

72<sup>st</sup> Western Reserve District 5 Science Day – University of Akron -- 2020



Prof. Ali Dhinojwala, Director  
Department of Polymer Science  
The University of Akron

Sheila King, Co-Director  
NEOHSTEM Alliance, Rockwell Automation

John Fellenstein &  
Laurel Lohrey, Coordinators  
Akron Global Polymer Academy  
The University of Akron

Daniel H. Jones, Sponsored Awards  
Akron Council of Engineering &  
Scientific Societies

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Judging Directors

Abby Tanner  
ATI: Flat Rolled Products

Diane Minich, M.D  
Cleveland Clinic Foundation

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Sainath Jadhav  
The University of Akron

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## GENERAL SPONSORS – THANK YOU!!!

The University of Akron

- College of Polymer Science and Polymer Engineering (The University of Akron)
- Department of Polymer Engineering (The University of Akron)
  - Leidy Engineering Sales, Inc.
  - Ohio Oil and Gas Energy Education Program
    - OMNOVA Solutions Foundation
    - Reuther Mold & Manufacturing Co.
      - Rubber Division, ACS
  - Society of Plastics Engineers - Akron Section
  - University of Akron Research Foundation

**WESTERN RESERVE DISTRICT 5**  
**SCIENCE DAY**



at The University of Akron



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# Category Awards

# Earth and Environmental Science & Environmental Engineering

1<sup>st</sup> - \$100:

**Andrew Smith**

An analysis of environmentally sustainable alternative components to concrete  
Mentor High School – Mentor,  
Grade 12

2<sup>nd</sup> - \$75:

**Abem Fetene**

Carbon Sequestration  
The University School : College Prep - Chagrin Falls,  
Grade 10

3<sup>rd</sup> - \$50:

**Ruth Adams Gemmell**

Gobble, Gobble, Gone! Eliminating Hepatotoxins Caused by Cyanobacteria: A Study of the Grazing Habits  
of Paramecium Caudatum on Microcystis Aeruginosa in a Eutrophic Environment  
St Vincent De Paul – Akron,  
Grade 8

## Plant Science & Animal Sciences

1<sup>st</sup> - \$100:

**Sara Ramaiah**

Water Usage and Leaf Venation Structures in Rhododendron Species and Hybrids

Mentor High School - Mentor

Grade 12

2<sup>nd</sup> - \$75:

**Giancarlo Cefaratti**

A Decoupled Aquaponics System Improves the Production, Yield and Quality of Microgreens within the Brassicaceae and Asteraceae Families vs. a Traditional Coupled Aquaponics System

St Anselm - Chesterland

Grade 7

3<sup>rd</sup> - \$50:

**Vishwum Kapadia**

The Taste of Healthy Food Choices

The University School : College Prep Prep - Chagrin Falls

Grade 7

## Behavioral & Social Sciences

1<sup>st</sup> - \$100:

**Sarah Ochocki**

Expressive Vocabulary Acquisition in Students with Neurodevelopmental Disorders  
Mentor High School - Mentor  
Grade 12

2<sup>nd</sup> - \$75:

**Elizabeth Stevenson**

Examining Socioeconomic Trends in Post-Industrial Rust Belt Cities with Historic and New Markets Tax Credit  
Investment  
Mentor High School - Mentor  
Grade 11

3<sup>rd</sup> - \$50:

**Anna Welch**

Music and Concentration  
St Brendan - North Olmsted  
Grade 7

Biomedical Engineering & Biomedical and Health  
Sciences & Translational Medical Science

1<sup>st</sup> - \$100:

**Zuha Jaffar**

Localized Dual Cancer Drug Delivery From Affinity Based Devices  
Hathaway Brown - Shaker Heights  
Grade 11

2<sup>nd</sup> - \$75:

**Sohum Kapadia**

Dimensions and Geometry of the Mitral and Tricuspid Valves in Normal and Diseased States  
The University School : College Prep Prep - Chagrin Falls  
Grade 11

3<sup>rd</sup> - \$50:

**Nathan Mu**

Developing EDTA-polymerized Cyclodextrin as a Drug-Delivering Polymer For Use in a Coronary Drug-  
Eluting Stent Coating  
The University School : College Prep Prep - Chagrin Falls  
Grade 10

## Chemistry

1<sup>st</sup> - \$100:

Elena Nemeckay

The Dermatological Implications of Athletic Compression Attire

Mentor High School - Mentor

Grade 12

2<sup>nd</sup> - \$75:

Lucy Chmura

Nanoparticle Suspensions: An Examination of Alkali Metal Chloride Electrolytes on Titanium Dioxide Surface  
Potential

St Vincent St Mary - Akron

Grade 11

3<sup>rd</sup> - \$50:

Emily Cseh

The Effectuality of BLOC in Forensic Data Collection

Mentor High School - Mentor

Grade 12



## Energy: Sustainable Materials and Design & Materials Science

1<sup>st</sup> - \$100: **Andrew Ciccotelli**

The synthesis of helical polymer containing a ROTC complex

St Vincent St Mary - Akron

Grade 11

2<sup>nd</sup> - \$75: **Laney King**

The Effect of Surface Chemistry on the Wet Self-Cleaning Ability of Gecko-Inspired Synthetic Adhesives

St Vincent St Mary - Akron

Grade 10

3<sup>rd</sup> - \$50: **John Shin**

Enhancing Graphene & Carbon Fiber Electrochemical Supercapacitors with Electrolytes and Redox Agents

Hawken School - Chesterland

Grade 9

Engineering Mechanics & Robotics and Intelligent Machines  
& Systems Software & Embedded Systems & Computational  
Biology and Bioinformatics

1<sup>st</sup> - \$100:

**Aditya Kalahasti**

Analyzing patterns of gene expression in inflamed microglia stimulated with a pro-inflammatory molecule  
(TNF Alpha)  
Solon High School - Solon  
Grade 10

2<sup>nd</sup> - \$75:

**Vincent Chen**

Using Blockchain to Streamline the College Application Process  
The University School : College Prep Prep - Chagrin Falls  
Grade 11

3<sup>rd</sup> - \$50:

**Harbir Dass**

Torsional Stiffness of a Competition Go Kart Frame  
The University School : College Prep Prep - Chagrin Falls  
Grade 9

## Physics and Astronomy

1<sup>st</sup> - \$100: **Zoltan Kotrebai**

Energy Efficiency of LED Lighting (Investigating the Reasons for LED Light Source Efficiency Over Incandescent Light Sources and Calculating the Savings from Switching to an all LED Household)

St Paschal Baylon - Cleveland  
Grade 8

2<sup>nd</sup> - \$75: **Adam Khan**

Model Rocket Nose Cone Aerodynamics  
Stanton Middle School - Kent  
Grade 8

3<sup>rd</sup> - \$50: **Nathan Smith**

Do Tennis Racket Dampeners Affect How Far the Tennis Ball will Travel?  
Immaculate Heart Of Mary - Cuyahoga Falls  
Grade 8

## Polymer

1<sup>st</sup> : - \$100: **Andrew Ciccotelli**

The synthesis of helical polymer containing a ROTC complex  
St Vincent St Mary - Akron  
Grade 11

2<sup>nd</sup> : - \$75: **Nathan Mu**

Developing EDTA-polymerized Cyclodextrin as a Drug-Delivering Polymer For Use in a Coronary Drug-  
Eluting Stent Coating  
The University School : College Prep Prep - Chagrin Falls  
Grade 10

3<sup>rd</sup> : -\$50: **Lucy Chmura**

Nanoparticle Suspensions: An Examination of Alkali Metal Chloride Electrolytes on Titanium Dioxide  
Surface Potential  
St Vincent St Mary - Akron  
Grade 11

# Sponsored Awards

# Akron Council of Engineering and Scientific Societies

Best Overall Middle School (\$50):

1<sup>st</sup> : **Isabella Rambler**

Not Fake News: Climate Change is Real

National Inventors Hall of Fame School Center for STEM - Akron  
Grade 8

2<sup>nd</sup> : **Sasha Taylor**

How Humidity Affects Strands of Hair

National Inventors Hall of Fame School Center for STEM - Akron  
Grade 8

# Akron Council of Engineering and Scientific Societies

Best Overall High School (\$50):

1<sup>st</sup> : **Zuha Jaffar**

Localized Dual Cancer Drug Delivery from Affinity-Based Devices  
Hathaway Brown - Shaker Heights  
Grade 11

2<sup>nd</sup> : **Alex Devine**

Sunscreen to Solar Power:  
Creating and Testing a Zinc Oxide Dye Sensitized Solar Cell  
The University School - College Prep - Chagrin Falls  
Grade 10

Akron District Society of Professional Engineers

MS (\$50): **Kaitlyn Ernst**

A Novel Method of Creating Electricity via A Thermoelectric  
Generator Fueled By Heat Waste Energy from Compost  
Laurel School - Shaker Heights  
Grade 8

HS (\$50): **Jacob Rintamaki**

Transformable Tents: A Novel Design To Aid Humanitarian Efforts  
Westlake High School - Westlake  
Grade 10



# American Chemical Society

Akron Section

MS (\$100): **Noel Maddox**

Crazy Crystals: The Effect of Contaminants on Crystal Growth

St Raphael - Bay Village

Grade 7

HS (\$100): **Shruthi Ravichandran**

Targeted Delivery of Immune Agonists for  
Antitumoral Response of the Tumor Microenvironment

Hathaway Brown - Shaker Heights

Grade 11

Institute of Electrical & Electronics Engineers  
Akron-Canton Section

Honorable Mentions (\$25):

**Kaitlyn Ernst**

A Novel Method of Creating Electricity via A Thermoelectric  
Generator Fueled By Heat Waste Energy from Compost  
Laurel School - Shaker Heights  
Grade 8

**Lauren Rolda**

Maximizing Solar Cell Power Output With Solar Concentrators  
St Mary Of The Falls - Olmsted Falls  
Grade 8

Institute of Electrical & Electronics Engineers  
Akron-Canton Section

Honorable Mentions (\$25):

**Parker Good**

The Enlightening Truth About Light Bulbs  
Menlo Park Academy - Cleveland  
Grade 6

**Maya Blazer**

Wind Turbine Efficiency Models  
Incarnate Word Academy - Parma Heights  
Grade 7

Institute of Electrical & Electronics Engineers  
Akron-Canton Section

Best Project (\$50):

MS: **Zoltan Kotrebai**

Energy Efficiency of LED Lighting (Investigating the Reasons for LED Light Source Efficiency Over Incandescent Light Sources and Calculating the Savings from Switching to an all LED Household)  
St Paschal Baylon - Cleveland  
Grade 8

HS: **John Shin**

Enhancing Graphene & Carbon Fiber Electrochemical Supercapacitors with Electrolytes and Redox Agents  
Hawken School - Chesterland  
Grade 9

# Office of Naval Research

Middle School:

## Carlo Polisena

Ready, Set, GROW!  
St Francis Of Assisi - Gates Mills  
Grade 8

## Kaitlyn Wood

Rethink Your Cookie Sheet  
St Raphael - Bay Village  
Grade 6

# Office of Naval Research

Middle School:

## Maya Tang

The Effect of Binocular Versus Monocular Vision on Depth Perception

Hathaway Brown - Shaker Heights

Grade 7

# Office of Naval Research

High School (\$50):

## Elena Nemeckay

The Dermatological Implications of Athletic Compression Attire

Mentor High School - Mentor

Grade 12

## Harbir Doss

Torsional Stiffness of a Competition Go Kart Frame

The University School : College Prep - Chagrin Falls

Grade 9

# Ohio Nurses Association

Summit and Portage District

Best Health Care Project (\$50)

MS: **James Fornadel**

The "Beat" of the Heart: The Effects of Music on Blood Pressure  
St Rita - Solon  
Grade 7

HS: **Sohum Kapadia**

Dimensions and Geometry of the Mitral and Tricuspid  
Valves in Normal and Diseased States  
The University School : College Prep - Chagrin Falls  
Grade 11



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# Ohio Soybean Council

## Ohio Soybean Bioscience Award (\$100)

### Gemma Wichmann

Red Light Therapy: Healthy Plants are Happy Plants  
St Raphael - Bay Village,  
Grade 6

### Nikolaus Spatz

Will the use of biosolids in soil increase growth in kidney beans?  
Mentor High School - Mentor,  
Grade 12

### Abigail May

The Impact of Nitrogen Inclusive Fertilizers on Glycine max and Water Runoff  
St Vincent St Mary – Akron,  
Grade 11

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# Society of Plastics Engineers

Akron Section

Best Plastics-related Project – HS (\$35):

**Matthew Yatsko**

Biomimicking Gels: Swelling and Nonlinear Elasticity

St Vincent St Mary - Akron

Grade 11

**Laney King**

The Effect of Surface Chemistry on the Wet Self-Cleaning

Ability of Gecko-Inspired Synthetic Adhesives

St Vincent St Mary - Akron

Grade 10

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# Society of Plastics Engineers

Akron Section

Best Plastics-related Project - MS (\$75):

## Jack Benoit

The Biggest Stretch: Comparison of Accelerators in Natural Latex Compounds

St Francis De Sales – Akron

Grade 7

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## Ohio Trust Winners

### Giancarlo Cefaratti

A Decoupled Aquaponics System Improves the Production, Yield and Quality of Microgreens within the Brassicaceae and Asteraceae Families vs. a Traditional Coupled Aquaponics System St Anselm - Chesterland ,  
Grade 7

### Ruth Adams Gemmell

Gobble, Gobble, Gone! Eliminating Hepatotoxins Caused by Cyanobacteria: A Study of the Grazing Habits of Paramecium Caudatum on Microcystis Aeruginosa in a Eutrophic Environment  
St Vincent De Paul – Akron,  
Grade 8

### 1st Alternate: Kaitlyn Ernst

A Novel Method of Creating Electricity via A Thermoelectric Generator Fueled By Heat Waste Energy from Compost  
Laurel School - Shaker Heights,  
Grade 8

### 2<sup>nd</sup> Alternate: Zoltan Kotrebai

Energy Efficiency of LED Lighting (Investigating the Reasons for LED Light Source Efficiency Over Incandescent Light Sources and Calculating the Savings from Switching to an all LED Household)  
St Paschal Baylon - Cleveland  
Grade 8

Outstanding School Awards

Outstanding High School:

Mentor High School - Mentor

Outstanding Middle School:

St Raphael - Bay Village

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## State Science Day Qualifiers

Please see list on

<https://uakron.edu/wrsd/>