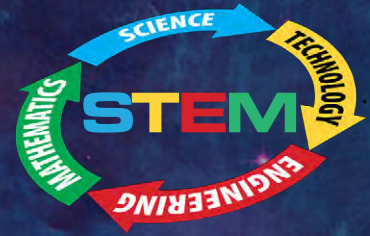


2019 PROGRAM BOOK

69TH ANNUAL
CHICAGO PUBLIC SCHOOLS STUDENT SCIENCE FAIR, INC.

Exploring the Unexplored Through



2019 EXHIBITION OF STUDENT STEM RESEARCH

Illinois Institute of Technology, March 21 - 24, 2019

Symposium Presentations, March 21, 2019



MOTOROLA SOLUTIONS
FOUNDATION



powering lives



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TO HELPING PEOPLE
BE THEIR BEST
IN THE MOMENTS
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MOTOROLA SOLUTIONS FOUNDATION IS
HONORED TO SUPPORT THE 2019 CHICAGO
PUBLIC SCHOOLS EXHIBITION OF
STUDENT STEM RESEARCH.



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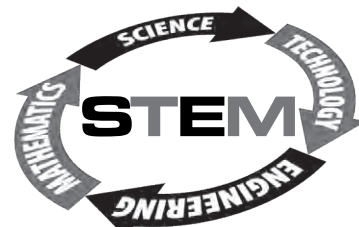
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2019 STEM Exhibition Program Book

69th ANNUAL CHICAGO PUBLIC SCHOOLS EXHIBITION OF STEM RESEARCH

Exploring the Unexplored Through



Brought to you by:

Chicago Public Schools Student Science Fair, Inc.

Academic and Exhibition Site Supporters:
Chicago Public Schools - Office of Teaching and Learning

Site Host:
Illinois Institute of Technology

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Sylvia Nelson Jordan
Manager, Academic Competitions
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Schedule of Events

Thursday, March 21, 2019 – Symposium – details on page 24

9:00 A.M. – 11:30 A.M.	Symposium Morning Sessions (Rooms HH 002, HH 003 & HH 010)
11:30 A.M. – 12:45 P.M.	Symposium Luncheon (Hermann Hall Expo) - by invitation only
1:00 P.M. – 3:30 P.M.	Symposium Afternoon Sessions (Rooms HH 002, HH 003, & HH 010)

Friday, March 22, 2019 – Exhibit Judging – details on page 26

7:15 A.M. – 8:00 A.M.	Judges Breakfast (Hermann Hall Expo)
8:00 A.M. – 8:30	Judges Briefing (Hermann Hall Auditorium)
8:30 A.M. – 1:00 P.M.	Judging of Exhibits (Hermann Hall, Ballroom, Alumni Lounge & Gallery Lounge)
8:30 A.M. – 1:00 P.M.	Judging of Exhibits (Hermann Hall)
10:30 A.M. – 11:15 A.M	Opening Ceremony/Ribbon Cutting (Hermann Hall Expo)
11:15 A.M. – 1:00 P.M.	Judging Continues
11:30 A.M. – 1:00 P.M.	Judges Buffet Luncheon (Hermann Hall Expo)
12:00 NOON – 1:15 P.M.	Recognition Luncheon (MTCC Ballroom) – by invitation only
1:00 P.M. – 3:15 P.M.	STEM Exhibition Open to Public (Hermann Hall)

Saturday, March 23, 2019– Public Viewing and Additional Events – details on page 39

9:30 A.M. – 3:15 P.M.	City Student STEM Exhibition Open to the Public (Hermann Hall)
9:30 A.M. – 1:00 P.M.	International Science and Engineering Fair Judging (Hermann Hall Room HH 005)
11:45 A.M. – 1:00 P.M.	Sixth-Grade Regional Exhibition Winners Luncheon (Hermann Hall Expo)
2:00 P.M. – 3:00 P.M.	ComEd Science Club Social (Hermann Hall Expo) – by ticket only

Sunday, March 24, 2019 –Awards Convocation – details page 41

1:00 p.m. – 3:00 P.M.	Awards Convocation (Hermann Hall - Auditorium) – by ticket only
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Proclamation from the Mayor of the City of Chicago



OFFICE OF THE MAYOR
CITY OF CHICAGO

RAHM EMANUEL
MAYOR

PROCLAMATION

WHEREAS, from March 21 through March 24, 2019, the Chicago Public Schools Student Science Fair, Inc., will sponsor for Chicago Public Schools' students, the 69th Annual Citywide Chicago Public Schools Exhibition of Student STEM Research which will be held at the Illinois Institute of Technology; and

WHEREAS, the 2019 Exhibition of Student STEM Research follows the theme, Exploring the Unexplored through Science, Technology, Engineering and Mathematics; and

WHEREAS, approximately 250 students from a total of 10,000 participants at the local school and network levels will be selected to exhibit their projects and symposium papers at the Illinois Institute of Technology; and

WHEREAS, 70 of those students will be sent to the Illinois Junior Academy State Science Fair at Southern Illinois University in Carbondale, Illinois and four students will be sent to the International Science and Engineering Fair in Phoenix, Arizona; and

WHEREAS, students will compete in sixteen categories, including aerospace science, behavioral science, biochemistry, botany, chemistry, computer science, earth science, electronics, engineering science, environmental science, health science, materials science, mathematics, microbiology, physics, and zoology;

NOW, THEREFORE, I, RAHM EMANUEL, MAYOR OF THE CITY OF CHICAGO, do hereby proclaim March 21-24, 2019 to be CHICAGO PUBLIC SCHOOLS STUDENT STEM EXHIBITION DAYS IN CHICAGO, in recognition of the exceptional talents displayed by these students and in appreciation of the corporate sponsors, teacher sponsors, and parents who have provided support and encouragement for these young scientists.

Dated this 1st day of March, 2019.


Mayor



2018 Opening Ceremony

On Friday, March 17th, the 68th Annual Chicago Public Schools Student Science Fair opened with corporate and CPS sponsors' greetings, accolades and words of encouragement for the student scientists at this year's fair.



Chairperson Elizabeth Copper welcomes all present and acknowledges all the students on their excellent projects.



Dr. Debra Sutkowski greets Sgt. Powell and cadets of the Phoenix Military JROTC as they prepare to post colors.



The 2018 Annual City Exhibition of Student STEM Research is officially opened for the last time at the Museum of Science and Industry with the cutting of the ribbon by Chairperson Elizabeth Copper, sponsors and guests.



Fidel Marquez from ComEd welcomes everyone as he celebrates his 40th year anniversary of being a CPS Science Fair winner.



CPS representatives Sylvia Nelson Jordan, Luba Johnson, LaTanya McDade, CPS CEo, and Paschel Bennett are enjoying the 68th Annual STEM Exhibition.



About the Chicago Public Schools Exhibition of Student STEM Research

About the Exhibition

We are proud to present the 69th Annual Chicago Public Schools (CPS) Exhibition of Student STEM Research. The exhibition originated in 1950 as a vehicle to encourage and motivate young high school science students. Since then, a volunteer army of teachers and administrators has sustained this exemplary program. The objectives of the CPS Student STEM Exhibition are to:

- provide opportunities and support for students to conduct authentic research
- expose students to diverse STEM learning communities
- obtain scholarships for selected Chicago Public Schools graduating seniors
- maintain perpetual interest in fostering scientific and design research, invention, and technological development
- promote scientific/design interests and hobbies of students
- conduct an annual student STEM exhibition, symposium and essay contest

School, Regional and City Student STEM Exhibitions

More than 8,000 students enter projects, beginning at the local school level. Local school winners exhibit at the regional level. Approximately 250 winners from 9 Regional Networks STEM Exhibitions are exhibiting at this three-day citywide exhibition. The CPS Exhibition of Student STEM Research is always held in the spring.

Student STEM Symposium and IJAS Essay Contest

Additional components of the exhibition are the CPS Student STEM Symposium and IJAS Essay Contests. High school students participate in the symposium competition, presenting their research to a panel of judges. High school students and 7th- and 8th-graders participate in the essay contests, writing about a given contemporary issue in science.

State and International Exhibitions

Each year, approximately 45 students are selected to participate at the Illinois Junior Academy of Science (IJAS) State Fair, and 15 research paper presentations

are delivered at the IJAS. This event is scheduled May 3 and May 4, 2019, at Southern Illinois University in Carbondale, Illinois. In addition, the four top-scoring students from the CPS Exhibition of Student STEM Research will participate at the International Science and Engineering Fair (ISEF), which will be held in Phoenix, Arizona, May 12-17, 2019.

Sponsors

Primarily, the CPS Student Science Fair, Inc. has three sponsoring organizations. The Chicago Public Schools, Office of Teaching and Learning oversee the planning for the local school and regional STEM exhibitions. The CPS Office of Teaching and Learning is the host department for CPSSSF, employing the Regional STEM Exhibition Coordinator, CPS/SSF Liaison and contributing operational funds to run the exhibition each year. This year we welcome and give thanks to Illinois Tech (Illinois Institute of Technology) our new site host of the citywide Student STEM Exhibition. Chicago-area corporations spearhead the drive within the Chicago business community to obtain the necessary financial support for a successful Student STEM Exhibition experience. The Motorola Solutions Foundation, ComEd, An Exelon Company, BP America, Inc., and Peoples Gas are this year's corporate sponsors.

How You Can Help

To help the CPS Student STEM Exhibition and encourage young high school students to consider careers in the STEM fields, monetary contributions must be solicited. Without this financial support, the school and regional exhibition support, the production of the high quality event of the City Exhibition of Student STEM Research, and the participation in the state and international science fairs would be greatly limited.

Please consider being a contributor to the operating fund or scholarship fund, or providing special awards and tours prizes. Please send a letter of interest to contribute to CPS Student Science Fair, Inc., P.O. Box 803945, Chicago, IL 60680-3945, or visit website at cpsscifair.org.



Greetings from the President of the Board of Directors Chicago Public Schools Student Science Fair, Inc.

*Welcome! On behalf of the Board of
the CPS SSF, INC, welcome to the 2019
STEM Exhibition*

The Exhibition exists through the generosity of our Corporate Sponsors – BP America, ComEd an Exelon Company, Motorola Solutions Foundation, and Peoples Gas; our dedicated Chicago Public School Teachers, Administrators and leadership as well as the volunteer Board.

This year is filled with “newness” as this is the first year the STEM exhibition will be held at the Illinois Institute of Technology. CPS SSF, INC is grateful for IIT’s support in hosting. We encourage participants at the exhibition to tour the beautiful in-city campus during the Exhibition.

It is important that the efforts of the Chicago Public School participants be fully supported. The students for this year’s Exhibition come from public schools throughout all areas of Chicago and represent the additional educational focus of local school science clubs and the CPS Science & Math Teachers at the local school level.

Many of this year’s participants will continue their education in the STEM field and will receive financial support to pursue a STEM education, because of their efforts and success, through the scholarships awarded out of this Exhibition, which are made possible through both private and public donations.

We salute all who have participated and volunteered over the years, some as much as forty-nine (49) years of service specifically in this yearly Exhibition.

I have participated in this organization for over ten years and see the mission of this independent 501-c-3 as a worthy cause to financially support and to also become active as a volunteer. We welcome all levels of support.



Again, welcome.
Best regards,

Brian Stepp
President, Board of Directors



CHICAGO PUBLIC SCHOOLS
STUDENT SCIENCE FAIR, INC



WELCOME

Greetings from Student Science Fair, Inc. Executive Director

*Welcome to the 69th Chicago Public
Schools Student Exhibition of STEM
Research.*

I know today you will present your research/design projects to judges. Remember this is one step in possibly opening doors to future interests in your field of study. But WAIT, there may be a project that YOU would never have thought about in this room! This weekend is SPECIAL because of you. This weekend gives you an opportunity to: explore other topics outside your immediate interest; meet new people outside your immediate school; and create an intellectual environment to challenge your academic potential.

Today begins an era for us in this NEW place. It shows the resiliency of the people who believe that science presentation opportunities are important for students to have to apply and communicate their scientific concepts. Being in this new location, demonstrates the flexibility needed to grow as an individual, community and organization.

I would like to thank ALL of you, your parents/guardians, teacher sponsors, administrators and staff and university partners for supporting your efforts in STEM research. Keep up the great work, for our future really lies in your discoveries, curiosities and explorations

A big Thank you to all of the judges and volunteers; the CPS Student Science Fair, Inc Board of Directors and our many corporate sponsors. Thank you Chicago Public Schools and especially a HUGE thank you to Illinois Tech for hosting our 69th Chicago Public School Student Exhibition of STEM Research..

Sincerely,

Elizabeth S. Copper
CPSSSF, Inc., Executive Director



CHICAGO PUBLIC SCHOOLS
STUDENT SCIENCE FAIR, INC



Greetings from BP America, Inc. Corporate Sponsor

Dear students,

On behalf of BP America, Inc., let me offer congratulations on your participation in the annual Chicago Public Schools City STEM Exhibition. You should be extremely proud of the hard work you have done and the commitment you have made. What a great achievement!

BP has been a proud supporter of the City STEM Exhibition for many years. This year's theme, "Exploring the Unexplored through STEM," is truly the essence of a career in STEM—and a mission we foster at BP. As one of the world's leading energy companies, our employees do research on the cutting edge of science and technology and put it into practice every day throughout the globe. That work includes the more than 3,500 BP employees, your friends and neighbors, right here in Chicagoland and Northwest Indiana.

With our expertise in the fields of oil, natural gas and wind energies, we provide people with fuel for transportation, energy for heat and light, retail services and petrochemical products for everyday items.

At BP, we're committed to providing the energy that fuels growth and improves lives but in new ways, with fewer emissions. We are working to reduce carbon emissions in our own operations; we're improving our products to help customers lower their emissions; and we're creating low carbon businesses. We're setting high standards that will require intense innovation and investment. That innovation includes things like keeping our net growth in operational emissions to zero out to 2025 and expanding our businesses in biofuels, biopower, wind and solar. That expansion includes \$200 million over three years in solar alone and investing \$200 million every year in ideas like faster-charging electric vehicles and turning household waste into aviation fuel.

This effort to reduce carbon and come up with new products is one of the reasons we need young people like yourselves. The world needs solutions and your pursuit of STEM will help find those solutions.



No matter what career you decide to pursue, you will be well-served by the curiosity, drive and passion to continually increase your knowledge and understanding. The work you're showcasing today shows the great importance of scientific inquiry. Many of our employees got their start by participating in science fairs just like this one.

Again, congratulations to all the City STEM Exhibition participants, families and teachers. On behalf of myself and our entire company, I look forward to seeing your projects and wish you the best as you embark on this wonderful experience.

Sincerely,

Kelli McDonald
Commodity Risk Manager
BP America, Inc.





Greetings from ComEd, An Exelon Company Corporate Sponsor

To our Student STEM participants,

Congratulations on being part of the 69th annual Chicago Public Schools Exhibition of Student STEM Research! Whether this is your first science exhibition, or you have participated in the past, we are thrilled that you decided to explore your potential in STEM.

Developing a project for the exhibition is both a challenging and rewarding experience. You've put your knowledge of reading, writing, math, critical thinking, data analysis, and computer science to work. Soon, you'll also get to practice public speaking by explaining and defending your project to a panel of judges.

This process helps you build the skills you'll need for a successful career in STEM. In fact, one of ComEd's leaders, Fidel Marquez, senior vice president of governmental and external affairs, stood in your shoes in this same competition 41 years ago!

That is why ComEd continues to energetically support the science fair and students like you. We know that events like these are key to your personal and professional development and provide you with the skills you need to be part of our future workforce in Illinois.

I hope that building your projects over the last few months gives you a taste of the excitement that comes with a career in STEM. We wish you the best at this next level of competition and look forward to seeing how your final projects "Explore the Unexplored!"

Joe Dominguez
CEO, ComEd



WELCOME

ComEd[®]
An Exelon Company



Greetings from Motorola Solutions Foundation, Corporate Sponsor

To all Student STEM Participants

Congratulations on being selected to participate in the Chicago Public Schools Exhibition of Student STEM Research! We applaud your interest in science and your commitment to exploring the world around you.

At Motorola Solutions, we share your passion for innovation and scientific exploration. Motorola's global team of scientists, engineers, and technicians use many of the processes you're demonstrating today to develop new devices and technologies to make communities safe and thriving.

Motorola Solutions and Motorola Solutions Foundation are proud to support your commitment to learning. We extend our thanks to your teachers, parents, friends, family members, and volunteers who have helped you reach this level of success. We encourage you to continue to be your best and create the discoveries and innovations of tomorrow that will make the world a happier, healthier, safer place.

Best Regards,
Matt Blakely
Executive Director
Motorola Solutions Foundation



MOTOROLA SOLUTIONS
FOUNDATION



Greetings from Peoples Gas Corporate Sponsor

Welcome to the 2019 Exhibition of Student STEM Research.

Through our partnership with Chicago Public Schools, Peoples Gas has a proud tradition of supporting the education of Chicago's future workforce and its next generation of community, business and civic leaders.

The CPS science fair has provided an opportunity for generations of students to showcase their talents and achievements in the areas of science, technology, engineering and math. The students exhibiting their projects here today offer a look at our future. They are the teachers, engineers and scientists of tomorrow.

The themes of the research may have changed over the years, but the dedication to excellence by CPS students has remained constant. We salute your hard work, curiosity and determination.

At Peoples Gas, we have been longtime supporters of the exhibition both as a corporate sponsor and through our volunteer efforts. Throughout the year, Peoples Gas engineers serve as advisers to middle school science clubs, helping students prepare their projects. Many of our current and former employees also are serving as judges today, and some have been judges for many years.

Careers in the energy industry are growing and changing every day, offering great opportunities for the next generation of workers. When I think about the talent displayed at this exhibition, it gives me great confidence about the future of our industry.

On behalf of everyone at Peoples Gas, congratulations to the students competing in the 2019 Exhibition of Student STEM Research, and thank you to the teachers, staff, parents and judges who made it possible.

Charles Matthews
President and CEO
Peoples Gas



WELCOME

PEOPLES GAS®

We Keep Life Moving



Greetings from IIT

*Welcome from the President of
Illinois Institute of Technology*

Discover, Create and Solve

More than 125 years ago, Illinois Institute of Technology was founded to provide young people with the opportunity to learn the knowledge and skills needed to solve society's most pressing challenges.

As participants in the 69th Annual CPS Exhibition of Student STEM Research, hundreds of students from across the city will join the illustrious ranks of Chicago's leaders, dreamers, and visionaries on the forefront of science, technology, engineering and mathematics. We welcome these young innovators in the same spirit that we welcome our own students, encouraging them to make Illinois Tech a place where they can imagine solutions and make them real.

We thank the parents, teachers, judges and supporters who have helped to make this event a reality.

We wish a warm welcome to all and hope that each of you have an unparalleled opportunity to discover, create, and solve here at Illinois Tech.

Best Wishes,

Alan W. Cramb
President
Illinois Institute of Technology



ILLINOIS INSTITUTE
OF TECHNOLOGY
College of Science



WELCOME

Greetings from the Chicago Public Schools Chief Executive Officer

*Dear STEM Exhibition
Community,*

It is my great pleasure to welcome you to the 2019 Chicago Public Schools Citywide STEM Exhibition!

The students who are presenting their projects have worked hard in their classes and labs to prepare for this event, researching topics in the fields of Science, Technology, Engineering and Math (STEM). I have no doubt that the knowledge and experience they have gained will help prepare them for success in college and in a global, 21st century career.

In addition to growing their knowledge, events like this one give students the opportunity to build their confidence and improve their critical thinking and communication skills. I want to thank all of the teachers and families who have helped our students develop these critically- important skills, and who have been a constant source of support along their path to this special day.

I applaud all of our students for their hard work and hope all participants and supporters enjoy the 2019 Chicago Public Schools Citywide STEM Exhibition!

Sincerely,

Janice K. Jackson, EdD
Chief Executive Officer
Chicago Public Schools





Greetings from the Chicago Public Schools Chief Education Officer

*Dear STEM Exhibition Students,
Parents and Educators,*

As the Chief Education Officer for Chicago Public Schools, it is my pleasure to welcome you to the 69th Chicago Student Citywide STEM Exhibition.

Our goal at CPS is to provide all students with a high-quality, well-rounded education, and academic competitions are a key component in achieving that goal. The STEM Exhibition provides students from across the city with the opportunity to explore issues in the areas of Science, Technology, Engineering and Math (STEM). By developing their own work plans and solving complex problems, students can use their projects from this exhibition as a springboard to a possible future in a STEM field, which are among the fastest-growing career opportunities in today's economy.

In addition to the academic benefits, this STEM Exhibition helps our students build their confidence, communication and leadership skills, preparing them to serve as our city's next generation of leaders. I want to congratulate our students on their hard work, and I thank the families and teachers who have been such a great source of support for them along the way.

I wish all of our participants the best of luck, not only during this STEM Exhibition, but throughout the rest of the school year and in all your future endeavors.

Sincerely

LaTanya D. McDade,
Chief Education Officer
Chicago Public Schools,





Greetings from the CPS Manager, Academic Competitions

Dear STEM Exhibition Students, Parents, and Educators,

On behalf of the Academic Competitions team, I am proud to welcome students, teachers, volunteers, and staff to the 69th Annual Exhibition of Student STEM Research! Congratulations to the students and the teachers who have guided students' advancement to this prestigious event. This event is a collaborative effort with CPS Student Science Fair, Inc. to celebrate you.

Students and teachers spend an immense amount of time and dedication to develop projects, test and analyze them prior to presenting them before you today. Additionally, teachers serve in the critical role of guiding their students and coaching them through the project development process. Both teachers and students have often sacrificed time beyond the school hours to ensure today's presentation is successful.

I also want to extend a warm thank you to our partners at Student Science Fair, Inc., staff and volunteers for making this event possible. Our partners are a committed group of professionals who devote their time to fundraising, planning, and organizing this event. Their arduous work is carried out with the goal to improve student outcomes, engage them in meaningful academic work, and prepare them for the growing fields of science, technology, engineering, and mathematics. STEM Exhibition participants learn critical academic skills. They also practicing time management and discipline. The skills students acquire from STEM Exhibition will assist them succeeding in the classroom and in their future careers. I believe that we get closer to accomplishing our aims for every cohort of students each year.



I hope you enjoy this event and highly encourage you to participate next year.

Sincerely,

Sylvia Nelson Jordan
Manager
Academic Competitions





Greetings from Student STEM Exhibition Chairperson

Congratulations!

Through your hard work and passion for STEM, you have made it to the 69th Exhibition of Student STEM Research here at Illinois Tech (Illinois Institute of Technology). I am honored to be your 2019 Exhibition of Student STEM Research Chairperson. As a former Chicago Public School student and science fair participant, this weekend holds a special place in my heart and in my career as a STEM educator. As a STEM educator, it makes me so proud to see so many of you here showcasing your research to professionals and scientists in the STEM fields. I am excited for your futures and for the future of our society because of your dedication and passion to continuing STEM research.

This year's theme is *Exploring the Unexplored through STEM*. Each of you here, through your curiosity, questions, and explorations are setting the stage for a more hopeful and prosperous future for our society. You are the ones that will be making discoveries that will cure diseases and expand life expectancy. You will create new technologies to help us extend the life of our planet. Today is your day to stand with others in the STEM fields and be part of an exciting time in research and discovery.

I would like to thank the students, your parents/guardians, teacher sponsors, school administrators and staff, and university partners for the support that they have provided to make this Exhibition of Student STEM Research possible. I would also like to thank the countless judges and volunteers who dedicate their time to support our students' research efforts. A special thank you to the chairpersons who make this exhibition possible each year. Thank you to the CPS Student Science Fair, Inc. Board of Directors and major corporate sponsors: BP America, ComEd An Excelon Company, Motorola Solutions Foundation, and Peoples Gas.



In closing, I would like to thank the Chicago Public Schools for the academic support to our students and to Illinois Tech for hosting the exhibition this year.

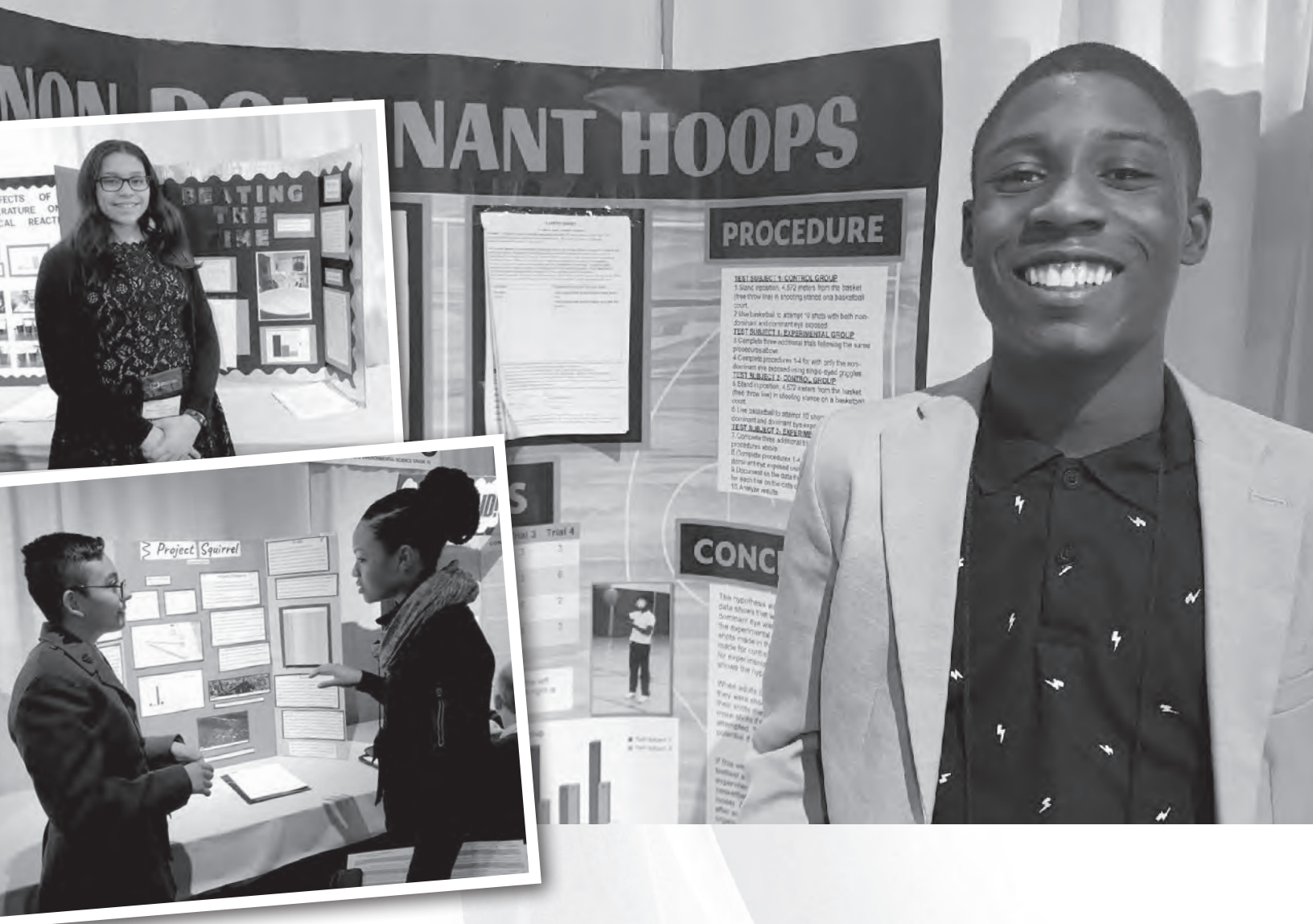
2019 Exhibition of Student STEM Research Chairperson
Chicago Public Schools Student Science Fair, Inc

Sincerely,

Jeanette Bartley
2019 Exhibition of Student STEM Research
Chairperson
Chicago Public Schools Student Science Fair, Inc.



CHICAGO PUBLIC SCHOOLS
STUDENT SCIENCE FAIR, INC



Peoples Gas is proud to support the 2019 Exhibition of Student STEM Research.

We are always amazed by these brilliant students who are Exploring the Unexplored through Science, Technology, Engineering and Mathematics.

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We Keep Life Moving



Corporate Sponsors

Beginning in 1958, the scope and complexity of the STEM Exhibitions outgrew the ability of the Chicago Board of Education and the teacher volunteers to continue without financial support from the business community. Illinois Bell Telephone was the first to recognize the importance of this premier academic event to the students of this city and participated as a corporate sponsor.

We are particularly grateful to those at Motorola Solutions Foundation, ComEd, An Exelon Company, BP America, Inc. and Peoples Gas, whose leadership was essential in helping us obtain the necessary support of local business and industry, and whose generous financial contributions made this year's Exhibition of Student STEM Research possible.

Over the years, the involvement, responsibilities, and obligations of the corporate sponsor have evolved. Currently, CPS Student Science Fair, Inc. asks the following

of the corporate sponsor:

- Provide a substantial contribution, a minimum of \$25,000, for operating capital and/or scholarships
- Provide assistance in soliciting additional funds for the balance of the costs incurred. These costs include goods and services, publications, scholarships and grants, support to regional exhibitions and the city exhibition, and participation at the Illinois Junior Academy of Science State Science Fair and the International Science and Engineering Fair.
- Provide help in securing a corporate sponsor for the next year's Student STEM Exhibitions.

For further information about becoming a corporate sponsor please send inquiries to CPS Student Science Fair, Inc., P.O. Box 803945, Chicago, IL 60680-3945

We would greatly appreciate your partnership.

2019	BP America, Inc. ComEd, An Exelon Company The Motorola Solutions Foundation Peoples Gas	2012	The Motorola Solutions Foundation Takeda Global Research & Development Center, Inc. BP America, Inc., ComEd, An Exelon Company	1994-95	Argonne National Laboratory With support from The University of Chicago Board of Governors
2018	BP America, Inc. ComEd, An Exelon Company The Motorola Solutions Foundation Peoples Gas	2011	The Motorola Solutions Foundation Takeda Global Research & Development Center, Inc. ComEd, An Exelon Company	1993	Chicago Sun- Times
2017	BP America, Inc. ComEd, An Exelon Company The Motorola Solutions Foundation Peoples Gas Takeda Pharmaceuticals International, Inc.	2010	The Motorola Solutions Foundation Takeda Global Research & Development Center, Inc. ComEd, An Exelon Company	1990-92	Motorola, Inc.
2016	BP America, Inc. ComEd, An Exelon Company The Motorola Solutions Foundation Peoples Gas Takeda Pharmaceuticals International, Inc.	2006-09	BP America, Inc ComEd, An Exelon Company The Motorola Solutions Foundation	1989	Sara Lee Corporation
2015	BP America, Inc. ComEd, An Exelon Company The Motorola Solutions Foundation Peoples Gas Takeda Pharmaceuticals International, Inc.	2004-05	BP America Inc. ComEd, An Exelon Company Kraft Foods	1988	AMOCO Corporation
2014	BP America, Inc., ComEd, An Exelon Company The Motorola Solutions Foundation Peoples Gas Takeda Global Research & Development Center, Inc.	2003	The Motorola Solutions Foundation BP America Inc. Kraft Foods	1987	Acme Steel Company
2013	BP America, Inc., ComEd, An Exelon Company	2000-02	The Motorola Solutions Foundation Kraft Foods	1986	Interlake Corporation, Inc.
		1999	The Motorola Solutions Foundation	1985	Chicago Sun-Times
		1998	Kraft Foods	1984	First National Bank of Chicago
		1996-97	The Motorola Solutions Foundation	1983	Peoples Gas
				1982	Illinois Bell Telephone
				1981	Sears, Roebuck and Company
				1980	International Harvester
				1979	Morton Norwich
				1978	Bell & Howell
				1977	Zenith Radio Corporation
				1976	Standard Oil (Indiana)
				1975	U.S. Steel
				1974	Commonwealth Edison
				1973	Harris Bank
				1972	Peoples Gas
				1971	Motorola, Inc.
				1970	Illinois Bell Telephone
				1969	Borg-Warner
				1968	Western Electric
				1967	Sears, Roebuck and Company
				1966	Inland Steel
				1965	Montgomery Ward
				1964	Standard Oil (Indiana)
				1963	Swift & Co.
				1962	Commonwealth Edison
				1961	International Harvester
				1960	Peoples Gas
				1959	U.S. Steel
				1958	Illinois Bell Telephone



Contributors

To all of those who contributed to the operating, scholarship funds and Special Awards & Tours, we offer a very special THANK YOU for helping make the 2019 Exhibition of Student STEM Research a success.

Operating Fund

Donations to the Operating Fund help produce the City Exhibition of Student STEM Research, the Regional Networks Student STEM Exhibitions and many programs supporting students' independent research for Student STEM Exhibitions.

Academic Sponsor

- CPS, Office of Teaching and Learning

Site Sponsor

- Illinois Institute of Technology

Corporate Sponsor – \$25,000 Minimum

- BP America, Inc.
- Chicago Public Schools
- ComEd, An Exelon Company
- Motorola Solutions Foundation
- Peoples Gas

Executive Circle - \$5,000 Minimum

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- Illinois Tool Works
- Roy Coleman & Dianna Uchida

Angels - \$1,000 Minimum

- The Chicago Community Foundation
- Anonymous
- Kenneth Zdunek & Mary Memhardt
- S & C Electric Company

Patrons - \$500 Minimum

Donors - \$100 Minimum

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- Rudy Joan Lubov
- Stella Muir
- Morton Suggestions
- Naylor Pipe Company
- Henry Rosenbaum

Scholarship Fund and Special Awards and Tours

Donations to the Scholarship Fund go to qualified high school seniors who have presented a project at a Regional and/or City-wide Student STEM Exhibitions and will major in one of the STEM in college. Donations to the Special Awards and Tours go directly to students, whose projects meet criteria set by the donors and are selected by Special Awards Judges.

Benefactors of Academic Scholarships

- DePaul University
- Illinois Institute of Technology
- Loyola University
- University of Chicago
- University of Illinois at Chicago
- University of Illinois at Urbana-Champaign

Executive Circle - \$5,000 Minimum

- Roy Coleman & Dianna Uchida

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- BP America, Inc.
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- Alpha Delta Chapter - DKG
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- David Gilligan
- Luba Johnson
- Christine Krupa
- Stephen McVeigh
- National Sorority of PDK
- Tracy Raoul

If you are interested in supporting Student STEM Exhibitions or becoming a sponsor, additional information can be obtained by sending an inquiry to CPS Student Science Fair, Inc., P.O. Box 803945 Chicago, IL, 60680-3945, or by contacting Luba Johnson at ljohnson131@cps.edu.



Symposium and Essay Contests

Symposium Information

Symposium is an integral and popular feature of the Chicago Public Schools Exhibition of Student STEM Research. This event held on Thursday, March 21, 2019, takes place at Illinois Institute of Technology in Hermann Hall. Student presenters from Grades 9–12, through their teacher sponsor, first submitted a scientific research paper. In January, a committee of volunteer readers evaluated these papers; and research papers were chosen to be presented on March 21, 2019. Each student must have performed the primary research described in their paper, must defend the scientific merit of the research, and display written and oral communication skills. During the Symposium competition, a panel of judges from the scientific, academic, and business communities listen to, question, and evaluate each presentation. Fifteen finalists are selected to participate at the Illinois Junior Academy of Science (IJAS) State Science Fair at Southern Illinois University in Carbondale, Illinois on May 3 and 4, 2019.

Essay Contests

IJAS Essay Contest

Also evaluated by volunteer readers at the January Symposium & Essay Reading Session are the essay papers submitted by students from Grades 7–12. As an ancillary activity of the State Science Fair, the IJAS sponsors an essay contest for students who conduct library research and prepare a 1500-word essay. The 2019 topic is: "Under the Sea". Five of the IJAS student essays are selected as outstanding and the top scoring essays will be forwarded to the IJAS for evaluation at the state level.



2019 Essay Contest Semi-Finalists

Ex No	First Name	Grd	Network	School	Title
801	Ayala Alesandra	12	NW16	Hubbard	Pollution In Our Earth's Ocean
802	Chloe Bryant	8	NW10	Carroll-Rosenwald	The Effects of Pollution on Sea Life
803	Bonnie Kennedy	11	NW14	Lane	Mega-nourishment and Beach Erosion
804	Gerardo Lopez	12	NW16	Hubbard	Effects of Coral Reefs Dying Out
805	Ana Orduno	12	NW16	Hubbard	Plastics Under the Sea
806	Griselda Pasillas	12	NW15	Curie	Climate Change and Element Distribution
807	Ianna Perdomo	10	ISP	Juarez	Ecological Effects of Underwater Volcanoes
808	Cynthia Regalado	12	NW15	Curie	Coral Reefs in Marine Environments
809	Janet Rodriguez	12	NW15	Curie	Effect of Man on Marine Life Habitats
810	Corina Vinarov	8	ISP	Lincoln	Inside The Tank

* See page 27 for the Network Abbreviation Key



Symposium Schedule

Thursday, March 21, 2019

ROOM HH 010 - Session A 9:00 - 11:30 A.M..

Ex#	Student Name	Grade	Project Title	School	Category	Network
601	Ann Kennedy	11	Effect of Anticipation on Memory	Lane HS	Behavioral Science	NW14
602	Citlali Rizo	9	Color of Memory	Curie HS	Behavioral Science	NW15
603	Tasnim Mahi	11	Effect of Acidity and Solutions on Betalains	Lane HS	Biochemistry	NW14
604	Koyuki Yamada	9	The Effect of Tree Trunk on Leaf Size	Lincoln Park HS	Botany	ISP
605	Mercy Oladipo	12	Saving Skin Year Two: An Algorithmic Model	Young HS	Health Science	ISP
606	Michael Pucsko	11	Effect of Carvacrol on Antibiotic Efficacy	Lane HS	Microbiology	NW14
607	Malika Al-Safarini	10	The Affecting Factors of Rising Sea Levels	Von Steuben HS	Environmental Science	NW14

ROOM HH 002 - Session B 9:00 - 11:30 A.M.

608	Ewan Evans	11	Particle Fallout	Von Steuben HS	Environmental Science	NW14
609	Steven Li	11	Combating Plastic With Facebook	Payton HS	Environmental Science	ISP
610	Xu Liu	9	Back to Future!	Lincoln Park HS	Environmental Science	ISP
611	Michaela Whiteley	9	The Effects of Roasting on Coffee Acidity	Lincoln Park HS	Chemistry	ISP
612	Shannon Assouline	10	The Evolution of Cryptography	Young HS	Computer Science	ISP
613	Sena Cetin	9	The Effect of Weight on Mattress Type	Lincoln Park HS	Materials Science	ISP
614	Stoykof Nunez	12	Post-Tensioned Infrastructural Concrete	Phoenix Military HS	Materials Science	ISP

ROOM HH 003 - Session C 9:00 - 11:30 A.M.

615	Abigail Arnashus	11	Revolutionizing Repi-Lighting: The LED	Von Steuben HS	Engineering Science	NW14
616	Safa Azad	11	Plastic Concrete	Von Steuben HS	Engineering Science	NW14
617	Michael LeMasters	9	Security of RFID Compared to Master Lock	Amundsen HS	Engineering Science	ISP
618	Fatoumata Dioubate	11	Weight Capacity and Wall Structure	Von Steuben HS	Physics	NW14
619	Mouaad Lamsahel	10	Hooke's Law in an Aqueous Environment	Von Steuben HS	Physics	NW14
620	Erin Moore	11	Which Roof Shape Is The Strongest?	Von Steuben HS	Physics	NW14

ROOM HH 010 - Session D 1:00 - 3:30 P.M.

621	Jane Miller	9	The Effect of Water on Soil Erosion	Lincoln Park HS	Environmental Science	ISP
622	Ishani Pidara	9	The Effect of Fuel Type on Energy Output	Lincoln Park HS	Environmental Science	ISP
623	Robert Szymczyk	12	The Effects of Water Pollution on Mosquitoes	Lane HS	Environmental Science	NW14

ROOM HH 002 - Session E 1:00 - 3:30 P.M.

624	Christopher Moret	11	Gear Shift for Vex	Von Steuben HS	Engineering Science	NW14
625	Anel Reinoso	10	Effect of Voltage Levels on Prosthetic Hand	Lane HS	Engineering Science	NW14
626	Sofia Rogel	11	Thermo-Dynamic Joint Contracture Brace	Von Steuben HS	Engineering Science	NW14

ROOM HH 003 - Session F 1:00 - 3:30 P.M.

627	Kathryn Roseland	9	Effects of Temperature on Electrical Energy	Von Steuben HS	Physics	NW14
628	Amina Solangi	10	Keep It Hot!	Von Steuben HS	Physics	NW14
629	Casey Witkowski	11	What Type of Wood Is The Strongest?	Von Steuben HS	Physics	NW14
630	Kayla Huang	11	K-edge Sulfur XANES Analysis	Young HS	Physics	ISP

* See page 27 for the Network Abbreviation Key



Symposium & Essay Luncheon Schedule

Thursday, March 21, 2019

IIT-Hermann Hall – Expo North – 11:30 A.M.

Welcome and Remarks

Jeanette Bartley

Chairperson, CPS Student Science Fair, Inc.

Introduction of Special Guest

Jennifer Patush

Symposium & Essay Committee Chairperson

Guest Speaker

Evan Scott, Ph.D.

Assistant Professor of Biomedical Engineering
Northwestern University

Recognition of Symposium
Participants

Jennifer Patush

Symposium & Essay Committee Chairperson

Recognition of Judges
(Years of Service)

Jennifer Patush

Elizabeth Copper





Exhibit Information

The CPS Student STEM Exhibition offers academically and scientifically talented young CPS students an opportunity to showcase their accomplishments. The projects on display represent the most outstanding scientific and design endeavors of students in Grades 7–12.

The exhibitors at this year's CPS Exhibition of Student STEM Research were selected from approximately 8,000 students who competed in school and regional STEM Exhibitions throughout the city during this past January and February. These winners were chosen based on their scientific or design approach, thoroughness, creativity, and presentation. Once again, we welcome CPS student winners from the QED: Chicago's Youth Math Symposium. These winners were chosen based on their mathematical approach, thoroughness, creativity, and presentation. QED is an abbreviation of the Latin phrase "quod erat demonstrandum," which is commonly used to signal the completion of a mathematical proof. We welcome all student participants to the 69th Annual City-wide Exhibition of Student STEM Research

On Friday, March 22, 2019, over 250 judges from the scientific, academic, and business communities will observe, listen to, question, and evaluate the exhibitors. Winners are selected based on established criteria as indicated in the STEM Exhibition Handbook.

The top 45 winners will participate at the Illinois Junior Academy of Science (IJAS) State Science Fair, held May 3 and May 4, 2019, hosted by Southern Illinois University in Carbondale, Illinois. Students will compete with other students from around the state.

On Saturday, March 23, 2019, the top 30 outstanding high school projects will be evaluated by a special panel of judges. Four finalists will be invited to compete at the International Science and Engineering Fair (ISEF), which is being held May 12-17, 2019 in Phoenix, Arizona.



Some of the judges also function as Special Awards judges for the companies that have graciously sent them to evaluate the exhibitors. Each company may have one or more special criteria, in addition to the established criteria, by which to determine the recipient of its special award. All CPS Student STEM Exhibition participants will be recognized with certificates and souvenirs at the Awards Convocation on Sunday, March 24, 2019, at 1:00 p.m., in the Hermann Hall Auditorium of Illinois Tech (Illinois Institutes of Technology). Approximately 100 students will be individually recognized with cash prizes, awards, and other special gifts. In addition, all CPS Student STEM Exhibition participants are eligible to apply for financial support grants and college scholarships in their senior year of high school.

All CPS Exhibition of Student STEM Research participants are WINNERS!

If you would like to serve as a judge, please contact Yolanda Del Rio at yolanda_delrio@comcast.net to have your name added to the database. At a minimum, judges must have a degree in science, mathematics, computer science, or engineering. They may not be a current employee of the Chicago Public Schools.



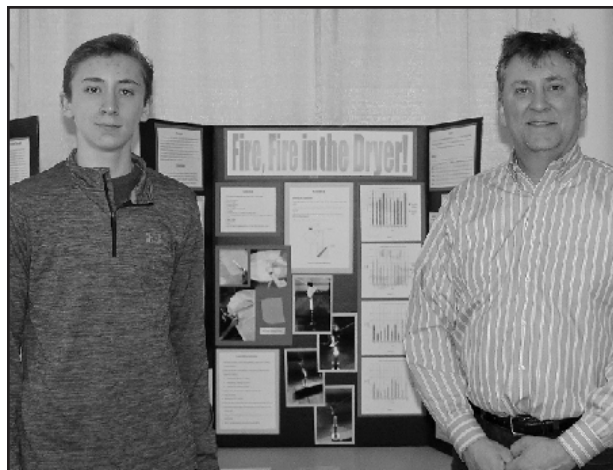


Exhibit Judging Schedule

Friday, March 22, 2019

Exhibition of Student STEM Research Exhibit Judging

7:15 A.M. – 8:00 A.M.	Continental Breakfast	Hermann Hall Expo
8:00 A.M. – 8:30 A.M.	Judges Briefing	Hermann Hall Auditorium
8:30 A.M. – 10:30 A.M.	Judging of Exhibits	Hermann Hall Ballroom/Alumni Lounge/ Gallery Lounge
10:30 A.M. – 11:15 A.M.	Opening Ceremony/Ribbon Cutting	Hermann Hall Expo
11:30 A.M. – 1:30 P.M.	Judges Buffet Luncheon	Hermann Hall Expo
11:45 A.M. – 1:00 P.M.	Judging Continues	Hermann Hall Ballroom/Alumni Lounge/ Gallery Lounge
1:00 P.M. – 3:15 P.M.	STEM Exhibition (Open to the Public)	Hermann Hall



**EXHIBIT JUDGING
FRIDAY**



Exhibits by Category

Ex#	Student Name	Grade	Title	Network	School
Aero-Space Science					
1 E	Fernando Rodriguez	8	Wing Angle vs. Balsa Wood Airplane Flight	ISP	Burroughs
2 E	Alejandro Arellano	11	Ways To Get Aero Like a Pro!	ISP	Chicago Agri HS
3 E	Omar Majzoub	11	Aerodynamics of Fuselage Takeoff Angles	ISP	Jones HS
4 E	Jeffrey Ren	11	Next Gen Aircraft: Cost Benefit Analysis	ISP	Phoenix Military HS
5 E	Uzair Ahmed	12	The Effect of Liquid Fuel on Thrust Yield	NW14	Lake View HS
Behavioral Science					
6 E	Jalen Grimes	7	Classroom Conformity	NW01	Edison
7 E	Tamara Zhyllka	7	Afterimages	ISP	Columbus
7 E	Sofia Baranovska	7	Afterimages	ISP	Columbus
8 E	Mia Combs	8	Crafting Cognition	NW03	Whitney Young
9 E	Leilani Correa	8	Sweet Skillz!	ISP	Columbus
9 E	Deayjah Mitchell	8	Sweet Skillz!	ISP	Columbus
10 E	Iyannah Hatcher	8	Anxiety Analysis	ISP	Columbus
10 E	Evelina Nosa	8	Anxiety Analysis	ISP	Columbus
11 E	Svyatoslav Meleshko	8	Gum Power	ISP	Columbus
11 E	Diana Kruhlyak	8	Gum Power	ISP	Columbus
12 E	Elizabeth Perez	8	Coordination Situation!	NW03	Locke J
13 E	Naomi Verdi	8	Eye Witness, You Witness	NW13	Washington G
14 E	Fariya Adil	9	Time Perception and Blood Pressure With Age	NW14	Mather HS
15 E	Evelyn Olejniczak-Similio	9	Positive and Negative Reinforcement	ISP	Amundsen HS
16 E	Citlali Rizo	9	Color on Memory	NW15	Curie HS
17 E	Breonna Hill	10	Open Your Eyes!	NW16	Julian HS
18 E	Amber Robinson	10	Can You Deal With It?	NW16	Julian HS
19 E	Sylvie Tran	10	Which Age Group Retains Information the Best	NW14	Mather HS
20 E	Teanna White	12	The Perception of Beauty	NW15	Clark HS
Biochemistry					
21 E	Jakob Nagy	7	What Sugar Works Best?	NW01	Beaubien
22 E	Sierra Sikora	7	The C In Citrus	NW14	Taft
23 E	Ahtziri Torres	7	A Bloody Process	NW02	McPherson
24 E	Olivia Fuentes	8	How Sensitive Is the Kastle-Meyer Test?	NW03	Sayre
25 E	Kizzanna Nicholson	8	Don't Swallow That Gum!	NW05	Tilton
26 E	Yasmine Zmali-Meftah	8	Effects of Green Tea on Lowering Sugar Levels	NW06	Burr
27 E	Cynthia Castro	9	Fats in Your Chips	NW15	Curie HS
28 E	Anjelo Evans	9	Genetic Mutations Associated With Alzheimer's	NW14	Lake View HS
29 E	Izabella Journet	9	Get Rid of My Pain in No Time!	NW14	Lake View HS

Network (Abbreviation)

Charter (CHTR)	Network 4 (NW04)	Network 9 (NW09)	Network 14 (NW14)
Independent School Principals (ISP)	Network 5 (NW05)	Network 10 (NW10)	Network 15 (NW15)
Network 1 (NW01)	Network 6 (NW06)	Network 11 (NW11)	Network 16 (NW16)
Network 2 (NW02)	Network 7 (NW07)	Network 12 (NW12)	Network 17 (NW17)
Network 3 (NW03)	Network 8 (NW08)	Network 13 (NW13)	



Exhibits by Category

Ex#	Student Name	Grade	Title	Network	School
30 E	Angela Ruiz	10	It Dried Up So Much That It Burned	ISP	Phoenix Military HS
31 E	Kamaldeen Akorede	11	The Effect of pH on Efficiency of Catalase	ISP	Amundsen HS
32 E	Nicole Alicea	11	Substrate Concentration and Reaction Rate	ISP	Amundsen HS
33 E	Aneesh Anagha	11	Nanomedicine: A Study of Exosomal Endocytosis	ISP	Payton HS
34 E	Tasnim Mahi	11	Effect of Acidity and Solutions on Betalains	NW14	Lane Tech HS
35 E	Juan Chavira	12	pH Levels vs. Enzyme Activity	ISP	Amundsen HS
Botany					
36 E	David Chen	7	Acidic Reproduction	ISP	Sheridan
37 E	Jacquelin Ortega	7	Good Vibes	NW13	Southeast
38 E	Jack Spreyne	7	Compaction-Reaction	NW10	Kellogg
39 E	Lucia Bobadilla	8	Light It Up!	NW10	Stevenson
40 E	Daniel Gomez	8	Uno Moss	NW13	Washington G
41 E	Robert Griffith	8	Cheat Day(s)	NW04	Audubon
42 E	Amelie Liebhaber	8	How Does Acid Rain Affect Plant Growth?	NW01	Dever
43 E	Jayla Moore	8	The Effects of Elements on Plant Growth	NW13	Dunne
44 E	Daniel Morales	8	Magnetized Algae	NW08	Shields
44 E	Fernando Cisneros	8	Magnetized Algae	NW08	Shields
45 E	Fiza Rohgat	8	Cool Beans	NW03	Locke J
46 E	Navarez Aldo	9	Hydroponics vs. Natural: Which Is Better?	NW15	Curie HS
47 E	Kayla Savaglio	9	Asexual Plant Propagation of C.comosum	NW14	Lake View HS
48 E	Veronica Salgado	10	The Effect of Fertilizer on Plants	NW14	Lake View HS
49 E	Payton Fleming	12	Gibberellic Acidity vs. Plant Activity	ISP	Chicago Agri HS
Chemistry					
50 E	Iyana Carpenter	7	Heat Up To Some Cool Reactions	NW13	Dunne
51 E	Dayona Clark	7	Reaction Rate and Temperature	NW13	Hughes L
52 E	Sebastian Davila	7	Temperature vs. Battery	NW13	Washington G
53 E	Bridget Galibois	7	How the Eggless Cookie Crumbles	NW04	Skinner North
54 E	Samantha Gamero	7	Too Hot or Too Cold	ISP	Clark G R
55 E	Ivan Hernandez	7	UV Light vs. Sunscreen	NW10	Richardson Middle
55 E	Isabel Aguirre	7	UV Light vs. Sunscreen	NW10	Richardson Middle
56 E	Taylor Lawson	7	Testing Viscosity	NW13	Owens
57 E	Sinead O'Sullivan	7	To Burn or Not To Burn, That Is The Question?	NW14	Taft
58 E	Rekyla Reed	7	The Effects of Salt	NW12	Ruggles
59 E	Rowan Reynolds	7	Electromagnets: Can We Lift It? Yes We Can!	NW10	Keller
60 E	Sophia Rowan	7	Water Everywhere But Not a Drop to Drink	NW10	Keller
61 E	Reginald Addo	8	Salty Sea	NW05	Mason
62 E	Caroline Bryan	8	On The Rise	NW04	LaSalle
63 E	Kayla Cabello	8	Crystallization: Epsom Salt vs. Sugar	NW10	Richardson Middle

* See page 27 for the Network Abbreviation Key



Exhibits by Category

Ex#	Student Name	Grade	Title	Network	School
63 E	Jimmy Salazar	8	Crystallization: Epsom Salt vs. Sugar	NW10	Richardson Middle
64 E	Isabella Chacon	8	Eggcellent Eggs	NW06	Jackson A
65 E	Patrick Conlon	8	My Nuts Are Burning!	ISP	Franklin
66 E	Caitlyn Contreras	8	Does Flour Matter?	NW01	Dever
67 E	Abigail Diemer	8	Osmosis and the Three Bears	NW04	LaSalle
68 E	Maya Encarnacion	8	Does Iodine Affect Antioxidants in Vitamin C?	ISP	Chappell
69 E	Makylah Hill	8	Getting The Scoop	NW13	Southeast
70 E	Catia Hopson	8	The Rate of Diffusion	NE03	Leland
71 E	Anabelle Le	8	How Does Temperature Affect Liquid pH Levels?	NW01	Solomon
71 E	Ayla Rivera	8	How Does Temperature Affect Liquid pH Levels?	NW01	Solomon
72 E	Estaban Medina	8	Why Is It So Cold?	NW10	Stevenson
73 E	Inysse Tyler	8	Electrolyzing Water	CHTR	Frazier Intl.
74 E	Zosia Wilczek	8	The Cool Blue Light of Luminol	ISP	Smyser
74 E	Julia Koziol	8	The Cool Blue Light of Luminol	ISP	Smyser
75 E	Matthew Bell	9	Investigation of the Mpemba Effect	ISP	Amundsen HS
76 E	Namari Bell	9	Natural Solutions vs. The Rate of Ice Melting	NW17	Carver Military HS
77 E	Mirca Hernandez	9	Frozen Salt	NW17	Carver Military HS
78 E	Brook Dudlo	10	Cool Blue Luminol	NW15	Curie HS
79 E	Katherine Dunaway	10	How Can Saltwater Be Changed to Freshwater?	ISP	Amundsen HS
80 E	Jasmine Hughes	10	Does Particle Size Affect Dissolving Time?	NW17	Carver Military HS
81 E	Matthew Kamber	10	The Effect of Lactase Enzyme on Milk	ISP	Lincoln Park HS
82 E	Khansa Nasir	10	The Effect of Brand Shampoos on Colored Hair	NW14	Mather HS
83 E	Francisco Pantoja	10	Which Ibuprofen Dissolves Fastest?	ISP	Juarez HS
84 E	Guadalupe Pulido	10	Which Anti-Acid Works The Best?	NW17	Carver Military HS
85 E	Valerie Alvarez	11	How Grape Is Column Chromatography!	NW17	Brooks HS
86 E	Nallely Duran	11	Block the UV Light	ISP	Juarez HS
87 E	Marina Garduza-Ortega	11	The Most Kiss-proof Lipstick	ISP	Juarez HS
88 E	Anayely Reyes-Trejo	11	Down To The C In Berries	ISP	Juarez HS
Computer Science					
89 D	Darcy Combs	8	Predicting Perfect Parks With Python Programs	NW03	Whitney Young
90 D	Shannon Assouline	10	The Evolution of Cryptography	ISP	Young HS
91 E	Jamar Sullivan	11	Genetically Modified Algorithms	NW17	Brooks HS
Earth Science					
92 E	Michelle Thran	11	Effect of Soil Amendments on Mars Regolith	NW14	Lane Tech HS
Electronics					
93 E	Alvin Chen	7	The Batter(y) Brand	NW06	Healy
94 D	Rishi Sandrana	7	FaceBox	NW01	Edison
95 E	Rita Ni	9	Wifi vs. Materials	NW14	Lake View HS

* See page 27 for the Network Abbreviation Key

EXHIBIT JUDGING
FRIDAY



Exhibits by Category

Ex#	Student Name	Grade	Title	Network	School
96 E	Andrew Fay	10	Wired Charging or Wireless Charging	NW14	Mather HS
97 E	Sarah Bacon	11	Wifi Interferes	NW17	Brooks HS
98 E	Donald Tichy	11	Finding the Phantom	ISP	Chicago Agri HS
Engineering Science					
99 E	Omosefe Edomwande	7	What Battery Is The Best?	CHTR	Providence
100 E	Jaleesa Hamilton	7	All In The Atoms	CHTR	Providence
101 D	Yuri Kolovos	7	Best Design for Rescue Robot	ISP	Budlong
102 D	Nathan Ruger	7	Up For Grabs!	NW04	Audubon
102 D	Aaron Chang	7	Up For Grabs!	NW04	Audubon
103 E	Joy Williams	7	Make the Wind Work for You!	NW10	Kellogg
104 D	Mark Dace	8	Backpacking to Clean Water	NW10	Kellogg
105 E	Avi Dhir	8	The Degree of Energy	NW06	Jackson A
106 D	Toan Thai	8	Cleaning Paint Rinse Water	NW02	Clinton
106 D	Braulio Coronel	8	Cleaning Paint Rinse Water	NW02	Clinton
107 D	Rabier Benabdallah	9	The Pressure of Scuba Diving	ISP	Young HS
108 E	Daniel Kroger	9	Different Metals; Different Magnets	ISP	Phoenix Military HS
109 E	Michael LeMasters	9	Security of RFID Compared to Master Lock	ISP	Amundsen HS
110 E	Samuel Reynolds	9	Spaghetti: The Superhero in Disguise	NW14	Von Steuben HS
111 E	Guadalupe Zalazar	9	Bridges Falling Down	NW14	Mather HS
112 D	Dhruv Bala	10	Vision Based Robot System	NW14	Lane Tech HS
113 E	Gerardo Celis	10	Manipulating Magnets to Improve Generators	ISP	Marine Leadership HS
114 D	Gabriele Ron	10	The Efficiency of EM Energy Harvesting	NW14	Lane Tech HS
115 D	Abigail Arnashus	11	Revolutionizing Repti-Lighting: The LED	NW14	Von Steuben HS
116 D	Christopher Moret	11	Gear Shift For Vex	NW14	Von Steuben HS
117 D	Sofia Rogel	11	Thermo-Dynamic Joint Contracture Brace	NW14	Von Steuben HS
118 E	Sophia Villacarlos	11	House vs. Water	NW14	Von Steuben HS
119 D	Alexander Rienks	12	Electrostatic Wind Efficiency (E.W.E.)	ISP	Chicago Agri HS
Environmental Science					
120 E	Melanie Brito	8	Warming Up To Hurricanes	ISP	Smyser
121 E	Taylor Nicholoff	7	Sugar, Water, Flower	NW06	Healy
122 E	Theodore Schuler	7	Watt's Up With Alternative Energy	NW06	Burr
123 E	Sainabu Akinlolu	8	Bluegills, Lempomis, Macrochirus	NW02	McCutcheon
124 E	Yonatan De La Mora	8	UV & Activated Carbon For Water Purification	ISP	Jungman
124 E	Jerry Contreras	8	UV & Activated Carbon For Water Purification	ISP	Jungman
125 E	Briana Edwards	8	Destructive Rain Drops	CHTR	Chicago Intl Longwood
126 E	Talia Henderson	8	How Flocculation Cleans Turbid Water	NW13	Burnham
127 E	Riya Joshi	8	Tomato Power	NW03	Whitney Young
128 E	Ryan Goodrich	9	Soak It Up!	NW14	Lake View HS

* See page 27 for the Network Abbreviation Key



Exhibits by Category

Ex#	Student Name	Grade	Title	Network	School
129 E	Thomas Haran	9	Power Plants	ISP	Chicago Agri HS
130 E	Nicole Sandu	9	The Effect of Deforestation on Nitrate Levels	NW14	Lane Tech HS
131 E	Jade Jackson	10	Plantastic Growth	NW16	Lindblom HS
132 D	Zufsha Khan	10	Taming the Tsunamis	NW14	Mather HS
133 E	Ewan Evans	11	Particle Fallout	NW14	Von Steuben HS
134 E	Steven Li	11	Combating Plastic With Facebook	ISP	Payton HS
135 E	Maeghan O'Laughlin	11	The Effect of Mycorrhiza on Soybeans in Soil	ISP	Chicago Agri HS
136 E	Amalia Petropoulos	11	Phosphatase Activity & Inorganic Phosphorus	NW14	Mather HS
137 E	Helen Sa Tsu	11	Carbon Dioxide vs. UV and IR Radiation	ISP	Chicago Agri HS
138 E	Markel Venson	11	Mosquito CO ₂ Trap	NW14	Von Steuben HS
139 E	Natalia Goral	12	What's Coming Out of My Facet?	ISP	Amundsen HS
140 E	Kristine Schoenecker	12	The Optimal Flocculant	ISP	Chicago Agri HS
141 E	Robert Szymczyk	12	The Effects of Water Pollution on Mosquitoes	NW14	Lane Tech HS
142 E	Tanzanikia Taylor	12	Global Warming and Carbon Dioxide	NW15	Clark HS
Health Science					
143 E	Katelin Brock	7	Does Sleep Deprivation Affect Blood Pressure	NW12	Earhart
144 E	Jasmyne Corpuz	7	Apples, Aging, and Antioxidants	NW01	Prussing
145 E	Antonio Gonzalez	7	Which Type of Suture Holds A Wound The Best?	NW03	Locke J
146 E	Sophie Gueret	7	A Spoonful of Sugar	NW06	Jackson A
147 E	Claire Shank	7	Music In My Heart	NW01	Peterson
147 E	Huma Ughratdar	7	Music In My Heart	NW01	Peterson
148 E	Jacob Weitzenfeld	7	pH: Finding Balance in Food	ISP	Ebinger
149 E	Gabriella Hagen	8	How Many Is Too Many?	ISP	Ebinger
149 E	Artemis Rohrman	8	How Many Is Too Many?	ISP	Ebinger
150 E	Rory Maxwell	8	Sun-Sational Protection	NW06	Jackson A
151 E	Andre Sutton	8	How Does Sugar Effect the Potency of Vitamin C	NW11	Turner-Drew
152 E	Ana Rivas	9	Store bought vs. Homemade Soap	NW14	Kelvyn Park HS
153 E	Jenny Huynh	10	The Amount of Energy Stored Within Junkfood	ISP	Lincoln Park HS
154 E	Samera Franklin	12	Code Red!	NW16	Julian HS
155 D	Mercy Oladipo	12	Saving Skin Year Two: An Algorithmic Model	ISP	Young HS
Materials Science					
156 E	Xitlaly Gaytan	7	How Strong Is A Toothpick Platform?	NW07	Saucedo
156 E	Andrea Ruiz-Luna	7	How Strong Is A Toothpick Platform?	NW07	Saucedo
157 E	Nora Winans	7	Effect of Pointe Shoes on Balance Time	NW17	Kenwood
158 E	Sydney Howard	8	Ukulele String Composition and Tuning	ISP	Burley
159 E	Estella Moster	8	Burn Baby Burn	NW04	Hawthorne
160 E	Kameron Robinson	8	Solar Cooking: Copper or Aluminum	NW05	Melody
160 E	Connor Johnson	8	Solar Cooking: Copper or Aluminum	NW05	Melody

* See page 27 for the Network Abbreviation Key

EXHIBIT JUDGING
FRIDAY



Exhibits by Category

Ex#	Student Name	Grade	Title	Network	School
161 E	Noel Rosania	8	The Freezing Phenomenon	NW02	Coonley
162 E	Natalie Lewandowski	11	Spin! Spin! Spin!	NW14	Lake View HS
163 E	Stoykof Nunez	12	Post-Tensioned Infrastructural Concrete	ISP	Phoenix Military HS
164 E	Michael Victory	12	Soaking Up The World	NW15	Clark HS
Mathematics					
165 D	Ricardo Cabrera	7	Barcode Logic	NW16	Lindblom HS
166 E	Colin Jung	7	Julia Points and Their Sets	NW01	Edison
167 E	Phoebe Koehler	7	Lottery Strategies?	NW03	Whitney Young
168 D	Linnea Holcomb	8	Survive and Thrive	NW01	Peterson
169 D	Amie Kitjasateanphun	8	The Probability Analysis of Biased Judging	ISP	Whitney Young
169 D	Maggie Tsyganova	8	The Probability Analysis of Biased Judging	ISP	Whitney Young
170 D	Micah Kohng	8	Spot Solitaire	ISP	Whitney Young
171 D	Vivian Liu	8	Amida Kuji 2.0	ISP	Whitney Young
172 E	Ozzie Telisman	8	Spider Walk Probability	NW04	Skinner North
172 E	Raymond Sansonetti	8	Spider Walk Probability	NW04	Skinner North
173 D	Isabel McGuigan	10	Solutions to Multivariable Congruences mod p	ISP	Young HS
174 E	Kwam Byll	11	Data Sorting Algorithms	NW17	Brooks HS
175 D	Angel Gong	11	State Games and Markov Chairs	ISP	Payton HS
176 D	Lane Vanderslice	11	Optimal Leading Strategies for Euchre	ISP	Payton HS
177 D	Elisabeth Fraser	12	Travel-Sized: An Exploration in Origami	ISP	Payton HS
178 E	Lillian Jirousek	12	The Mercurial Matrix	ISP	Payton HS
Microbiology					
179 E	Amaya Martin	7	Preservatives and Microorganisms	NW09	Hendricks
180 E	Maya Joshi	8	Antimicrobial Effects of Turmeric & Castor Oil	ISP	Whitney Young
181 E	Dylan Kaminski	8	Temperature Troubles	NW04	Hawthorne
181 E	Jonah Pfeifer	8	Temperature Troubles	NW04	Hawthorne
182 E	Princess Ponce De Leon	8	Effect of Diluted Hand Sanitizer on E.coli	NW14	Kelvyn Park
182 E	Maritza Martinez	8	Effect of Diluted Hand Sanitizer on E.coli	NW14	Kelvyn Park
183 E	Ritvik Viniak	8	Natural vs. Pharmaceutical Antibiotics	ISP	Whitney Young
184 E	Maia Palomar	10	Effect of Natural Antibiotics on E.coli	NW14	Lane Tech HS
185 E	Dayna Dayson	11	The Magic of Essential Oils	NW14	Steinmetz HS
186 E	Mia Madrigal	11	Effects of Different Agents on Skin Bacteria	NW14	Lane Tech HS
187 E	Ciara Martinez	11	Effect of Disinfectants on Bacterial Growth	NW14	Lake View HS
188 E	Michael Puczko	11	Effect of Carvacrol on Antibiotic Efficacy	NW14	Lane Tech HS
189 E	Christopher Adame	12	Response to 25D in Prostate Cancer Cells	CHTR	Catalyst - Maria HS
190 E	Abhishek Joshi	12	Effect of Temperature on Algal Photosynthesis	NW14	Lane Tech HS

* See page 27 for the Network Abbreviation Key



Exhibits by Category

Ex#	Student Name	Grade	Title	Network	School
Physics					
191 E	Zitlali Cantoran	7	Sound on the String	NW07	Saucedo
191 E	Yajeisly Vargas	7	Sound on the String	NW07	Saucedo
192 E	Josiane Johnson	7	The Mpemba Effect	NW13	Southeast
192 E	Jazmine Vitela	7	The Mpemba Effect	NW13	Southeast
193 E	Jade Madden	7	They All Fall Down	NW10	Keller
194 E	Isabella Navarrete	7	Absorbance of Light	NW13	Gallistel
194 E	Natalia Noriega	7	Absorbance of Light	NW13	Gallistel
195 E	Matthew Poueymirou	7	Effect of Car Shape on Speed	NW17	Kenwood
196 E	Kinzie Reed	7	Effect of Frequency on Sound Reverberation	NW17	Kenwood
197 E	Dylan Sebanc	7	Ice Cream Freezer	NW02	Waters
198 E	Laila Bahena	8	Nice and Cozy	NW03	Locke J
199 E	Aidan Elliot	8	Generating Electricity	ISP	Chappell
200 E	Philip Esparza	8	Is The Bank Open?	ISP	Zapata
200 E	Julian Barrera	8	Is The Bank Open?	ISP	Zapata
201 E	Jhaidyn Ford	8	Thermal Conductivity	NW12	Dixon
202 E	Jasmin Garcia	8	Can A Laser Measure Sugar Concentrations?	NW14	Kelvyn Park
203 E	Zayd Majzoub	8	Aerodynamics of Propeller Tip Shape	ISP	Franklin
204 E	Promize Reed	8	Decreasing Intensity of Light	NW05	Lawndale
205 E	Julia Risk	8	Keeping An Even Keel	ISP	Burley
206 E	Leah Williams	8	The Wallflower of Radiation	ISP	Franklin
207 E	Mila Wolf	8	Into Thin Air	NW04	LaSalle
208 E	Adamaris Galicia	9	Soccer Science	NW14	Mather HS
209 E	Madeline Ren	9	The Factors That Affect Singing Stemwares	NW14	Mather HS
210 E	Andrew Martin	10	Radiation Levels	ISP	Chicago Agri HS
211 E	Amina Solangi	10	Keep It Hot!	NW14	Von Steuben HS
212 E	Michel Adelen	11	Inductive Efficiency	NW17	Brooks HS
213 E	Kayla Huang	11	K-edge Sulfur XANES Analysis	ISP	Whitney Young HS
214 E	Erin Moore	11	Which Roof Shape Is The Strongest?	NW14	Von Steuben HS
215 E	Cindy Vilchiz	11	Too Much or Not Enough?	NW17	Carver Military HS
216 E	Casey Witkowski	11	What Type of Wood Is the Strongest?	NW14	Von Steuben HS
217 E	Nolan Trost	12	Magnetic Acceleration Device	ISP	Chicago Agri HS
Zoology					
218 E	Adriana Alvarez	8	Cricket Diets	NW10	Stevenson

* See page 27 for the Network Abbreviation Key

EXHIBIT JUDGING
FRIDAY



Illinois Tech Hermann Hall

Projects
1-88

P = Power

Gallery Lounge

Hermann Hall
EXPO

Information Desk

Projects
89-197

Projects
198-218

69th ANNUAL CHICAGO PUBLIC SCHOOLS
EXHIBITION OF STEM RESEARCH

Exploring the Unexplored Through

Illinois Institute of Technology



EXHIBIT JUDGING
FRIDAY



Student Exhibitors

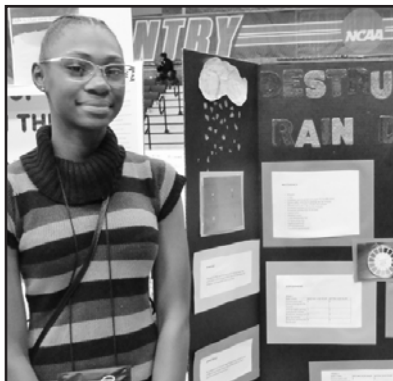
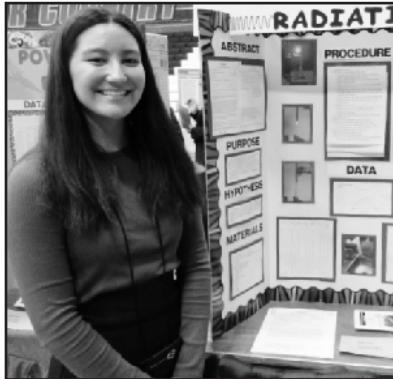
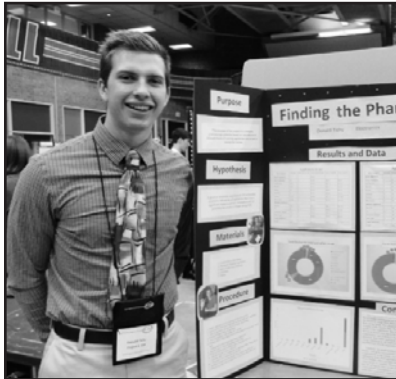


EXHIBIT JUDGING
FRIDAY



Student Exhibitors

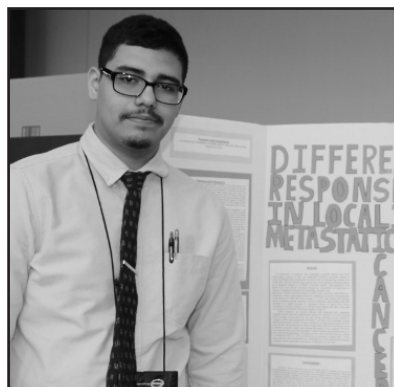
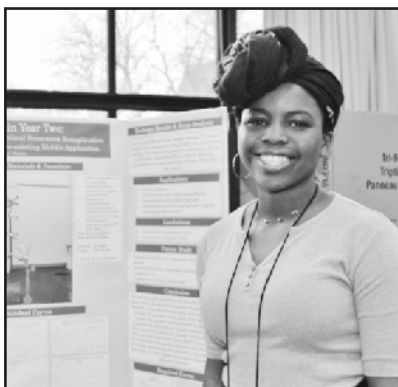
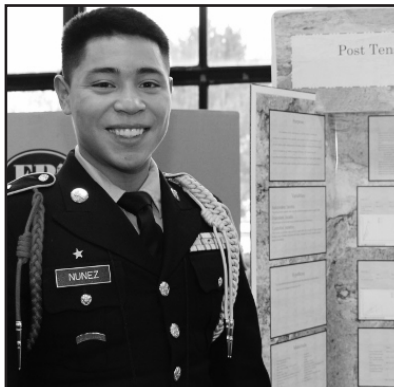
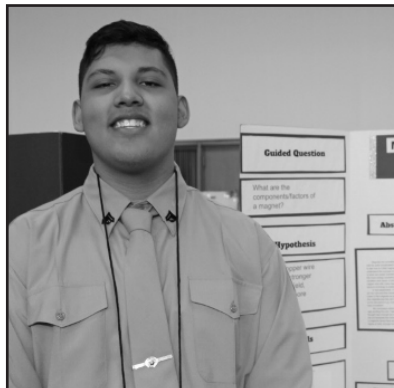
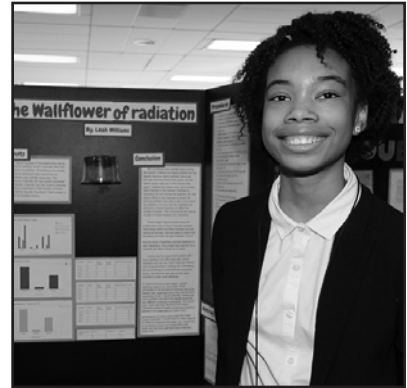
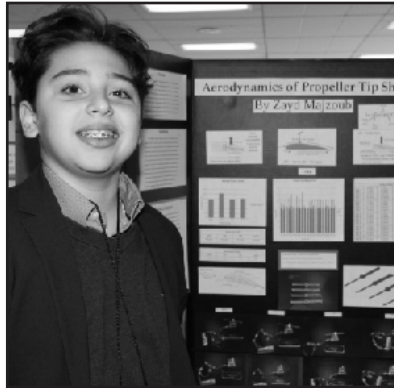
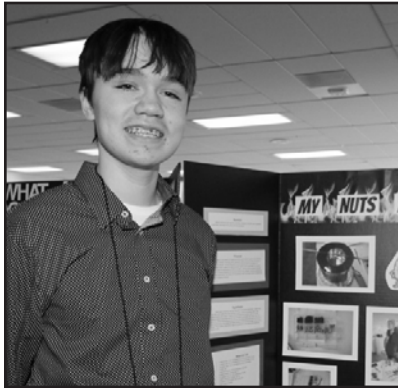


EXHIBIT JUDGING
FRIDAY



Student Exhibitors

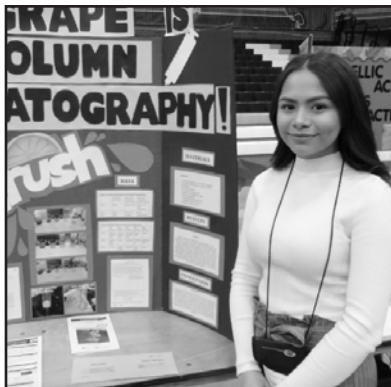
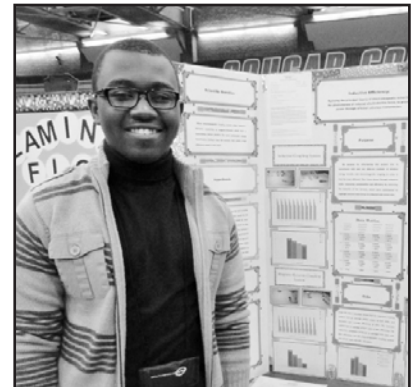
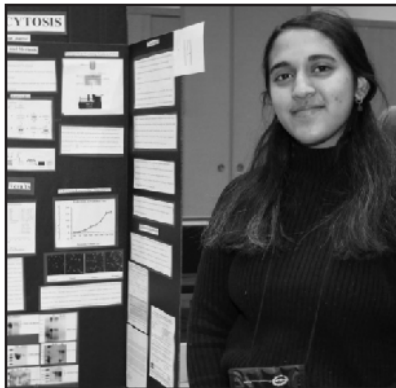
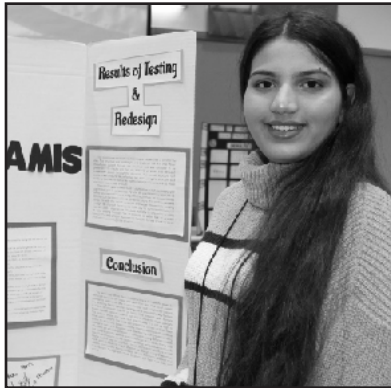
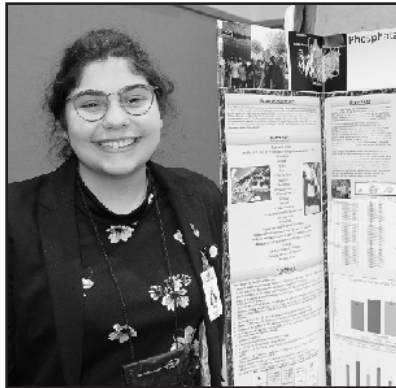


EXHIBIT JUDGING
FRIDAY



Sixth Grade Regional Exhibitions Winners Recognition Luncheon

Saturday, March 23, 2019

11:45 A.M. – Hermann Hall Expo

Welcome

Jeanette Bartley
Chairperson
CPS Student Science Fair, Inc.

Remarks

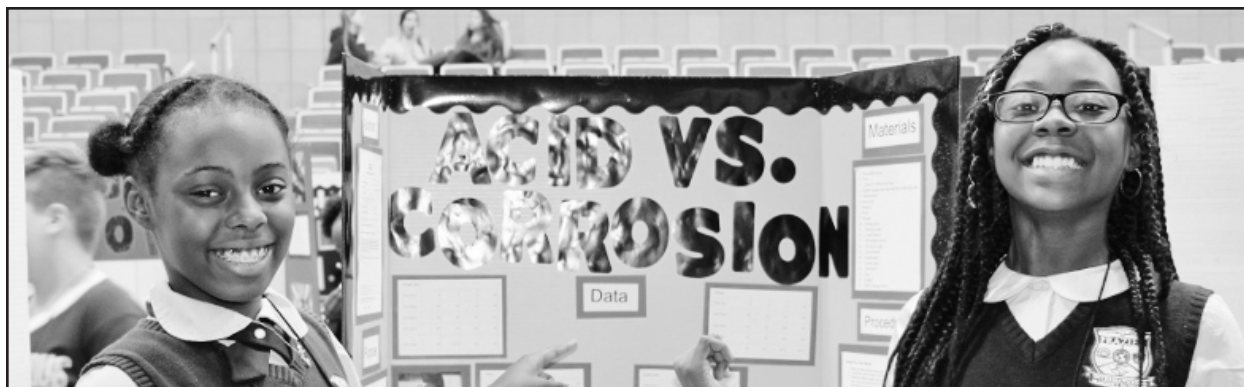
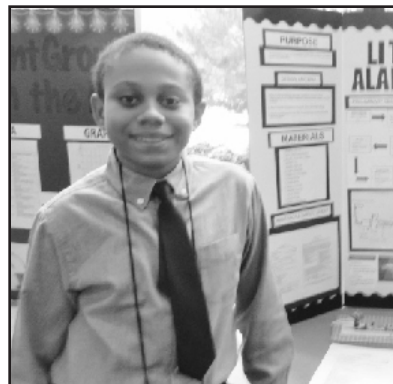
Elizabeth Copper
Executive Director
CPS Student Science Fair, Inc.

Presentation of Awards

Jeanette Bartley
Carrie Kaestner
Elizabeth Copper

Group Photo

Allan Reisberg
Chairperson, Digital Imaging
CPS Student Science Fair, Inc.



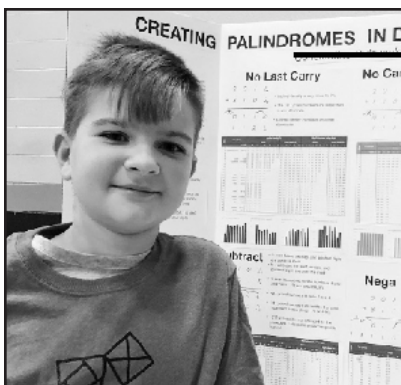
**PUBLIC VIEWING & 6TH GRADE
LUNCH SATURDAY**



Sixth-Grade Regional Winners

List of 2019 Sixth-Grade Regional Winners

Name (s)	Network	School	Project Title
Emily Aponte	NW01	Haugan	The Stroop Effect
Gaeta Benjamin	NW13	Poe	Camera Life Test
Constantine Bulavenko	NW01	Edison	Creating Palindromes in Different Bases
Camiah Cantrell	NW13	Pullman	Dissolving Pain Relievers
Lylah Dziwak	NW03	Sayre	What Type of Strawberry Extracts the Most DNA
Akosua Haynes	ISP	Lenart	Do Gas Stations Affect the Soil Around Them?
Daniel Ingram	NW09	Murray	Littlebits Alarm System
Jesus Martinez and Daniel Ascencio	NW08	Hernandez	Luminol Glow
Sanne Nordlund	NW01	Peterson	Salt vs. Sugar: BP Battle
Luka Pinto	NW04	LaSalle	Will Increased Stress Affect Performance
Juliana Resendiz and Yahaira Ibarra	ISP	Edwards	Does Paint's Density Affect Its Coverage?
Emilia Touw	NW04	Audubon	Are You My Soil-Mate?
Morgan Warren	NW09	Ray	Which Liquid Makes Plants Grow the Fastest?
Jaslynn Williams and Imani Crittle	CHTR	Frazier Intl.	How Does Acid Affect the Rate of Corrosion



PUBLIC VIEWING & 6TH GRADE
LUNCH SATURDAY



Awards Convocation

Sunday, March 24, 2019
1:00 P.M. – IIT – Hermann Hall Auditorium

Pledge of Allegiance

National Anthem

Greetings.....**Jeanette Bartley**
Chairperson, CPS Student Science Fair, Inc.

Welcome..... **Peter Kilpatrick**
Provost, Illinois Institute of Technology

Remarks..... **Sylvia Nelson Jordan**
Manager, CPS Academic Competitions
Office of Teaching and Learning
Brian Stepp
President, CPS Student Science Fair, Inc. Board of Directors

Awards Presentation..... **Ruby Parnell-Booth**
Chairperson, Special Awards and Tours Committee

- Special Awards
- Military Awards
- Special Tour Awards

Winners Recognized by.....**Brian Stepp**
Alderman King
Sylvia Nelson Jordan

Symposium Winners**Jennifer Patush**
Chairperson, Symposium & Essay Committee

Illinois Junior Academy
of Science (IJAS) Awards**Monique Murray**
Juanita Paulinski
Co-Chairpersons, IJAS Committee

International Science and
Engineering FAIR (ISEF) Awards**Elizabeth Copper**
Chairperson, CPS Student Science Fair, Inc.

Closing Remarks.....**Jeanette Bartley**
Chairperson, CPS Student Science Fair, Inc.





Special Awards

A variety of incentives are provided by individuals, industry, educational organizations and professional societies. The contributors listed below and their representatives serving as judges, have donated cash awards, certificates of merit, gift cards, invitations to attend special recognition programs, luncheons and opportunities in real laboratory settings. Some Special Award sponsors have dedicated special recognition to the Teacher Sponsors that encourage these exhibitors to stretch to reach their potential.

At the Awards Convocation on Sunday, March 18, 2019, students whose projects are selected by Special Awards judges will be the direct recipients of these awards.

If you are interested in offering a Special Award at the next Exhibition of Student STEM Research, please contact Ruby Sheree Parnell-Booth Special Awards, P.O. Box 803945, Chicago, IL 60680 or by email at rsparnell-booth@cps.edu

On behalf of all the young scientists, a special THANK YOU is extended to the contributors of Special Awards.

Achievement Award

A \$50 cash award will be given to a first time high school student exhibitor with an outstanding project

- Rita Nelson
- RyAnn Nelson-Jaiyesimi

Alpha Delta Chapter of Delta Kappa Gamma Society International

One \$100 cash award to a senior female student exhibitor with an Outstanding project in STEM.

- Alpha Delta Chapter - DKG

American Meteorological Society

A certificate of "Outstanding Achievement" to each of two high school student exhibitors with outstanding projects in the category of atmospheric, oceanic or hydrologic science

- Society for Science and the Public

American Nuclear Society-Chicago Section

One \$100 cash award and a book by Max Carbon will be given to a student exhibitor with an "Outstanding" project; one \$50 cash award and a book by Max Carbon will be given to a student exhibitor with an "Excellent" project

- Dr. Roger W. Tillbrook

American Psychological Association

A certificate of "Outstanding Research" will be given to a student exhibitor with an outstanding project in behavioral science, biochemistry, computer science, environmental science, mathematical science, medicine or health science.

- Society for Science and the Public

Anti-Cruelty Society

A \$50 Visa gift card will be given to a student exhibitor with an outstanding project exhibiting humane care and treatment of animals

- Elliott Serrano

ASM Materials Education Foundation

A medallion and certificate of outstanding achievement will be given to a student exhibitor with an outstanding project in the category of engineering

- Society for Science and the Public

Association for Women Geoscientists

A certificate of "outstanding achievement" will be given to a female student exhibitor with an outstanding project that increases the public awareness of the geosciences, illustrate the interdisciplinary nature of the geosciences, or promote the sensitivity to the Earth as a global system.

- Society for Science and the Public

ASU Rob and Melani Walton Sustainability Solutions Initiative

A certificate and a nomination will be given to each of two exhibitors to enter for the Grand Prize: a trip to Arizona for the 2019 Sustainability Solutions Festival.

- Society for Science and the Public

Bartley Family Award

A \$50 gift card will be given to each of two student exhibitors with outstanding projects

- Jeanette Bartley

Broadcom MASTERS

A special invitation for the top 10% of middle school student exhibitors to be nominees for the Science & Engineering Fair national competition

- Society for Science and the Public

Charles Braxton Brown Jr. Memorial Technology Award

A \$50 cash award will be given to an African-American male student with an outstanding project in the category of electricity/electronics

- Vincent C. Brown

Charms, Inc. - Chicago Chapter

A \$50 gift card will be given to one female high school student exhibitor and one female elementary school student exhibitor with outstanding projects

- Jackie Sharp Judy Walter Ruby Sheree Parnell-Booth

Chicago Academy of Sciences and its Peggy Notebaert Nature Museum

A One-year Family Membership to the Peggy Notebaert Nature Museum (\$60 value) and a \$50 Visa gift card to one middle school and one high school student



Special Awards

with an outstanding environmental science project

- David Bild

Chicago Botanic Garden

One "Day at the Garden" package which includes free parking, four free tram tickets, four Railroad Garden or Wonderland Express tickets, and \$10 off any membership purchase will be awarded to a student exhibitor with an outstanding project

- Nancy Issac

Chicago Intellectual Property Alliance (CIPA)

Three "Most Inventive" awards: First place - assistance with filing a patent application and a \$500 cash award; Second place - a \$300 cash award; Third place - a \$200 cash award

- Sarah Biggs

Chicago Principals and Administrators Association

A \$50 Target gift card to each of five high school student exhibitors and to each of five elementary school student exhibitors in behavioral science, biochemistry, chemistry, environmental science, mathematics or microbiology.

- Kent Lau

Chicago Section STLE

A \$100 cash award will be given to each of three student exhibitors that have outstanding projects

- Karen Harrington

Chicago Zoological Society-Brookfield Zoo

A one year Brookfield Zoo family membership will be given to each of ten student exhibitors with outstanding projects

- Paul Gooding

Christine M. Krupa Award

A \$100 cash award will be given to a student exhibitor with an outstanding mathematics project

- Christine M. Krupa

College of Engineering, University of Illinois at Chicago (MC 152)

A \$250 cash award will be given to each of five student exhibitors with outstanding projects in the category of engineering

- Dr. Peter Nelson, Dean Dale Reed
- Gerry Smith Jovita Banks

Copper's Encouragement Award

A \$50 gift card will be given to each of two female high school student exhibitors with "outstanding" projects in health science and a \$25 gift card will be given to a female high school student exhibitor with "excellent" projects in health science

- Elizabeth Copper

Cynthia Slater Insurance Agency

A \$50 cash award will be given to a student exhibitor with an outstanding project

- Cynthia Slater

Davis Family Achievement Award

A \$25 gift card will be given to each of six student exhibitors with outstanding projects

- Lillian B. Qualls
- Lois McClinton
- Jacqueline Johnson
- Ruby Sheree Parnell-Booth

DNA Learning Center-Notre Dame

A fully paid scholarship for a one week session to DNA Learning Center Summer Camp located at the University of Notre Dame for one of the following dates for summer 2019: June 23 – June 28, July 14 – July 19, or July 21 – 26, 2019 for a student with an outstanding project.

- Dr. Amy Stark

Federal Managers Association Chapter 375 EPA Chicago

A \$100 gift card will be given to each of three student exhibitors with outstanding projects

- Deborah Baltazar

Fogelson Family Foundation- Paul J. Salley, Jr. Prize for Outstanding Mathematical Research by a Young Mathematician

A \$433 Paul J. Sally, Jr. cash award will be given to a student exhibitor with outstanding work of research in mathematics

- The Fogelson Family Foundation

Fogelson Family Foundation-Outstanding Teacher in Mathematics and Related Sciences

A \$349 Foglestone Family Foundation cash award will be given to an outstanding mathematics and related sciences teacher

- The Fogelson Family Foundation

Fogelson Family Foundation – Outstanding School or Team in Mathematics and Related Sciences

A \$401 Fogelson Family Foundation cash award will be given to a school or team which supported the most math/related sciences projects that entered the City STEM Exhibition.

- The Fogelson Family Foundation



Special Awards

Fogelson Family Foundation- QED Prizes for Outstanding Research in Mathematics and Related Sciences

A \$331 QED cash award will be given to each of two student exhibitors for outstanding works of research in Pure Mathematics, Applied Mathematics, Mathematics in Engineering, and Mathematics in Computer-Related Sciences, and to a work demonstrating exceptional mathematical insight.

- The Fogelson Family Foundation

Fogelson Family Foundation- Distinguished Mathematics Research

A \$281 Fogelson Family Foundation cash award will be given to each of two student exhibitors for distinguished mathematical research

- The Fogelson Family Foundation

Fogelson Family Foundation- Special Awards for Mathematical Investigations or application

A \$281 Fogelson Family Foundation cash award will be given to each of two student exhibitors for outstanding mathematical investigations or application project

- The Fogelson Family Foundation

Gonzalez, Wahlberg, James, Gonzalez Award

A \$100 cash award will be given to four middle school student exhibitors that best use the scientific method in their exhibits

- Eddie Marie Gonzalez

IJAS

An accommodation for each of the top 45 student exhibitors and each of the top 15 symposium presenters to attend the IJAS State Exposition

- CPS Student Science Fair, Inc.

IJAS Essay Finalists

A \$250 cash award will be given to each of the top two essays; a \$125 cash award will be given to the third place essay; a \$75 cash award will be given to the fourth place essay; and a \$50 cash award will be given to the fifth place essay

- CPS Student Science Fair, Inc.

Illinois Speech-Language-Hearing Association

A \$100 cash award will be given to each of two student exhibitors with outstanding projects related to communication disorders

- Bryan White

Intel ECS Award

An "Excellence in Computer Science" certificate will be given to a student exhibitor with an outstanding project in the category of computer science

- Society for Science and the Public

Intel ISEF

A trip to the International Science and Engineering Fair for each of four high school student exhibitors with outstanding projects; Recognition of each of two alternates

CPS Student Science Fair, Inc.

Janice Lamar Brown Memorial Females in STEM Award

A \$50 cash award will be given to an African-American female student with an outstanding project in mathematics

- Vincent C. Brown

Lemelson Early Inventor Prize

A \$100 cash award will be given to a middle school student exhibitor whose project best demonstrates problem-solving by identifying a critical problem; applies empathy and STEM knowledge to find a practical solution; displays entrepreneurial thinking; develops an invention to solve a critical societal problem and improve the lives of others

Society for Science and the Public

Luba Johnson Science Award

A \$50 cash award will be given to each of two student exhibitors with outstanding projects

- Luba Johnson

Melody STEM School Award

A \$25 cash award will be given to each of two Melody STEM School student exhibitors with outstanding projects

- Maggie Sandoval

McGraw Hill School Education Group

A \$100 gift card will be given to a student exhibitor with an outstanding project in the category of biology; A \$100 gift card will be given to a student exhibitor with an outstanding project in the category of chemistry

- Ardena White Kate Taylor

Metropolitan Water Reclamation District

Each of 25 student exhibitors with outstanding projects will experience a day event that includes a tour of the world's largest wastewater treatment plant, Stickney, located in Cicero, IL; awards luncheon with our Board of Commissioners; and student winners will meet scientists at the District.

- Rebecca Wooley

Mu Alpha Theta

A certificate of "outstanding achievement" will be given to a high school student exhibitor that creatively using modern mathematics

- Society for Science and the Public



Special Awards

NASA

A certificate of “outstanding achievement” will be given to a student exhibitor whose project offers the greatest insight into Earth's interconnected systems

- Society for Science and the Public

National Oceanic & Atmospheric Administration

A certificate and medallion will be given to a student exhibitor whose research best emphasizes prediction of changes in climate, weather, oceans, and coasts.

- Society for Science and the Public

National Technical Association

A \$50 cash award will be given to an outstanding student exhibitor

- Melvin Slater
- Cynthia Slater

Omega Psi Phi Fraternity, Inc. Iota Chapter

A \$100 cash award will be given to each of eight student exhibitors with outstanding projects.

- | | |
|-------------------|------------------|
| • Melvin Slater | • Michael Meeks |
| • Melvin Hargrett | • Andre Garner |
| • Reggie Smith | • Eric Fullilove |
| • Clayton Harris | • Eric Davis |
| • Jerrold DeRon | • Rick Williams |

Optical Society of Chicago

A \$200 cash award will be given to a student exhibitor with an outstanding project that best exhibits the use of light, optics, or color; a \$150 cash award for 2nd place; a \$100 cash award for 3rd place.

- Tara Maggiano

Pearson NCS

A \$100 cash award will be given to each of six student exhibitors with an outstanding projects

- Adrian G. Willis

Ricoh Sustainable Development Award

A certificate of “outstanding achievement” will be given to a student exhibitor that best reflects the principles of sustainability - balancing economic development with environmental responsibility

- Society for Science and the Public

Richardson Middle School Award

A \$25 cash award will be given to a Richardson Middle School student participating in the City Science Fair

- Marie Clouston

Science Merit Award

A \$50 cash award will be given to a student exhibitor with an outstanding project in behavioral science, environmental science, chemistry, or physics.

- Rita Nelson
- RyAnn Nelson -Jaiyesimi

Slater Association

One \$50 cash award will be given to an outstanding exhibitor

- Melvin Slater
- Cynthia Slater

Society for In Vitro Biology

A certificate of “outstanding achievement” will be given to an 11th grade student exhibitor with an outstanding project exhibiting plant or animal in vitro biology or tissue culture

- Society for Science and the Public

Society for Science & the Public Award for Community Innovation

A \$500 cash award will be given to a high school student exhibitor whose project best solves a local concern or problem and demonstrates a direct and positive impact on the local community

- Society for Science and the Public

Stockholm Junior Water Prize

A certificate will be given to each of six high school student exhibitors that have outstanding water related exhibits; eligibility to participate in the Stockholm Junior Water State Competition

- Society for Science and the Public

Symposium Award

Cash awards to symposium participants: \$250 first place; \$125 second place; \$75 third place; \$50 fourth place; eleven participation awards of \$25

- CPS Student Science Fair Inc.

Teach Our Children, Inc. - Tyron K. Smith Award

One \$100 cash award will be given to a student exhibitor with an outstanding project in electronics

- Tracy Raoul

The National Sorority of Phi Delta Kappa, Inc.

A \$50 cash award will be given to each of two student exhibitors with outstanding projects

- Shannette Rooks

United States Army

Each student exhibitor will be given a blue tooth speaker, lanyard and a periodic table.

- Brent Curry M CIV USARMY USAREC (US)

US Metric Association

A certificate for “outstanding achievement” will be given to a student exhibitor that has an outstanding project in which the measures were integrally important to the research

- Society for Science and the Public



Special Awards

United States Navy and Marine Corps - Office of Naval Research

A letter of congratulations, certificate of achievement and a medallion to 3 exemplary middle school exhibitors; A letter of congratulations, certificate of achievement, a medallion and a redeemable recognition award (\$50 gift card) for 4 exemplary high school exhibitors

- Society for Science and the Public

West Ridge Citizen Science Center

A \$50 cash award will be given to each of four student exhibitors with outstanding projects

- Gary Morrissey

Yale Science & Engineering Association

A certificate of "outstanding achievement" will be given to an 11th grade student exhibitor with an outstanding project in the category of Computer Science, Engineering, Physics, or Chemistry

- Society for Science and the Public

Yolanda Del Rio 6th Grade Recognition Gift

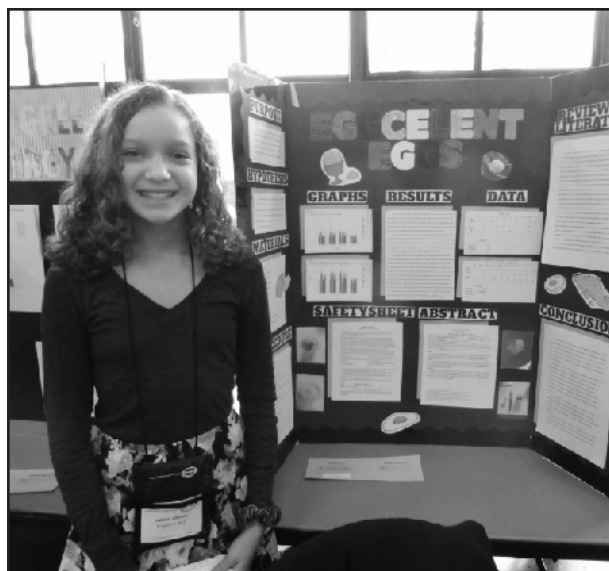
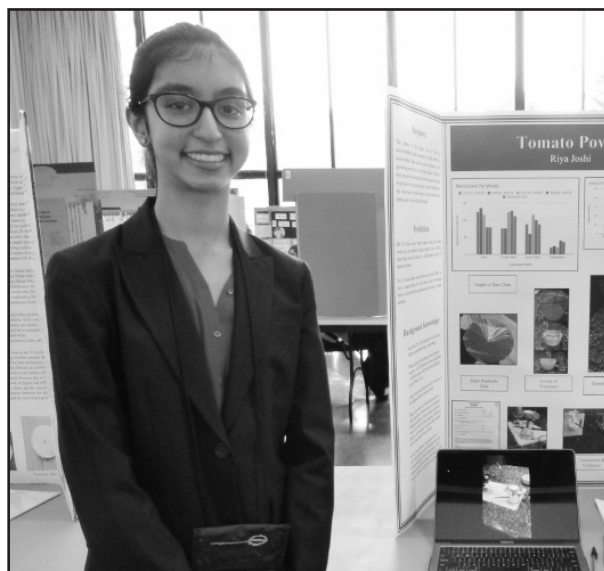
A McDonald's gift card will be given to each 6th grade student participant that attends the 6th Grade Luncheon at the City Science Fair.

- Yolanda Del Rio

Young Scientist Award

A \$50 cash award will be given to a high school student exhibitor with outstanding research endeavors in biochemistry, health science, microbiology or zoology.

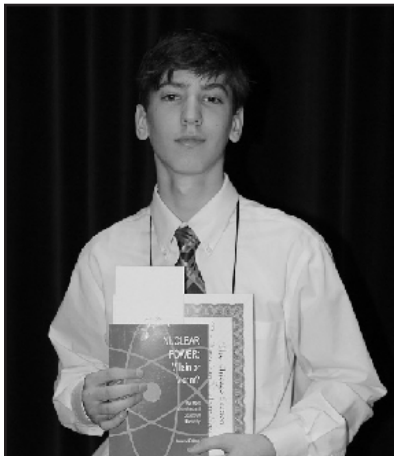
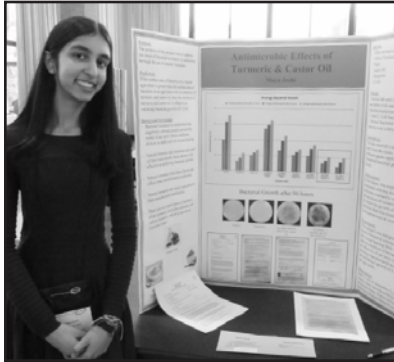
- Rita Nelson
- RyAnn Nelson-Jaiyesimi





Special Awards

AWARDS SUNDAY





CPS Student STEM Exhibition Special Programs

Research Grants – money for student research

Mini-grants are available to students in Grades 7 through 12 for the purpose of providing financial aid while conducting research projects. Students may apply for renewable grants of up to \$100 per semester. These funds may be used for the purchase of materials and equipment not available in their schools, but which are needed to complete the student's experimental research. Students may apply to the Research Grants Committee of CPS Student Science Fair, Inc.

Maxi-grants are awarded to students in Grades 9 through 12 and provide financial support in amounts of \$100–\$500. This grant is available to students who have already demonstrated excellence in STEM projects and need more expensive materials and equipment to continue their research. Students must apply to the Research Grants Committee of CPS Student STEM Fair, Inc. and, if accepted, must submit their work to members of this committee. An application can be found in the current *STEM Exhibition Handbook* and on the Internet at: www.cpsscifair.org.

Advise-a-Student – professional advice for student research

The Advise-a-Student program is designed to provide technical advice to students in Grades 7 through 12 who are working on a research project. Advice is available only after students exhaust school resources and have thoroughly researched their topic in the library. In order to discuss and obtain assistance in improving their projects, students must apply for a research advisor by submitting an application to the Advise-A-Student Committee of CPS Student Science Fair, Inc. An application can be found in the current *STEM Exhibition Handbook* and on the Internet at: www.cpsscifair.org.

STEM Exhibition Central – workshops for student research

Northeastern Illinois University (NEIU) and Chicago State University (CSU) opened labs in their science buildings on Saturday mornings this past October and invited high school and elementary school students,

teachers, parents, and mentors to the campus. NEIU and CSU provided professional scientists, including university faculty and staff, to advise and assist the students. In some cases, lab set-up space and materials were made available. Details regarding these workshops are sent to teachers at the beginning of the school year.

STEM Clubs – after school help from teachers for student research

ComEd, An Exelon Company has continued to provide funding for 20 high school STEM clubs this school year. The primary objective is to compensate teacher-sponsors for guiding students as they developed STEM Exhibition projects. Club sponsors receive supplies, materials, and/or equipment for conducting club activities. Peoples Gas provided funding for 16 middle school STEM clubs this school year. In addition to stipends, teachers could help students collect data by using Vernier *LabQuest* and *LEGO Robotics*, which brought more technology into the classroom. These clubs also have engineers from Peoples Gas who volunteer to advise club members on their STEM research.

Scholarships – college funds for STEM Exhibition alumni

In order to support the CPS Exhibition of Student STEM Research and to encourage students to consider careers in STEM, several local universities have provided renewable tuition waiver scholarships. In addition, monetary contributions from various sources in the business community have been volunteered as well as solicited to provide additional scholarships. Any prospective Chicago public high school graduate who has participated in at least one STEM Exhibition (during Grades 7–12) at the regional or city level and/or the symposium is eligible to apply for a scholarship. The Scholarship Committee, comprising STEM Exhibition representatives, business and education, selects scholarship recipients based on participation in the Chicago Public Schools STEM Exhibitions, scholastic achievement, future goals, and personal interviews. Since 1956, CPS Student Science Fair Inc. has awarded 2,139 scholarships valued at \$3.8 million to students from 76 Chicago public high schools.

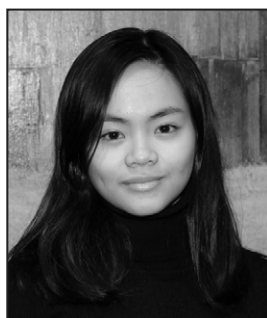


2018 Scholarship Winners

Any prospective June CPS high school graduate who has participated in CPS STEM exhibitions (during grades 7-12) at a regional or the city level and/or the symposium/essay competition; and who is planning to major in science, technology, engineering, and/or mathematics was eligible to apply for a scholarship. The Scholarship Committee, representing business and education, selects scholarship recipients on the basis of participation in the Chicago Public Schools STEM Exhibitions, scholastic achievement, future goals, and personal interviews.

The June 2018 high school graduates listed below were selected to receive financial scholarships by the Chicago Public Schools Student Science Fair, Inc. Scholarship Committee.

Since 1956, Student Science Fair, Inc. has awarded **2,139** scholarships, valued at **\$3,800,492** to students from **76** Chicago public high schools



Trisha Cabrera/Lincoln Park
Loyola University of Chicago
Biology
Loyola University of Chicago
4-year Renewable, \$2,000/year



Emma DeVarenne/Von Steuben
St. Louis University
Doctor of Physical Therapy
CPS Student Science Fair, Inc.
Scholarship, \$2,000



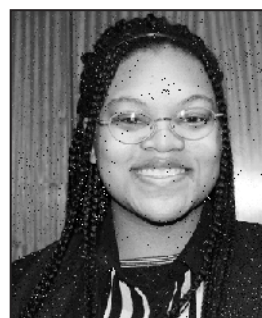
Malia Gehrenbeck/Von Steuben
University of Illinois Urbana-Champaign
Animal Science
Kenneth Zdunek and Mary Memhardt Scholarship, \$3,000



Brandon Gomez/Von Steuben
Illinois Institute of Technology
Mechanical Engineering
Illinois Institute of Technology
4-year Renewable, \$4,000/year



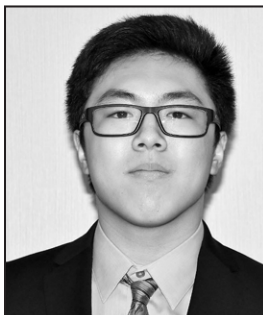
Daniel Ibarra/Ogden International
University of Illinois at Chicago
Bioengineering
University of Illinois at Chicago
Full Tuition Waiver, 4-Year Renewable,
\$10,600/year



Kelly Jones/Julian
Olive Harvey College
Broadcast Technology
ComEd, An Exelon Co.
Scholarship, \$3,000



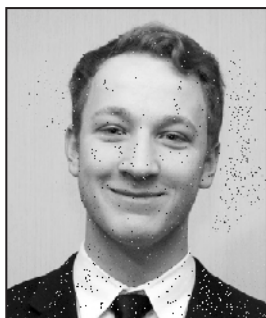
Tanvi Kapatral/Young
University of Illinois
Urbana-Champaign
Health Sciences
Geri Blakely Memorial
Scholarship,
\$1,000



Alvin Lam/Von Steuben
University of Illinois at Chicago
Computer Science
CPS Student Science Fair, Inc.
Scholarship, \$1,000



Aristeo Martinez/Phoenix
Dominican University
Neuroscience
Allen Nelson Memorial
Scholarship,
\$3,000



Marcus Mrdak/Von Steuben
University of Illinois
Urbana-Champaign
Engineering
Kolver Family Foundation
Scholarship,
\$1,000



Aaliyah Muhammad/Julian
Harris Stowe State University
Nursing
Charles Lange Memorial
Scholarship,
\$1,500



Abigail Pio/Phoenix
Cornell University
Psychology
Harold Keihm Memorial
Scholarship (\$4,000) and
CPS Student Science Fair Inc.
(\$2,000), \$6,000 total



Jonathan Poole/CHSAS
University of Illinois
Urbana-Champaign
Food Science and Human
Nutrition
BP America Inc. Scholarship,
\$3,000



Daniel Puczko/Lane
Harvard University
Biochemistry
Dolores Rosenbaum Memorial
Scholarship (\$4,000) and
CPS Student Science Fair Inc.
(\$2,000), \$6,000 total



Maegan Resuello/Amundsen
DePauw University
Biology and Computer Science
Barbara Bulmash Memorial
Scholarship, \$1,000



Selena Salgado-Espino/Curie
University of Illinois
Urbana-Champaign
Biology
Motorola Foundation
Scholarship,
\$3,000



Dominique Taylor/Julian
Northern Illinois University
Biology
CPS Student Science Fair, Inc.
Scholarship, \$1,500



Alexander Vinarov/Payton
University of Chicago
Biological Chemistry
University of Chicago Tuition
Waiver, 4-year Renewable,
\$2,000/yr



Daniel Vogwill/CHSAS
University of Illinois
Urbana-Champaign
Biochemistry
MSDOnline, Inc. Scholarship,
\$3,000

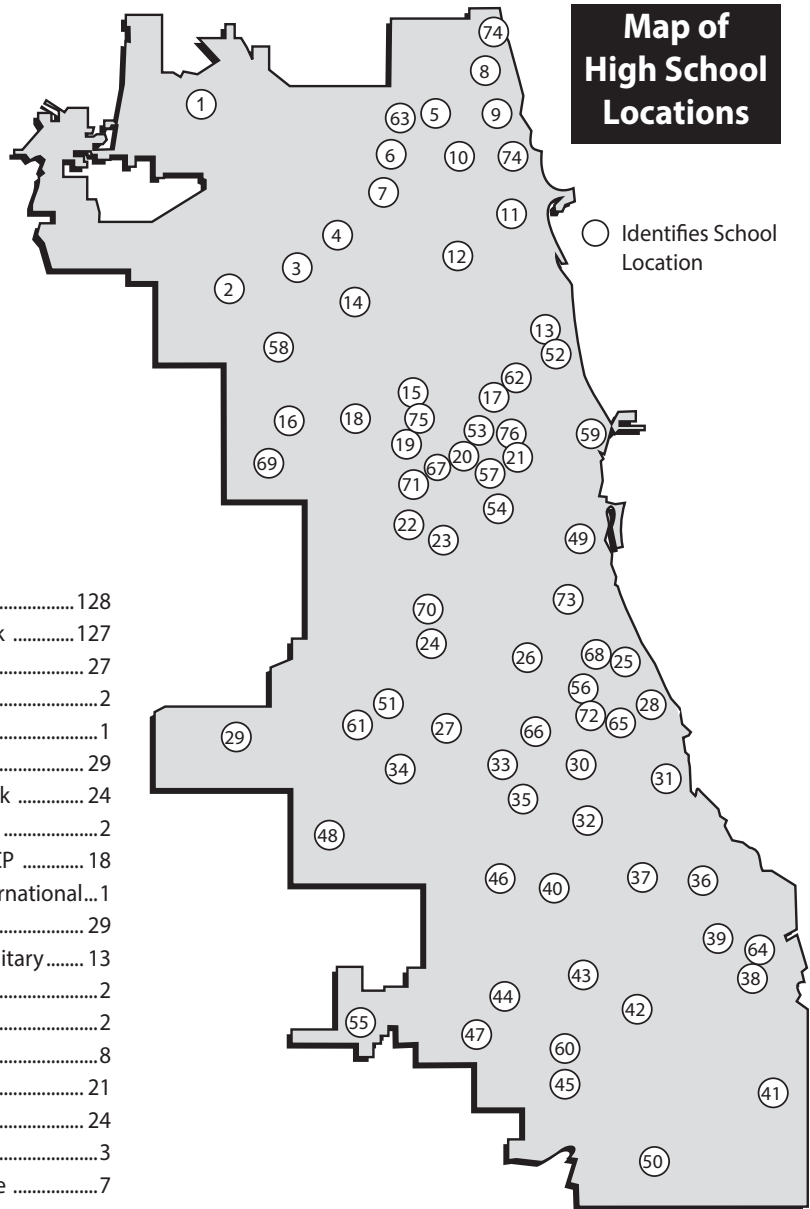


Number of Scholarships Awarded (1956 – 2018)

Map no. School Scholarships

73	Air Force Academy	.....1
10	Amundsen	.....43
16	Austin	.....8
64	BEST	.....1
57	Best Practice	.....1
48	Bogan	.....28
38	Bowen	.....15
68	Bronzeville	.....1
60	Brooks	.....3
46	Calumet	.....4
50	Carver	.....6
69	Chicago Academy	.....1
55	Chicago Ag. Sci.	.....54
74	Chicago Math and Science Academy	.....1
39	Chicago Voc.	.....7
15	Clemente	.....1
42	Corliss	.....11
20	Crane	.....1
53	Cregier	.....2
51	Curie	.....20
49	Dunbar	.....1
56	DuSable	.....3
65	Dyett	.....1
30	Englewood	.....4
22	Farragut	.....4
45	Fenger	.....14
18	Flower	.....1
03	Foreman	.....24
27	Gage Park	.....4
61	Hancock	.....4
43	Harlan	.....5
35	Harper	.....4
23	Harrison	.....4
37	Hirsch	.....5
66	Hope	.....3
34	Hubbard	.....18
31	Hyde Park	.....16
59	Jones	.....5
54	Juarez	.....8
44	Julian	.....12
24	Kelly	.....11
14	Kelvyn Park	.....14
29	Kennedy	.....15
28	Kenwood	.....18
25	King CP	.....7
11	Lake View	.....15

12	Lane	.....128
13	Lincoln Park	.....127
33	Lindblom	.....27
19	Marshall	.....2
71	Manley	.....1
05	Mather	.....29
47	Morgan Park	.....24
52	Near North	.....2
63	Northside CP	.....18
76	Ogden International	.....1
62	Payton	.....29
67	Phoenix Military	.....13
58	Prosser	.....2
32	Robeson	.....2
07	Roosevelt	.....8
04	Schurz	.....21
09	Senn	.....24
40	Simeon	.....3
36	South Shore	.....7
02	Steinmetz	.....13
08	Sullivan	.....9
01	Taft	.....22
26	Tilden	.....19
06	Von Steuben	.....65
41	Washington	.....30
17	Wells	.....7
75	Westinghouse	.....1
21	Whitney Young	.....54
72	Williams Medical	.....2
70	World Language	.....2





ComEd High School STEM Club Program 2018-2019

The following high schools have approved after-school STEM clubs sponsored by ComEd, An Exelon Company. Each club is provided with a stipend for the club sponsor and receives supply funds to help support the Science Club. The primary objective of the ComEd Science Club Program is to provide extended STEM experiences and guidance to students interested in developing STEM research projects.

Amundsen
Eman Sarhan

Brooks
Aurora Tyagi

Carver Military
Onome Alabi

Chicago Ag
Amanda Lovall-Cole

Chicago Military
Rachel Owens

Clark
Yolanda Tucker

Curie
Neshell Graham

Excel Academy Southwest
Michael Tyler

Goode STEM
Evelyn Villagomez

Juarez
Patricia Sullivan

Julian
Monique Murray

Lake View
Jaclyn Carmichael

Lane Tech
Lucy Young

Lindblom
Elizabeth Copper

Marine Leadership Academy
Monica Gomez

Payton
Walter Kinderman

Phillips
Gyzelle Watkins

Phoenix
Beatrice Jaji

Von Steuben
Carrie Kaestner





Peoples Gas Middle School Science Club Program 2018-2019

The following elementary schools have approved after-school STEM clubs sponsored by Peoples Gas and some Peoples Gas STEM Clubs supplemented by CPS Student Science Fair, Inc.. Each club was provided with a stipend for the club sponsor. Materials used during club sessions include incorporating Vernier LabQuest in collecting data for analysis and using Vernier Engineering Projects with LEGO Mindstorms Ed EV3. Giving students the knowledge and experience of using STEM helps to inspire ideas for independent research projects. Peoples Gas engineers volunteered to lend their expertise to club members on their projects. The primary objectives of the Peoples Gas STEM Club Program were to provide guidance to students interested in developing STEM Exhibition projects and using LabQuest for data collection

Audubon

Alessandria Grisanzio

Bateman

Vasiliki Valkanas

Coonley

Xavier Loza

Dever

Andrew Bean

Foster Park

Michelle D. Bullock

Garvey

Tonia Thomas

Haugan

Sara Baar-Ledford

Healy

Pauline Swenson

Hughes

Tracy Sevier

Kilmer

Zijada Cobovic

Kanoon Magnet

Araceli Buenrostro

Melody STEM

Maggie Sandoval

Mt. Vernon

Yolanda Pender-Bey

Owens Community

Davina Allen

Parker Community

LaTanya A. Waters

Ruggles

Adayo Moton

Saucedo

Rosario Canizales

Sauganash

Anna Pauleo McGowan

Shoemith Elementary

Margaret Hoover

Tilton

Korinne Carr

Turner Drew LA

Cherie Shorty

Ward STEM

Tara Stamps

Wildwood World

Brigid Clare Jennings

Zapata Academy

Monica Rutkowski

Peoples Gas Engineers

Erin Carlson

Tanya Carter

Michael Gabino

Mohamed A. Mohamedein

Renee Narcisse

Jonathan Nekvinda

James Pena

Benjamin Rosenberg

Bryan Stajura

Sheena Woodford

Mary H. Houpt

Manager, Community Partnerships

Charles W. Graham

Area Manager/North District

Kyle Frayn, P.E.

Manager, Transmission

Engineering | Gas Engineering





STEM Exhibition Volunteers

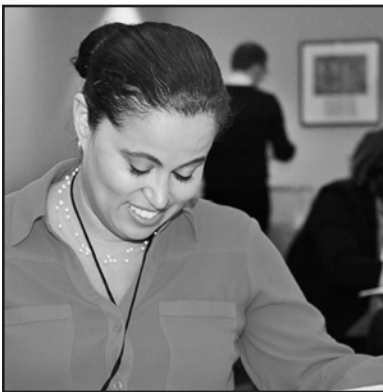
On the following pages are the pictures and names of hundreds of people who give of their own time and of themselves to make the CPS Exhibition of Student STEM Research possible. **THANK YOU!**



THANK YOU



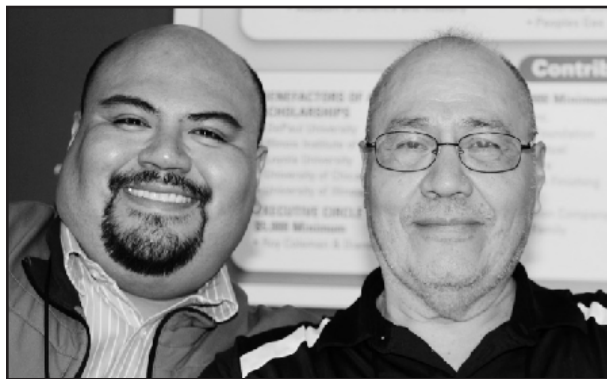
Faces of the Student STEM Exhibition



THANK YOU



Faces of the Student STEM Exhibition



THANK YOU



Faces of the Student STEM Exhibition



THANK YOU



Exhibit Judges

Each year approximately 300 judges from the scientific, academic, and business communities generously donate their time, effort, and expertise to objectively and professionally evaluate the most scientifically talented students from the Chicago Public Schools. Student STEM Exhibition honors judges who have served for a minimum of five years and on every fifth anniversary. Judges receiving a plaque for service are invited to a special Recognition Luncheon which will be held after judging is completed.

Student STEM Exhibition salutes ALL the Exhibit Judges participating in the 69th Exhibition of Student STEM Research.

Thank you and congratulations for a job well done!

Sara Abu-Ghnaim
Conversant

Katrina Adams-Adewusi
Girls Like Me

Faisal Afridi
T-Mobile, USA

Baris Agar
Baxter Healthcare Corporation

Syed W. Ali
ComEd

Larry Alofs

Michael Ander

Mash Angolkar
Navistar

Roberto Arroyo
Peoples Gas

Alan Babjak
Koppers, Inc.

Shawn Bairstow
Baxter Healthcare Corporation

Bilal Batroukh
T-Mobile, USA

Zane Beckwith
Xaptum, Inc.

Albana Bega
Environmental Protection Agency

James Belcastro
Douglas Machine

David Benjaih
Northeastern Illinois University

John Benson
MSDSonline

David Bild
Xaptum, Inc.

Pat Billing-Medel

Alexis Billingslea
National Society of Black Engineers

Donna S. Bracey
CCC, Inc.

Ann Brandon

Pat Bridges
Peoples Gas

Michael Brocksmith
Peoples Gas

Carol Burck
Loyola University

Kenneth Burke
Sonova

Brenda B Calfin

Mark Camp
Becht Engineering

Dan Carlson
BP

Bill Carroll
Peoples Gas

Frank Carter

Leela Chikoti
Lurie Children's Hospital

Mark Cleveland
BP

Brenda Coleman
Floristic Arts

CyntKaille Coleman
EGB

Samantha Contreras

Peter Cooloorgeorgen

James Covello
Peoples Gas

Ernest Crafton

Brent Curry
U.S. Army

Alexandra Daemicke
Northern Illinois University

Edward Davis
Nokia

Victoria Denenberg

Samone Dicks
T-Mobile, USA

Michael Dominik
BP

Yolandus Douglas
Save A Life Chicago/Meditrain

Kristy Du
PepsiCo

Maureen Dudzinski

Rhonda Dugan
Rand R. Networks and Engineering

John Dworak
Jadco, Inc.

Olivia Ellsworth

Charles T. Elly

Noel Elvambuena
Peoples Gas

Olivia D Evans
Nokia

Barry Finkel

Robert Fisher
U. S. Army

Glady Flora
T-Mobile, USA

Peter Fong
J.P. Morgan Chase

James Foster
Educational GameWorks, LLC

Curtis B. Frank P.E.
Frank Professional Electrical Engineers

Karl Frisk
Peoples Gas

THANK YOU



Exhibit Judges

Kalim Fuzail
BP

Michael Gabino
Peoples Gas

Milos Galic
Peoples Gas

Austin Gardner
Northwestern University

Jose O. Garza
ComEd

Norman Gelfand
Fermilab

Martin R. Gonzalez
BP

Paul Gregoire P.E.
Illinois Department of Transportation

Slade A. Gwyn
U.S. Army

Jessica Harre
Sargent & Lundy LLC

Todd Harriett

Kelsey Hedlund
Western Illinois University

Kurt Hedlund
ARRIS

Gordon Henderson

Sheridan Hicks Banks

Kirsten Higgins
BP

Steven E Hill
Metropolitan Water Reclamation
District

Lananh Ho
Peoples Gas

Shona C. Holman
Peoples Gas

Janet Honeywell
BP

Miguel Jacob
Peoples Gas

Orrin James
Illinois Department of Transportation

Paul Johnson
BP

Wynton A. Johnson
Burns & McDonnell

George Jonas
BP

Daniel Jordan
Columbia College Chicago

Michelle Joyce
BP

Jim Julion Jardine
Water Plant

Pat Jurczewski
Peoples Gas

Melissa Marie Kaczmarczyk
PepsiCo

Joseph Kaczmariski
Invenergy LLC

Karen Kaikaris

Alison Kamil
PepsiCo

Sean Kampe
Ortho Illinois

Demetra Kimecik-Deligiannis Col.
USAF MC Ret

Colton Knox
Peoples Gas

Nelson Koopman

Dorothy Kramer

Mark Kruse
Peoples Gas

Gaurav Kumar
BP

Jainender Kumar
SAP America

Amy LaFata
BP

James Lamb
Peoples Gas

Carl Landahl
Gas Services

Virginia Landahl
Metrosouth

Robert Lau
Metropolitan Water Reclamation
District

Scott Leduc
Peoples Gas

Beth Levy
Oakton Community College

Leia Levy
University of St. Francis

Jenny Liljegren
U.S. EPA

Julie Lohmeier
Nicor Home Solutions

Denise Lopez
Northwestern University

James Lovitz
BP

Jacqueline Luciano
IDPH - Young Living

Dan Lyons
ComEd

Brian Martin
Peoples Gas

Daryl Martin
T-Mobile, USA

Moises Martinez
BP

Jacob Mascarello
U.S. Army

Mohammad Mashal
City of Chicago

Steven H. Mason
MIC LLC

James Massuci
Peoples Gas

Andrea McCoy
T-Mobile, USA

Myriam McCoy
Baxter Healthcare

Lisa McCune
Baxter Healthcare

Steve McVeigh

Dave Miller
Trinity High School

Julie Minbiole Ph.D.
Columbia College Chicago

Heather Minges Wols Ph.D.
Columbia College Chicago

Mohamed A. Mohamedein
Peoples Gas

Melanie Moore

John Moraga
Baxter Healthcare Corporation

THANK YOU



Exhibit Judges

Jessica Morgan

Donald A Morrison

University of Illinois at Chicago

Stephanie H. Moy

Chicago Exotics Animal Hospital

Deborah A. Murphy

DXC Technologies

Kirk Nelson

Velocity EHS

Minh Nguyen

ComEd

Patrick Nolan

Navistar

Tito Olguin

Peoples Gas

Juanita Olmos

Peoples Gas

Chidi C. Osuji

Zebra Technologies

Marianne Palczewski

University of Illinois at Chicago

Kenneth Pang

Commonwealth Edison

Larry Parker

U.S. Cellular Corporation

Denise Patrick

Chicago State University

Thomas A. Perez

Peoples Gas

Oliver Pergams

Olive-Harvey College

Thanh T. Phan

Lyondell Basell

Michael Pickard

Micro Paraphernalia

Rheta Pickard

Erin Pierce-Spurrier

Velocity EHS

Christina Pila

T-Mobile, USA

Joanne Pilgrim

T-Mobile, USA

Janice L. Podolski

Rush University Medical Center-

Walter F Podolski

Harold Primack

Lauren Prost

Velocity EHS

Tom Puljic

Peoples Gas

Alexandra Rader

University of Illinois Chicago College of Medicine

Rebecca Ralph

Navistar

Richard A. Rikoski Ph.D., P.E.

Technical Analysis Corp.

Brian Rogers

Robert A. Rosenstein

Truman College

Julius Rush

T-Mobile, USA

Bara Sarraj Ph.D.

QCYM Harold Washington College

Stephen Schade

AIChE

John Schaller

Dominic Schiavone M.S.

Fresenius Kabi USA

Dale Schlottman

BP

William C Schu

Joseph Schuler

Colleen Schultz

Lauren Schultz

North Shore Oncology-Hematology

Topher Schultz

U.S. Cellular Corporation

MaryAnne Schuster-Korkut

Jonathan J. Schweizer

U.S. Environmental Protection Agency

Nora Seidman

Koppers, Inc.

Allie Shea

Burns & McDonnell

Steven Shosey

T-Mobile, USA

Nicole L. Shoshenskiy

Velocity EHS

Abdallah Shouli

T-Mobile, USA

Anna Simon

BP

Kimberly Ann Sinitiere

BP

Madeline Smierciak

BP Americas

Shannon Smith

Tempus

Robert Sobioch

T-Mobile, USA

Ronald Spatzek

Harold Spinka

Argonne National Laboratory

Nancy Stach

Northeastern Illinois University

Robert F. Stegmann

Haynes Stephens

University of Chicago

Randy Stevens

T-Mobile, USA

Carolyn M. Stokes

South Water Filtration Plant

Earl Szymanski

Stephen K. Tahir

Abbott Laboratories

Joseph Tassone

Peoples Gas

Diandra Taylor

University of Illinois at Chicago

Carol Timms

Educational Dividends

Sandra M. Tobias

Illinois Institute of Technology-

George Tunaru

T-Mobile, USA

Jodie M. Ulaszek

Illinois Institute of Technology-

Onur Usmen

Sargent and Lundy

Paul W. Valaitis

Baxter Healthcare Corporation

Magdalena Vargas

T-Mobile, USA

Przemyslaw Shemek Walczak

Peoples Gas

THANK YOU



Exhibit Judges

Clowana Walker

Peoples Gas

Myles W. Wallace

Sharon Waller

Sustainable Systems LLC

Khristina Weaver

BP

Steve Webster

ComEd

Amy Weik

Carol A. Westbrook

Ronald S Wideman

ComEd

Mark Wilson

T-Mobile, USA

Fred J. Wittenberg

Envimech

Julia P. Wozniak EA

*Engineering, Science and
Technology, Inc. PBC*

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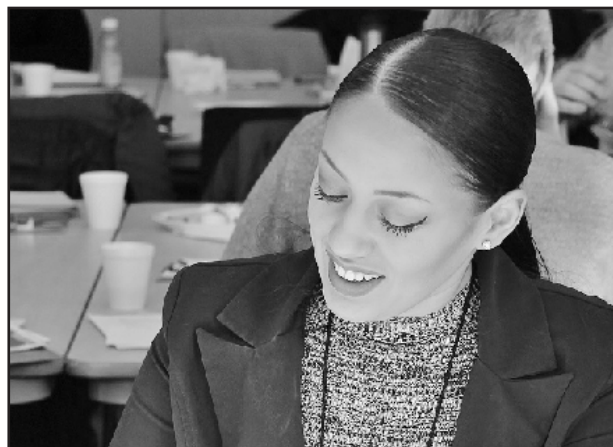
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Symposium and Essay Readers and Judges

The following individuals, in addition to the Symposium Committee, generously volunteered their time and expertise on Saturday, January 27, 2019 to read research and essay papers submitted for evaluation.

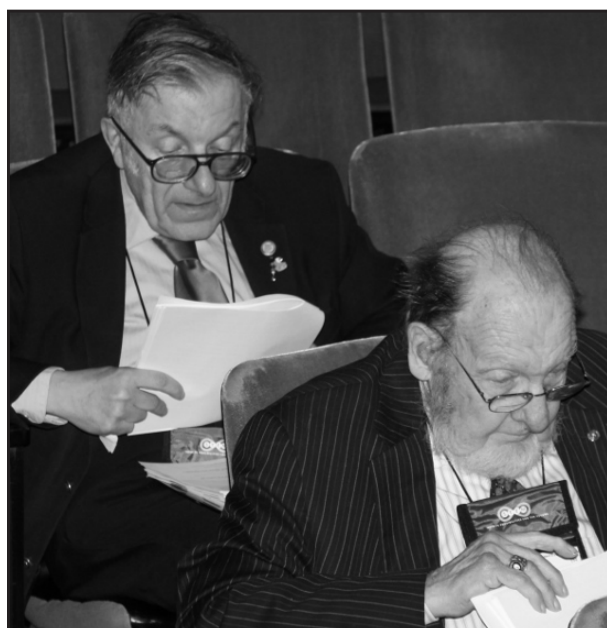
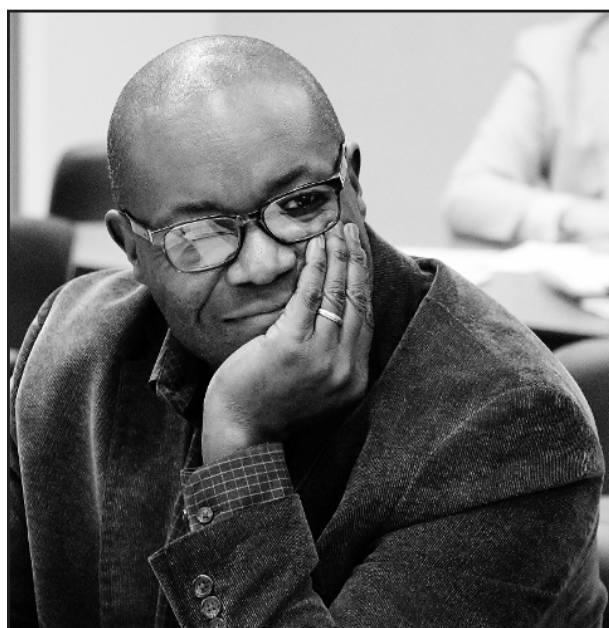
Thank you, Symposium Readers!

Samantha Ahmadi	Erin Faulkner	Carrie Kaestner	Sara Phelan
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Symposium Judges

The following scientists and engineers volunteered their time and expertise on Thursday, March 21, 2019 to act on a panel of judges to select the finalists who will participate in the Illinois Junior Academy of Science Symposium.

Jenny Beck <i>University of Chicago</i>	Robert Fisher <i>U.S. Army</i>	Les Lynn <i>Argument Centered Education</i>	Kirill Shmilovich <i>University of Chicago</i>
Rebecca Butler <i>University of Chicago</i>	Curtis Frank, P.E. <i>Frank Professional Engineers</i>	Russell J. Martin, P.E. <i>USEPA, retired</i>	Debra Sutkowski, Ph.D. <i>Astellas</i>
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Brent Curry <i>U.S. Army</i>	Jimmie Julion Jr. <i>Chicago Dept. of Water Management</i>	Jessica Morgan <i>University of Chicago</i>	Terri J. Wilson <i>U.S. EPA</i>
Newton Ellens <i>U.S. EPA</i>			Howard Zar <i>U.S. EPA</i>



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The City Exhibition of Student STEM Research would not be possible were it not for the effort of the dedicated CPS employees and retirees who give days and weeks of their time and have done so for years. They invest their time behind the scenes preparing an event and supporting programs for the purpose of fostering STEM education, encouraging students to engage in independent research and providing those students a public forum to present their work.

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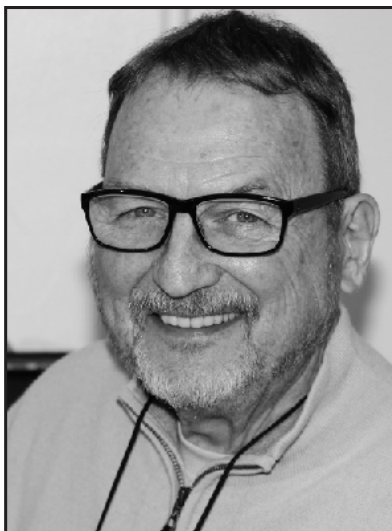
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Many thanks go to the Regional Networks STEM Exhibition Chairpersons and their Committees. These groups of teachers contribute their time and effort to create successful Regional Network Student STEM Exhibitions throughout the city, serving all CPS and Charter schools. The committees may include teachers, lead science teachers and STEM Coordinators from participating schools. Their efforts to insure a successful Regional STEM Exhibitions is greatly appreciated. Though the focus of the event is on students' projects, these events succeed due to the care and attention to detail of those people working on arrangements, credentials, exhibits, judging and safety committees. This year the nine Regional Networks STEM Exhibitions were grouped by schools closest to the hosting site.

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The teachers who sponsor student STEM projects are more than just those students' science teachers. They go beyond classroom instruction to launch students into learning and doing their own STEM independent research experiment. Additionally, they make sure their students follow safety rules, write a solid research paper and complete the necessary paperwork to produce a STEM research project.

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Acknowledgments

The Annual Chicago Public Schools Exhibition of Student STEM Research represents one of the best syntheses of the city's business and educational communities. The not-profit CPS Student Science Fair, Inc. is a coalition of current and retired public school teachers and administrators. They coordinate this yearly showcase with the aid of the aforementioned Chicago Public Schools Office of Teaching and Learning, Illinois Tech (Illinois Institute of Technology), and this year's corporate sponsors, BP American Inc., Chicago Public Schools, ComEd, An Exelon Company, Motorola Solutions Foundation and Peoples Gas, as well as many other individual donors.

In addition to our corporate, academic and site sponsors, contributors, committees and judges there are many others whose support must be acknowledged. We wish to express our sincere appreciation to the following individuals and organizations for their invaluable contributions to the 2019 CPS Exhibition of Student STEM Research.

Illinois Tech (Illinois Institute of Technology) is our new site host for the 2019 Citywide Exhibition of Student STEM Research (Student Science Fair). We thank the Illinois Tech staff for working with us in making this transition. We look forward to a successful STEM Exhibition at our new site.

- The students who worked so diligently to develop the outstanding research and displays presented at this event
- The parents, teachers, and other adults who inspired the Young HS people in various aspects of their projects

- The professors, engineers, scientists, and mathematicians who volunteered their services to help students develop their research
- Faculty and administrative personnel who organized the school STEM Exhibitions which give students their first opportunity to present their research to judges
- Volunteer helpers who work so hard on various Operating Committees to make this STEM Exhibition possible
- IKON Office Solutions for the donation of a copying machine to use during the week of Student STEM Exhibition
- Dr. Huseyin Colak, Northeastern Illinois University and Prof. Archie Peters, Chicago State University for presenting STEM Exhibition Central workshops
- Tom Schrey, Artmark Graphics and Allan Reisberg, Photographer, who worked so diligently to develop the 2019 Exhibition of Student STEM Research Program Book with photographs.
- Dennis Hart and Roy Coleman for their technical support for data entry
- Yolanda Del Rio, for providing prizes for the ComEd High School After-School Science Club Ice Cream Social
- Phoenix Military Academy High School JROTC cadets for serving as Color Guard at the Opening Ceremony and Awards Program.

Your support will ensure the continuation of the CPS Exhibition of Student STEM Exhibition in its exemplary form.

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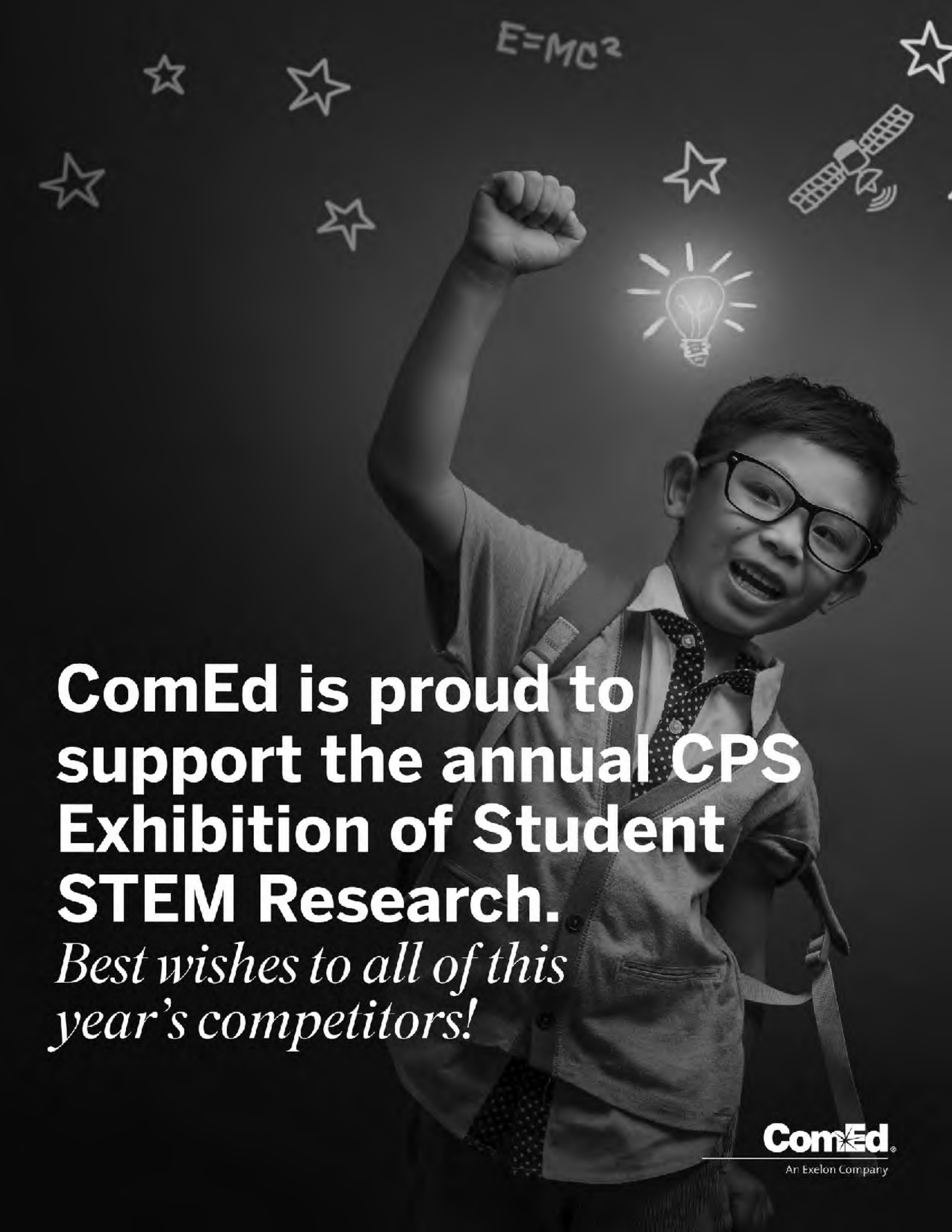
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