Weldon Wichman

PHYS012 Using Trigonometric Parallax to Discover the Possibly Extant Triple Star System G41-14ABC

Joseph Min Seok Kim, 16, Junior, Maui High School, Kahului, Hawaii,
T: Keith Imada

Waipahu, USHI02, Leeward District Science and Engineering Fair

MATS013 Utilizing Dynamic Bracing Orthosis in Forward Head Posture Rehabilitation

Arianna Marie Guiao Claveria, 17, Senior, Kapolei High School, Kapolei, Hawaii, T: Stacie Inouye

MCRO015 Analyzing the Resistance and Susceptibility of *Corchorus olitorius* against *Escherichia coli*

Liza Mae A. Mamuad, 17, Senior, Waipahu High School, Waipahu, Hawaii, T: Michael Sana

TMED009T The Cytotoxic Effects that Are Created by Different Aspects of Pulverized *Moringa oleifera* on HeLa Cells

Deserie Miguel Pagatpatan, 16, Junior; Melara Faye Nicolas Cabrera, 16, Junior, Waipahu High School, Waipahu, Hawaii, T: Michael Sana

ILLINOIS

Chicago, USIL01, Chicago Public Schools Student Science Fair

EGCH024 The Effect of Mixed Culture on MFC

Daniel Puczko, 16, Sophomore, Lane Technology High School, Chicago, Illinois, T: Lucy Young

ENEV078 Poop to Power! Constructing Biogas Generators for Household Use

Erika Lynn Anderson, 17, Junior, Von Steuben Metropolitan Science Center, Chicago, Illinois, T: Emmanuel Aldana

ENMC043 Combating Dust Storms with Wiper Mechanism

Nova Xu, 18, Senior, Walter Payton College Preparatory High School, Chicago, Illinois, T: Walter Kinderman

TMED022 Diet and Exercise in Colon Cancer Progression

Emily Claire Neeson, 17, Junior, Chicago High School for Agricultural Sciences, Chicago, Illinois, T: Daniel Martin

Edwardsville, USIL02, STEM Science and Engineering Research Challenge

PLNT055 Growth and Fitness of *Bouteloua curtipendula* under Exposure to Xanthan Gum Solution

Matthew Morse, 18, Senior, Edwardsville Senior High School, Edwardsville, Illinois, T: Julia Doll

Macomb, USIL03, Heart of Illinois Science and Engineering Fair

EAEV075T To Drink or Not to Drink: The Lysis of *Escherichia coli* by Ultraviolet Light through a Makeshift Filtration System

Taylor Michelle Lawrence, 17, Junior; Abigail Lynn Rademaker, 17, Junior, Delavan High School, Delavan, Illinois, T: Mary Kay Michelle Adamczyk Wonders

Skokie, USIL05, Illinois Junior Academy of Science North Suburban Region 6 Science and Engineering Fair

BEHA009 The Effects of Bisphenol S on the Behavior Patterns of *Drosophila melanogaster* with FMR1 Gene Insertions

Arooba Lodhi, 16, Junior, Niles North High School, Skokie, Illinois, T: Christine Camel

ENEV013 The Mycoremediation of Polychlorinated Biphenyls Using *Pleurotus ostreatus* in a Soil-like Medium

Sara Tariq Siddiqui, 17, Junior, Niles North High School, Skokie, Illinois, T: Christine Camel

PHYS066 A Scintillating Xenon Bubble Chamber for Dark Matter Particle Detection: Temperature and Pressure Regulation

Sharmain Tariq Siddiqui, 18, Senior, Niles North High School, Skokie, Illinois, T: Christine Camel

PLNT021 The Effect of Site and Flower Color on the Genetic History of *Castilleja levisecta* (Golden Paintbrush), *Castilleja hispida* (Harsh Paintbrush), and *C. levisecta* x *C. hispida*

Rebecca Ann Nelson, 17, Senior, Adlai E. Stevenson High School, Lincolnshire, Illinois, T: Christina Palffy

TMED007 The Effect of Spermidine on *C. elegans*: A Model System for Alzheimer's Disease

Sedra Khan, 16, Junior, Niles West High School, Skokie, Illinois, T: JulieAnn Villa

- Springfield, *USIL04, Illinois Junior Academy of Science Region X Science Fair*
EGPH020 **Photoelectrolysis: A Study of Intensity and Hydrogen Production**
 # John Patrick Cramsey, 17, Junior, Southeastern Junior/Senior High School, Augusta, Illinois, T: Stephen Christopher Foster
- PLNT049** **Effect of Biochar on *Zea mays* Growth in Different Soil Types**
 Jayleigh Michelle Peuster, 15, Freshman, Southeastern Junior/Senior High School, Augusta, Illinois, T: Stephen Christopher Foster

INDIANA

Angola, *USIN01, Northeastern Indiana Tri-State Regional Science Fair*

- MCRO061** **Engineering of a Conjugated Endolysin as an Efficient Method for Acne Treatment**
 Sepehr Asgari, 15, Freshman, Carmel High School, Carmel, Indiana, T: Jacob Fitzgerald

Bloomington, *USIN02, South Central Indiana Regional Science and Engineering Fair*

- CELL038** **Improving Sample Preparation in Cryo-EM**
 Taj El-Khalili, 15, Freshman, William Henry Harrison High School, West Lafayette, Indiana, T: Lynette Schneider

Evansville, *USIN03, Tri-State Regional Science and Engineering Fair*

- BEHA046** **The Role of Friendship Networks and Motivational Goals in Interracial Interactions**
 Corina Greiner, 18, Senior, Brown County High School, Nashville, Indiana, T: Paige Burton
- EAEV076** **Ice Ice Maybe**
 Brooke-destinee Lockwood, 15, Freshman, DeKalb High School, Waterloo, Indiana, T: Susan Zuber

Fort Wayne, *USIN04, Northeast Indiana Regional Science and Engineering Fair*

- PHYS057** **Determining the Gravitational Center of the Galaxy Based on Globular Clusters**
 Zachary Lee Potter, 16, Sophomore, Signature School, Evansville, Indiana, T: Jennifer Lea Potter

Gary, *USIN05, Calumet Regional Science Fair*

- PLNT051** **The Green Algae, *Chlorella vulgaris*, Mitigates Detrimental Effects of Methylmercury in Zebrafish**
 Jay Maturi, 16, Sophomore, University High School of Indiana, Carmel, Indiana, T: Luke Crawley

Greencastle, *USIN10, West Central Indiana Regional Science and Engineering Fair*

- ANIM045** **Using Pharmacogenetics to Determine the Role of the Orexin System in Panic-Associated Behavior and Physiology**
 # # Asmaa Mahoui, 16, Junior, Eman Schools, Fishers, Indiana, T: Mia Sankari
- EAEV059** **Can Wetland Plants (*Lemnoideae*) Be a Viable Source of Remediation to Prevent Harmful Algae Blooms in Western Lake Erie?**
 Julia Marie Hunckler, 17, Junior, Marian High School, Mishawaka, Indiana, T: Ken Andrzejewski

Indianapolis, *USIN06, Central Indiana Regional Science and Engineering Fair*

- MATH046** **Fast Sampling of Stochastic Kronecker Graphs by Identifying Erdos-Renyi Subregions**
 # # Arjun Srinivasan Ramani, 17, Junior, West Lafayette Junior-Senior High School, West Lafayette, Indiana, T: Jane Schott
- ROBO036T** **Permaximize**
 Abraham James Oliver, 16, Sophomore; Jadan Taylor Ercoli, 15, Sophomore, Brown County High School, Nashville, Indiana, T: Paige Burton

Indianapolis, *USIN50, Hoosier Science and Engineering Fair*

- BMED089** **Therapeutic Evaluation of Griseofulvin in a Mouse Model of Choroidal Neovascularization**
 # Kamna Gupta, 18, Senior, Carmel High School, Carmel, Indiana, T: Timothy W. Corson
- EAEV069** **The Effect of Epoxy Resin Liners on Bisphenol A Contamination of Canned Foods**
 Zhiyue Wang, 16, Junior, West Lafayette Junior-Senior High School, West Lafayette, Indiana, T: Jane C. Schott

- EAEV077 Microbead Invasion**
Rylie Shyanne Prough, 15, Freshman, Eastside Junior-Senior High School, Butler, Indiana, T: Ryan Stellhorn
Muncie, USIN07, East Central Indiana Regional Science Fair
- CELL045 The Effect of Expression of miRNA-15b on the Migration of Glioblastoma Multiforme**
Jooyoung Lee, 16, Junior, West Lafayette Junior-Senior High School, West Lafayette, Indiana, T: Jane C. Schott
South Bend, USIN09, Northern Indiana Regional Science and Engineering Fair
- PHYS058 Molecular Dynamics of Adenosine Triphosphate Interacting with Phosphatidylcholine Lipid Bilayers**
Abhinav Ramkumar, 16, Junior, Carmel High School, Carmel, Indiana, T: Horia I. Petrache
Valparaiso, USIN12, Northwestern Indiana Science and Engineering Fair
- CELL041 Differential Induced Gene Expression in Platinum Based Chemotherapy**
Alexis Gabrielle Thornburg, 18, Senior, Marian High School, Mishawaka, Indiana, T: Ken Andrzejewski
West Lafayette, USIN11, Lafayette Regional Science and Engineering Fair
- EGCH049 Influence of Self Heating on the Performance & Lifespan of Lithium Ion Batteries**
Aditya Mishra, 18, Senior, Munster High School, Munster, Indiana, T: Kshitij Mishra
- IOWA**
Ames, USIA50, State Science and Technology Fair of Iowa
- EAEV056 The Analysis of Different Fertilizer Methods and the Effects of Water Quality on Zea mays**
Regan Ball, 18, Senior, Central Lee High School, Donnellson, Iowa, T: Alicia Schiller
- EGPH030T Waste to Watts, Stage II**
Blake Allen Wade, 18, Senior; Madison Ross Pfaffe, 18, Senior, Keokuk High School, Keokuk, Iowa, T: Arie Schiller
- ENEV080 Engineering a Biological Filter System for Freshwater Denitrification for Use in Agricultural Applications, Phase I**
Alexandra Anne Zelenski, 15, Junior, Burlington Community High School, Burlington, Iowa, T: Elizabeth Sanning
- MCRO076 Metagenomics, Digital & qPCR Molecular Analysis of Bed-Time Oral Brushing**
Pranav Chhaliyil, 15, Freshman, Maharishi School of the Age of Enlightenment, Fairfield, Iowa, T: Pradheep Chhaliyil
- PHYS056T Determining the Properties of Star Clusters**
Mason Lewis Rhodes, 18, Senior; Vy Ngo, 18, Senior; Gabriel Mintzer, 16, Junior, Des Moines Central Campus, Des Moines, Iowa, T: Kacia Cain
Cedar Rapids, USIA01, Eastern Iowa Science and Engineering Fair
- CELL030 Loss of Fascin Enhances Nuclear Actin Filament Formation**
Sweta Sudhir, 17, Senior, John F. Kennedy High School, Cedar Rapids, Iowa, T: Tina L. Tootle
- EBED025 Creating an Affordable and Open Source Braille Printer**
Doga Ozesmi, 17, Senior, Fairfield High School, Fairfield, Iowa, T: Stacy L. Maurer
Sheldon, USIA02, Western Iowa Science and Engineering Fair
- EGPH018 Is Solar Energy a Viable Option for the Future?**
Bryn Groff, 17, Junior, Sheldon High School, Sheldon, Iowa, T: Kris Groff
- KANSAS**
El Dorado, USKS50, Kansas State Science and Engineering Fair
- CHEM053T Cowpost Chemistry: The Effect of Ruminant Stomach Contents on the Buffering Abilities of Compost**
Nathan John Dowell, 18, Senior; Shandon Levi Classen, 18, Senior, Liberal High School, Liberal, Kansas, T: Melisa Westerman

EAEV068T Soil Profiles
Paige LaNae Claassen, 16, Sophomore; Deserae Nicole Schwindt, 16, Sophomore, Rolla Junior/Senior High, Rolla, Kansas, T: Zeta Kay Greene

KENTUCKY

Highland Heights, USKY04, Science and Engineering Fair of Northern Kentucky

BMED008 Muscles, Movement and Microvolts
Will Broomhead, 14, Freshman, Dixie Heights High School, Fort Mitchell, Kentucky, T: Lynne Poston

Lexington, USKY05, Central Kentucky Regional Science and Engineering Fair

ENMC036 Understanding Heat Transfer Mechanisms in Forest Fire Spread: Convection, Radiation, Fluid Dynamics, and Their Applications for Firefighter Protection in a High Temperature Fine Fuel Particle Environment

Kyra Leigh Seevers, 17, Senior, Paul Laurence Dunbar High School, Lexington, Kentucky, T: Karen Young

MATS010 Investigating the Flexural Properties of Uniaxial Composites Made from Acid Treated Hemp Bast Fiber and Epoxy
Brenna Wallin, 15, Freshman, Lafayette Senior High School, Lexington, Kentucky, T: Gene Toth

TMED006T Rapamycin as a Novel Therapeutic for Alzheimer's Disease: Prevention Assessed through Neuroimaging
Amy C. Wang, 16, Junior; David Wang Ma, 16, Sophomore, Paul Laurence Dunbar High School, Lexington, Kentucky, T: Ai-Ling Lin

Louisville, USKY02, Louisville Regional Science and Engineering Fair

BCHM010 Analysis of Different Nrf2 Inducers on Reversal of Stress-induced Changes in Renal Tubule Cells
Shruti Wadhwa, 17, Junior, Kentucky Country Day School, Louisville, Kentucky, T: Michelle Barati

EAEV039 How Does a Gravel Seafloor versus a Sand Seafloor Effect the Wave Velocity of a Tsunami?
Sydney Nicole Kessler, 16, Sophomore, Ballard High School, Louisville, Kentucky, T: Ronda Fields

ENMC056 Development of a Hybrid Inkjet 3D Printer: A Novel Approach to 3D Printing Conductive Architectures and Flexible Electronics
Joshua Murphy Jacob, 16, Sophomore, Saint Xavier High School, Louisville, Kentucky, T: Greg Cambron

PHYS011 Vapor Propelled Marangoni Effect
William Prescott Schuhmann, 16, Sophomore, Ballard High School, Louisville, Kentucky, T: Ronda Fields

Louisville, USKY03, Dupont Manual High School Regional Fair

BEHA011T The Effect of Prosthetic Arm Vibrotactile Indicators: An Active Haptic Sensing Study of the Effect of Vibration and Visual Stimuli on Perception Accuracy
Diya Mathur #, 17, Junior; Sophia Nicole Korner #, 17, Junior, duPont Manual High School, Louisville, Kentucky, T: Glenn Zwanzig

EBED018 Development of the First Ever Low-Cost Open-Source Hearing Test and Hearing Aid
Mukund Venkatakrishnan, 16, Junior, duPont Manual High School, Louisville, Kentucky, T: Glenn Zwanzig

MATS011T Electrospinning Nanodiamond Fiber Patches for the Prevention of Secondary Myocardial Infarctions
Manasa Sunkara, 16, Junior; Danielle Lauren Graves, 18, Senior, duPont Manual High School, Louisville, Kentucky, T: Glenn Zwanzig

PHYS041 A Simulation-Based Study of Nanocluster Growth through Deposition and Surface Diffusion
Emily Jiayuan Liu, 17, Junior, duPont Manual High School, Louisville, Kentucky, T: Robert Baar

TMED011	Development of Low Cost Paper-Base Point-of-Care Platform for Quantitative Biomarker Analysis
#	Praharshasai Paladugu, 17, Junior, duPont Manual High School, Louisville, Kentucky, T: Kathy Fries
<i>Richmond, USKY50, Kentucky Science and Engineering Fair</i>	
BCHM032	The Role of NF-E2 in Regulating Chemotherapeutic Metabolite Acrolein-Induced Nephrotoxicity
# # #	Sanjana J. Rane, 18, Senior, duPont Manual High School, Louisville, Kentucky, T: Robert Baar
BEHA045	The Effect of Distraction on Perception Reaction Time
	Julie Truc Nguyen, 16, Sophomore, J. Graham Brown School, Louisville, Kentucky, T: Kathleen Mattingly
EGCH028	Development and Optimization of High Energy Density Sodium-Sulfur Secondary Battery Technology: Attractive Alternative to Lithium
#	Roshan Duggineni, 18, Senior, duPont Manual High School, Louisville, Kentucky, T: Robert Baar
ENEV065	Implementation of a Diverter Based Water Conservation System for Showers
	Conor Patrick Blackburn, 16, Sophomore, duPont Manual High School, Louisville, Kentucky, T: Glenn Zwanzig
TMED041	An Effective Drug-Delivery-Mechanism-Based Approach to Clinical Radiosensitization
	Lavanya Sai Kanneganti, 16, Junior, duPont Manual High School, Louisville, Kentucky, T: Glenn Zwanzig
LOUISIANA	
<i>Baton Rouge, USLA01, Louisiana Region VII-Science and Engineering Fair</i>	
EAEOV12	Staying Afloat: Utilizing the Physiological Adaptation Mechanisms of Marsh Vegetation and the Use of Mathematical Modeling for Barrier Island Restoration, Year Three
# #	Natalie Marie Bush, 17, Senior, Saint Josephs Academy, Baton Rouge, Louisiana, T: Linda Kerr Messina
MATH008	A Tree Branch Path Solution to the Collatz Conjecture
# #	David Chang Luo, 18, Senior, Baton Rouge Magnet High School, Baton Rouge, Louisiana, T: Lai Cao
<i>Baton Rouge, USLA50, Louisiana Science and Engineering Fair</i>	
BEHA023	The Correlation between Taster Status and Risk of Breast Cancer
	Abigail Marie Livingston, 17, Junior, St. Joseph's Academy, Baton Rouge, Louisiana, T: Linda Kerr Messina
ENEV048T	Glow in the Dark Concrete: Assessing the Effectiveness of Different Surface Treatments Incorporating Strontium Aluminate in Regards to Visible Luminescence Emission and Resistance to Abrasion
	Aniko Alicia Nowakowski # #, 18, Senior; Meredith Claire Guidry, 17, Junior, Saint Josephs Academy, Baton Rouge, Louisiana; St. Joseph's Academy, Baton Rouge, Louisiana, T: Linda Kerr Messina
MCRO028	The Effect of St. John's Wort (<i>Hypericum perforatum</i>) on the Development and Reproduction of Hydra (<i>Hydra littoralis</i>)
	Joshua Michael Devier, 15, Freshman, Saint Paul's School, Covington, Louisiana, T: John Carambat
PHYS031	Proximity-Induced Ferromagnetism on a Topological Insulator Surface: Bi₂Se₃/EuS Heterostructures
	Jamin David Kidd, 17, Senior, Louisiana School for Math, Science, and the Arts, Natchitoches, Louisiana, T: Robert Dalling
ROBO031	The Effect of Errors on Gathering in Robot Swarms
	Deepti Vaidyanathan, 16, Sophomore, McKinley Senior High School, Baton Rouge, Louisiana, T: Shashi Srivastava

Bossier City, USLA02, Bossier Parish Community College Louisiana Region I Science and Engineering Fair

BCHM015 The Differential Effect of Opioids on Breast Cancer Cell Pro-Survival and Pro-Apoptotic Pathways

Meghana Srivyas Rao, 17, Senior, Caddo Parish Magnet High School, Shreveport, Louisiana, T: Kris Clements

CELL017 Exploring Glomerular Podocyte Proximal Tubule Communication via Exosomes/Microparticles

Margaret Camille McNew, 17, Senior, Caddo Parish Magnet High School, Shreveport, Louisiana, T: Kris Clements

PHYS010 Shear Heating of Black Hole Accretion Disks

Ankur Khanna, 17, Junior, Caddo Parish Magnet High School, Shreveport, Louisiana, T: Kris Clements

Houma, USLA03, Terrebonne Parish Science Fair

BMED078 Sucrose Goes Glucose

Adeline Martin, 16, Sophomore, South Terrebonne High School, Bourg, Louisiana, T: Chris Brown

ENEV023 The Mechanical Separation of an Oil and Water Mixture

Gabrielle White, 18, Senior, South Terrebonne High School, Bourg, Louisiana, T: Chris Brown

Lafayette, USLA04, Louisiana Region VI Science and Engineering Fair

CHEM031 The Testing of the Mpemba Effect at Varying Salinities

Samuel Allen Senegal, II, 16, Junior, Ovey Comeaux High School, Lafayette, Louisiana, T: Lisa Boquet Ranney

ENEV022T Eichhornia crassipes: Phytoremediation Viability for Heavy Metals in Hostile Water

Drake Lawrence Bergeron #, 18, Senior; Tommy Le Nguyen, 17, Junior, Ovey Comeaux High School, Lafayette, Louisiana, T: Lisa Boquet Ranney

Lake Charles, USLA05, Louisiana Region V Science and Engineering Fair

SOFT036T Protect Your Room!

William George Albrecht III, 17, Junior; Alexandra Elizabeth Albrecht, 16, Freshman, Alfred M. Barbe High School, Lake Charles, Louisiana, T: Lisa Albrecht

New Orleans, USLA08, Greater New Orleans Science and Engineering Fair

ANIM016 The Food Preference of the Invasive Giant Apple Snail, *Pomacea maculata*

Camille Marguerite Moss, 17, Junior, Benjamin Franklin High School, New Orleans, Louisiana, T: Kady Clincy

CHEM011 What Is the Effect of Composition on the Reactivity of Dion-Jacobson Perovskites?

Tyler Ryan Libert, 18, Senior, Patrick F. Taylor Science and Technology Academy, Avondale, Louisiana, T: Janell Simpson

EGCH020 How Does the Thermal Conductivity of Liquids Affect Heat Absorption in Photovoltaic Troughs?

Mason Richard Varuso, 17, Junior, Patrick F. Taylor Science and Technology Academy, Avondale, Louisiana, T: Janell Simpson

EGPH014 The Effect of Liquid Cooling on the Energy Efficiency of Solar Panels

Michael Moore Glaser, 17, Junior, Benjamin Franklin High School, New Orleans, Louisiana, T: Lisa Hartman

Ruston, USLA09, Louisiana Region II Science and Engineering Fair

MATS016 Temperature and Its Effect on the Elasticity of Rubber Bands

Sarfraz Nasir Ahmed, 17, Junior, Cedar Creek School, Ruston, Louisiana, T: Sue Simmons

St. James Parish, USLA06, St. James Parish Science Fair

MATS022 iCharge: An Analysis of Products and Processes that Can Extend the Life of iOS Cables

Kaylee Bourgeois, 15, Freshman, Lutchter High School, Lutchter, Louisiana, T: Jenny Vicknair

MAINE

Bangor, USME50, Maine State Science Fair

- ENBM035 The Design and Analysis of an Artificial Muscle Comprised of Ionic-Polymer Metal Composites**
Sydney Victoria McDonald, 17, Junior, Bangor High School, Bangor, Maine,
T: Cary Edward James
- ENEV066 Developing Inexpensive Calcium Alginate Based Scaffolds for Phosphate Sorption in Stormwater**
Paige Elizabeth Brown, 17, Senior, Bangor High School, Bangor, Maine,
T: Cary Edward James
- TMED049 Bioengineering Functional Kidney Tissue from Human Pluripotent Stem Cells: A Promising New Treatment for Kidney Disease**
Demetri Maxim, 18, Senior, Gould Academy, Bethel, Maine, T: Peter Southam

MARYLAND

Baltimore, USMD07, Morgan State University Science-Math-Engineering Fair

- CHEM063 Chemiluminescent Aptasensor Capable of Rapidly Quantifying Escherichia coli O157:H7**
Kang Wook Chung, 17, Junior, School: Gilman School, Baltimore, Maryland,
T: Ji Hoon Lee

Frederick, USMD02, Frederick County Science and Engineering Fair

- PHYS051T Differential Rotation as an Explanation for Saturn's B-Field Periodicity, Phase II**
Frederika Irene Rentzeperis, 18, Senior; Richard Carson Derr, 17, Senior,
Middletown High School, Middletown, Maryland, T: Daniel Burr
- Glen Burnie, USMD01, Anne Arundel County Regional Science and Engineering Fair
- MATH012 On the Number of Primes Less than a Given Magnitude**
Sebastien Brennan, 15, Freshman, Severna Park Senior High School,
Severna Park, Maryland, T: Theresa Stahl
- MATS057 Replacing Silicon: 2D Semiconductors with a Promising Future**
Allison Paul Bowman, 15, Sophomore, South River High School, Edgewater,
Maryland, T: Tara Johnson

Largo, USMD05, Prince George's Area Science Fair

- ENMC058 Wireless Monitoring of Blade Impacts**
Jonathan Yu, 17, Junior, Great Mills High School, Great Mills, Maryland,
T: Jennifer Morgenthaler
- ENMC059 Creating a Spherical 3D Printer**
Jay Dai-Ping Lee, 14, Freshman, Great Mills High School, Great Mills,
Maryland, T: Rhonda Morgan
- MATS041 Electrochemical Applications of TiO₂ Hollandite in Touchscreens**
David M. Moore, 18, Senior, Eleanor Roosevelt High School, Greenbelt,
Maryland, T: Alex Kinder
- ROBO018 Multi-Goal Motion Planning for Steerable Surgical Needles**
David Jonathan Gardner, 17, Senior, Eleanor Roosevelt High School,
Greenbelt, Maryland, T: Arlynda Jorgensen

Silver Spring, USMD03, ScienceMontgomery

- ENMC021 VAXXWAGON: An Innovative "No Ice, No Electric" Active Refrigeration System for Last-Leg Vaccine Transportation**
Anurudh Ganesan, 16, Junior, Clarksburg High School, Clarksburg, Maryland,
T: Glen Dunham
- ROBO019 Investigating Deep Learning for Face Recognition**
Diwakar Ganesan, 17, Senior, Poolesville High School, Poolesville, Maryland,
T: Patricia Miller
- SOFT023 Collaborative Maze Solving and Map Development via Gestural Communication Using Multiple Ground Robots**
Vineet Shah, 17, Senior, Poolesville High School, Poolesville, Maryland,
T: Patricia Miller
- TMED015 Development of Peptide-Based Cancer Drugs Targeting the Polo-Box Domain of Polo-like Kinase 1**
Jihoon Jang, 18, Senior, Poolesville High School, Poolesville, Maryland,
T: Patricia Miller

Towson, USMD06, Baltimore Science Fair

BMED074 The Role of Ets Related Gene in the Regulation of Mitochondrial Functions in Prostate Cancer

Deep Biswas, 18, Senior, Oakland Mills High School, Columbia, Maryland,
T: Julia Bakhru

EBED040 Drones Equipped with LiDAR For 3D Mapping

Alexander David Hilger, 17, Senior, Baltimore Polytechnic Institute, Baltimore, Maryland, T: David Nelson

PHYS037 Performing Joint Measurements on Electron Spin Qubits by Measuring Current through a Nearby Conductance Channel

Kevin S. Huang, 17, Junior, Centennial High School, Ellicott City, Maryland,
T: Michelle Bagley

MASSACHUSETTS

Boston, USMA06, Massachusetts Region VI Science Fair

ENBM047 Utilizing Artificial Muscles to Enhance the Human Body

James Magnasco, 19, Senior, East Boston High School, East Boston, Massachusetts, T: Shannon Morey

ENEV026T I(c)onic Filter, Part Two

Brian O'Rourke #, 17, Junior; Allegra Rollo #, 16, Junior, Boston Latin School, Boston, Massachusetts, T: Kathleen Bateman

TMED014T Fighting Cancer with Herbs and Spices

Khanh Pham, 18, Junior; Kevin Van Duong, 16, Junior, Excel High School, Boston, Massachusetts, T: Ivyrose Likis

Bridgewater, USMA01, Massachusetts Region V Science Fair

SOFT021 Innovative Safe Zone Technology to Reduce Gun Violence

Indumathi Prakash, 16, Sophomore, Sharon High School, Sharon, Massachusetts, T: Emily Burke

Cambridge, USMA50, Massachusetts State Science and Engineering Fair

BCHM018 Modeling the Structures of Disease-Causing ACVR1 Mutants Using Ab initio Methods

Nicholas Joseph Freitas, 17, Junior, Massachusetts Academy of Math and Science, Worcester, Massachusetts, T: Maria Borowski

EGCH036 Lipid Content in Algae: The Foundation of Biofuel Production

Katherine R. Beadle, 17, Sophomore, Bishop Feehan High School, Attleboro, Massachusetts, T: Richard Desjardins

EGCH044 Algal Biofuel Production

Christopher Wayne Clark, 17, Senior, Westfield High School, Westfield, Massachusetts, T: Jon Tyler

ENBM020 Viability of Co-cultured Mycobacterium smegmatis and THP-1 Cell-Derived Macrophages Following Infection in vitro

Ann Le, 17, Senior, Medford High School, Medford, Massachusetts,
T: Jodie Driscoll

ENEV028 Designing a Cost Effective Aquaponics System for Small Urban Households

Juliana Maria Pereira, 16, Junior, Edward M. Kennedy Academy for Health Careers, Boston, Massachusetts, T: Malcolm Smith Pringle

MATH014 Equivalences between Well-Defined and Undefined Partitions of Infinity

Max Davis Abrams, 17, Junior, Falmouth High School, Falmouth, Massachusetts, T: Cory Dubuque

MCRO020 A Prevotella intermedia Genomic Library to Identify Hemolysin Genes

Chelsey Alexandra Skeete, 18, Senior, Boston Latin Academy, Boston, Massachusetts, T: Robert Huie

MCRO022 Tracing Evolutionary Patterns in West Africa: A Phylogenetic Analysis of the HIV-1 and HIV-2 Strains

Vivek Bhupatiraju, 14, Sophomore, Lexington High School, Lexington, Massachusetts, T: Janice Compton

Fall River, USMA03, Massachusetts Region III Science Fair

BEHA037 How Texting Affects Spelling

Samuel Hyun-Joon Carter, 16, Sophomore, Bishop Feehan High School, Attleboro, Massachusetts, T: Richard Desjardins

- CHEM012** **The Effect of Ultraviolet Light on the Chemistry of Gatorade**
Sumit De, 15, Sophomore, Foxborough Regional Charter School, Foxborough, Massachusetts, T: Roy Pavao
North Adams, USMA04, Massachusetts Region I Science Fair
- ENMC026** **Magnapole**
Jill C. Scussel, 16, Junior, Taconic High School, Pittsfield, Massachusetts, T: Laura Costello
Somerville, USMA02, Massachusetts Region IV Science Fair
- EAEV038** **Mapping the Spread of Invasive Plants by UAV**
Linnea Warburton, 18, Senior, Lexington High School, Lexington, Massachusetts, T: Kelly Kilts
Worcester, USMA05, Massachusetts Region II State Science Fair
- BMED064** **The Effects of Near Infrared Light and Curcumin on Wound Healing and Tissue Regeneration in *Girardia tigrina***
Aarushi Iris Pendharkar, 14, Junior, Massachusetts Academy of Math and Science, Worcester, Massachusetts, T: Maria Borowski
- CBIO020** **A New Front in Evolution: A Structural Landscape of Frameshift Mutations**
Niam Milan Shah, 16, Junior, Massachusetts Academy of Math and Science, Worcester, Massachusetts, T: Angela Taricco
- MCRO031** **One Step Closer to Curing Tuberculosis: Testing the Stability of ORBIT in *Mycobacterium smegmatis***
Desmond Blair Goodwin, 18, Senior, Saint Mark's School, Southborough, Massachusetts, T: Lindsey Lohwater
- SOFT022** **Smart Safety Warning and Notification System for Treadmills**
Himanshu Minocha, 16, Sophomore, Hopkinton High School, Hopkinton, Massachusetts, T: Devon Grilly
- MICHIGAN**
Ann Arbor, USMI01, Southeast Michigan Science Fair
- ENEV083** **An Experimental Study on Using Wet Scrubbing Process to Clean Flue Gas from Wood Burning**
Hojin Han, 17, Junior, Pioneer High School, Ann Arbor, Michigan, T: Cinda Sue Davis
- MCRO086** **Basil Protects Human Lung Cells from *K. pneumoniae* by Increasing Their Viability**
Arundhathy Suresh, 14, Freshman, Pioneer High School, Ann Arbor, Michigan, T: Cinda Sue Davis
Detroit, USMI02, Science and Engineering Fair of Metropolitan Detroit
- CHEM010** **A Novel Ultrastable Zwitterionic Quantum Dot Synthesis**
Shrikant Chand, 15, Sophomore, Detroit Country Day School, Beverly Hills, Michigan, T: Patricia Hanlan
- CHEM030** **Development of Cobalt Recovery Process from Waste Lithium-ion Batteries**
Amy Yinghua Li, 18, Senior, Troy High School, Troy, Michigan, T: Rebecca Brewer
- EAEV036** **Investigation of Nanoparticle Size to Optimize SERS Substrates for Aerosol Particle Studies**
Darrell Belvins Tubbs, 17, Senior, Cass Tech High School, Detroit, Michigan, T: Sonya Ross
- EGCH041** **Dye-Sensitized Solar Cells**
Malini Mukherji, 16, Sophomore, Indus Center for Academic Excellence, Rochester, Virginia, T: Rahul Mital
- ENEV071T** **Effectiveness of Wastewater Treatment Plants in Removing Microplastics**
Jonathan Ni, 17, Senior; Elien Raskin Michielssen, 17, Junior; Marlies Raskin Michielssen, 17, Junior, Detroit Country Day School, Beverly Hills, Michigan; Washtenaw International High School, Ypsilanti, Michigan, T: John Dougherty
- ENMC039** **Wheelchair-Stroller: A Solution to Infant Transportation for Wheelchair Users**
Alden Elias Kane, 17, Senior, University of Detroit Jesuit High School, Detroit, Michigan, T: Dominic Coccitti-Smith

- SOFT010** **SPARQL Query Generation and Semantic Similarity for Medical RDF Databases**
Varun Sathyan, 16, Junior, Troy Athens High School, Troy, Michigan, T: Rachel Peterson
Detroit, USMI50, Michigan Science and Engineering Fair
- ANIM051** **Does the Use of Peanut Derived Products in Broiler Feed Affect Food Quality Standards?**
Haley Jo Lemle, 18, Senior, Jonesville High School, Jonesville, Michigan, T: Kimberly Salsbury
- MATH048** **The Arrangement Graph: A New Design for Computational Systems**
Omer Siddiqui, 16, Junior, Detroit Country Day School, Beverly Hills, Michigan, T: Ross Arseneau
Flint, USMI03, Flint Regional Science Fair
- MATS051** **Investigating Shear Thickening Fluid Applications to Decrease Linear and Rotational Mean Peak Acceleration as Measured by Dual Axis Accelerometers in Hockey Headgear and a Hybrid 3 Head Form**
Clara Elizabeth Wagner, 17, Junior, Saginaw Arts and Sciences Academy, Saginaw, Michigan, T: David Allan
- ROBO028** **Developing an Inexpensive Prosthetic Hand**
Christopher S. Barnes, 18, Senior, Saginaw Arts and Sciences Academy, Saginaw, Michigan, T: John Barnes
- TMED027** **Compounding Effects of Hyperlipidemia and Hyperglycemia in the Exacerbation and Early Detection of Diabetic Retinopathy**
Sophia R. Ahmed, 16, Junior, Port Huron Northern High School, Port Huron, Michigan, T: Renu Kowluru
Kalamazoo, USMI07, Southwest Michigan Science and Engineering Fair
- MATS033T** **Organic/Inorganic Hybrid Perovskites: Towards Sustainable Water Splitting**
Ziyan Mo #, 17, Senior; Natasha Goenawan #, 17, Senior, Kalamazoo Area Math and Science Center, Kalamazoo, Michigan, T: Ramakrishna Guda, Joesph Thorstenson
- PHYS059** **A Novel Technique to Simulate Two Dimensional Vortex Flow by the Acoustic Excitation of a Flat Bubble Film**
Praneeth Medepalli, 17, Junior, Kalamazoo Area Math and Science Center, Kalamazoo, Michigan, T: Joseph Thorstenson
- MINNESOTA**
Crookston, USMN05, Western Minnesota Regional Science Fair
- PLNT005** **What Did You Say? Plant Communication in Transgenic and Non-Transgenic Soybeans**
Jenna Raab Wegscheid, 18, Senior, Perham High School, Perham, Minnesota, T: Shawn Andrew Stafki
Duluth, USMN02, Northeast Minnesota Regional Science Fair
- ANIM017T** **The Effect of Time, Benthic Substrate, and Location within the St. Louis River Estuary on the Invasion of *Neogobius melanostomus* (Round Gobies) throughout the Watershed, as well as the Use of Underwater Speakers Emitting the Conspecific Male Mating Call as a Possible Trapping and Removal Method, Phase IV**
Christine Elizabeth Neumann #, 18, Senior; Crystal Moynan #, 18, Senior, Cloquet Senior High School, Cloquet, Minnesota, T: Cynthia Ann Welsh
- BCHM001** **Quack Quack, What's in My Water? What Effect Does the Concentration of Salicylic Acid (Aspirin) Have on the Growth of *Lemna minor* (Duckweed) While Under the Stress of Glyphosate (Roundup)?**
Emma Marie Wells, 14, Freshman, Cloquet Senior High School, Cloquet, Minnesota, T: Cynthia Ann Welsh
- BCHM017T** **The Effect of Ibuprofen Contaminated Sediment, Incubated Overtime, on *Lumbriculus variegatus*'s (Small Sediment Worm) Survival, Reproduction, and Avoidance of Contaminated Sediments in Boundary Waters Sediment and Lake Superior Water**
Jordin Jodell Weisz, 16, Sophomore; Morgan Elizabeth Smith, 15, Sophomore, Cloquet Senior High School, Cloquet, Minnesota, T: Cynthia Ann Welsh

TMED001	Anaphylactic Shocker! Katelyn Jo France, 16, Sophomore, Hinckley-Finlayson High School, Hinckley, Minnesota, T: Dennis Boxrud
<i>Mankato, USMN03, Southern Minnesota Regional Science and Engineering Fair</i>	
EAEOV010T	The Influence of Ecologically Relevant Triclosan Concentrations on the Reproductive Success of <i>Daphnia magna</i> Ella Suzanne Haefner, 17, Junior; Elaine Adams, 17, Junior, Loyola High School, Mankato, Minnesota, T: Sue Goebel
ENEV005	Assessing the Efficiency of Native Plants in Inactivating <i>Escherichia coli</i> (<i>E. coli</i>) in the Lower Minnesota River Watershed Abigail Butler, 17, Junior, Sibley East High School, Arlington, Minnesota, T: Christine Butler
ENEV009	Reducing Phosphorus in Stormwater Basins Using Algae Spherification Ester Rose Archer, 18, Senior, Loyola High School, Mankato, Minnesota, T: Susan Goebel
MATH007	Developing and Analyzing Strategies in a Two-Player Domino Tiling Game Griffin Nicolas Macris, 16, Junior, New Prague High School, New Prague, Minnesota, T: Jimmy Thorne
PLNT004	Soil Amendment Optimization, Phase III: Nutrient Analysis of Biochar and Hydrophilic Polymer Enriched Soils in a Simulated Large-Scale Agriculture Environment Samantha Jo Guldán, 16, Sophomore, Cathedral High School, New Ulm, Minnesota, T: Tim Guldán
<i>Minneapolis, USMN04, Twin Cities Regional Science Fair</i>	
EAEOV006	Change in Algae Growth Using Supplemental Carbon Dioxide Claire Elizabeth Wentzlaff, 16, Sophomore, Burnsville Senior High School, Burnsville, Minnesota, T: Jennifer Hugstad-Vaa
EBED016	Wearable Mask Fit Monitor Nathaniel Rudolph Farmer, 16, Junior, Stillwater Area High School, Stillwater, Minnesota, T: Shelly Holmberg
EGCH006	Energy Production from Waste Reduction, Phase III: Experimental Design Optimization of Surfactant Enhanced Waste Paper Hydrolysis
#	Maxwell Ylitalo, 17, Senior, Stillwater Area High School, Stillwater, Minnesota, T: Princesa Hansen
<i>Minneapolis, USMN09, St. Paul Science Fair</i>	
ENBM010	Inexpensive, Portable Glucose Monitor for Diabetics via a Crosslinked Sensing Fluid
#	Serena Liang Jing, 17, Junior, Saint Paul Central High School, St. Paul, Minnesota, T: Princesa Hansen
PLNT007	Behind the Kernels III: An Evaluation of Fungal Endophytes of Maize and their Hypothesized Mitigation of Temperature Stress
#	Emilia Frances Topp-Johnson, 15, Sophomore, Saint Paul Academy and Summit School, Saint Paul, Minnesota, T: Andrea Bailey
<i>Minneapolis, USMN10, Western Suburbs Science Fair</i>	
BMED024	Can APOBEC3B Be a Therapeutic Target for Breast Cancer? Jessica Weng, 18, Senior, Wayzata High School, Plymouth, Minnesota, T: Sue Iverson
PLNT008	An Eco-friendly Approach for Removal of Toxic Pentavalent Arsenic from <i>Oryza sativa</i> (Rice) Avni Jain, 14, Freshman, Eden Prairie High School, Eden Prairie, Minnesota, T: Caroline Ylitalo
TMED010T	Predicting a Cancerous Outcome: Creating a Novel Test for Assessing Risk of Human Papilloma Virus-Associated Oropharyngeal Cancer Prashant Sai Godishala, 18, Senior; Brennan Scott Clark, 18, Senior, Breck School, Golden Valley, Minnesota, T: Princesa Hansen
<i>Minneapolis South, USMN50, Minnesota Academy of Science State Science and Engineering Fair</i>	
CBIO034T	Window to the Brain: Using Retinal Biomarkers to Diagnose Alzheimer's Disease Archana Bhagyalakshmi Murali, 16, Junior; Elena Alexandra Berman, 16, Junior, Breck School, Golden Valley, Minnesota, T: Princesa Hansen

- EBED037** **Engineering a Modern-Day Enigma Machine**
Andrew John Eggebraaten, 15, Freshman, John Marshall High School, Rochester, Minnesota, T: Eric Stanslaski
- ENBM065T** **Turning Probiotics into Antibiotics: Engineering a Broad-Spectrum Antibacterial Probiotic via Inclusion of Antimicrobial Peptide-Encoding DNA, Year Two**
Madeline Chawla McCue, 18, Senior; Evelyn Grace McChesney, 17, Senior, Breck School, Golden Valley, Minnesota, T: Princesa Hansen
- ENEV082** **An Innovative Approach to Vehicle Suspension: Creating Retrofit Dampers to Minimize Gasoline Consumption and Carbon Dioxide Emissions**
Pujan Sanjaykumar Patel, 16, Sophomore, Mayo High School, Rochester, Minnesota, T: Bart Grafstrom
- TMED045** **Designing a Novel Technique to Determine Patient Suitability for Brain Cancer Clinical Trials**
Andrea Nicole Peterson, 17, Junior, Mayo High School, Rochester, Minnesota, T: Chris Smith
Rochester, USMN07, Rochester Regional Science Fair
- BMED009** **Resistant Starch: Nature's Solution to Hunger**
Yuxuan Geng, 14, Freshman, Mayo High School, Rochester, Minnesota, T: Darlene Vincent
- ENBM050** **Using an Inertial Measurement Unit to Objectively Quantify Symptoms of Essential Tremor and Parkinson's Disease**
Robert Bruce Kitaoka, 18, Senior, Mayo High School, Rochester, Minnesota, T: Robert Ward
Saint Cloud, USMN08, David F. Grether Central Minnesota Regional Science Fair and Research Paper Program
- BMED012** **An Eleven Year Retrospective Cohort Evaluation of the Effects of Pre and Post Robotic Surgery on Medical Resident Training in a Post ACGME Regulatory Restrictions Period at a Major Medical Teaching Hospital**
Sophia Elyce Brown, 17, Senior, Anoka Senior High School, Anoka, Minnesota, T: David Brown
- BMED031** **Take to Heart Your Fitness**
Audrey Elizabeth Whitman, 14, Freshman, Champlin Park High School, Champlin, Minnesota, T: Kevin Molohon
Winona, USMN06, Southeast Minnesota Regional Science Fair
- EGCH002** **A Refined Process for Synthesis and Examination of the Photoelectrical Properties of Nanoparticles**
Justin Ronald Franz, 15, Sophomore, Cotter High School, Winona, Minnesota, T: Tammy Drazkowski
- MISSISSIPPI**
Biloxi, USMS01, Mississippi Region VI Science and Engineering Fair
- BEHA053** **At The Movies: The Impact of Sensory-Friendly Movies**
Eimhear Mae Davis, 16, Junior, Magnolia State Homeschool Academy, Gulfport, Mississippi, T: Danette Moore
- MATS059** **How Strong Is Your Soil?**
Caroline Ko, 16, Junior, Pascagoula High School, Pascagoula, Mississippi, T: Elizabeth Bonilla
Booneville, USMS02, Mississippi Region IV Science Fair
- ENBM046** **A Novel Intein-Based System for Simultaneous Production and Purification of Insulin Chains**
Allen Yang Huang, 15, Junior, Oak Grove High School, Hattiesburg, Mississippi, T: Mark Holcomb
Greenville, USMS03, Mississippi Region III Science and Engineering Fair
- MCRO062** **The Effects of Chemotherapeutics on Fish Pathogen Levels in Pond Water**
Allison Lauren Wise, 17, Junior, Saint Joseph's Catholic School, Greenville, Mississippi, T: Eddie Dennis
- PHYS044** **Which Combination of Suit and Cap Has the Fastest Effect between Backstroke and Breaststroke?**
William Rex Baugh, 17, Junior, Cleveland High School, Cleveland, Mississippi, T: Jody Wright

Hattiesburg, USMS04, University of Southern Mississippi Region I Science and Engineering Fair

CELL031 **Characterization of Mesenchymal Stem Cells Derived from Mouse Embryonic Stem Cells**

Jason Guo, 16, Junior, Oak Grove High School, Hattiesburg, Mississippi, T: Mark Holcomb

CELL032 **Investigating the Role of Dicer in *Drosophila melanogaster* Wing Development**

Hannah Lee, 18, Senior, Oak Grove High School, Hattiesburg, Mississippi, T: Alex Flynt

Jackson, USMS05, Mississippi Region II Science and Engineering Fair

BCHM030 **Development of Diet-Induced Insulin Resistance in *Drosophila melanogaster* and a Characterization and Comparison of the Anti-Diabetic Effects of Resveratrol and Pterostilbene**

Arko Somujwal Dhar, 16, Sophomore, St. Andrew's Episcopal School, Ridgeland, Mississippi, T: Sandra Hindsman

CHEM043T **An Electrodynamic Approach to the Colligative Properties of Solutions through Thermodynamic and Quantum Consideration of Ionic Hydration Systems**

Andrew Owen Neely # #, 17, Senior; Charley Robert Hutchison, 16, Sophomore, St. Andrew's Episcopal School, Ridgeland, Mississippi, T: Sandra Hindsman

EAEV050 **The Greenhouse Effect: Combating the Production of Fossil Fuels with Renewable Energy Sources**

Brandon Hollins, 16, Junior, Jim Hill High School, Jackson, Mississippi, T: Jordan Henley

ENMC047T **H00dB0t: Next-Gen Surveillance**

Tyler Lamont Clinton, 17, Senior; Christopher D. Brown, 19, Senior, Jim Hill High School, Jackson, Mississippi, T: Susan Bender

Mississippi State, USMS06, Mississippi Region V Science and Engineering Fair

BMED036 **From Genes to Precision Medicine Cures: Systems Biology of Antibiotic Resistance in Bacteria**

Aylin Memili, 17, Senior, The Mississippi School for Mathematics and Science, Columbus, Mississippi, T: Elizabeth Morgan

EAEV025 **From Environmental Waste to Value-Added Product: Using Carbon-Encapsulated Copper Nanoparticles for Catalytic Conversion of Carbon Dioxide to Methanol**

Nancy CiCi Zhang, 16, Junior, Starkville High School, Starkville, Mississippi, T: Michael Adam

MCRO017 **Effect of Photocatalysis on Solar Water Disinfection: The Implementation of TiO₂, ZnO, and Chitosan on Solar Water Disinfection**

Helen Peng, 15, Freshman, Starkville High School, Starkville High School, Mississippi, T: Sarah Langford

Oxford, USMS07, Mississippi Region VII Science and Engineering Fair

EAEV065 **Environmental Impact: The Effects of Some Artificial Sweeteners in Nature**

Qihang Wang, 16, Sophomore, Oxford High School, Oxford, Mississippi, T: Sarah Robinson

EAEV072 **Developing a Numerical Box Model to Compute Algae Concentration (as Chlorophyll)**

Sichen Shawn Chao, 16, Junior, Oxford High School, Oxford, Mississippi, T: Sarah Robinson

University, USMS50, Mississippi Science and Engineering State Fair

BCHM038 **Determination of Antioxidants in Food and Their Anti-Cancer Activity**

Fatima Laraib, 17, Junior, Oxford High School, Oxford, Mississippi, T: Sarah Robinson

MCRO063 **Antibiotic Cocktail and Its Affect on *Streptococcus mutans***

Morgan Gracie McDaniel, 15, Freshman, Choctaw County High School, Ackerman, Mississippi, T: Emily Cade

MISSOURI

Cape Girardeau, USMO01, Southeast Missouri Regional Science Fair

CHEM008 **Skewing the Clues: Investigating the Accuracy of Forensic Science Assays through Peroxidases and Antioxidants**

Brynn Elizabeth Myers, 17, Junior, Oak Ridge R-6 High School, Oak Ridge, Missouri, T: Mark Gihring

EAEV040 **The Effects of Juglone on Waterborne Bacteria**

Jon Samuel Rodgers, 18, Senior, Dexter High School, Dexter, Missouri, T: Tiska Rodgers

Fayette, USMO10, Central Methodist Eagles Science and Engineering Fair

BMED079 **The Effect of Biomedical Suture Material on IgE Levels in Canine Blood Indicating Allergic Reaction**

Grace Clementine Venner, 18, Senior, Chillicothe High School, Chillicothe, Missouri, T: Stacy Surber

Hillsboro, USMO09, Mastodon Art/Science Regional Fair

MCRO023 **Screening Mycopesticides from Metarhizium Fungal Strains for Virulence Differences to Prevent Damage from *Popillia japonica* and *Agilus planipennis* Larvae**

Nick A. Wamsley, 16, Sophomore, Home School, Pacific, Missouri, T: Pamela Lynn Wamsley

PLNT015 **Advancing the Future of Agriculture Using Duckweed: A Continued Study of the Effects of Duckweed in an Aquaponic System**

Luke D. Little, 16, Sophomore, Home School, Pacific, Missouri, T: Pamela Wamsley

Jefferson City, USMO02, Lincoln University Regional Science Fair

BMED076 **The Effect of Antisense Oligonucleotides on ALS Models of *Drosophila melanogaster***

Ciara Gabrielle Stewart, 17, Junior, Eldon High School, Eldon, Missouri, T: Peggy Veatch

ENBM039 **Smart Biodegradable Plastic Capable of Delivering Diverse Antimicrobial Agents**

Allison Paige Hoerr, 18, Senior, Eldon High School, Eldon, Missouri, T: Peggy Veatch

Joplin, USMO03, Missouri Southern Regional Science Fair

BCHM034 **An Investigation into the Disaggregating Properties of a Potential Cataract Treatment: Use of Lanosterol for Anti-Glycation of a Glycation-Induced Cataract Model**

Anum Ahmed, 17, Senior, Joplin High School, Joplin, Missouri, T: Karisa Boyer

Kansas City, USMO04, Greater Kansas City Science and Engineering Fair

BMED087 **The Effect of *Crataegus songarica* Extract on Proliferation and Apoptosis in HCT116 and SW480 Colon Cancer Cells**

Renny Ma, 18, Senior, Shawnee Mission West High School, Overland Park, Kansas, T: Brenda Bott

CHEM051 **Constructing GroEL-Streptavidin Nanoclusters to Capture Protein Folding Transient States for Drug Discovery and Folding Platform Development**

Benjamin Cole Deatherage, 18, Senior, Shawnee Mission West High School, Overland Park, Kansas, T: Brenda Bott

MATS052 **The Creation of a Chitosan Scaffold for Bovine Chondrocyte Redifferentiation**

Alexis Joan Vance, 18, Senior, Blue Valley Center for Advanced Professional Studies, Overland Park, Kansas, T: Eric Kessler

Saint Charles, USMO05, Missouri Tri-County Regional Science and Engineering Fair

ANIM005 **Assessing the Suitability of *C. elegans* hum-7 as a Model for Celiac Disease**

Aimee Rose Ruth Aubuchon, 16, Junior, Wentzville Holt High School, Wentzville, Missouri, T: Jennifer Mallery

Saint Joseph, USMO06, Mid-America Regional Science and Engineering Fair

MCRO018 **Invention of a Device for Mutational Analysis of Bacterial Gene Expression**

Anthony Joseph Eckdahl, 17, Junior, Central High School, Saint Joseph, Missouri, T: Jay Meyers

Springfield, USMO08, Ozarks Science and Engineering Fair

SOFT048 Accuracy of Google Translate with American High School

Academic Vocabulary

Jesse Weaver Paxton, 16, Junior, Greenwood Laboratory School, Springfield, Missouri, T: Denise Vinton

St. Louis, USMO07, Academy of Science - Greater St. Louis Science Fair

MCRO038 A Study of Microbial Communities from Till and No-Till Missouri Soils Using Genetic Fingerprinting

Monica Mary Malone, 18, Senior, Ladue Horton Watkins High School, St. Louis, Missouri, T: Terry Woodford-Thomas

SOFT008 Spatial Distance Heuristics for Multidimensional Graph-Based Pathfinding

Haran Karthik Kumar, 15, Sophomore, Parkway West High School, Chesterfield, Missouri, T: Jason Townsend

MONTANA

Billings, USMT01, Billings Clinic Science Expo

EAEV037 The Effects of Crystallization on the Salinity Stratification and Impurity Levels Occurring in Rural Agricultural Water Sources

Tyler Stenson, 19, Senior, Stenson Home School, Billings, Montana, T: Timothy Stenson

Butte, USMT02, Montana Tech Regional Science and Engineering Fair

BMED027 Effects of Toxins on Neurological Function and Structure: Their Role in Parkinson's Disease

Molly Kauffman, 17, Junior, Hellgate High School, Missoula, Montana, T: Rob Jensen

CBIO025 The Effect of Multiple Sequence Alignment Guide Tree Choice on the Topology of the Alignment-Based Phylogeny

Joyce Muhan Liu, 16, Sophomore, Sentinel High School, Missoula, Montana, T: Lindsay Manzo

MATH019 Investigating Indecomposable Prime Matrices in the Special Linear Group and Applications in Information Theory

Kit Belamy Fieldhouse, 17, Senior, Hellgate High School, Missoula, Montana, T: Rob Jensen

Great Falls, USMT04, Montana Region II Science and Engineering Fair

EAEV045 Seasonal Variation of the Lower Atmosphere

Adeline Violet Grace Hahn, 14, Freshman, Fairfield High School, Fairfield, Montana, T: Marshall Lagge

ENEV029T Remediation Methods for Blowback Water

Paul Joseph Ehlers, 18, Senior; Logan Fredrick Simmes, 18, Senior, North Toole County High School, Sunburst, Montana, T: Amanda Joan Becker

PLNT016 Radiologic Mutations of *Brassica rapa* Seeds

Michelle Anna Simpson, 17, Junior, Simms High School, Simms, Montana, T: Raimund Hahn

Havre, USMT03, Hi-Line Regional Science and Engineering Fair—MSU-Northern

CBIO021 Computing with *Physarum polycephalum*

Jessica Elise Roth, 16, Sophomore, Big Sandy High School, Big Sandy, Montana, T: Melanie Schwarzbach

EGCH012T The Feasibility of *Dendroctonus ponderosae* Infested *Pinus ponderosae* as a Source of Biomass in Bio-Oil Production

Madison Clara Reichelt #, 17, Senior; Gabriella T.J. Blatt #, 17, Junior, Big Sandy High School, Big Sandy, Montana, T: Melanie Schwarzbach

Missoula, USMT50, Montana Science Fair

ANIM040T Modeling Evolution by Natural Selection Utilizing the *Drosophila melanogaster* White Mutant

Steven William Hammond, 17, Junior; Alex Vermeulen, 16, Junior; Aidan Patrick Harrington, 17, Junior, Billings Central Catholic High School, Billings, Montana, T: Deb Wines

CELL037 The Disruption of SFKs in Neuroblastoma Cells Leads to Decreased Cell Migration

Shelby Auchincloss Kinch, 15, Sophomore, Hellgate High School, Missoula, Montana, T: Rob Jensen

NEBRASKA

Curtis, USNE01, Central Nebraska Science and Engineering Fair

ANIM013T **How Does Caffeine Affect Heart Rate?**

Abby Marie Klammer, 16, Sophomore; Sophia Renae Conant, 15, Sophomore, Adams Central, Hastings, Nebraska, T: Jay Cecrle

Nebraska City, USNE02, Greater Nebraska Science and Engineering Fair

EAEV030 **The Use of Graph Theory to Determine the Effect of Loss Taxonomic Diversity on Trophic Function**

Marcella Maxine Jurotich, 16, Sophomore, Wayne Junior Senior High School, Wayne, Nebraska, T: Lee Ann Brogie

PLNT029 **Inoculation Methods with *Azospirillum lipoferum* and *Azospirillum brasilense* Promoting Germination and Growth of *Zea mays***

Brock Patrick Vetick, 17, Junior, Lyons-Decatur Northeast High School, Lyons, Nebraska, T: Paul Timm

NEVADA

Elko, USNV01, Elko County Science Fair

BCHM024 **The Nucleoporin 358 I585M Mutant Displays Non-Canonical Orientations in the C-Terminal Alpha Helices of the Alpha Helical Domain: Determining the Structure of Acute Necrotizing Encephalopathy 1 Associated Mutant via X-Ray Crystallography**

Hannah Kurka Margolis, 18, Senior, Elko High School, Elko, Nevada, T: Brian Zeisler

EAEV029 **Biomass to Biofuel: Using Mushrooms for the Production of Cellulosic Ethanol**

Allison Pauline Smith, 16, Junior, Spring Creek High School, Spring Creek, Nevada, T: Michelle Faubion Smith

Las Vegas, USNV02, Southern Nevada Regional Science and Engineering Fair

BMED038T **Debunking Food Myths: How Safe Is It?**

Raymond Ho-Yan Guan, 18, Senior; Tatiana Carmelise Lim, 18, Senior, West Career and Technical Academy, Las Vegas, Nevada, T: Andrea Michelle Jydstrup-McKinney

ENEV038 **Ultrasound Remediation of Oil Contaminated Sand in Simulated Wet and Dry Sand Environments**

Chris Mathews, 16, Junior, Gakuen Homeschool, Las Vegas, Nevada, T: Lisa Mathews

Reno, USNV03, Western Nevada Regional Science and Engineering Fair

CBIO013 **Comparing Circular RNA Levels in the Brains of Old and Young Mice by Analyzing RNA Sequencing Data**

Matthew Steven Bauer, 15, Sophomore, The Davidson Academy of Nevada, Reno, Nevada, T: Martin Braik

PLNT042T **Increasing the Efficacy of Plant-Based Treatments on *Sclerotium cepivorum***

Rylee Shayne Rawson, 17, Junior; Krystal Lynn Massey, 18, Senior, Reno High School, Reno, Nevada, T: Scott Huber

NEW HAMPSHIRE

Concord, USNH50, New Hampshire Science and Engineering Expo

BEHA025 **Food for Thought: A Novel Computational Approach to Modeling the Impacts of School Meal Policies**

Mary Zhu, 17, Junior, Nashua High School South, Nashua, New Hampshire, T: Neil Claffey

EBED044T **The Applications of Peristaltic Pumping Systems in Chemistry Laboratories**

Matthew Thomas Spettel, 18, Senior; Sara Mason, 17, Senior, Merrimack High School, Merrimack, New Hampshire, T: Sean Paul Muller

PHYS027 **A Biophysical Model of the Neuroendocrine Circuit in the Pancreas: Towards Better Diabetes Care**

Shaan Ram Bhandarkar, 15, Freshman, Phillips Exeter Academy, Exeter, New Hampshire, T: Panama Geer

NEW JERSEY

Jersey City, USNJ02, Jersey City Medical Center/Barnabas Health STEM Showcase

- BCHM013** **The Electrifying Speed of Enzymes**
Jackson Read Weaver, 17, Junior, Dr. Ronald E. McNair Academic High School, Jersey City, New Jersey, T: Maria Emma Osoria
- PHYS020** **Gold Nanoparticle Generation with the Assistance of Atmospheric Pressure Non-Thermal Microplasma**
Christopher Frias, 18, Senior, Union City High School, Union City, New Jersey, T: Nadia Makar

Lawrenceville, USNJ03, Mercer Science and Engineering Fair

- CELL056** **Testing Valproic Acid and Surfactant Regulation as Potential Therapeutics for Nitrogen Mustard Injury in Wistar Rats**
James Gordon Gow, 17, Junior, Lawrence High School, Lawrenceville, New Jersey, T: Alessandro Venosa
- MCRO057** **Point of Care Testing for Malaria Using a Smartphone and a Microfluidic ELISA System**
Nikhil Sajjan Gopal, 15, Sophomore, The Lawrenceville School, Lawrenceville, New Jersey, T: Linda Brzustowicz

New Brunswick, USNJ01, North Jersey Regional Science Fair

- ANIM025** **Color-Mediated Thermoregulation and Latitudinal Distribution of North American Snakes**
Gianna Isabella Fantell, 15, Freshman, Colonia High School, Colonia, New Jersey, T: James Danch
- BMED037** **The "Smart" Cancer Drug: Targeting Cancer's Achilles Heel with Novel CRISPR/Cas9**
Jiwoo Lee, 16, Junior, Academy for Medical Science Technology, Hackensack, New Jersey, T: Donna Leonardi
- EAEV028** **A Novel Profitable Phytoremediation Process for Reducing Eutrophication at Zero Cost**
Uttkarshni Tripathii, 15, Junior, Dalton School, New York, New York, T: Lisa Brizzolara
- PHYS024** **Electrically-Induced Acoustic Oscillations of Gas Bubbles**
Shailaja Humane, 18, Senior, Watchung Hills Regional High School, Warren, New Jersey, T: Michael Kutch
- PLNT013** **Dressing the Seed: A Comprehensive, Wide-Scale Approach to Food Insecurity**
Alon Millet, 18, Senior, Bergen County Academies, Hackensack, New Jersey, T: Donna Leonardi

NEW MEXICO

Albuquerque, USAI50, National American Indian Science and Engineering Fair

- ENBM055** **A Ketone Detecting Patch using Perspiration to Detect Type 1 Diabetes**
Anna Quinlan, 14, Freshman, Menlo-Atherton High School, Atherton, California, T: Paul Quinlan
- ENEV098** **Oceaneering Pile Driving Infrastructure Technology: Mitigating Anthropogenic Underwater Noise Impacts on Coastal Marine Life**
Randa Delainey Shaw, 15, Freshman, The Villages High School, The Villages, Florida, T: Monica Vinas
- Albuquerque, USNM01, Central New Mexico Regional Science and Engineering Challenge
- BMED062** **Novel Selection of Enzymes Loaded in Mesoporous Nanoparticle Carrier Engineered to Selectively Target Cancer Cells Using Aptamer**
Priyanka Jain, 18, Senior, La Cueva High School, Albuquerque, New Mexico, T: Lena Eddings
- CELL023** **Drosophila Mutant Holdup Arises from a Mutation in a Conserved Gene Required for Muscle Integrity**
Lien Tang, 16, Sophomore, Manzano High School, Albuquerque, New Mexico, T: Richard Cripps
- TMED017** **Predicting the Progression of Multiple Sclerosis Using Image Features**
Rebecca Pattichis, 16, Sophomore, Albuquerque Institute of Mathematics and Science, Albuquerque, New Mexico, T: Philip Watje

- Farmington, USNM02, San Juan New Mexico Regional Science and Engineering Fair*
MATS034 **Constituent Disintegration of CO₂ and DMF Sonic Exfoliation of Graphite Oxide for Graphene Synthesis**
 Noah Bruno Manz, 16, Junior, Farmington High School, Farmington, New Mexico, T: Robert Watson
- MCRO074T** **Alternative Medicines in the Treatment of MRSA and *Staphylococcus aureus***
 Levi James Myler #, 17, Senior; Isadora Solstice Renner, 18, Senior, Piedra Vista High School, Farmington, New Mexico, T: Gale Silva
- Grants, USNM03, Four Corners Regional Science and Engineering Fair*
CHEM050 **The Cancer Breathalyzer, Part II: Chemical Strips that Detect Chemicals in Breast, Colorectal, and Prostate Cancer Breathprint**
 # # Jon Tobin Goodart, 18, Senior, Grants High School, Grants, New Mexico, T: Shelby Lee Alexander
- EAEV031** **Getting the Dirt on Diversity II**
 # Chali Ann Simpson, 17, Junior, Grants High School, Grants, New Mexico, T: Shelby Lee Alexander
- Las Cruces, USNM04, Southwestern New Mexico Regional Science and Engineering Fair*
BEHA049 **Digitizing Manipulatives for the Blind and Visually Impaired, Phase Three**
 # # Sara Manshad, 17, Senior, Arrowhead Park Early College High School, Las Cruces, New Mexico, T: Muhanad S. Manshad
- EGPH033T** **Now You See It, Now You Don't**
 Stacy Leyann Swope, 17, Junior; Hannah Stockman, 16, Junior, Deming High School, Deming, New Mexico, T: Susan Ann Swope
- Las Vegas, USNM05, Northeastern New Mexico Regional Science and Engineering Fair*
EGPH026 **Natural Solar: Production of Biofriendly Naturally Produced Solar Panels**
 Lillian Rose Martinez, 17, Junior, Taos Academy Charter School, Taos, New Mexico, T: Laura J. Tenorio
- ENEV042T** **Chitobiotics: Chitin vs. Chitosan Novel Pharmaceutical Water Filtration and Filter Development**
 Arasely Margarita Rodriguez, 18, Senior; Andrea Chin-Lopez #, 16, Junior; Jinpeng (Will) Song, 17, Sophomore, Taos High School, Taos, New Mexico, T: Laura J. Tenorio
- Portales, USNM06, Southeastern New Mexico Regional Science and Engineering Fair*
ROBO034 **Autonomous Robotic Navigation**
 # Nathan Isaiah Christensen, 17, Senior, Carlsbad High School, Carlsbad, New Mexico, T: Deborah Haggerton
- Socorro, USNM50, New Mexico Science and Engineering Fair*
CBIO042T **Applying Jacobian Free Krylov Solvers to Model Epidemics**
 Jovan Y. Zhang # #, 18, Senior; Sophia Li, 17, Sophomore, Los Alamos High School, Los Alamos, New Mexico
- CELL049T** **Modeling and Experimental Characterization of IgE Receptor Signaling to Develop Drugs for Allergies**
 Alexander Latchesarov Ionkov, 16, Sophomore; Priyanka V. Velappan, 16, Sophomore, Los Alamos High School, Los Alamos, New Mexico, T: Lily A. Chylek, Nileena Velappan
- EAEV053** **Crustacean Filtration: Removal of Radionuclides using Chitosan Filtration from Different Sources**
 Richard Wayne Walker, 15, Freshman, Taos High School, Taos, New Mexico, T: Laura J. Tenorio
- ENBM021** **Passive Reduction of Involuntary Arm/Hand Tremors, Phase III**
 Russell W. Ludwigsen, 15, Freshman, Early College Academy, Albuquerque, New Mexico, T: Mark Walker
- MATH042** **Predictable or Chaotic? Orbits vs. Weather**
 Theodore M. Petersen, 18, Senior, Los Alamos High School, Los Alamos, New Mexico, T: Dawn Brown
- PHYS062T** **Improving Global Positioning Systems through Satellite Selection**
 Richard Joseph Dargan, 17, Junior; Carl Roger Cherne, 16, Junior, Albuquerque Academy, Albuquerque, New Mexico, T: Jim Mims

NEW YORK

Long Island, USNY02, Long Island Science and Engineering Fair

- ANIM014** **Geospatial Analysis of Cetacean Distribution and Habitat Utilization Related to Prey Density and Sea Surface Temperature off the Long Island, New York Coastline**
Jared Randolph Bergen, 18, Senior, Sayville High School, West Sayville, New York, T: Maria Brown
- ANIM015** **Development of a Caffeine Addiction Paradigm to Examine How Dietary Restriction and Level of TOR Signaling Modulate the Effects of Drugs**
Rachel Lauren Mashal, 18, Senior, John F. Kennedy High School, Bellmore, New York, T: Barbi Frank
- BCHM014** **Structural and Kinetic Analysis of Methicillin-resistant *Staphylococcus aureus* MenE, an acyl-CoA Synthetase of the Bacterial Menaquinone Biosynthesis Pathway as a Novel Antibacterial Target**
Kameron Sedigh, 17, Senior, Kings Park High School, Kings Park, New York, T: Mary Ellen Fay
- BEHA014** **Going for the Goal: The Effects of Removing Preparatory Information on the Fast and Unconscious Reading of Action Goals in a Computer-Simulated Competitive Interaction**
Miriam Shira Eisenberg, 18, Senior, North Shore Hebrew Academy High School, Great Neck, New York, T: Lisa Runco
- BEHA015** **Redefining the Neurological Basis of Fluid Intelligence: Investigating Connection Strength and Network Strength of Resting State Functional Connectivity**
Jessica Li Huang, 17, Senior, Jericho High School, Jericho, New York, T: Serena McCalla
- BMED030** **Organotypic ex vivo Culture of Liver Tissue for Assessment of HCC Chemoprevention Drug**
Mohamed Ehab El-Abtah, 16, Junior, Syosset High School, Syosset, New York, T: Veronica Grace Ade
- BMED041** **Proinflammatory Cytokines and miRNA: Identifying Novel Biomarkers of Immune Dysfunction in Schizophrenia**
Emma Madeline Rose Fagen, 18, Senior, Paul D. Schreiber High School, Port Washington, New York, T: John Schineller
- CBIO014T** **Deep Learning: Structural and Characteristic Classification of nsSNP Deleterity**
Michael Yumin Lee, 17, Junior; Raymond Minor Huffman, 17, Junior, Manhasset High School, Manhasset, New York, T: Alison Huenger
- CELL018** **Investigation of HCC Development Following Senescence in UHRF1 Overexpressing Zebrafish Livers**
Mahip Iqbal Grewal, 18, Senior, Roslyn High School, Roslyn Heights, New York, T: Allyson Weseley
- CHEM009** **Effect of Jahn-Teller Distortions on Relaxation Dynamics**
Archana Verma, 16, Junior, Jericho High School, Jericho, New York, T: Serena McCalla
- EGCH021** **Incorporation of Platinum and Gold Partially Reduced Graphene Oxide into Polymer Electrolyte Membrane Fuel Cells for Increased Output Power and Carbon Monoxide Tolerance**
Lee Blackburn, 17, Senior, Lawrence High School, Cedarhurst, New York, T: Rebecca Isseroff
- EGCH022** **Optimizing Microbial Fuel Cell Electrical Performance through a Single-Chamber Design and Novel, Natural, Cost-Effective Anodes**
Kimberly Alexis Te, 18, Senior, Manhasset High School, Manhasset, New York, T: Alison Huenger
- ENEV021** **Design and Implementation of a Sustainable Permeate Gap Membrane Distillation System for Water Purification in the Turkana Basin of Kenya**
Alexis Maria D'Alessandro, 18, Senior, Half Hollow Hills High School West, Dix Hills, New York, T: Michael Lake
- MATH011** **A Study of Bar and Arc k-Visibility Graphs**
Mehtaab Sawhney, 17, Senior, Commack High School, Commack, New York, T: Lorraine Solomon

MATS017	Advanced Au-SPIONs: Synthesis and Characterization of Multifunctional Nanoparticles for Personalized Nanomedicine Grace Hu, 17, Junior, Jericho High School, Jericho, New York, T: Serena McCalla
MCRO019	Enhancement of β-lactam Antibiotic Susceptibility by Tannic Acid through β-lactamase Inhibition Justin Kim, 16, Junior, Jericho High School, Jericho, New York, T: Serena McCalla
PHYS035	The Production of Ultra High Energy Cosmic Rays via Fermi Acceleration in Relativistic Jets August Sun Chen, 17, Senior, John L. Miller Great Neck North High School, Great Neck, New York, T: Alan Schorn
PLNT009	Isolation and Screening of Beneficial Microbes Associated with the Grapevine, <i>Vitis vinifera</i> Dara Elizabeth Gleeson, 17, Senior, Plainview-Old Bethpage John F. Kennedy High School, Plainview, New York, T: Mary Lou O'Donnell
ROBO007	A Novel Soft Robotic Grasper Andrew Jayce Meersand, 17, Senior, Lynbrook Senior High School, Lynbrook, New York, T: David Shanker
TMED013	Identification and Characterization of Novel Diagnostic and Therapeutic Targets in Pancreatic Ductal Adenocarcinoma Using an Antibody-Based Approach Julian Ubriaco, 18, Senior, Kings Park High School, Kings Park, New York, T: Mary Ellen Fay
ANIM050	New York City, <i>USNY03, New York City Science and Engineering Fair</i> Determining the Geographic Origins of Endangered Scalloped Hammerhead Shark (<i>Sphyrna lewini</i>) Fins Anusha Bishop, 18, Senior, Bronx High School of Science, Bronx, New York, T: Robert Muratore
BMED088	IL-2 as a Therapeutic Target for Treatment of Autoimmune Alopecia areata
#	Yi Hua Chen, 17, Senior, Bronx High School of Science, Bronx, New York, T: Susan Brauerman
CELL050	Antagonistic Roles of EED and Histone H3K36me2 in the Propagation of Histone H3K27me3 Abdallah Ahmed Mohamed, 18, Senior, Bronx High School of Science, Bronx, New York, T: Marisa Wagner
ENBM059	Development of Machine Learning Algorithms to Diagnose Parkinson's Disease Jay Shenoy, 16, Junior, Fordham Preparatory School, Bronx, New York, T: Gregory Curran
ENEV106	A Comparative Study of the Effectiveness of <i>Opuntia ficus-indica</i> and <i>Aloe barbadensis miller</i> in the Biosorption of Manganese (II) Ions and Dispersion of Oil Kelly Young, 16, Junior, Edward R. Murrow High School, Brooklyn, New York, T: Raywattie Chan
MATS055	Comparison of Heat to Work Conversion in First Order and Second Order Magnets Raja Bilal Azhar, 18, Senior, Midwood High School at Brooklyn College, Brooklyn, New York, T: Glenn Elert
MATS056	Engineering of Polysaccharide-Based Nanoparticles for Theranostic Applications Nancy Lu, 17, Junior, Hunter College High School, New York, New York, T: Gilana Reiss
MCRO083	Physical and Chemical Warfare between <i>Streptococcus mutans</i> and <i>Streptococcus sanguinis</i> Urooj Imran Ansari, 17, Senior, Midwood High School at Brooklyn College, Brooklyn, New York, T: Glenn Elert

PLNT056	Tracking the Spread of Potato Late Blight (<i>Phytophthora infestans</i>) on a Regional Scale Benjamin Firester, 16, Sophomore, Hunter College High School, New York, New York, T: Gilana Reiss
ROBO046	A Novel Haptic Actuator for Robotic Surgery: Utilizing Soft Robotic Pneumatic Networks, a Closed Loop Control System, and an Electro-Pneumatic Control Board to Accurately Restore an Operator's Sense of Touch # Simone Braunstein, 18, Senior, Dalton School, New York, New York, T: Lisa Brizzolara
ROBO047T	Fido: A Universal Robot Control System Using Reinforcement Learning with Limited Feedback Joshua Aaron Gruenstein, 16, Junior; Michael Truell, 15, Sophomore, Horace Mann School, Bronx, New York, T: Jeff Weitz
TMED051	Putative High-pIC50 SpDHBP Synthase Inhibitors against Multi-Drug Resistant <i>S. pneumoniae</i> Catherine Jessica Yihui Lai, 17, Senior, Brearley School, New York, New York, T: Jean Drew
TMED052	Alternative Preservation Methods in ex vivo Bovine Liver Brandon Michael Muncan, 16, Junior, Queens High School for the Sciences at York College, Jamaica, New York, T: Shanaz Baksh
TMED053	The Use of Curcumin in the Treatment of Cervical Cancer Tatheer Adnan, 17, Senior, Staten Island Technical High School, Staten Island, New York, T: John Davis
TMED054	A Rapid and Cost Effective Carbon Nanotube Sensor for Biomarker Detection Using Cancer as a Model Disease Christopher Lee, 17, Senior, Hunter College High School, New York, New York, T: Gilana Reiss
Poughkeepsie, USNY01, Dutchess County Regional Science Fair	
TMED057	The Cytotoxic and Mutagenic Effects of Arsenic on Mammalian Cells and the Countering Antioxidant Effects of Caffeic Acid Phenethyl Ester and Turmeric Sarah Choudhury, 18, Senior, Spackenkill, Poughkeepsie, New York, T: Jennifer Maloney
Queens, USNY50, New York State Science and Engineering Fair	
BCHM028	Enzymatic Activity of the K173Q Polymorphism of NPP1: Kinetic Analysis for Assessing Implications in Disease # Aaron Henry Wang, 17, Senior, Jericho High School, Jericho, New York, T: Serena McCalla
BEHA028	Golden Ratio Typography: A Novel Approach to Improving Reading Comprehension in Nystagmus Patients Jordyn Arielle Schor, 17, Senior, Plainview-Old Bethpage John F. Kennedy High School, Plainview, New York, T: Raymond Tesar
BMED052	PGC1-Alpha and Cyclin D1 Synergistically Activate Lipogenesis via Upregulated Oxidative Pentose Phosphate Pathway and TCA Cycle Citrate Efflux Cassandra Mia Grello, 17, Senior, Half Hollow Hills High School East, Dix Hills, New York, T: Michael Lake
BMED070	Evaluation of PEGylated and UnPEGylated Sea Turtle (<i>Chelonia mydas</i> and <i>Caretta caretta</i>) Hemoglobin Development of a Hemoglobin Based Oxygen Carrier and Reperfusion Injury Treatment Selamawit Anteneh Moges, 18, Senior, Elmont Memorial, Elmont, New York, T: Michelle Flannory
CELL026	Investigation of the Inhibitory Effect of Small Molecules on PLK1 Function in Triple Negative Breast Cancer Steven Picillo, 17, Senior, Oceanside High School, Oceanside, New York, T: Heather Hall
CELL027	Alpha and Beta Adrenergic Agonists Increase Hindrance to Diffusion of 3-kDa Dextran in Mouse Visual Cortex Extracellular Space Matthew Raymond Perkins, 16, Junior, George W. Hewlett High School, Hewlett, New York, T: Terrence Bissoondial

- CHEM033** **Next Generation Fatty Acid Binding Protein Inhibitors: Computer-Aided Drug Design and Synthesis of Novel Truxillic Acid Diesters for Chronic Pain Inhibition**
Sarah Lee, 17, Senior, Syosset High School, Syosset, New York, T: Iwao Ojima
- ENBM031** **Collagen Microfiber Scaffolding for Nerve Repair Applications**
Rishi Nilesh Shah, 17, Senior, Jericho High School, Jericho, New York, T: Serena McCalla
- ENMC042T** **Combating Storm Surge Inundation in Underground Transit Systems**
Kyle Joseph Mitra, 17, Junior; Raymond Joseph Janis, 16, Junior, Commack High School, Commack, New York, T: Richard Kurtz
- MATH035** **A Mathematical Model of the Ebola Virus in Guinea**
Allegra Caitlin Noto, 17, Senior, Paul D. Schreiber High School, Port Washington, New York, T: Tina Gallagher
- MCRO043** **Microfluidic Analysis of *E. coli* Chemotaxis**
Ariel Slepian, 18, Senior, George W. Hewlett High School, Hewlett, New York, T: Terrence Bissoondial
- PLNT033T** **Elucidating the Role of Early Light Induced Proteins through a Cryptogam Perspective**
Chenab Kaur Khakh, 17, Senior; Remi Sophia Golden, 18, Senior; Alec Joseph Fischthal, 16, Junior, George W. Hewlett High School, Hewlett, New York, T: Terrence Bissoondial
- TMED019** **Lidocaine Suppresses TRPM7 Channel Activity: Implications for the Use of Anesthetics as Post-Operative Anti-Tumor Therapeutics**
Karena Etwaru, 17, Senior, Half Hollow Hills High School East, Dix Hills, New York, T: Michael Lake
Rochester, USNY09, Central Western Section-Science Teachers Association of New York State Science Congress
- BCHM029** **Pricey to Priceless Gel Electrophoresis**
Mariah Christina Bloise, 17, Senior, Portville Central School, Portville, New York, T: Robert Stives
- PHYS046** **Analysis of Chemical Vapor Deposition Diamonds for Neutron Detection on the OMEGA Facility**
Ishir Seth, 18, Senior, Brighton High School, Rochester, New York, T: Melinda Rivello
Syracuse, USNY06, Central New York Science and Engineering Fair
- CHEM040** **Revolutionizing Energy Storage with Supercapacitors and Metal Organic Frameworks**
Hwan Park, 17, Junior, Manlius-Pebble Hill School, Syracuse, New York, T: Susan Foster
- EBED030** **CastMinder: Embedded Smart Sensors and Companion Software to Detect the Onset of Conditions Associated with Cast and Splint Complications and to Promote Patient Healing in Orthopedic Casts and Splints**
Alexander Frederick Wulff, 16, Junior, Skaneateles High School, Skaneateles, New York, T: Matthew Slauson
Troy, USNY07, Greater Capital Region Science and Engineering Fair, Inc.
- CBIO028** **A Universal Automated Algorithm for the Generation of Potent Antimicrobial Peptides**
Gwenda Law, 17, Senior, Burnt Hills-Ballston Lake High School, Burnt Hills, New York, T: Regina Reals
- EGCH042** **Development of Organic-Semiconductor Nanocrystal Bulk Heterojunction Photovoltaic Cells**
Parth Mahesh Bhide, 16, Senior, Columbia High School, East Greenbush, New York, T: Heidi Gleason
- SOFT033** **A Novel Single Channel Electroencephalogram-Eye Tracking Based Computer Interface System**
Sean Konz, 17, Senior, Rondout Valley High School, Accord, New York, T: Thomas Ticknor
Utica, USNY08, Utica College Regional Science Fair
- BCHM040** **Cellulose Based Filtration of Heavy Metals from Wastewater**
Melisa Sabanovic, 14, Freshman, Utica Academy of Science Charter School, Frankfort, New York, T: Ayten Ay

Westchester, USNY05, Regeneron-Westchester Science and Engineering Fair

- BCHM026 Exploring the Role of ω -Amidase as a Repair Enzyme for Hydroxyglutaramate and Hydroxsuccinamate**
Vivek Hariharan, 18, Senior, Ardsley High School, Ardsley, New York,
T: Diana Evangelista
- BEHA022T Physical Activity and Intranasal Administration of Neuropeptide Y and Y1 Agonists Mitigate the Symptoms of ADHD and PTSD**
Matthew James Forman, 17, Senior; Jack Joseph Lepkowski, 17, Senior,
Ossining High School, Ossining, New York, T: Angelo Piccirillo
- BEHA026 Individual Neural Network Activity Patterns Underlie Complex Cognitive Task Performance: An fMRI Study with Clinical Implications**
Sarah Fendrich, 17, Senior, Ossining High School, Ossining, New York,
T: Angelo Piccirillo
- BEHA027 Developing a Comprehensive Intervention Plan for Parents of Children with Autism with Regard to Parental Stress and Training**
Kevin James Carroll, 18, Senior, Yorktown High School, Yorktown Heights,
New York, T: Michael Jay Blueglass
- BMED044 Limiting Pain-Related Nerve Sprouting Using Anti-Growth Factor Receptor Antibodies**
Emily Forbes Thayer, 18, Senior, Sleepy Hollow High School, Sleepy Hollow,
New York, T: Janet Longo-Abinanti
- CELL022 Comparing Gene Expression in the Hippocampal Formation of Animals Subjected to Chronic Stress vs. Controls**
Manisha Kunala, 17, Senior, Somers High School, Lincolnale, New York,
T: William Maelia
- CELL024T The Molecular Basis of the Transdifferentiation of Embryonic Chick Limb Chondrogenic Precursors into a Beige Fate**
Kruti A. Sutaria, 17, Junior; Anisha Reddy Duvvi, 17, Junior, Ardsley High
School, Ardsley, New York; Yorktown High School, Yorktown Heights,
New York, T: Diana Evangelista
- CELL033 mTOR Regulates the Phenotypic Modulation of De-differentiated Mesenchymal Stem Cells in Vascular Disease**
Meera Parvathy Kumanan, 17, Senior, Yorktown High School, Yorktown
Heights, New York, T: Michael Jay Blueglass
- CHEM024T The Fogging and Mechanical Properties of Flexible Polyurethane Foams with Additive and Reactive Flame Retardants**
Wesley Pedone, 16, Junior; Ben Hurd, 16, Junior, Pelham Memorial High
School, Pelham, New York, T: Steven Beltecas
- EGCH015 Assessment of the Stability and Durability of Pt/C and AuPt/C Nanocatalysts in Proton Exchange Membrane Fuel Cells**
Nimat Rahman Maloney, 17, Senior, Somers High School, Lincolnale,
New York, T: William Maelia
- ENEV050 Solar Powered UV-c Treatment for Fecal Coliform and *Enterococcus* Bacteria in Storm Water Overflow**
Megan Coral Ploch, 16, Junior, Pelham Memorial High School, Pelham,
New York, T: Megan Coral Ploch
- PHYS028 Two-Dimensional Mapping of Energy Transfer in Graphene/MoS₂ Photodetectors**
Michael Thomas Earle, 18, Senior, Ossining High School, Ossining, New York,
T: Angelo Piccirillo
- PHYS029 Determining the Frequency of Jupiter Analogs and the Announcement of a New Jupiter Analog Orbiting HD32963**
Dominick Michael Rowan, 17, Senior, Byram Hills High School, Armonk,
New York, T: David Keith
- PLNT017 Plant Tissues that Fail to Regenerate Undergo Early Steps of Remodeling but Fail to Induce a Cytokinin Hormone Response**
Charlotte Underwood Keeley, 17, Senior, Ossining High School, Ossining,
New York, T: Angelo Piccirillo
- PLNT026 Benefits of Three Cover Crops for Corn Based on Cover Crop and Weed Biomass and Corn Yield**
Alison Leigh Mann, 16, Junior, Mamaroneck High School, Mamaroneck,
New York, T: Guido Garbarino

NORTH CAROLINA

Charlotte, USNC01, Charlotte-Mecklenburg Regional Science Fair

CELL002 Red Fluorescent Visualization of Chimeric Antigen Receptor Expression on T Cells to Detect Immune Response Capability of Targeting Tumor-Associated MUC1

Neil Sachin Palkar, 17, Junior, Marvin Ridge High School, Waxhaw, North Carolina, T: Pinku Mukherjee

EBED006 Preventing Vehicular Hyperthermia Using Electronic Sensors and Bluetooth Technology

Mihir Nitin Patwardhan, 15, Freshman, Ardrey Kell High School, Charlotte, North Carolina, T: Jessica Bunn

Durham, USNC02, North Carolina Central Region III Science Fair

EBED007 B.I.K.E. Helmet: Bicycle Intersection 'Kollision' Eliminator

Jeremy Michael Dunne, 16, Sophomore, Franklin Academy High School, Wake Forest, North Carolina, T: Kelly Hartzell

Durham, USNC03, North Carolina Science Fair Region 3B

EGPH010 A Novel Method of Reverse Electrowetting Utilizing Self-Induced Potential with Direct Applications in Energy Harvesting

Rishi Shankar Sundaresan, 18, Senior, North Carolina School of Science and Mathematics, Durham, North Carolina, T: Myra Halpin

TMED003 Developing Cellularly Active Inhibitors of CARM1 for New Anti-Cancer Treatment

Katherine Shulin Yang, 17, Senior, North Carolina School of Science and Mathematics, Durham, North Carolina, T: Amy Lynn Sheck

Raleigh, USNC50, North Carolina State Science Fair

ANIM052 The Effects of Climate Change on Evergreen Bagworm Development and Immunity

Kimberly Andreassen, 16, Senior, North Carolina School of Science and Mathematics, Durham, North Carolina, T: Amy Lynn Sheck

BCHM044 Enhancing the Feasibility of Bioethanol Production Using Agriculturally Produced Waste Products

Navami Jain, 15, Freshman, Myers Park High School, Charlotte, North Carolina, T: Chaula Jain

CELL046 Mechanism of Inactivation of Piezo Ion Channels

Alisa Fangchun Cui, 18, Senior, North Carolina School of Science and Mathematics, Durham, North Carolina, T: Michael Bruno

EAEV074T A Breakdown of the Effects of Coal Ash Contaminants on the Photosynthetic Production of *Elodea canadensis*

Parker Alexander Kekoa Chatham, 16, Junior; Eliza Grace Watson, 16, Jenna Ann Crutchfield, 16, Junior, Swain County High School, Bryson City, North Carolina, T: Norma Pattillo

EBED043 Leveraging IoT using an Arduino and ESP Wifi Module Based Dual Tripwire System to Reduce Electricity Wastage and Environmental Pollution

Rohan Deshpande, 16, Sophomore, East Chapel Hill High School, Chapel Hill, North Carolina, T: Don Bryson

ENBM056 Lightning in a Bottle: Effect of Plasma Activation on Muscle Cells

Nathan Leonard Kinsey, 16, Sophomore, Eugene Ashley High School, Wilmington, North Carolina, T: Gwendolyn Abraham

ENEV102T Phytoremediation: Biosorption and Rhizofiltration of Heavy Metals—A Dual Approach

Sara Zangi, 14, Freshman; Emily Liu, 14, Freshman, East Chapel Hill High School, Chapel Hill, North Carolina, T: Peter Hans Cable

MATS049 Highly Sensitive Respiration Strain Sensor Based on Tuned Silver Nanowire Network

Sophia Jia Luo, 16, Sophomore, William G. Enloe High School, Raleigh, North Carolina, T: Rhonda Smith

MATS058 Improving Exciton Transport in Novel Tetracarboalkoxyphenyl Porphyrin Thin Films for Enhanced Organic Optoelectronics

Taesoo Daniel Lee, 17, Senior, North Carolina School of Science and Mathematics, Durham, North Carolina, T: Myra Halpin

- PHYS061** **Optical Imaging of Diffusive Electrons with Different Kinetic Energies in a Semiconductor**
Sunny Yao Zhang, 15, Sophomore, Providence High School, Charlotte, North Carolina, T: Liqin Su
- SOFT043** **Your Brainwave Is Your Password: Exploring EEG-Based Authentication for a Safer Cyber World**
Emily Jamie Wang, 15, Freshman, William G. Enloe High School, Raleigh, North Carolina, T: James Lamberth
- TMED046** **A Novel Measurement Method to Determine Patient Adherence to PCSK9 Inhibitor Treatment**
Madeline Alice Musaus, 17, Junior, Ravenscroft School, Raleigh, North Carolina, T: Nelson Nunalee

NORTH DAKOTA

Bismarck, USND01, Southwest Central North Dakota Regional Science and Engineering Fair

- EGCH050** **Capturing Waste Energy from North Dakota Oil Field Flares**
Eric John Spilman, 16, Junior, Mandan High School, Mandan, North Dakota, T: Ciera Kroh

- ENMC055** **Wind Tunnel Demonstration of Airfoil Drag Reduction**
Dale Patrick Spilman, 16, Junior, Mandan High School, Mandan, North Dakota, T: Ciera Kroh

Fargo, USND03, Southeast North Dakota Regional Science and Engineering Fair

- MCRO054** **The Antimicrobial Potential of Conifer Chemical Extracts**
Braden Reed Prochnow, 15, Freshman, Hankinson Public School, Hankinson, North Dakota, T: Patty Marie Kratcha

Grand Forks, USND05, Northeast North Dakota Regional Science and Engineering Fair

- ENEV086** **Dynamic River Dikes: A Study of the Effect of Channel Grade on Agricultural Dikes**
Alyssa Mae Kemp, 14, Freshman, Cavalier Public High School, Cavalier, North Dakota, T: Chad Kemp

Grand Forks, USND50, North Dakota State Science and Engineering Fair

- ENBM042** **The Eye of the Beholder: Creating a New Prototype of a Medical Infusion Pump**
Madison Margaret Goetzfridt, 17, Senior, Mandan High School, Mandan, North Dakota, T: Ciera Kroh

- TMED026** **A Bacteriological Analysis of Hand Sanitization Products**
Josiana Mabel Prochnow, 15, Sophomore, Hankinson Public School, Hankinson, North Dakota, T: Patty Marie Kratcha

- TMED040** **Can the Metastatic Potential of Cancer Be Predicted?: A Study of the Differential Expression Levels of N-Cadherin (CDH2) and P-Cadherin (CDH3) as Potential Biomarkers for Aggressive Bladder Cancers Using Arsenic (As3+) and Cadmium (Cd2+) Transformed UROtsa Cells and UROspheres**
Riley A.S. McLean, 17, Junior, Saint Mary's Central High School, Bismarck, North Dakota, T: Julie Hein

Jamestown, USND04, Southeast Central North Dakota Science and Engineering Fair

- ANIM044** **The Identification of Parasites in Bovine Feces**
Paige Hildegard Schmidt, 18, Senior, Kidder County Tappen, Tappen, North Dakota, T: Benjamin Paul Juelfs

- MCRO053** **Where to Go?**
Kathleen Marie Schmidt, 16, Sophomore, Ashley Public School, Ashley, North Dakota, T: Lucas Mark Moldenhauer

Leeds, USND02, North Central North Dakota Science and Engineering Fair

- BCHM033** **Caffeine: The Effects on Physical and Mental Alertness**
Roman Knudsvig, 17, Junior, Berthold High School, Berthold, North Dakota, T: Emily Marshall

Williston, USND06, Northwest North Dakota Regional Science Fair

- BEHA041** **Survey Says!**
Nokomis Hope Poitra, 15, Freshman, Trenton High School, Trenton, North Dakota, T: Robert J. Turcotte

EGCH045	The Energy in Trash Carson James Hatter, 15, Freshman, Trenton High School, Trenton, North Dakota, T: Robert J. Turcotte
MCRO052	Critters in Your Cooler Reese Joseph Nielson, 15, Freshman, Trenton High School, Trenton, North Dakota, T: Robbert J. Turcotte
OHIO <i>Archbold, USOH06, Northwest Ohio Science and Engineering Fair</i>	
BEHA007	Analyzing Women's Representation in the Health Care Field on American Television from 1965-2015
#	Katherine Janeway Murphy, 18, Senior, Hicksville High School, Hicksville, Ohio, T: Kathy Laney
TMED004	The Effects of Nonsteroidal Anti-Inflammatory Agents on Cancer Cells Karennna Gulnara Margaret Langhals, 17, Junior, Columbus Grove High School, Columbus Grove, Ohio, T: Patricia Jean Langhals
<i>Athens, USOH01, Southeastern Ohio Regional Science and Engineering Fair</i>	
SOFT009	Password Proximity Algorithm Yu-Shiang Jeng, 14, Sophomore, Athens High School, The Plains, Ohio, T: Andrea Anderson
<i>Cleveland, USOH02, Northeastern Ohio Science and Engineering Fair</i>	
BCHM023	Inhibition of the Amyloid Processing Pathway by Micronutrients: A Systematic Genome-Wide Chemical Repositioning Approach to Counteract Alzheimer's Pathology
#	Swathi Ravi Srinivasan, 16, Junior, Beachwood High School, Beachwood, Ohio, T: Stephen Haynesworth
ENBM027	Sleep Tight Jalicia Azzalyna Desiree Smalley, 17, Junior, Horizon Science Academy-Lorain, Lorain, Ohio, T: Feyza Keles
MCRO067	The Effect of Varying Concentrations of <i>B. atrophaeus</i> on the Prevacuum Steam Sterilization Resistance of Dual Microbe Biological Indicators Consisting of <i>G. stearothermophilus</i> and <i>B. atrophaeus</i> Ruchin Patel, 17, Senior, Mentor High School, Mentor, Ohio, T: Lori Cohen
PLNT027	Evaluating the Impact of Soil Management on Weed Pressure in Organic and Transitioning Agricultural Ecosystems Rahul Rambhatla, 18, Senior, Solon High School, Solon, Ohio, T: Nicole Geiger
ROBO010	Beyond the Perceptron: A Computational Geometric Approach to Machine Learning
#	Michael William Litt, 16, Junior, Orange High School, Pepper Pike, Ohio, T: Jonathan Litt
<i>Columbus, USOH11, Buckeye Science and Engineering Fair</i>	
BMED086	Using Gene Expression Analysis to Identify Tumor Evolution across Cancer Types Shaheel Shankar Mitra, 17, Junior, Cincinnati Country Day School, Cincinnati, Ohio, T: Paula Butler
BMED090T	Autism and Neurodegeneration: Linking Copy Number Variations in Genomic Regions of Autism to Neurological Disease Prathik Abhay Chakravarthy, 15, Freshman; Rohit Vallabh Chakravarthy # #, 17, Junior, Beavercreek High School, Beavercreek, Ohio, T: Jeffrey Jones, Dave Yoder
CELL052	Identification and Validation of Novel Small Molecule Kinase Antagonists of the PRLR in Breast Cancer for Selective Therapeutic Targeting Chinmay Bakshi, 17, Junior, William Mason High School, Mason, Ohio, T: Karen Young
EAEV078	Examination of Oxidative Stress in Evergreen Trees Alison Marie Bachowski, 15, Freshman, Emmanuel Christian Academy, Springfield, Ohio, T: Jimmelyn Scoby
EGPH040	Phase Change Material Based Thermal Energy Storage for Higher Efficiency Photovoltaics Aditya Jog, 17, Junior, William Mason High School, Mason, Ohio, T: Karen Young

MCRO085	Changes in Amino Acid Sequence that Confers Functionality of Heme-Iron Transport Proteins in <i>Haemophilus influenzae</i> Samantha Bliss Loeffler, 18, Senior, Metro Early College High School, Columbus, Ohio, T: Joe Carter <i>Dayton, USOH04, Montgomery County Science and Engineering Fair</i>
BMED028	A <i>Drosophila</i> Glioma Model to Investigate Therapy Resistance and Repopulation Kriti Agrawal, 16, Junior, Centerville High School, Centerville, Ohio, T: Penny Manfredi
EGPH011	Numerical and Analytical Model Development for Tidal Barrage Energy Output Peter Joseph Menart, 16, Sophomore, Carroll High School, Dayton, Ohio, T: Christina O'Malley
SOFT029	Traffic Camera Dangerous Driver Detection (TCD3): Contextually Aware Heuristic Feature & OFA Density-Based Computer Vision with Movement Machine Learning Analysis of Live Streaming Traffic Camera Footage to Identify Anomalous & Dangerous Driving
#	Vidur Tenali Prasad, 17, Senior, Dayton Regional STEM School, Kettering, Ohio, T: Philip Bottelier <i>Marion, USOH07, Marion Area Science and Engineering Fair</i>
EGCH017	Revolutionizing Bioethanol Production: Genetic Engineering of <i>S. cerevisiae</i> for the Single Step Conversion of Biomass to Bioethanol
# #	Srinath Vijay Seshadri, 16, Junior, Village Academy Upper School, Powell, Ohio, T: Thomas Mitchell
PHYS033	A Label Free Optical Technique to Detect Protein-Protein Binding Sulekh Frederic Fernando-Peiris, 15, Sophomore, Mount Vernon High School, Mount Vernon, Ohio, T: Benjamin Lloyd <i>Shaker Heights, USOH05, Hathaway Brown Upper School Fair</i>
BMED029	Identification of a Potential AML Therapeutic Compound from an <i>in vitro</i> Screen Caitlin Elizabeth Coyne, 17, Junior, Hathaway Brown School, Shaker Heights, Ohio, T: Patricia Hunt
BMED055	Characterizing the Role of Trem2 in Alzheimer's Disease (AD) Margaret Broihier, 17, Junior, Hathaway Brown School, Shaker Heights, Ohio, T: Crystal Miller
ENBM018	A Nanomedicine Approach for Targeted Thrombolysis
#	Kavya Ravichandran, 17, Senior, Hathaway Brown School, Shaker Heights, Ohio, T: Crystal Miller <i>Upper Arlington, USOH09, Central Ohio Regional Science and Engineering Fair</i>
BMED032	Effect of Transitive RNAi on Gene Expression in Human Cells Minjue Wu, 15, Sophomore, Upper Arlington High School, Upper Arlington, Ohio, T: Laura Brennan
CBIO012	A Novel Orientation-Based Statistical Potential for Efficient Prediction of Protein Structure
#	Venkatesh S. Sivaraman, 17, Senior, Bexley High School, Bexley, Ohio, T: Tami Golliday
ENBM014	The Mechanisms of Glioblastoma Migration in a Bioengineered 3D Brain Model Rama Nidhya Balasubramaniam, 17, Junior, Dublin Coffman High School, Dublin, Ohio, T: Roger Rabold
OKLAHOMA	
<i>Ada, USOK07, East Central Oklahoma Regional Science and Engineering Fair</i>	
EAEOV033	Natural Attenuation of the Photo-catalytic Characteristic of Titanium Dioxide Nanoparticles Rayna Shianne Ellison, 16, Sophomore, Latta Public School, Ada, Oklahoma, T: Michelle Diane Ellison <i>Ada, USOK50, Oklahoma State Science and Engineering Fair</i>
BCHM043	All That Remains: Forensic Entomotoxicology Testing for the Presence of Ketamine and Flunixin Transference to a Decomposing Host
#	Alexia Dean Benson, 17, Junior, Grove High School, Grove, Oklahoma, T: Keliana Steen

- MCRO088** **The Effects of Prebiotics and Probiotics on the Growth and Antibiotic Resistance of *Escherichia coli***
Erika Eleonora Ravitch, 15, Sophomore, Cascia Hall Preparatory School, Tulsa, Oklahoma, T: Sally Fenska
- TMED050** **Evaluating the Effects of Honey and Propolis on Cancer Cell Viability, Metabolism, Morphology, and DNA Production in Selected Cell Lines and Evaluating the Effects of Honey on Antibiotic Resistance in Selected Microbial Cell Models**
Katherine Grace Rule, 17, Senior, Cascia Hall Preparatory School, Tulsa, Oklahoma, T: Sally Fenska
- Alva, USOK01, Northwestern Oklahoma State University Regional Science Fair*
- MCRO064** **Alcohol Based and Non-alcohol Based Hand Sanitizer: A Comparative Study of the Efficacy of Different Brands of Hand Sanitizer to Kill *E. coli* and *S. aureus***
Beatriz Angeli Dacudao Penaflor, 16, Sophomore, Shattuck High School, Shattuck, Oklahoma, T: Robin Coleman
- Bartlesville, USOK02, Bartlesville District Science Fair*
- EGPH012** **Tiny but Mighty: Small Scale Wind Power**
Greta Olsen, 16, Sophomore, Bartlesville High School, Bartlesville, Oklahoma, T: Gary Layman
- PLNT014** **Shocking Scum: The Effects of Electrical Stimulation on *Chlorella vulgaris***
James Bryan Martinez, 15, Sophomore, Bartlesville High School, Bartlesville, Oklahoma, T: Gary Layman
- Edmond, USOK03, Central Oklahoma Regional Science and Engineering Fair*
- ANIM035** **Sensational Slime Aquatic Allies against Microbial Foes**
Lauren Nicole York, 18, Senior, Southmoore High School, Moore, Oklahoma, T: Darla K. Wyatt
- Miami, USOK04, Northeastern Oklahoma A&M Science and Engineering Fair*
- TMED012** **The Effects of Ginkgo biloba Extract EGb 761 and Trial Drug LY450139 Semagacestat on the Alzheimer's Beta Amyloid Protein: A Comparative Study for the Treatment of Beta Amyloid Plaques Using *C. elegans* as a Model Organism**
Drew Grant Brown, 17, Junior, Grove High School, Grove, Oklahoma, T: Keli Steen
- Muskogee, USOK05, Muskogee Regional Science and Engineering Fair*
- ENEV032** **An Eye in the Sky: Determining the Viability of Using Drones for Agricultural Improvement**
Waylon Reid Williams, 18, Senior, Muldrow High School, Muldrow, Oklahoma, T: Altha Hall
- Wilburton, USOK09, Eastern Oklahoma Regional Science and Engineering Fair*
- MCRO026** **Analysis of the Antimicrobial Efficacies and Structural Characteristics of Fractional Components of Selected Algal Extracts**
Beau Taylor Bingham, 16, Junior, Cascia Hall Preparatory School, Tulsa, Oklahoma, T: Sally Fenska
- OREGON**
- Bend, USOR08, Central Oregon Community College Regional Science Expo*
- MCRO056** **Nature vs. Nurture: Do Your Genetics or Environment Affect Your Surface Microbiome More?**
Linnea Lane, 15, Sophomore, Bend Science Station, Bend, Oregon, T: David Walton Bermudez
- Eugene, USOR07, Central Western Oregon Science Expo*
- BEHA043** **A Study of Biases in Perception**
Sophia Alexandra Hawley, 14, Freshman, West Salem High School, Salem, Oregon, T: Michael Lampert
- CBIO030** **Diagnosis of Dementia with Deep Convolutional Neural Networks**
Ethan Zibo Liu, 16, Sophomore, Crescent Valley High School, Corvallis, Oregon, T: Raviv Raich

Gresham, USOR01, Gresham-Barlow Science Expo

- BEHA013** **Evaluating the Relationship between College Information Literacy and College-Going Self-Efficacy in High School Students**
 # Austin L. Gardner, 18, Senior, Gresham High School, Gresham, Oregon,
 T: Kathy Childress
- CHEM036** **A Highly Efficient and Economically Profitable Electrocatalytic Conversion of Carbon Dioxide Using Nanostructured Electrodes**
 # # Nikhil Murthy, 16, Junior, Catlin Gabel School, Portland, Oregon,
 T: Jeff Crosby
- ENEV020** **Addressing Global Water Scarcity with a Novel Hydrogel Based Desalination Technique Using Saponified Starch-g-polyacrylamide and Its Hydrophilic Properties to Harvest Fresh Water with a Low Energy and Chemical Footprint**
 # Chaitanya Dasharathi Karamchedu, 16, Junior, Jesuit High School, Portland, Oregon, T: Lara Shamieh

Hillsboro, USOR04, Beaverton-Hillsboro Science Expo

- BCHM008** **Investigating a Novel Treatment for Breast Cancer Brain Metastasis: The α -v Integrin Inhibitor Cilengitide Potentiates Cisplatin Chemotherapy**
 Sharanya Suresh, 16, Junior, Westview High School, Portland, Oregon,
 T: Debbie Cooper
- CBIO032** **Lung Cancer Decision Support System: Novel Automated Noninvasive Tumor Malignancy and Patient Outcomes Prediction Modelling through Radiomics Phenotype Feature Quantification**
 # Aditya Jain, 16, Sophomore, Westview High School, Portland, Oregon,
 T: Debbie Cooper
- ENMC011** **A Smart Burn and Spill Proof "SAFE" Microwave that Spares the Salad: Novel Application of Levenberg-Marquardt Algorithms in Bayesian Analysis for Real-Time Numerical Thermodynamic Modeling**
 Muhammad Shahir Rahman, 16, Sophomore, Westview High School, Portland, Oregon, T: Fabian Mak
- PHYS030** **Spectroscopic Analysis of Titanium Oxide Presence in Stars**
 Sarah Amina Maazouz, 17, Senior, Liberty High School, Hillsboro, Oregon,
 T: Milton Scholl

Portland, USOR02, Portland Public Schools Science Expo

- EAEOV026** **Riparian Disturbance & Remote Sensing Technology: A Novel Method to Identify Vulnerabilities within Urban Areas of the Willamette River Basin**
 # Adam C. Nayak, 16, Sophomore, Cleveland High School, Portland, Oregon,
 T: Kate Fickas
- ENBM013** **Development of a Device to Assess the Impact of Real-Time Auditory Biofeedback on Gait in Patients with Multiple Sclerosis**
 Daniel William Kenneth Weidman, 17, Senior, U.S. Grant High School, Portland, Oregon, T: Kelly Allen
- SOFT034** **Wireless Network Simulator**
 Roy Stracovsky, 16, Sophomore, Lincoln High School, Portland, Oregon,
 T: Angie McVay

Portland, USOR05, Aardvark Science Exposition

- BCHM022** **Protein Interface Targeted Aptamers Screened Using Competitive Selection**
 Pushkar Shinde, 15, Sophomore, Oregon Episcopal School, Portland, Oregon,
 T: Bevin Daglen
- EGCH014** **Fabrication, Characterization, and Modeling of a Biodegradable Battery for Transient Electronics**
 # Vineet Edupuganti, 16, Junior, Oregon Episcopal School, Portland, Oregon,
 T: Bettina Gregg
- ROBO027** **Deep Learning Action Recognition on Small Data: Transfer Learning the Stanford 40 Actions Dataset**
 Chandler Mills Watson, 17, Junior, Oregon Episcopal School, Portland, Oregon, T: Peter Langley

- SOFT035** **Efficient, Hardware Implementations of Computationally-Intensive Operations in Quotient Polynomial Rings for NTRU-Based Digital Signatures**
 # Vikul Gupta, 17, Senior, Oregon Episcopal School, Portland, Oregon, T: Peter Langley
Portland, USOR50, Intel Northwest Science Expo
- BCHM035** **A Novel Approach to Cancer Treatment: Allosteric Inhibition of the Carbonic Anhydrase IX Isozyme for Anticancer Applications**
 # Nandini Tondamantham Naidu, 15, Sophomore, Valley Catholic High School, Beaverton, Oregon, T: Amy Lacks
- EAEV079** **Quakify: A Low-Cost, Crowdsourced, Real-Time Solution to Earthquake Early Warning**
 Harish Palani, 16, Sophomore, Sunset High School, Portland, Oregon, T: Rekha Rasiah
- MATS046** **The Novel Fabrication of a Superhydrophobic Glass Surface**
 Lauren Cooper, 17, Junior, Lake Oswego High School, Lake Oswego, Oregon, T: Keith Grosse
- MATS050** **Novel Synthesis of Water-Soluble Paramagnetic Polymer Nanoparticles (Metal Free) for Selective Drug Delivery and Cancer Therapy Applications**
 # Arnob Das, 16, Sophomore, Jesuit High School, Portland, Oregon, T: Lara Shamieh
- MCRO073** **The Effects of Expressing DNA Repair Enzymes, UVDE and cv-pdg, in E. coli cells under UVB Light**
 Stuti Paavani Garg, 16, Sophomore, Westview High School, Portland, Oregon, T: Debbie Cooper
- TMED048** **A Novel Nanoparticle-microRNA Treatment to Overcome Drug Resistance and Tumor Metastasis in Lung Cancer**
 Anirudh Jain, 18, Senior, Catlin Gabel School, Portland, Oregon, T: Jeff Crosby
West Linn, USOR06, CREST-Jane Goodall Science Symposium
- BMED039T** **New Evidence for a Potential Citalopram Hydrobromide Mediated Mechanism Influencing the Suppression of Serotonergic Neurons During Brain Development**
 Daniel Tang, 16, Junior; Benjamin Sebastian, 18, Senior, West Linn High School, West Linn, Oregon, T: Nancy Monson
- EGCH038** **Continuous Production of Biodiesel through Reactive Distillation Using Eggshell Catalysts**
 Libby Helene Williams, 18, Senior, Wilsonville High School, Wilsonville, Oregon, T: Jim O'Connell
- MATH016** **Alzheimer's Disease Risk Model Using Survival Analysis: Identifying Key Modifiable Risk Factors to Be Implemented in Public Health Strategy**
 # Talia Alysse Lichtenberg, 18, Senior, West Linn High School, West Linn, Oregon, T: Amy Schauer
- PENNSYLVANIA**
Harrisburg, USPA01, Capital Area Science and Engineering Fair
- ANIM022** **The Effects of Electromagnetic Radiation on *Dugesia tigrina* Regeneration**
 Pia Jillian Alderman, 17, Senior, Trinity High School, Camp Hill, Pennsylvania, T: Jo Reider
- MCRO021** **Methanogenerate! A Methanogen-Methanotroph Carbon Recycler**
 Wesley Sheker, 18, Senior, Harrisburg Academy, Lemoyne, Pennsylvania, T: Joseph Spear
- ROBO014** **Developing an iOS App to Enable an Arduino Controlled 3D-Printed Hand**
 Alan Wei Hwang, 16, Junior, Hershey High School, Hershey, Pennsylvania, T: Jason Sibbach
Lancaster, USPA02, North Museum Science and Engineering Fair
- BMED040** **Reducing the Risk of Alzheimer's in Type II Diabetes Patients**
 Marissa Janai Witmer, 17, Junior, Solanco High School, Quarryville, Pennsylvania, T: Jessica Tipping

EBED023	Geolocating Active Shooters Using Proximity and Cloud-Based Multilateration Algorithms
#	Shohini Banerjee, 17, Junior, Warwick High School, Lititz, Pennsylvania, T: Laurel Hess
Philadelphia, USPA03, Delaware Valley Science Fairs	
BMED095	The Smoking Gun: Toxicological Effects of Electronic Cigarettes on Epithelial Cells Using Air Liquid Interface, Year Two
# #	Ralph Ignacio Lawton, 17, Senior, Pennsylvania Leadership Charter School - University Scholars Program, West Chester, Pennsylvania, T: Jamie Castle
ENBM053	Design and Assembly of CRISPR/Cas9-Based Virus-Like Particles for Orthogonal and Programmable Genetic Engineering in Mammalian Cells
	Michael Zhang, 18, Senior, Conestoga High School, Berwyn, Pennsylvania, T: Scott Best
ENBM054T	Biological Phenomena of Neural Stem Cell Differentiation
	Arvind S. Parthasarathy, 17, Junior; Sabrina Ghosh, 17, Junior, Parkland High School, Allentown, Pennsylvania, T: Sam Ghosh, Sabrina Jedlicka
ENBM061	Designing a Cost-Effective Device to Decrease the Risk of Vesicovaginal and Rectovaginal Fistulae during Labor
	Lori Liu Zhang, 16, Sophomore, High Technology High School, Lincroft, New Jersey, T: Michael T. Roche
MATH036	Cosheaf Theoretical Constructions in Networks and Persistent Homology
	Karthik Yegnesh, 16, Sophomore, Methacton High School, Eagleville, Pennsylvania, T: Robert Helm
MCRO060	The Identification of ATPase Activity Regulation in <i>Tetrahymena thermophila</i>: Understanding the Function of the Malarial ATP Synthase in Order to Develop New Antimalarials
	Rachana Mudipalli, 17, Junior, Downingtown STEM Academy, Downingtown, Pennsylvania, T: Christine Dinger
PLNT036	Molecular-Based Genotyping of <i>Lactuca sativa</i> for Accelerated Genotypic Selection
	Sophia Edith Swartz, 16, Sophomore, Central Bucks High School South, Warrington, Pennsylvania, T: Brian Testa
SOFT028	The Dawn of Genetic Storage: Proof-of-Concept, Phase I
	Ethan Moyer, 15, Freshman, Souderton Area High School, Souderton, Pennsylvania, T: Karen Wolfe
SOFT052	Classification of Subtle Morphological Features for Individual Nuclei in Stained Glioma Tissue Slides
	Kunal Varun Singh, 18, Senior, High Technology High School, Lincroft, New Jersey, T: Michael T. Roche
TMED028	Novel TolC Inhibitors: Computer-Aided Drug Discovery for MDR-Conferring Efflux Pumps
#	Shayan Daniel Farmand, 16, Junior, Methacton High School, Eagleville, Pennsylvania, T: Robert Helm
TMED029	The Effect of the Plant Hormone Absciscic Acid on the Sprouting of Blood Vessels <i>in vitro</i>
	Julienne Chaqour, 15, Freshman, High Technology High School, Lincroft, New Jersey, T: Michael T. Roche
TMED031	A Novel Device for Eliminating Airborne Pathogens
	Swathi Pavuluri, 16, Junior, High Technology High School, Lincroft, New Jersey, T: Michael T. Roche
TMED055	Design and Evaluation of Betulin-Based Anti-Cancer Compounds
	Anjali Chakradhar, 14, Freshman, High Technology High School, Lincroft, New Jersey, T: Michael T. Roche
Pittsburgh, USPA04, Covestro Pittsburgh Regional Science and Engineering Fair	
BMED066	A Novel Mechanism of Chloroquine in Cancer Therapy
	Xiaoxi Gao, 17, Junior, Pittsburgh Allderdice High School, Pittsburgh, Pennsylvania, T: Janet Waldeck
BMED093	Popping Bubbles: Relationship between Cell Surface Area and Ultrasound Microbubble Mediated Toxicity
	Ananya Satyawadi, 16, Junior, Shady Side Academy, Pittsburgh, Pennsylvania, T: Heather Fani

- CHEM042** **Atomistic Simulation of Pathways for Mg²⁺-Water Dissociation with Rigorous Kinetics**
Natalia Hajlasz, 15, Junior, Pittsburgh Allderdice High School, Pittsburgh, Pennsylvania, T: Janet Waldeck
- ENMC060** **Get Up 'N' Go: Walker Stabilization Device**
Alexandra Jade Miller, 17, Senior, Northern Garrett High School, Accident, Maryland, T: Derek Berger
- Reading, USPA05, Reading and Berks Science and Engineering Fair*
- BMED045** **Analysis of Tissue Transglutaminase as a Possible Indicator of Gluten Sensitivity in Human Saliva**
Joseph Daniel Gresoi, 16, Sophomore, Conrad Weiser High School, Robeson, Pennsylvania, T: Adelle Lynn Schade
- BMED061** **Late Stage Osteoarthritis Reveals Increased Expression of SQSTM1**
Alexa Nicole Schneck, 18, Senior, Conrad Weiser High School, Robeson, Pennsylvania, T: Adelle Lynn Schade
- York, USPA06, York County Science and Engineering Fair*
- ENEV034T** **Reduce, Reuse, Recycle: Optimizing the Reclamation of Polyethylene Plastics for Utilization as Fluorescent Thread Fibers**
Mickayla Marie Smith, 17, Junior; Levi Parrish Jones, 17, Junior, Red Lion Area Senior High School, Red Lion, Pennsylvania, T: Heather E. Fogell, Ben Smith
- MATS042** **Engineering a Better Brain Electrode**

Katelyn Salotto, 18, Senior, Dallastown Area High School, Dallastown, Pennsylvania, T: Mark Ilyes
- RHODE ISLAND**
Warwick, USRI50, Rhode Island Science and Engineering Fair
- EAEV061** **Investigating the Death of an Ecosystem**
Nicolas Maxwell Berg, 16, Junior, Bishop Hendricken High School, Warwick, Rhode Island, T: Jeremy Paul Graney
- EGPH032** **Wave Rider: Harnessing Wave Energy for Marine Safety**
Denilex Rodriguez, 19, Senior, Times Squared STEM Academy, Providence, Rhode Island, T: Mark Fontaine
- SOUTH CAROLINA**
Aiken, USSC01, Central Savannah River Area Science and Engineering Fair
- CHEM015** **The Effect of Calcium Lactate Concentrations on the Process of Frozen Reverse Spherification**
Reece Spradley, 16, Sophomore, Batesburg-Leesville High School, Batesburg, South Carolina, T: Teddy Higgins
- Bluffton, USSC02, Sea Island Regional Science Fair*
- EAEV052** **Minimizing the Effects of Ocean Acidification on Coral Reef Health**
Lucas Alexander Tomita, 15, Freshman, Hilton Head Preparatory School, Hilton Head Island, South Carolina, T: Janet Sullivan
- ENMC048T** **A Comparative Analysis of the Effectiveness of Stealth Aircraft Design Methodologies**
Decker Michael Paulmeier #, 16, Sophomore; Andrew Joseph Lee #, 16, Sophomore, Bluffton High School, Bluffton, South Carolina, T: Susan Dee
- ENMC051** **Design of a Sounding Rocket for Maximum Altitude**
Victoria Rose Hamlin, 16, Sophomore, Hilton Head Island High School, Hilton Head Island, South Carolina, T: Glenn Burckart
- MATH031** **Writing a Mathematical Model for Bubble Formation**

Ashley Maye Hamlin, 18, Senior, Hilton Head Island High School, Hilton Head Island, South Carolina, T: Edith Philips
- MATS035** **A Comparative Strength Analysis of an Artificial Monofilament Nylon Passive Fiber Muscle vs. a Linear Actuator**
Maile Summer Paulmeier, 14, Freshman, H.E. McCracken School, Bluffton, South Carolina, T: Susan Dee

- MCRO082** **An Investigative Study on the Effect of Fibroin Protein Application on Gram-positive and Gram-negative Bacteria**
Alexis Natalie Voulgaropoulos, 17, Junior, Hilton Head Preparatory School, Hilton Head Island, South Carolina, T: Janet Sullivan
Charleston, USSC03, Low Country Science Fair
- BEHA052** **Music in My Mind**
Isabella Mika Neubauer, 15, Sophomore, The Georgetown School of Arts and Sciences, Georgetown, South Carolina, T: Michelle Neubauer
Columbia, USSC04, USC Central South Carolina Region II Science and Engineering Fair
- EAEV034** **The Effect of Tri-sprintec and Metformin and Their Doses on the Mortality and Reproduction of Ampullariidae, Daphnia magna, and Lemnoideae & the Heart Rate of Daphnia magna in Aquatic Ecosystems**
Sarayu K. Das, 15, Sophomore, Spring Valley High School, Columbia, South Carolina, T: Dale Soblo
- EAEV057** **The Effect of Living Near a Combined Coal Ash/Nuclear Waste Pond on Certain Cancer Measures and Health Conditions in Hartsville, South Carolina**
Luke Brennan Marazzo, 17, Junior, Spring Valley High School, Columbia, South Carolina, T: Michelle Spigner
Spartanburg, USSC07, Piedmont South Carolina Region III Science Fair
- MCRO049T** **Blowing Smoke: Differential Effects on Oral Bacteria between Vaping and Cigarette Usage**
Devin Srivastava, 17, Junior; Ian Michael Kusher, 16, Sophomore, Spartanburg Day School, Spartanburg, South Carolina, T: Jason Lonon

SOUTH DAKOTA

- Aberdeen, USSD01, Northern South Dakota Science and Math Fair*
- ANIM041** **Viability of Bovine Semen, Phase III**
Sadie Renee Vander Wal, 15, Sophomore, Northwestern Area High School, Mellette, South Dakota, T: Denise Clemens
- CBIO036** **A Mathematical Model of the Spread of a Pathogenic Disease in Rural South Dakota**
Omar Elkhader, 18, Senior, Aberdeen Central High School, Aberdeen, South Dakota, T: Charles Hermansen
- EGPH028T** **Design and Construction of a Modulating Wind Turbine**
Thomas John Trautman, 18, Senior; Andrew Tobin, 19, Senior, Central High School, Aberdeen, South Dakota, T: Charles Hermansen
Brookings, USSD02, Eastern South Dakota Science and Engineering Fair
- ANIM036** **The Effect of Antibiotic Supplemented Feed on Growth Rate of Broiler Chicks**
Jordan Leafy Davelaar, 17, Senior, Unity Christian High School, Orange City, Iowa, T: Mark Kauk
- BEHA020** **Making the Mind Matter: Stress Mindset Effects on Sleep Quality, Stress Response, Emotion and Cognition in the Developing Adolescent Brain and the Role of the Prefrontal-Amygdala Circuit**
Kashfia Nehrin Rahman, 15, Sophomore, Brookings High School, Brookings, South Dakota, T: Lee Schmidt
- EGCH026** **Fuel Ethanol Potential of Barley, Phase II**
Morgan Marcella Kohl, 16, Sophomore, Waverly-South Shore Public School, Waverly, South Dakota, T: Nancy Adair
- ROBO023T** **Proto-Bot**
Schuyler Wade Malenke, 18, Senior; Paxton De Haan, 19, Senior, Unity Christian High School, Orange City, Iowa, T: Timothy Kamp
Mitchell, USSD04, South Central South Dakota Science and Engineering Fair
- ANIM023** **What's in the Water?: The Links Algae May Have to Alzheimer's and Parkinson's Disease**
Thea Lauren Patrick, 16, Sophomore, Mitchell High School, Mitchell, South Dakota, T: Julie Ann Olson
- BMED046T** **Analyzing the Effects of House Dust on Growth, Development, and Fat Content in the *T. molitor***
Madison Rose Hetland #, 16, Sophomore; Hannah Renae Hetland, 14, Freshman, Mitchell High School, Mitchell, South Dakota, T: Julie Ann Olson

ENEV035T Environmentally Safe Solution to Styrofoam Waste
Alexander J. Rodriguez, 16, Junior; Haley Suzanne Rust, 17, Junior,
Mitchell Senior High School, Mitchell, South Dakota, T: Julie Ann Olson
Rapid City, USSD03, High Plains Regional Science and Engineering Fair

MCRO046 Devolution of Ampicillin Resistance in *E. coli*
Grayson Christian Nelson, 15, Sophomore, Sturgis Brown High School,
Sturgis, South Dakota, T: Kristin Wheaton

TENNESSEE

Chattanooga, USTN01, Chattanooga Regional Science and Engineering Fair

MATH040 Conjecture of Maximum Number of Minimum-Area Triangles Determined by N Lattice Points in No-Three-in-Line Situation
Xuanlin Li, 18, Junior, The McCallie School, Chattanooga, Tennessee,
T: Nancy Olenchek

MCRO034 Indomethacin and Prednisone Protect Symbiodinium Clades B and D Cell Growth During Heat Stress, Year III

Andrew Aultman, 16, Junior, The McCallie School, Chattanooga, Tennessee,
T: Karah Nazor

MCRO075 Automatic Spirulina Culturing System Using Arduino
Arthur Sung, 17, Sophomore, The McCallie School, Chattanooga, Tennessee,
T: Nancy Olenchek

Knoxville, USTN04, Southern Appalachian Science and Engineering Fair

CBIO038 dQCuts: Simplifying Analysis of Large Molecular Dynamic Trajectories Using Higher Order Statistical Signatures
Gabe Vacaliuc, 17, Senior, Oak Ridge High School, Oak Ridge, Tennessee,
T: Jessica Williams

PLNT053T Nematicidal Activity and Saponin Concentration of Chenopod Extracts
Emma Kate Batson, 17, Senior; Taimur Kouser, 18, Senior, Karns High School,
Knoxville, Tennessee; Webb School of Knoxville, Knoxville, Tennessee,
T: Kimberly D. Gwinn, Melissa Mink

Memphis, USTN05, Memphis-Shelby County Science and Engineering Fair

ENBM066 A Better Tissue Engineered Vascular Graft
Cina Pourhashemi, 18, Senior, Pleasant View School, Memphis, Tennessee,
T: Gary Bowlin

Nashville, USTN06, Middle Tennessee Science and Engineering Fair

EGCH032 Biomass to Biofuel: Production Enzymes
Rachel M. Baker, 18, Senior, Camden Central High School, Camden,
Tennessee, T: Karen Gauthier

TMED043 Integrin-Free Tetraspanin CD151 as a Biomarker of PSA-Relapse in Prostate Cancer
Xiuya Yao, 18, Senior, Martin Luther King Jr. Magnet High School for Health
Science and Engineering, Nashville, Tennessee, T: Angela Michelle Eeds

TEXAS

Austin, USTX13, Austin Energy Regional Science Festival

BCHM047 Deciphering the Roles and Mechanism of Zn7MT3 and CeONP in Abating Neuronal Cytotoxicity
Yingxuan (Jason) Tan, 17, Junior, College Station High School, College
Station, Texas, T: Casey Akin

ENEV045 Effective Remediation of Air Pollution through an Algal System Integrated with Carbon Mineralization Technology: Phase II – Enhancing the Biohydrogen Production using Flue Gas Derived Bicarbonate and Nutrient Limitation Methods

Sai Sameer Pusapaty, 17, Junior, Liberal Arts and Science Academy, Austin,
Texas, T: Amy Moore

MATS018 Design of Bioink: An Innovative Biomaterial for 3D Medical Implants
Sujay Sarathy Shankar, 17, Junior, A. & M. Consolidated High School,
College Station, Texas, T: Michelle Jedlicka

MCRO001 Novel Approach to Antibiotics and Antifungals: Testing the Effectiveness of *Azadirachta indica* Extracts
Saket Myneni, 16, Junior, Westwood High School, Austin, Texas,
T: Judy Grimsley

PHYS067	Strip PET Design: Testing Cost Effective Scintillators through Singles Detection Merusha Mukherjee, 17, Junior, College Station High School, College Station, Texas, T: Casey Akin
SOFT012	Determining Network Robustness Using Region Based Connectivity Rucha Joshi, 16, Sophomore, Westwood High School, Austin, Texas, T: Judy Grimsley
<i>Brownsville, USTX04, Rio Grande Valley Regional Science and Engineering Fair</i>	
EAEV019	Efficacy of Selected Biopesticides against the Sweet Potato Whitefly, <i>Bermisia tabaci</i> (Genadius) Biotype B on Tomato under Laboratory and Greenhouse Conditions Analaura Trevino, 17, Junior, Weslaco East High School, Weslaco, Texas, T: Patty Herrera
MATS014T	Hibiscus sabdariffa: A Functional Green Reducing Agent to Synthesize Metal Nanoparticles for their Corresponding Application and Nano-Characterization Kathy Estrella, 17, Junior; Sarah Noemi Chacon, 17, Junior; Jose Chacon, 15, Sophomore, Homer Hanna High School, Brownsville, Texas; Hanna Early College High School, Brownsville, Texas, T: Sally Chong
ROBO004T	Crystal Clear Collection Kevin Le, 18, Senior; Brandon Anthony Campos, 18, Senior; Rodney Morales, 18, Senior, Homer Hanna High School, Brownsville, Texas, T: Nelda Rogers
<i>Corpus Christi, USTX15, Coastal Bend Regional Science Fair</i>	
ENEV090	Fracking a Safer Way: A Novel Analysis of Potential Innocuous Alternatives for Chemical Compounds Currently Utilized in Hydraulic Fracturing Fluid, Year Two
# #	Roger Christian Garcia, 17, Senior, Taft High School, Taft, Texas, T: Peter Bosquez
MCRO069	Gloves Are No Guarantee! Modifying Surgical Gloves to Reduce Microbial Transfer Tatiana Victorovna Ortiz, 15, Freshman, Flour Bluff High School, Corpus Christi, Texas, T: Tracy Erickson
<i>Dallas, USTX01, Beal Bank Dallas Regional Science and Engineering Fair</i>	
ANIM007T	The Bee's Knees: The Effect of Secondary Metabolites in Place of Neonicotinoid Pesticides on <i>Apis mellifera</i> and <i>Drosophila melanogaster</i> Austin Wolfgang Katzer, 16, Sophomore; Jason Tanner Smith, 16, Sophomore, Jasper High School, Plano, Texas, T: Patricia Kite
BMED056	A Novel Method of Early Detection of Arteriosclerosis: Analyzing the Effect of Arterial Stiffness and Arterial Clogging on Blood Pressure during Systolic-Diastolic Cardiac Cycle Shelly Goel, 15, Freshman, School of Science and Engineering at Yvonne A. Ewell Townview Magnet Center, Dallas, Texas, T: Keivon Spencer
CBIO043T	Linked Fuzzy Inference System: A Novel Approach to Schizophrenia Diagnosis Adhya Beesam, 15, Sophomore; Shriya Beesam, 15, Sophomore, Plano East Senior High School, Plano, Texas, T: Julie Baker
CELL013	Novel Inhibitors of Glucose Transporter 1 (GLUT1) for Cancer Brian Jason Du, 17, Junior, Plano West Senior High School, Plano, Texas, T: Neil Milburn
EAEV018	A Super Soaker for Greenhouse Gas: The Design and Synthesis of a Novel Metal Organic Framework for Adsorption and Storage of Gases like CO₂ Megha Vyakaranam, 15, Sophomore, Independence High School, Frisco, Texas, T: Kendra Durham
EGPH008	Development of a High Efficiency Solar Cell Using Adaptive Self-Cooling Tiasha Joardar, 17, Senior, Plano West Senior High School, Plano, Texas, T: Neil Milburn
ENMC015	GAZ-EL Tech: An Innovative Method to Reduce Glare from the Sun While Driving Using Gaze and Electrochromic Technology Darshan Shaastri, 16, Junior, Plano East Senior High School, Plano, Texas, T: Julie Baker

MATS005	Optical Encryption with Cellulose Nanocrystals: Polymer and Amino Resin Cellulose Composites Decorated with Nanoparticles
#	Nicky Wojtania, 16, Junior, Plano West Senior High School, Plano, Texas, T: Neil Milburn
ROBO012	Use the Force, Lyapunov! A Novel Quadcopter Motor Controller Using Force Sensor Feedback
	Steven Thomas Elliott, 17, Junior, The Home Educator's Outsourcing High School, Plano, Texas, T: Linda Chisholm
	<i>El Paso, USTX02, Sun Country Science Fair</i>
ANIM008	The Effects of Forest Fires on Stream Invertebrates and Water Quality at Two Different Sites in New Mexico
	Jillian Gabrielle Serrano, 16, Junior, Mission Early College High School, El Paso, Texas, T: Helen Geller
EGCH010	H₂O and Bacteria Make the Current Go
	Jose Luis Candelaria, 18, Senior, Riverside High School, El Paso, Texas, T: Veronica De Avila
	<i>Fort Worth, USTX03, Fort Worth Regional Science and Engineering Fair</i>
BEHA029	Diagnostic Test for Dyslexia
	Ainsley McDonald-Boyer, 16, Sophomore, Azle High School, Azle, Texas, T: Monica Amyett
CBIO006	Determination of Efficacies of Somatic Muscle Cell Transcription Factors for Direct Reprogramming into Induced Muscle Stem Cells
	Daniel Zhong, 17, Junior, Texas Academy of Mathematics and Science, Denton, Texas, T: Samuel Earls
CHEM014	Molecular Dynamics Simulations of the NF-κB Inducing Kinase in Disease Prevention: The Structure-Function Relationship of the NIK protein and Its Effect on Cancer
	Joshua Yue, 18, Senior, Texas Academy of Mathematics and Science, Denton, Texas, T: Angela Wilson
ENEV033	A Magnetite-Incorporated Hydroxyapatite-Based Electrochemical Sensor for Rapid Detection of Phenolic Content in Water
	Matthew Law, 18, Senior, Texas Academy of Mathematics and Science, Denton, Texas, T: Vivian Huynh
ENMC024T	Solar Tracker Design and Analysis
	Kinsey Brawner, 15, Freshman; Kaylee Brawner, 17, Junior, Granbury High School, Granbury, Texas, T: Kayli Morris
PLNT019	Dehydroabietinal Signaling in Plant Defenses
	Arjun Yagnamurthy, 17, Junior, Texas Academy of Mathematics and Science, Denton, Texas, T: Samuel Earls
	<i>Houston, USTX05, Science Engineering Fair of Houston</i>
BCHM021	A Novel Protocol for Protein Purification and a Conformational Study of <i>Thermatoga maritima</i> Rad50 Zn-hook via Heteronuclear Single Quantum Coherence Spectrometry
	Kanchana Raja, 18, Senior, Saint John's School, Houston, Texas, T: Paula Angus
BEHA019	Healthy Food Score (HFS): The Real World Applications, IV
	Tassica Linmei Lim, 17, Junior, Michael E. DeBaKey High School for Health Professions, Houston, Texas, T: Barbara Williams
EBED022	Brace Yourself: A Novel Electronically Aided Leg Orthosis
	Syamantak Payra, 15, Sophomore, Clear Brook High School, Friendswood, Texas, T: Alaina Garza
EGCH039	Novel Brine Water-Graphene Based Energy Generation: Engineering the Endless Cycle
	Hannah Meiseles, 16, Junior, The Woodlands College Park High School, The Woodlands, Texas, T: Larry Walker
EGPH017	From Nano Defects to Mega Power: Heavily-Zirconium-Doped Trapped Field (Gd,Y)BaCuO Superconductor Tapes for High Power Wind Turbine Generators
# #	Kavita Selva, 16, Junior, Clear Lake High School, Houston, Texas, T: Brenda Pinchbeck

- MATS019** **Bio-Engineered Concrete: A Sustainable Self-Healing Material**
Nicholas Rocco Bracci, 16, Sophomore, The Woodlands College Park High School, The Woodlands, Texas, T: Larry Walker
- PLNT038** **Turning the Red Planet Green: Study of Cyanobacteria/Algae Growth Kinetics Coupled with Hydroponics Applications for Terraforming and Settling on Mars**
Andrew Dong-Hyun Kim, 16, Sophomore, The Woodlands College Park High School, The Woodlands, Texas, T: Linda Costanzo
- TMED021T** **Effects of E-Cigarette and Vaporizer Exposure: Mucous Membrane and Developing Tissue Studies**
Megan Claire Alam, 16, Junior; Juliana Steward, 16, Junior, The Woodlands College Park High School, The Woodlands, Texas, T: Larry Walker
- TMED034** **Characterization of Severe Myoclonic Epilepsy of Infancy (SMEI) Using a *Drosophila melanogaster* Model**
Devanshi Udeshi, 15, Sophomore, Stephen F. Austin High School, Sugar Land, Texas, T: Christopher Kwan
- Kilgore, USTX06, East Texas Regional Science Fair*
- MCRO045** **Antimicrobial Effect of Venom from *Hogna carolinensis* (Carolina Wolf Spider)**
Joshua Andrew Fulton, 15, Freshman, North Lamar High School, Paris, Texas, T: Teresa Bussell
- Laredo, USTX07, United Independent School District Regional Science Fair*
- BEHA018** **A New Form of Music Therapy for Alzheimer's and Dementia Patients**
Elizabeth Nicole Miller, 16, Sophomore, John B. Alexander High School, Laredo, Texas, T: Veronica Villarreal
- Laredo, USTX14, Laredo Independent School District Science Fair*
- EAEO020** **The Repercussions of Electromagnetic Fields on the Reproductive Capacity of *Drosophila melanogaster***
Jazmine Odeet Cardenas, 16, Sophomore, Joseph W. Nixon High School, Laredo, Texas, T: Itzel Hinojosa
- MATS047** **The Biodegradability of Corn Produced Plastic**
Monika Rodriguez, 17, Junior, Joseph W. Nixon High School, Laredo, Texas, T: Itzel Hinojosa
- Lubbock, USTX08, South Plains Regional Science and Engineering Fair*
- ENBM067** **The Iron Hand, Year Four**
Forrest Robert Shipton, 18, Senior, Christ the King Cathedral School, Lubbock, Texas, T: Alicea Chaloupka
- PLNT010** **The Effect of Application Rates on the Growth and Yield of *Gossypium hirsutum* L.**
David Anthony Mendoza, 17, Junior, Christ the King Cathedral School, Lubbock, Texas, T: Alicea Chaloupka
- Odessa, USTX09, Permian Basin Regional Science Fair*
- BMED085** **Nutritional Balance on SNAP Allotment, a Second Year Study**
Carmen Amalia Dragun, 16, Junior, Trinity School of Midland, Midland, Texas, T: Chuck Bell
- ENEV108** **Evaluating the Viability of Public Transportation: A Case Study**
Anthony John Dragun, 18, Senior, Trinity School of Midland, Midland, Texas, T: Chuck Bell
- San Antonio, USTX11, Alamo Regional Science and Engineering Fair*
- ANIM021** **The Effects of Consuming GMO vs. Organic Corn on Fruit Fly Health**
Janelle Delilah Arnold, 15, Freshman, Young Women's Leadership Academy, San Antonio, Texas, T: Karen Harris
- BCHM016T** **New Approach to Prevent Monocyte Dysfunction Associated with Metabolic Diseases**
Ruben Isaiah Dicker, 18, Senior; Shayan Mohammad Sarrami, 17, Senior, Health Careers High School, San Antonio, Texas, T: Daniel Bump
- BCHM019** **Does Gotu Kola (*Centella asiatica*) or Moringa (*Moringa oleifera*) Have an Effect on ALS Flies?**
Ashara Naomi Somawardana, 14, Freshman, Basis San Antonio Medical Center, San Antonio, Texas, T: Ryan Hamilton

BCHM020	Converting Tropical Feedstocks into Bio-Ethanol via Enzymatic Hydrolysis and Fermentation by <i>Saccharomyces cerevisiae</i> David James Zulli, 17, Junior, John Jay Science and Engineering Academy, San Antonio, Texas, T: Jean Karst
CBIO011	Optimizing a Biophysics Supercomputer Application Haram Kim, 18, Senior, Health Careers High School, San Antonio, Texas, T: Daniel Bump
EGPH016	A Novel Approach on Improving the On-Demand Cooling of Solar Panels through the Use of an Automated Algorithmic Control System Christopher Rafael Botello, 17, Senior, John Jay Science and Engineering Academy, San Antonio, Texas, T: Jean Karst
# #	
ENBM007	Utilizing Cardiac and Pulmonary Function with Piezoelectricity to Power a Cardiac Pacemaker, Year II Isuru Ashan Somawardana, 17, Junior, Keystone School, San Antonio, Texas, T: Jason Nydegger <i>San Antonio, USTX50, Texas Science and Engineering Fair</i>
BCHM036	Effects of Various Cu Complexes Derived from Cu (II) Sulfate on Amylase-starch Complex Rates Shreeya Dinesh Chodavadia, 17, Junior, Plano East Senior High School, Plano, Texas, T: Julie Baker
BEHA042	Understanding Parkinson's Disease: Basal ganglia Dysfunction's Role in the Visual Adaptation of Speech Divya Prabhakaran, 17, Junior, Plano East Senior High School, Plano, Texas, T: Julie Baker
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BMED073	An Investigation of East Indian Sandalwood Oil (EISO)'s Mechanism of Inhibition in AGS Gastric Cancer Cells: A Patch Clamp Study of TRPM7 Ion Channels Nia Myfanwy Clements, 15, Sophomore, Keystone School, San Antonio, Texas, T: Jason Nydegger
CHEM047	Sea Sponges and Silicon Daniel Duran, 17, Junior, The Woodlands College Park High School, The Woodlands, Texas, T: Larry Walker
ENBM060T	CRISPR/Cas9 Based Mechanisms for Controlled Gene Delivery with Applications for Alzheimer's and Pain Management for Veterans Kshitij Sachan, 16, Sophomore; Yesh Doctor, 16, Sophomore, Plano East Senior High School, Plano, Texas, T: Julie Baker
ENMC064T	True-HEV: An Innovation for Hybrid Electric Engines Burzin Poras Balsara #, 16, Sophomore; Malav H. Shah #, 16, Sophomore, Clark High School, Plano, Texas, T: Farzana Sikora
MCRO071	Nano Is Novel: Improving Antibiotic Efficacy for <i>S. epidermidis</i> with Structurally Modified Silver Afeefah Fatimah Khazi-Syed, 16, Junior, Harmony School of Innovation-Fort Worth, Fort Worth, Texas, T: Bilal Yildirim
#	
ROBO041T	Unmanned Explosive Disposal Alejandro Morales-Sobrevilla, 16, Junior; Jose Nazario Chavez, 16, Junior; Edgar Idelfonso De Hoyos, 16, Junior, Weslaco East High School, Weslaco, Texas, T: Thomas Jacob Padilla
SOFT041	Schedule Advisory: Investigating Genetic Algorithms to Solve Class Scheduling Uma Sethuraman, 15, Sophomore, William P. Clements High School, Sugar Land, Texas, T: Wai Chan <i>Waco, USTX12, Central Texas Science and Engineering Fair</i>
BCHM011	Highly Sensitive Single Mutation Detection of EGFR by Bridged Nucleic Acid Edward Sangyoon Kim, 16, Junior, Midway High School, Waco, Texas, T: Kathy McMillan
#	
BMED010	Differential Expression of Angiotensin Converting Enzymes in Lymphatic Endothelial Cells Correlation to Clearance of Amyloid-beta Lauren Elizabeth Willey, 18, Senior, C. H. Yoe High School, Cameron, Texas, T: Toni Lafferty
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UTAH

Cedar City, USUT02, Southern Utah Science and Engineering Fair

BEHA039 A Treatment to De-escalate from the Effects of Violent Video Game Play
Burgess Andrew Milner, 16, Sophomore, Cedar City High School, Cedar City, Utah, T: Anna Lewin

CHEM025 Removal of Heavy Metals from Water Using *Zea mays* Stover
Stephanie Luan Martinez, 16, Junior, Success Academy D.S.U., St. George, Utah, T: Charmain Brammer

ENEV052 Filtering *E. coli* with Common Homemade Filters
Addison Sara Nisson, 17, Junior, Success Academy D.S.U., St. George, Utah, T: Charmain Brammer

MATS025 Can You Hear Me Still?
Parker Jeremiah Humes, 15, Freshman, Carbon High School, Price, Utah, T: Doug Morris

Layton, USUT01, North Davis Area Science and Engineering Fair

ANIM027 The Effect of Classical Music When Grooming a Horse on the Neck and Withers after Exercise

Abigail Louise Faz, 15, Sophomore, Northridge High School, Layton, Utah, T: Colleen Bagley

BMED092T Pulmonary Function and Intercostal Constriction by Sports Bras in Distance Runners
Heather Ann Mills #, 17, ; Sadie Elise Gunnerson, 18, Senior, Woods Cross High School, Woods Cross, Utah, T: Jana Barrow

EBED021 Precision Flow and Measurement of Helium Gas for High Altitude Application
Niko Mueller, 15, Freshman, Northridge High School, Layton, Utah, T: Carleen McNees

ENMC049 Blown Away: A Study of the Flight Characteristics of Conventional and Canard Wing Configurations

Andrew Bennett, 16, Sophomore, Bountiful High School, Bountiful, Utah, T: Austin Walker

MATH015 The Investigation of an Impartial Normal Play Game
Emil Sebastian Geisler, 14, Freshman, Bountiful High School, Bountiful, Utah, T: Kristin Bates

PHYS025 Light Curve Inversion for Asteroids
Kelsey Mackenna Barber, 16, Junior, Bountiful High School, Bountiful, Utah, T: Jenni Barber

Logan, USUT06, Bridgerland Science and Engineering Fair

BMED019 Vascular Endothelial Growth Factor (VEGF) Expression of Retinal Pigment Epithelium (RPE)
Jennifer Alice Ban, 17, Senior, Logan High School, Logan, Utah, T: Elizabeth Vargis

ENEV015 Removing Aqueous Phosphate with Sand Adsorption Columns
Raymond Li, 17, Junior, Logan High School, Logan, Utah, T: David Britt

Ogden, USUT03, Weber Area Science and Engineering Fair

BEHA017 Causes and Effects of Stress in Adolescents
Quristienna Iris Bateman, 17, Junior, Bonneville High School, Washington Terrace, Utah, T: Benjamin Prall

CHEM016T Analysis of Acidic and Basic Catalysts on the Transesterification of Wasted Grease
Tyler Michael Staten # #, 17, Junior; Riley Paul Midgley #, 17, Junior, Bonneville High School, Washington Terrace, Utah, T: Benjamin Prall

ENEV037 Evaluating the Viability of Reducing Waste with *Tenebrio molitor*
Katee Brooke Hughes, 16, Junior, Bonneville High School, Washington Terrace, Utah, T: Benjamin Prall

ENEV039 Creating a Cleaner Atmosphere with Zeolite: Utilizing the Carbon-Sequestering Properties of Molecular Sieves to Selectively Eliminate Pollutants in Vehicle Exhaust
Christian John Marriott, 17, Senior, Bonneville High School, Washington Terrace, Utah, T: Benjamin Prall

MCRO027	The Effect of Antibacterial Toothpaste on the Flora of the Oral Cavity Matthew Staten, 14, Freshman, Bonneville High School, Washington Terrace, Utah, T: Claudette Nielsen
<i>Ogden, USUT07, Harold W. & Helen M. Ritchey Science and Engineering Fair of Utah</i>	
EAEV046	Calibration Methodology for Vertical Inversion Atmospheric Measurement System Elizabeth Frances Dowell, 16, Sophomore, Northern Utah Academy for Math, Engineering and Science, Layton, Utah, T: Nickole Brooks
MATH023	The Birthday Paradox: An Application to the USA's No-Fly List Kate Netherton, 15, Freshman, Morgan High School, Morgan, Utah, T: Stacey D. Floyd
MCRO035 # #	Suppression of Antimicrobial Resistance in MRSA Using CRISPRs, Part II Karissa Wang, 17, Senior, Northern Utah Academy for Math, Engineering and Science, Layton, Utah, T: Nickole Brooks
MCRO036	Synergistic Effects of Elderberry Extract in Conjunction with Antibiotics Tristen Kelson, 15, Sophomore, Ogden High School, Ogden, Utah, T: Sara Byrd
<i>Provo, USUT04, Central Utah STEM Fair</i>	
BMED072 # #	Identification of Thymidine Kinase I as a Universal Cell Surface Target for Treating Cancer and Development of a Novel Antibody Drug Conjugate Michael Xiao, 18, Senior, Lone Peak High School, Highland, Utah, T: Tom Erekson
ENEV069	RainCloud: Water Conserving Hand Sanitation Device Morgan Barron, 17, Senior, Riverton High School, Riverton, Utah, T: Tamra Rossiter
ENEV095	The Carbon Sequestrator, Year Two Amanda Paige Thatcher, 17, Junior, Herriman High School, Herriman, Utah, T: Kathryn Blattman
PHYS045	3D Printed Gas Electron Multiplier Adam Syndergaard, 16, Junior, Maple Mountain High School, Spanish Fork, Utah, T: Kyle Miller
ROBO039T	Neuroengineering <i>B. discoidalis</i> and <i>B. dubia</i> Antennae to Wirelessly Manipulate Locomotion as an Alternative to Robotics Noah Anderson Mann, 17, Junior; Samuel Hardman, 17, Junior; Hyrum Thomas Diesen, 17, Junior, Pleasant Grove High School, Pleasant Grove, Utah, T: David Van Dijk
<i>Salt Lake City, USUT05, Salt Lake Valley Science and Engineering Fair</i>	
BMED047 #	Investigating p16 Control of Mitochondrial Biogenesis in Melanoma Chelsea L. Li, 17, Junior, West High School, Salt Lake City, Utah, T: Crystal King
CBIO022T	An Investigation of Poxvirus Response to the Integrated Cellular Stress Mechanism through Steady-State Analysis and Stochastic and Deterministic Models Annie Tianjin Yun, 15, Junior; Yang Yan, 17, Senior, West High School, Salt Lake City, Utah; The Waterford School, Sandy, Utah, T: Hilary Thirlwell
CELL042	A Novel Solution for Therapeutic Neurogenesis: Manipulating Neural Stem Cell Differentiation and Growth Using Glycan-Based Small Molecules DaEun Sung, 16, Junior, West High School, Salt Lake City, Utah, T: Hilary Thirlwell
EGCH029 #	Nature-Based Solid Polymer Electrolytes for Improved Safety, Sustainability, and Efficiency in High-Performance Rechargeable Batteries Kathy Liu, 17, Junior, West High School, Salt Lake City, Utah, T: Enrique Arce-Laretta
ENBM044	Using Machine Learning and Image Segmentation to Analyze Retinal Blood Vessel Densities Alexander Cheng, 15, Freshman, Hillcrest High School, Midvale, Utah, T: Alexander Mettler
PHYS034 #	Superluminal Data Transfer via Photons through Semi-Stabilized Einstein-Rosen Bridges Alexander Ethan George-Kennedy, 17, Senior, Juan Diego Catholic High School, Draper, Utah, T: Christine Celestino

VERMONT

Northfield, USVT50, Vermont State Science and Mathematics Fair

- CELL029** **The Effect of Malathion on Human Epithelial Cell Line DNA BEAS-2B: RBx8**
Katherine Grace Young, 15, Sophomore, South Burlington High School, South Burlington, Vermont, T: Nathaniel Thundering Bear Moore
- EBED035** **Open Source Home Automation**
Vincent Paul August Moeykens, 16, Sophomore, Windsor High School, Windsor, Vermont, T: Catharine Engwall
- PLNT037** **The Effects of Hydroponic and Drip Irrigation on *Brassica oleracea* var. *Sabellica* 'Premier' and *Lactuca sativa* 'Spretnak' Growth**
Avi Jonah Cohen, 15, Sophomore, South Burlington High School, South Burlington, Vermont, T: Nathaniel Moore

VIRGINIA

Arlington, USVA01, Northern Virginia Science and Engineering Fair

- CHEM052** **Photodegradation of Organic Dyes through Improved Catalysis across a Graphene Oxide-Doped Titanium Dioxide Substrate**
Bilguunzaya Battogtokh, 17, Junior, Yorktown High School, Arlington, Virginia, T: Paul Hessler
- ENBM025** **Power of Touch: Challenges in Designing Haptic Sensing and Feedback for Neural Controlled Bionic/Prosthetic Hand**
Megan Guinn O'Briant, 18, Senior, Yorktown High School, Arlington, Virginia, T: Adrienne Wright

Ashburn, USVA07, Loudoun County Science and Engineering Fair

- CELL058** **FOXO Transcription Factor: A Novel Therapeutic for Cardiometabolic Disease**
Marissa Sumathipala, 15, Sophomore, Broad Run High School, Ashburn, Virginia, T: Laura Hicks
- ENEV049** **Reinventing the Leaf: A Manufactured Biohybrid Photosynthetic System**
Wyatt Martin Pontius, 18, Senior, Academy of Science, Sterling, Virginia, T: Jackie Curley
- MCRO033T** **Developing Antibacterial Surfaces Using Bio-Inspired Methods: Investigating the Bactericidal Efficiencies of Different Nanopillar Arrangements Found on Insect Wings**
Meghna Gorrela, 18, Senior; Molly S. Magoffin, 17, Senior, Academy of Science, Sterling, Virginia, T: Jackie Curley
- TMED030** **Preventing *Staphylococcus epidermidis* and *Pseudomonas fluorescens* Infection and Growth Using Fungal Volatile Organic Compounds with and without *Lactobacillus acidophilus***
Kyle T. Enriquez, 16, Senior, Stone Bridge High School/The Academy of Science, Ashburn, Virginia, T: Janet Cascio

Charlottesville, USVA02, Virginia Piedmont Regional Science Fair

- ENMC045T** **The Design of a Versatile Ultralow Field MRI Machine**
Ishpreet Singh #, 17, Junior; Ryan Scholes, 16, Junior; Sander Abraham, 17, Junior, Albemarle High School, Charlottesville, Virginia, T: Kirsten Fuoti
- PLNT046** **Drought Resurrection: A Novel Method to Induce Drought Resistance in Plants**
Ashwin Swaminathan, 15, Sophomore, Albemarle High School, Charlottesville, Virginia, T: Kirsten Fuoti

Fairfax, USVA03, Fairfax County Regional Science and Engineering Fair

- ANIM031** **The Effect of Intralipid on Bupivacaine-Induced Cardiac Activity in *Daphnia magna***
Nicholas Lin, 15, Freshman, Westfield High School, Chantilly, Virginia, T: Mary Constantino
- ANIM042** **The Excitotoxicity Effects of Neotame and Aspartame on the Heart Rate of *Daphnia magna***
Claire Elaine Dozier, 16, Sophomore, McLean High School, McLean, Virginia, T: Jenn Choumil
- BCHM025** **Investigating Interfacial Cross Linking to Combat Hard Fouling: An Experimental Study on Enzymatic Activities of the *Balanus amphitrite***
Christina So-Ye Oh, 17, Junior, Thomas Jefferson High School for Science and Technology, Alexandria, Virginia, T: Daniel Burden

CELL021	Role of Sirt1 during Oligodendrocyte Progenitor Proliferation in Cerebellar White Matter after Hypoxia Jay Gupta, 17, Senior, Thomas Jefferson High School for Science and Technology, Alexandria, Virginia, T: Mark Hannum
ENEV056T	A Novel Approach to Heavy Metal Removal Using Home-Based Superparamagnetic Iron Oxide Nanoparticle Enhanced BioSand Filters Jennifer Marchibroda, 17, Junior; Alexander Charles Lin, 17, Junior, James W. Robinson Jr. Secondary School, Fairfax, Virginia, T: Mary Stromwall
ENEV077T	Development of a Toxic Metal Ion Sensor in Water Using Gold Nanoparticle-Amino Acid Assays Aneesh Susarla, 17, Senior; Nirmaan Shanker, 17, Senior, Thomas Jefferson High School for Science and Technology, Alexandria, Virginia, T: Brian Kennedy
ENMC046	Using Chevron Wing Extenders to Stabilize Plank Style Flying Wings Abdullah Can Agcayazi, 18, Senior, James W. Robinson Jr. Secondary School, Fairfax, Virginia, T: Anna Rose Tuszka
MATH018 #	Embedding a Flat Torus in Three Dimensional Euclidean Space Stephanie Shi-Ning Mui, 16, Senior, Oakton High School, Vienna, Virginia, T: Grace Wang
PLNT031	The Effect of Induced Hypoxia upon the Phototoxicity of Plants Shannen Kelly Prindle, 15, Sophomore, Oakton High School, Vienna, Virginia, T: Grace Wang
SOFT015	User Authentication Based on Gait Analysis Chloe Baker, 16, Junior, Lake Braddock Secondary School, Burke, Virginia, T: Christopher Beatty
<i>Harrisonburg, USVA04, Shenandoah Valley Regional Science Fair</i>	
EAEV021	The Relationship between Roads and Frog Calling Intensity Claire Ashley Morrow, 18, Senior, Indus Center for Academic Excellence, Rochester, Virginia, T: Denise Wells Thompson
SOFT004 #	iSight: A New Method of Gesture Recognition and Analysis Logan Alexander Apple, 16, Junior, Millbrook High School, Winchester, Virginia, T: Saharsha Nambiar
<i>Lexington, USVA50, Virginia State Science and Engineering Fair</i>	
CBIO041	A Machine Learning Approach to Identifying Ordered Binding Regions on Order-Disorder Protein Interfaces
# #	Jake Yee Cui, 17, Senior, Thomas Jefferson High School for Science and Technology, Alexandria, Virginia, T: Paul Kosek
CHEM061	Alginate-Based Gel Particle as a Novel Drug Delivery Vehicle for Curcumin Vishnusai Reddy Karri, 15, Sophomore, Roanoke Valley Governor's School for Science and Technology, Roanoke, Virginia, T: Steve Smith
EAEV066	Identifying Greenhouse Gas Hotspots in Megacities Siona Prasad, 15, Freshman, Thomas Jefferson High School for Science and Technology, Alexandria, Virginia, T: Craig Lewis
PHYS053	Constructive Interference of Seismic Surface Waves Antipodal to Crater Impact Sites on Terrestrial Bodies Camille Virginia Yoke, 18, Senior, Maggie L. Walker Governor's School, Richmond, Virginia, T: Harold Houghton
<i>Lynchburg, USVA05, Central Virginia Regional Science Fair</i>	
CELL015	A Comparison of the Effects of O55:B5 and O111:B4 Lipopolysaccharides from <i>E. coli</i> in RAW 264.7 Murine Macrophages Thomas McCall Baker, 17, Junior, Central Virginia Governor's School for Science and Technology, Lynchburg, Virginia, T: Michelle Douglass
PHYS052	Shielding Space Radiation Hannah Mae Steele, 15, Sophomore, Liberty High School, Bedford, Virginia, T: Jeff Steele
<i>Manassas, USVA06, Prince William-Manassas Regional Science Fair</i>	
ROBO016T	Finding the Right Whale: A Machine Learning Approach to Visual Recognition of the <i>Eubalaena glacialis</i> Oleg Igorevich Menyaylenko, 18, Senior; Shaheer Atif Imam, 17, Senior; Brandon Alexander Walker, 18, Senior, Governor's School at Innovation Park, Manassas, Virginia, T: Ales Psaker

Norfolk, USVA09, Tidewater Science and Engineering Fair

- ENEV087** **Low Cost Continuous Flow Microbial Desalination Cells for Environmentally Sustainable Integrated Water Treatment**
Rhiannon Edwards, 18, Senior, New Horizons Governor's School for Science and Technology (Warwick High School), Hampton, Virginia, T: Mary Patterson
- TMED042** **Novel Nanomedicine Therapy for Multidrug Resistant Cancer**
Robin Bai, 17, Senior, New Horizons Governor's School for Science and Technology, Hampton, Virginia, T: Feng Li

Radford, USVA10, Blue Ridge Highlands Regional Science Fair

- ANIM043** **Slaying the Destructor, Part II: Dosage Optimization and Effects of Oxalic Acid on Honeybee Hives**
Emily Elizabeth Llaneras, 17, Senior, Southwest Virginia Governor's School, Pulaski, Virginia, T: Krista Stith
- BMED018** **Revolutionary Blood Test Tube 2.0**
Julian Elmasry, 18, Senior, Southwest Virginia Governor's School, Pulaski, Virginia, T: Jared Brown

Richmond, USVA11, Metro Richmond STEM Fair

- CELL040** **An Investigation on Type 1 Diabetes Using Manassantin B: A Potential and Novel Cure**
John Min, 17, Junior, John Randolph Tucker High School, Richmond, Virginia, T: Natalie McKinney
- ENMC044** **The Effect of a Bridge Pier Column Retrofit's Configuration on Minimizing Local Scour for Existing Circular Pier Columns**
Ashley Marie Harris, 15, Sophomore, Patrick Henry High School, Ashland, Virginia, T: Charlotte Embrey
- MCRO059** **Reversing Antibiotic-Resistance: Discovery, Evaluation, and Optimization of Carbapenemase Inhibitors**
David M. Lu, 18, Senior, Mills E. Godwin High School, Henrico, Virginia, T: Bishop Boshier
- MCRO068** **A Novel Alternative to Antibiotics: Gold Nanoparticles**
Pranav Sundar Neyveli, 15, Sophomore, Mills E. Godwin High School, Henrico, Virginia, T: Dana Delano
- ROBO030** **Investigations into Cardiology: Categorizing Heart Rhythms Using Machine Learning**
Oliver Hamilton, 17, Junior, Mills E. Godwin High School, Henrico, Virginia, T: Samantha Cope

Roanoke, USVA08, Western Virginia Regional Science Fair

- BEHA024** **Network Topology and Recovery Phenotype Effects on Social Media Engagement**
Alexus V. McBride, 17, Senior, Roanoke Valley Governor's School for Science and Technology, Roanoke, Virginia, T: Lee Ann Russell
- MCRO032** **Isolation and Investigation of Streptomyces Species for Anti-Bacterial/Cancer Agents**
Chinweoke N. Ugochukwu, 17, Senior, Roanoke Valley Governor's School for Science and Technology, Roanoke, Virginia, T: Lee Ann Russell

Warrenton, USVA12, Fauquier County Regional Science and Engineering Fair

- EBED020** **Car-dian Angel: Feasibility Prototype Reducing Risk of Vehicular Hyperthermic Death**
Niles Lance Ribeiro, 18, Senior, Indus Center for Academic Excellence, Rochester, Virginia, T: Denise Thompson

WASHINGTON

Bellevue, USWA03, Central Sound Regional Science and Engineering Fair

- CBIO015** **Drug Vulnerabilities of the Cancer Cell Line Encyclopedia Are Revealed by Machine Learning Approaches**
Mahalaxmi Elango, 17, Senior, Interlake High School, Bellevue, Washington, T: Beth Gatewood
- ENBM045** **Computational and Experimental Design of MIP Nanoparticles: A Novel Theranostic Solution to Detect and Neutralize Endotoxins**
Sriharshita Vani Musunuri, 16, Sophomore, Henry M. Jackson High School, Bothell, Washington, T: Andrew Sevald

Bremerton, USWA50, Washington State Science and Engineering Fair

- BCHM039** **Development of a Novel Class of Antidiabetic and Anticancer Agents Targeting PTP1B Enzyme**
Dyuti Shreya Nandy, 17, Junior, Newport High School, Bellevue, Washington, T: Sarah Nehring
- EBED039** **Communication by Ultrasound Using Radio Modulation Techniques**
Adeline Frances Hillier, 15, Sophomore, Newport High School, Bellevue, Washington, T: Sarah Nehring
- EBED042** **A Portable Optoelectronic Molecular Identification and Spectral Analysis System for Assessing the Quality, Safety, and Composition of Food and Pharmaceuticals Using Machine Learning**
Eshika Saxena, 14, Freshman, Interlake High School, Bellevue, Washington, T: Edward Wang
- ENEV104T** **Developing a Device to Assist with the Field Application of Solar Water Disinfection**
Benjamin Patrick Zabback, 17, Junior; Margo Nanneman, 16, Junior; Maheck Jerez, 17, Junior, Nikola Tesla STEM High School, Redmond, Washington, T: Kate Allender, Erica Danaee
- PHYS054T** **The Role of Secondary Electrons in IEC and BT Fusion**
Noah Hoppis, 18, Senior; Kevin Lee, 17, Senior, Kings High School, Shoreline, Washington; Todd Beamer High School, Federal Way, Washington, T: Jerry Glaser

Kennewick, USWA01, Mid-Columbia Regional Science and Engineering Fair

- EGPH015** **Improving Energy Efficiency and Reducing Our Carbon Footprint: A Novel Approach for Fabricating Inexpensive Electrochromic Coatings for Smart Windows**
Naveena Bontha, 16, Junior, Hanford High School, Richland, Washington, T: Ben Koch
- EGPH027** **Development of a Thermoelectric Generator Using Common Materials**
Anneka Walton, 16, Sophomore, Hanford High School, Richland, Washington, T: Brian Palmer

Tacoma, USWA02, South Sound Regional Science and Engineering Fair

- EBED031** **MyHealth: A Wearable for Detection, Monitoring, and Control of Parkinsonian Tremor**
Surabhi Gopal Mundada, 16, Junior, Olympia High School, Olympia, Washington, T: Brian Wright
- MCRO050** **A Novel Approach to the Reduction of Antibiotic Resistant *Escherichia coli* Present in Livestock Waste through Use of Plant Extracts**
Sarah Kay Strickler, 18, Senior, Bonney Lake High School, Bonney Lake, Washington, T: Ellen Berwick
- TMED024T** **Towards Next Generation Cancer Therapy: *In vivo* Dosimetry Studies of Boron Neutron Capture Therapy Using Protist Models**
Nitya Krishna Kumar, 16, Junior; Veenadhari Kollipara, 15, Sophomore, Olympia High School, Olympia, Washington; Interlake High School, Bellevue, Washington, T: Carl Greninger

Vancouver, USWA04, Southwest Washington Science and Engineering Fair

- CELL014** **Ginkgo biloba Flavonoids Damage Lateral Line Hair Cells via Oxidative Stress Mechanisms**
Anna Roche, 18, Senior, Camas High School, Camas, Washington, T: Kimberly Newman
- ROBO013** **Mimicking Robotic "Smart" Prosthetic Arm**
Niko Ray Bhagwandin, 17, Senior, W. F. West High School, Chehalis, Washington, T: Clifton White

WEST VIRGINIA

Fairmont, USWV50, West Virginia State Science and Engineering Fair

- ENEV094** **Utilization of Gas Compressed Hybridized Algae to Eliminate Conventional Synthetic Emissions**
Robert Donald Phillips, 18, Senior, Musselman High School, Inwood, West Virginia, T: Theresa Deters

- MATH045** **Using Patterns Found in the Distribution of Prime Numbers to Assist in Writing a Very Efficient Prime Sieve**
Robert George Barrat, 16, Junior, Jefferson High School, Shenandoah Junction, West Virginia, T: Laura Carter
Keyser, USWV01, West Virginia Eastern Panhandle Regional High School Science Fair
- BMED068T** **Caffeine and Memory: A Good Idea?**
Tyler Samuel Sine, 16, Sophomore; Christopher Michael Fox, 16, Sophomore, Musselman High School, Inwood, West Virginia, T: Brenda Waterworth
- ROBO040** **Give Me a Hand**
Ryan Christopher Gross, 16, Sophomore, Spring Mills High School, Martinsburg, West Virginia, T: Jana Woofert
West Liberty, USWV03, West Liberty State University Regional Science and Engineering Fair
- TMED039** **Bioaerosol Boss: Desquamative and Other Bioaerosols Deactivation Ultra-Violet C Light Irradiation Prototype**
Luke Edward Rapp, 15, Freshman, Wheeling Park High School, Wheeling, West Virginia, T: Kevin Orth

WISCONSIN

- Glendale, USWI02, Nicolet Science and Engineering Fair*
- SOFT020** **Program-Based Interpretation of Electrocardiograms to Diagnose Cardiac Conditions**
Neville Nazareth, 14, Freshman, Nicolet High School, Glendale, Wisconsin, T: Stephanie Deering
Madison, USWI04, Capital Science and Engineering Fair
- ENBM052** **Role of Integrin Signaling Pathways Driving the Collective Migration of Human Keratinocytes**
Lillibeth Carole Snellman, 17, Junior, James Madison Memorial High School, Madison, Wisconsin, T: Cynthia Kellor
Milwaukee, USWI03, University School of Milwaukee—Science Fair
- BMED059** **Chemotherapeutic Induced Cellular Death (Apoptosis/Necrosis) Inhibition through Telomerase Modulation (Ags 499/BIBR 1532)**
Nabeel Jami Quryshi, 16, Sophomore, University School of Milwaukee, Milwaukee, Wisconsin, T: Robert Juranitch
- ENBM015** **Next Generation Surgical Tool using Three-Dimensional (3-D) Printing for Cerebral Aneurysm Treatment**
Arundhati Pillai, 17, Junior, University School of Milwaukee, Milwaukee, Wisconsin, T: Robert Juranitch
- MCRO002** **Isolation and Characterization of Bacteriophages Effective at Killing *Enterococcus faecalis***
Candace Walther, 16, Junior, University School of Milwaukee, Milwaukee, Wisconsin, T: Robert Juranitch
Milwaukee, USWI50, Badger State Science and Engineering Fair
- CHEM003** **Development of a Computational Method for Rapid Identification of Organic Molecules for Efficient Solar Energy Conversion**
Anshul Bhatnagar, 17, Junior, University School of Milwaukee, Milwaukee, Wisconsin, T: Robert Juranitch
- PHYS048** **Galaxy Clusters, New Discoveries to Fill in the Gaps**
Daniel Matthew Glazer, 17, Junior, University School of Milwaukee, Milwaukee, Wisconsin, T: Robert Juranitch
- SOFT025** **Optical Character Recognition Algorithms: Reading, Playing, and Converting Music to Braille**
Amit Rajesh, 16, Sophomore, James Madison Memorial High School, Madison, Wisconsin, T: Lisa Stec

WYOMING

- Greybull, USWY01, Northern Wyoming District Science Fair*
- ANIM026** **Spectrophotometric Analysis of the Effects of Insect Growth Regulators on *Tenebrio molitor***
MaKyela Dawn Sorensen, 16, Sophomore, Greybull High School, Greybull, Wyoming, T: Joel Kuper

- ENEV010 Utilization of Freeze Protocols to Improve Seed Viability to Enhance Reclamation**
Dante Arther Sylvester, 17, Junior, Greybull High School, Greybull, Wyoming,
T: Joel Kuper
Laramie, USWY50, Wyoming State Science Fair
- EGPH013 Utilizing Phase Change Materials in Data Center Cooling**
Darbi Schlenker, 17, Senior, Meeteetse High School, Meeteetse, Wyoming,
T: Michael Power
- MCRO044 The Cannon Fungus**
Jennel Mead, 16, Junior, Cheyenne South High School, Cheyenne, Wyoming,
T: Shannon Cunningham
- PHYS036 Geostationary Satellites: Can We Place One Over Any Location on Earth?**
Woodrow Gamboa, 15, Freshman, Laramie High School, Laramie, Wyoming,
T: Erin Klauk
- SOFT003 Mapping and Pathfinding**
Qingfeng Li, 14, Freshman, Laramie High School, Laramie, Wyoming,
T: Erin Klauk

UNITED STATES VIRGIN ISLANDS

St. Croix, TEVI02, Good Hope Country Day School Science Fair

- CELL055 SIRT3: A Unique Potential Therapeutic Target for Sepsis-Induced Skeletal Muscle Atrophy**
Kira Griffith, 15, Junior, Good Hope Country Day School, Kingshill, United States Virgin Islands, T: Mary Jane Coles
- ENBM038 In silico Study of Ana Lymphoma Kinase Implicated in Neuroblastoma**
Jada Alexandria Romer, 15, Sophomore, Good Hope Country Day School, Kingshill, United States Virgin Islands, T: Mary Jane Coles

URUGUAY

Montevideo, URY001, Feria Nacional de Clubes de Ciencia

- BEHA030T The Reality of Transgenic Corn**
Lucia Nidegger, 18, Senior; Santiago Alles, 18, Senior; Lucia Gilles, 18, Senior; Agustin Urbano Indart Curuchet High School, Rosario, Uruguay,
T: Teresita Fontes
- EBED009T Visus**
Giovanna Vinoli, 17, Junior; Marcos Aaron Pessano, 17, Junior; Luis Eduardo Pereyra, 17, Junior, Liceo Militar "General Artigas", Montevideo, Uruguay,
T: Sebastian Ignacio Suarez
- ENEV002T Radiographies Recycling**
Aldana Gimenez, 18, Senior; Bryan Fabian Fernandez, 18, Senior; Veronica Vanessa Barro, 21, Senior, Instituto Tecnologico Superior Buceo, Montevideo, Uruguay, T: Marta Lindner

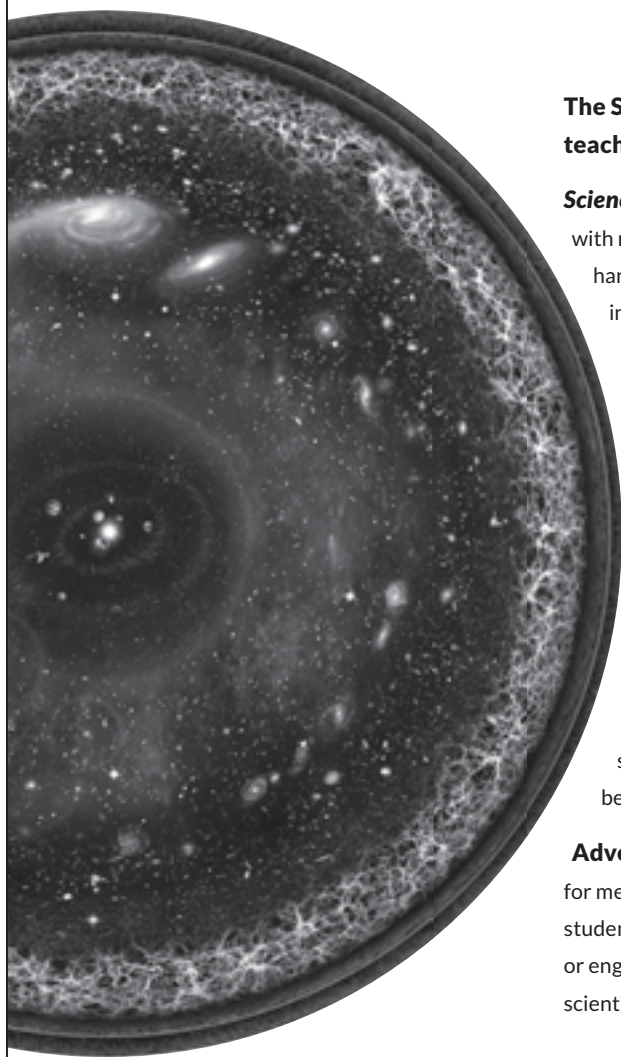
VIET NAM

Ha Noi City, VNM001, Ha Noi Science Fair

- BMED077T Anti-inflammatory Effects of Vietnamese Bee (*Alpis melifera*) Venom**
Hai Viet Le, 16, Junior; Hung Quang Nguyen, 17, Junior, Nguyen Hue High School for Gifted Students, Hanoi, Viet Nam, T: Ha Phuong Kim
- CELL043T Study on the Ability of Binding and Killing Several Cancer Cell Lines of Antinuclear Antibody**
Chau Thu Minh Nguyen, 17, Junior; Chinh Lu Duc Hoang, 16, Junior, Thang Long High School for the Gifted, Da Lat, Viet Nam, T: Giau Ngoc Thi Phan
- CHEM044T Potential Anticancer Complexes from Platinum and Clove Basil Oil (*Ocimum gratissimum* L.)**
My Ha Nguyen, 16, Junior; Long Quang Nguyen, 18, Senior, High School for Gifted Students, Hanoi National University of Education, Hanoi, Viet Nam, T: Chi Thi Thanh Nguyen

- EAEV063T** **Rice Straw Phytolith to Enhance CO₂ Capture: Ideas for Sustainable Management of Rice Straw and Reduction of Greenhouse Gases from Paddy Soils**
Phong Tuan Pham Vu, 16, Junior; Ngoc Bao Nguyen, 16, Junior, H.U.S. High School for Gifted Students, Hanoi, Viet Nam, T: Minh Ngoc Nguyen
- ENEV091T** **A Novel Process for Safe and Sustainable Recovering of Used Hydraulic and Engine Oils**
Minh Duc Nguyen, 16, Sophomore; Ha Ngan Le, 15, Sophomore, Lam Son Gifted High School, Thanh Hoa, Viet Nam, T: Diep Hong Le
- ENMC066T** **Specialized Travelling Diverse Terrain Vehicle for the Elderly and the Disabled**
Ngan Hoang Nguyen, 18, Senior; Truc Thanh Pham, 18, Senior, Le Hong Phong High School for the Gifted, Ho Chi Minh City, Viet Nam, T: Tong Thanh Dao

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UNIVERSAL MAP This diagram, made up of stitched together NASA imagery, is essentially a map of the observable universe. The solar system is at center. The scale changes as you move outward so that the distances depicted toward the edge of the circle are enormous.

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