

Twin Cities Regional Science Fairs 2017

Welcome to the

**79th Annual Twin Cities Regional Science Fair
25th Annual St. Paul Science Fair
23rd Annual Western Suburbs Science Fair**



Affiliated with the Intel International Science & Engineering Fair
& the Minnesota State Science & Engineering Fair





Twin Cities Regional Science Fairs 2017

Before we begin our ceremony, we have a few reminders:

- Make sure that you are wearing your name badge when picking up your award!
- After you pick up your award, make sure to go have your picture taken.
- A parent or teacher may pick up an award for a student who was unable to attend but please do this **after the awards ceremony**. Please come to the front when the awards ceremony is finished to pick up an award for a missing student.



Orbital ATK Sponsor Award





Orbital ATK Sponsor Award

Winner

1160W Avni Jain



Solving the hip fracture crisis: Utilizing Silica Nanoparticles to synthesize a flexible, affordable, and bio-friendly Shear Thickening Fluid based innovation



Orbital ATK Sponsor Award

Alternate

1195W Archana Murali



Window to the brain: Using retinal biomarkers to predict progression of Alzheimer's and Parkinson's disease



Orbital ATK Sponsor Award

Alternate

1148W Genevieve Weiler



Exploring the use of a hydrostatic transmission in a mid-size wind turbine



Isthmus Engineering & Manufacturing Sponsor Award





Isthmus Engineering & Manufacturing Sponsor Award Winner

1144T Aradhana Menon



Skyfall: The Effect of Parachute
Shapes on Drop Velocity



Isthmus Engineering & Manufacturing Sponsor Award Alternate

1147T William Trussell



Effect of Water Flow Types and Blade
Numbers on Rotations of Turbines



Isthmus Engineering & Manufacturing Sponsor Award Alternate

1142T Hannah Farmer



Investigating Flow in Rotating
Cylindrical Tubes



Broadway Party and Tent Rental Sponsor Award



**BROADWAY
PARTY & TENT
RENTAL**

"We Rent Celebrations!"

www.broadwaypartyrental.com



Broadway Party and Tent Rental Sponsor Award Winner

8080T Joe Brennan



**BROADWAY
PARTY & TENT
RENTAL**

"We Rent Celebrations!"

www.broadwaypartyrental.com

Which Truss Do You Trust?



Broadway Party and Tent Rental Sponsor Award Alternate



**BROADWAY
PARTY & TENT
RENTAL**

"We Rent Celebrations!"

www.broadwaypartyrental.com

7098S Carter Swinney, Tanner Fenton

Pi challenge!



Broadway Party and Tent Rental Sponsor Award Alternate



**BROADWAY
PARTY & TENT
RENTAL**

"We Rent Celebrations!"

www.broadwaypartyrental.com

7088T Orion Tyrrell

Rocket, One Motor or Many

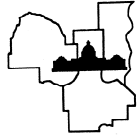


Slattery Sales Group



SLATTERY SALES GROUP, INC.

VALUE DIFFERENTIATION STRATEGIES
AND EXECUTION THAT ENHANCE RESULTS



Slatery Sales Group Finalist

8064S Alice Spong



Could Crushed Shells Slow Down the
Levels of Acidification in Our Oceans?



Slatery Sales Group Alternate

1103T Michael Finch



To Flush or Not To Flush



Slatery Sales Group Alternate

8054S Marit Isaacson



Going Green As You Clean



Ecolab Sponsor Award

ECOLAB[®]



Ecolab Sponsor Award Winner

1123T Maxwell Vogel



Can a Golf Course Riparian Buffer Zone Reduce Fertilizer, Pesticide and Sediment Runoff into the Brown's Creek Watershed? (Year One - Phase I)



Ecolab Sponsor Award Alternate

1109S Diane Huang



Evaluating Roof Runoff Contaminants
by Age



Ecolab Sponsor Award Alternate

1120W Sarah Scott, Christiana Wilke



Effect of Runoff on Water Quality



Dow Water and Process Solutions Sponsor Award



Water & Process Solutions



Dow Water and Process Solutions Sponsor Award Winner

1005W Mari Leland

Ant-ibiotics and the Study of Atta
Cephalotes



Water & Process Solutions



Dow Water and Process Solutions Sponsor Award Alternate

1058T Nathaniel Farmer

Are You Protected? Wearable Mask Fit
Monitor – Year II



Water & Process Solutions



Dow Water and Process Solutions Sponsor Award Alternate

8013S Rachel Levin

Slowing Traffic With Art



Water & Process Solutions



Premier Bank Sponsor Award



**Premier
Banks** MEMBER
FDIC



Premier Bank Sponsor Award Winner

1094T Chelsea Lai



**Premier
Banks** MEMBER
FDIC

Tooth Trauma and Protection



Premier Bank Sponsor Award Alternate

1095W Archana Murali



Window to the brain: Using retinal biomarkers to predict progression of Alzheimer's and Parkinson's disease



Premier Bank Sponsor Award Alternate

1128W Abhi Kamboj



An Immersive Virtual Reality: The
Effect of Haptics on Agency in a Virtual
Environment



Mintahoe Catering and Events Sponsor Award

Mintáhoe



H O S P I T A L I T Y G R O U P



Mintahoe Catering and Events Sponsor Award

Winner

6014W Madelon Pollard

Mintáhoe



HOSPITALITY GROUP

Growing Yeast



Mintahoe Catering and Events Sponsor Award

Alternate

7038W Allison Sowatzka

Mintáhoe



HOSPITALITY GROUP

What Factors Affect Reaction Time?



Mintahoe Catering and Events Sponsor Award

Alternate

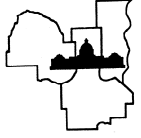
8029T Ashley Wilson

Mintáhoe



HOSPITALITY GROUP

Don't Wreck Your Teeth



University of Minnesota

UNIVERSITY OF MINNESOTA



University of Minnesota Finalist

1017W Elena Berman, Raunak Vijayakar

Hello, Stranger: A Big Data Approach to
Online Dating

UNIVERSITY OF MINNESOTA



University of Minnesota

Alternate

1161S Benjamin Mellin

The Affect of Monomer Ratio on the
Flexural Strength of a Block Copolymer

UNIVERSITY OF MINNESOTA



University of Minnesota Alternate

1094T Chelsea Lai

Tooth Trauma and Protection

UNIVERSITY OF MINNESOTA



City of St. Paul Youth Fund



The Most Livable
City in America



City of St. Paul Youth Fund

Winner

6008S Quinn Meaney

Do people collect more information when reading on paper or on an electronic device?



The Most Livable
City in America



City of St. Paul Youth Fund

Alternate



The Most Livable
City in America

1085S Geeta Rajamani

Controlling Noxa Protein Expression by
a Novel Approach to Study its Function
in Leukemic Cells: Phase II



City of St. Paul Youth Fund

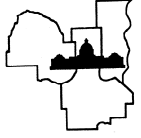
Alternate

1076S Serena Jing

Inexpensive Glucose Monitoring
Device for Diabetics Using Capillary
Action of Crosslinked Sensing Fluid
Year 2



The Most Livable
City in America



3M Sponsor Award

3M



3M Sponsor Award Winner

1154T Manashree Padiyath



Unleading The Way: Remediation of
Lead Contaminated Water with
Coriandrum Sativum (Cilantro) Biochar



3M Sponsor Award Alternate

1087W Samuel Kim



Does systematically increasing the number of uniformly-sized polyacrylamide beads in 20-mL vials correlate with the number of faces on the beads when they finish expanding in water?



3M Sponsor Award Alternate

1161S Benjamin Mellin



The Affect of Monomer Ratio on the
Flexural Strength of a Block Copolymer



Organizational Sponsor Awards



3M Film Manufacturing and Supply Chain and Inventor Recognition Award

1154T Manashree Padiyath

Unleading The Way: Remediation of Lead Contaminated Water
with *Coriandrum Sativum* (Cilantro) Biochar



3M Film Manufacturing and Supply Chain and Inventor Recognition Award

- 7117S Peter Wenger
Air Pressure of soccer balls
- 8033T Kate Christian, Katie Magallon
How Much Fat is in Your Food?



3M Film Manufacturing and Supply Chain and Inventor Recognition Award

1203W John Beutz

Inertial Electrostatic Confinement D+D Fusion Device Proof of Design

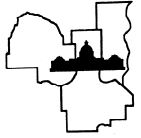
1093W Kerui Yang

Effects of pH on Polyvinyl Alcohol Behavior in Aqueous Solutions



3M Commercial Solutions Division Award

- 7067T Rikhil Seshadri
Low Cost Supercapacitors for Energy Storage
- 1104T Griffin Gutwa, Oluwaseyi Aguda Jr.
Going Green As You Clean



3M Commercial Solutions Division Award

7072S Frankie Grass
Plastic Pollution, An Insulation Solution

7044S Owen Finlay
Biodiesel

Projects Named to Minnesota State Science and Engineering Fair

| | | | | | |
|------|---|-------------------------------------|------|---|---|
| 1001 | W | Molly Carroll | 1087 | W | Samuel Kim |
| 1005 | W | Mari Leland | 1089 | T | Elijah Le |
| 1011 | S | Iya Abdulkarim | 1093 | W | Kerui Yang |
| 1013 | T | Jaelyn Baisch | 1095 | W | Archana Murali |
| 1016 | T | Ryan Beattie | 1098 | S | Nick Berg, Akira Callahan, James Paquet |
| 1017 | W | Elena Berman, Raunak Vijayakar | 1103 | T | Michael Finch |
| 1018 | T | Emily Bogaard | 1104 | T | Griffin Gutwa, Oluwaseyi Aguda Jr. |
| 1023 | W | James Clinton, Samuel Leville | 1106 | T | Emma Harrold |
| 1025 | T | Arianna Day | 1107 | T | Hanna Holmstrom |
| 1026 | T | Tatum Frey | 1108 | T | Yingyan Huang |
| 1028 | T | Najma Hassan | 1109 | S | Diane Huang |
| 1029 | T | Siham Hassan | 1112 | T | Haley Jostes |
| 1031 | T | Mikayla Hughes | 1122 | T | Percy Thomas, Alex Dodd, Vincent Mwebi |
| 1033 | T | Rachel Kelly | 1123 | T | Maxwell Vogel |
| 1034 | T | Brianna Kirk | 1125 | T | Claire Wentzlaff |
| 1036 | T | Sarah Kuplic | 1126 | W | Cassidy Yueh, Seyade Tadele |
| 1039 | T | Nicole Matter | 1127 | S | Henry Zietlow |
| 1048 | T | Liam Thomas | 1130 | W | Abigail Roh, Samantha Detor |
| 1054 | T | Andrew Carlson | 1131 | T | Davis Hey |
| 1058 | T | Nathaniel Farmer | 1132 | T | Abyan Osman |
| 1060 | T | Gregory Johnson | 1137 | T | Kiley O'Neil |
| 1061 | W | Brandon Lai | 1138 | T | Connor Van Dorpe, Braxton Kukulka |
| 1065 | W | Grant Parrish, James Williams IV | 1139 | T | Yin Wang, Jianghua Lu |
| 1069 | W | Maggie Scott, Cole Maxwell | 1140 | S | Ramona White |
| 1071 | W | Hyunsoo Song, Addison Gleekel | 1142 | T | Hannah Farmer |
| 1072 | W | Emma Carr, John Dempsey | 1143 | W | Siyuan Ma, Samuel Aronson |
| 1073 | W | Maya Czeneszew, Samuel Rex | 1144 | T | Aradhana Menon |
| 1075 | W | Meghana Iyer | 1145 | T | Cormac Pearce |
| 1076 | S | Serena Jing | 1147 | T | William Trussell |
| 1077 | W | Harini Kethar | 1148 | W | Genevieve Weiler |
| 1078 | T | Everett Kroll | 1149 | T | Anna Cruz |
| 1080 | W | Gauri Binoy | 1150 | T | Logan Eckholm |
| 1082 | T | Kara Odom, Madison Schwab, Emma Fee | 1154 | T | Manashree Padiyath |
| 1083 | T | Felix Oh | 1160 | W | Avni Jain |
| 1084 | W | Karthik Papisetty, Jyotirmya Kumar | 1161 | S | Benjamin Mellin |
| 1085 | S | Geeta Rajamani | 1164 | T | Ethan Tinklenberg |

1168 T Grace Campbell
1169 W Isabella Jennings, Melinda Samaratunga
1170 T Sarah Johnson
1171 T Alex Li, Rebecca Li
1173 T Megan Olson
1176 S Enrique Vazquez
1178 T Abigail Banks- Hehenberger
1180 W Jiaheng He, Sung Wan Huh
1185 S Salvador Vega
1193 T Abby Harrold
1194 S Mari Knudson
1196 T Sophia Middag
1197 T Jessica Nguyen
1200 T Heidi Stewart
1201 S Emilia Topp-Johnson
1203 W John Beutz
6001 T Dominique Deming
6004 W Anna Farley
6005 W Ava Frey
6006 W Genevieve Larson
6007 W Vivienne Larson
6008 S Quinn Meaney
6010 S Wynne Riemenschneider, Francesca Satoskar
6014 W Madelon Pollard
6048 W John Vaccaro
6049 S Andrew Woodage
6051 W Ryan Baird
6068 S Noelle Greenwalt
6077 W Samuel Fulton
6080 W Leo Ogle
6085 W Sophia Boockmeier
6087 W Andre Huggar
6090 W Colleen Noonan
6097 W Callie Ebbert
6098 T Ella Fix
6103 T Harsha Pillai
7003 W Maeve Katics
7006 W Mike Schmidt
7008 S Sebastian Zarkower

7015 T Helen Dombrock
7016 T Patrick Gainor
7019 W Ava Krocheski-Meyer
7021 T Isabelle Rippentrop
7029 T Fionnuala Foley
7032 S Annelise Purcell
7033 T Jasper Strayer, Aaden Spencer
7038 S Allison Sowatzka
7044 S Owen Finlay
7049 T Ellie Scheldberg
7053 W Bryan Heaton
7055 T Abby Machtig
7057 W Camden Mellema
7059 S Frances Ronning
7060 W Ravelle Rute
7067 T Rikhil Seshadri
7068 S Keegan Bersie-Mize
7071 S Aman Gidwani
7072 S Frankie Grass
7075 S Ana Mendoza
7076 S Griffin Moore
7083 T Bridget Gerber
7087 S Samuel Skinner
7089 W Jonathan Viehman
7092 W Quentin Hughes, Vaughn Hughes
7103 W Jack Boike
7115 T Braden Stock
7117 S Peter Wenger
7119 W Katherine Beekman
7124 S Teo Dieperink
7125 S Keira Gupta
7127 W Emily McCarthy
8002 S Mira Seeba
8004 S Emilie Tinnes
8017 W Simren Samba, Nell Ganley, Abigail Covell
8018 S Nora Thomey
8020 W Alex Iliarski, Ishan Nadkarni
8022 S Claire Aamodt
8041 T Abbey O'Brien

8046 S Zaiga Chance, Lee Tuggle
8048 S Lorraine Delonghersh
8050 W Ilse Fredrickson
8054 S Marit Isaacson
8059 S Addie Morrisette
8067 S Pa Houa Yang
8074 T Jack Martin
8091 S Adeleine Cooper

8096 S Helene Francis, Kaija Maier
8099 T Luke Trussell, Nate Trussell
8101 W Julia Brouwer
8102 S Anna Gaudio
8105 S Fae Katras
8109 S Tana Ososki
8111 W Anika Jackson, Julian Byrne
8112 T Lauren Lowe

Projects Named as Alternates to State Science Fair:

1015 T Samuel Bardwell
1032 T Lauren Jensen
1044 T Madeline Samz
1053 T Arbaz Ansar
1056 S Claire Davis
1059 T Heidi Hulbert
1156 T Joseph Andel
1167 T Emma Martin
1177 T Michael Ysaguirre
1179 T Zachary Benson
1183 T Isaac Nelson
6027 W Anna Abel
6094 T Zach Behme
6106 W Luke Vitt
6112 W Cece Walser
7036 W Wyatt Schindeldecker
7121 T Kassandra Caron

Broadcom MASTERS winners (top 10% of middle school projects)

| | | |
|------|---|---|
| 6001 | T | Dominique Deming |
| 6087 | T | Andre Huggar |
| 6103 | T | Harsha Pillai |
| 7015 | T | Helen Dombrock |
| 7021 | T | Isabelle Rippentrop |
| 7029 | T | Fionnuala Foley |
| 7049 | T | Ellie Scheldberg |
| 7055 | T | Abby Machtig |
| 7067 | T | Rikhil Seshadri |
| 8041 | T | Abbey O'Brien |
| 8074 | T | Jack Martin |
| 8099 | T | Luke Trussell, Nate Trussell |
| 6008 | S | Quinn Meaney |
| 6049 | S | Andrew Woodage |
| 6068 | S | Noelle Greenwalt |
| 7008 | S | Sebastian Zarkower |
| 7038 | S | Allison Sowatzka |
| 7071 | S | Aman Gidwani |
| 7072 | S | Frankie Grass |
| 7117 | S | Peter Wenger |
| 7124 | S | Teo Dieperink |
| 8022 | S | Claire Aamodt |
| 8048 | S | Lorraine Delonghersh |
| 8050 | S | Ilse Fredrickson |
| 8059 | S | Addie Morrisette |
| 8091 | S | Adeleine Cooper |
| 8096 | S | Helene Francis, Kaija Maier |
| 8102 | S | Anna Gaudio |
| 8109 | S | Tana Ososki |
| 6090 | W | Colleen Noonan |
| 6097 | W | Callie Ebbert |
| 7057 | W | Camden Mellema |
| 7092 | W | Quentin Hughes, Vaughn Hughes |
| 7103 | W | Jack Boike |
| 8017 | W | Simren Samba, Nell Ganley, Abigail Covell |
| 8101 | W | Julia Brouwer |
| 8111 | W | Anika Jackson, Julian Byrne |



HS Research Papers Named to Tri-state Junior Science & Humanities Symposium (JSHS):

| | | | |
|-----|-----------------------------|-----|--|
| 115 | Siyuan Ma, Samuel Aronson | 196 | Olivia Jane Rippentrop |
| 116 | Alex Li, Rebecca Li | 234 | Luke Chen |
| 117 | Avni Jain | 237 | Sarah Grace Kuplic |
| 118 | Meghana Iyer | 250 | Joshua Holtzleiter |
| 122 | Diane Huang | 251 | Archana Murali |
| 128 | Henry Zietlow | 255 | Maggie Scott, Cole Maxwell |
| 131 | Cassidy Yueh, Seyade Tadele | 257 | Emma Claire Carr, John Dempsey |
| 136 | Manashree Padiyath | 260 | Isabella Jennings, Melinda Samaratunga |
| 153 | Hanna Kate Holmstrom | 262 | Nathaniel Rudolph Farmer |
| 160 | Jacob Magnus Widen | 263 | Geeta Rajamani |
| 166 | Felix Oh | 266 | Smita Bhoopatiraju |
| 172 | Mikayla Grace Hughes | 268 | Kerui Yang |
| 173 | Heidi Jane Stewart | 271 | Jiaheng He, Sung Wan Huh |
| 177 | Maya Czeneszew, Samuel Rex | 272 | Karthik Papisetty, Jyotirmya Kumar |
| 179 | Emilia Frances Topp-Johnson | 279 | Ethan Paul Tinklenberg |
| 180 | Mari Leland | 282 | Marissa Marie Baker |
| 182 | Harini Kethar | | |

HS Research Papers Named as Alternates to JSHS:

| | |
|-----|------------------------------|
| 103 | Josh Lee Klavins |
| 106 | William Patrick Trussell |
| 119 | Hannah Elisabeth Lynn Farmer |
| 123 | Mari Michelle Knudson |
| 140 | Anna Jessica Cruz |
| 147 | Matthew Jerome Voigt |
| 170 | Abby Marie Harrold |
| 171 | Jessica Irene Nguyen |
| 199 | Tatum Kailee Frey |
| 201 | Jaelyn Baisch |
| 249 | Matthew Benjamin Berg |
| 259 | Iya Abdulkarim |
| 267 | Yutong Xu |
| 275 | Zachary Loren Hjermstad |
| 295 | Hayden Johnson |

MS Research Papers Named to Minnesota State Science & Engineering Fair:

- 503 Rohan Desai-Hunt
- 511 Julia Anne Brouwer
- 512 Griffin Henry Moore
- 516 Paul Joseph Goff
- 522 Quentin Xander Hughes, Vaughn Harrison Hughes
- 528 Juliet Ali-Caccamo
- 531 Teresa Le-Vu
- 532 Wyatt Schindeldecker
- 534 Braden Stock
- 546 Ana Lucille Mendoza

MS Research Papers Named as Alternates to State:

- 513 Emily Alexis Miller-Sweesy
- 514 Zaiga Rae Chance, Lee Elizabeth Tuggle
- 519 Addie Morrisette
- 521 Teo Dieperink
- 524 Harini Senthilkumar
- 526 Katherine Diane Beekman



Graduate Women In Science Projects Award

Grade 6

Project Anna Farley

Paper Rachel Poppleton



Graduate Women In Science Projects Award

Grade 7

Project Ava Krocheski-Meyer

Paper Ana Mendoza



Graduate Women In Science Projects Award

Grade 8

Project Abbey O'Brien

Paper Zaiga Rae Chance, Lee Elizabeth Tuggle

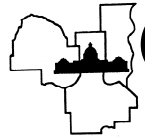


Graduate Women In Science Projects Award

Grade 9

Project Abigail Roh, Samantha Detor

Paper Abigail Roh, Samantha Detor



Graduate Women In Science Projects Award

Grade 10

Project Haley Jostes

Paper Hanna Kate Holmstrom



Graduate Women In Science Projects Award

Grade 11

Project Emilia Topp-Johnson

Paper Mari Leland



Graduate Women In Science Projects Award

Grade 12

Project Maggie Scott

Paper Geeta Rajamani



Nokomis



Minnesota Agriculture in the Classroom

Project Senior High

1123T Maxwell Vogel

Can a Golf Course Riparian Buffer Zone Reduce Fertilizer, Pesticide and Sediment Runoff into the Brown's Creek Watershed? (Year One - Phase I)



Minnesota Agriculture in the Classroom

Project Junior High

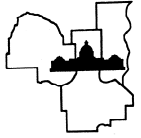
7119W Katherine Beekman
The Impact Of Mulch On Beans



Minnesota Agriculture in the Classroom

Paper Senior High

- 179 Emilia Topp-Johnson
Terraformation and Cultivation: Investigating Strategies to
Establish Martian Agriculture



Minnesota Agriculture in the Classroom

Paper Junior High

171

Jessica Nguyen

Correlation Between Plant Density and Plant Height



United States Department of Agricultural Research Award

6112W Cece Walser
Can plants stop soil erosion?

7053W Bryan Heaton
The Effect of CO₂ Concentrations on The Growth of *Lepidium Sativum*



United States Department of Agricultural Research Award

7121T Kassandra Caron

What Type of Light Source Promotes the Fastest Rate of
Photosynthesis in Green Plants?

1109S Diane Huang

Evaluating Roof Runoff Contaminants by Age



United States Department of Agricultural Research Award

1154T Manashree Padiyath

Unleading The Way: Remediation of Lead Contaminated Water
with *Coriandrum Sativum* (Cilantro) Biochar



American Chemical Society

1093W Kerui Yang

Effects of pH on Polyvinyl Alcohol Behavior in Aqueous Solutions



American Chemical Society

1087W Samuel Kim

Does systematically increasing the number of uniformly-sized polyacrylamide beads in 20-mL vials correlate with the number of faces on the beads when they finish expanding in water?

1089T Elijah Le

The Electrolysis slide



Minnesota Astronomical Society

6104W Ella Rushing
Craters and Meteorites

8061T Brooklyn Renberg
Aurora Borealis



Minnesota Astronomical Society

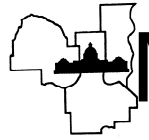
1099S Matthew Bluhm
Meteor Impact

1178T Abigail Banks- Hehenberger
Spectroscopic Analysis of Lightbulbs



Radio City Award

- 7068S Keegan Bersie-Mize
Energy Requiered to Light Different Colors of LEDs
- 8113S Kharme Mahamed
Something's Blocking My WiFi?



Minnesota Space Frontier Society Award

6078T Matthew Kennedy
The Egg-Cellent Parachute

6080W Leo Ogle
Stealth Shapes

The logo features a stylized outline of the state of Minnesota. Inside the outline, there is a silhouette of a space shuttle or rocket launching upwards from a launch pad.

Minnesota Space Frontier Society Award

6096W Nicholas Craemer
Parachutes

7080W Sam Zylstra
The Impact of Atomospheric Reentry on Thermal Heat Shield
Material



Minnesota Space Frontier Society Award

7088T Orion Tyrrell
Rocket, One Motor or Many

7097T Vincent Ramirez
Warm Wings



Minnesota Space Frontier Society Award

7118T Faraes Wubshet

Does Straw Height Affect how high a Ping Pong Ball Will Float?

8081S Dominic Dahdah

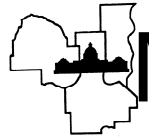
Which Propellor is Best?

The logo features a stylized outline of the state of Minnesota. Inside the outline, there is a silhouette of a space shuttle or rocket launching upwards.

Minnesota Space Frontier Society Award

8085T Milan Jostes
A Non-Rocket Satellite Launcher

8101W Julia Brouwer
Leafy Green Astronauts Year Two: How Space Radiation
Impacts Seed Germination and Subsequent Plant Growth of
Monocot Versus Dicot Seeds



Minnesota Space Frontier Society Award

1144T Aradhana Menon

Skyfall: The Effect of Parachute Shapes on Drop Velocity

1140S Ramona White

Free Fall

The logo features a stylized outline of the state of Minnesota. Inside the outline, there is a silhouette of a space station or satellite in orbit above a landscape with a mountain range.

Minnesota Space Frontier Society Award

1141T Chen Dai
 Captain America shield



MARS CON

- 1098S Nick Berg, Akira Callahan, James Paquet
Terra-forming Mars; one microorganism at a time.
- 1201S Emilia Topp-Johnson
Terraformation and Cultivation: Investigating Strategies to
Establish Martian Agriculture



US Air Force

St. Paul

8114S Bridget Lee
The Effects of Age on Peripheral Vision

8081S Dominic Dahdah
Which Propellor is Best?



US Air Force

Twin Cities

8085T Milan Jostes
A Non-Rocket Satellite Launcher

1144T Aradhana Menon
Skyfall: The Effect of Parachute Shapes on Drop Velocity



US Air Force

Western Suburbs

8077W Ani Tonoyan

Power Up! Wind Turbine Blade Design Optimization

6080W Leo Ogle

Stealth Shapes



US Army

St. Paul

1161S Benjamin Mellin

The Affect of Monomer Ratio on the Flexural Strength of a Block Copolymer

1155S Liza Strom

No Filter



US Army

St. Paul

1140S Ramona White
Free Fall

1068S Clara Schilder Manning
Sleep Study



US Army

Twin Cities

1028T Najma Hassan

Effects of cell phones upon reaction time

1018T Emily Bogaard

A Statistical Analysis of the Reaction Times of Athletes and Nonathletes



US Army

Twin Cities

1164T Ethan Tinklenberg
Shoes! On Race Day.

1141T Chen Dai
Captain America shield



US Army

Twin Cities

1025T Arianna Day

Involvement in Music and its Effect on the Speed of Processing Information



US Army

Western Suburbs

1180W Jiaheng He, Sung Wan Huh

From Takeout Box to Organic Laser: Transforming the Industry by Engineering a Transparent, Flexible Laser

1203W John Beutz

Inertial Electrostatic Confinement D+D Fusion Device Proof of Design



US Army

Western Suburbs

1071W Hyunsoo Song, Addison Gleekel

Preparing for the future: Analyzing the long-term effects of traumatic brain injury

1077W Harini Kethar

A Genetically Engineered Treatment for Chronic Pain and Peripheral Brain Damage through Vector-Mediated Gene Therapy



US Army

Western Suburbs

1130W Abigail Roh, Samantha Detor

A Novel Approach to Keeping Track Valuables During an Age of Wearable Technology



US Navy

St. Paul

1161S Benjamin Mellin

The Affect of Monomer Ratio on the Flexural Strength of a Block Copolymer

8081S Dominic Dahdah

Which Propellor is Best?



US Navy

St. Paul

8091S Adeleine Cooper

Force Necessary to Drive a Nail through Different Wood Types
in Relation to Grain and Density

8072S Ingrid Fellows

Counting the Blades - Optimizing Hydroelectric Generators



US Navy

Twin Cities

8074T Jack Martin
The Shining Benefits of Solar Power

8085T Milan Jostes
A Non-Rocket Satellite Launcher



US Navy

Twin Cities

1142T Hannah Farmer

Investigating Flow in Rotating Cylindrical Tubes

1144T Aradhana Menon

Skyfall: The Effect of Parachute Shapes on Drop Velocity



US Navy

Western Suburbs

8050W Ilse Fredrickson

Is the Water Impaired? Testing pH, Ammonia, and Nitrate levels in a Freshwater Ecosystem?

8077W Ani Tonoyan

Power Up! Wind Turbine Blade Design Optimization



US Navy

Western Suburbs

1148W Genevieve Weiler

Exploring the use of a hydrostatic transmission in a mid-size wind turbine



US Marine Corps Excellence Award

7036W Wyatt Schindeldecker

B.Cereus The Impact of Apple Cider Vinegar on a Common Bacteria



Teacher Excellence Award

Katie Meier

Capitol Hill

Sarah Connelly

Highland Park Sr. High School



Glen and Jacob Domeier Memorial Award

6083W Avery Nientimp

Solar Powered Water Desalination

1111S Jack Indritz

Leachate Metals and Organic Compounds in Roof Runoff by
Shingle Age



Killeen Memorial Award

6016W Peter Giertsen
How Sweet Is It?



Lohman Memorial Award

1011S Iya Abdulkarim

Applying the Novel Object Recognition Test in Zebrafish (*Danio rerio*)



ISEF Alumni – Timara Underbakke

8085T Milan Jostes
A Non-Rocket Satellite Launcher



ISEF Alumni – Dr. Kyrstin Ball

8094S Abby Blake

Do Essential Oils or Hand Sanitizers Kill more E.Coli Bacteria?



ISEF Alumni Award – Kyra Zimmerman

8101W Julia Brouwer

Leafy Green Astronauts Year Two: How Space Radiation Impacts Seed Germination and Subsequent Plant Growth of Monocot Versus Dicot Seeds

6111W Harini Senthilkumar

Effect of Dandelions on bacterial growth



Caffeinated Student – Kyra Zimmerman

1123T Maxwell Vogel

Can a Golf Course Riparian Buffer Zone Reduce Fertilizer, Pesticide and Sediment Runoff into the Brown's Creek Watershed? (Year One - Phase I)

1107T Hanna Holmstrom

A Comparison of Alternative Protein Sources and their Impact on the Environment



Caffeinated Student – Kyra Zimmerman

1078T Everett Kroll

3D Printable Transtibial Prosthetic



East Side Science Club

6081W Kristen Dougherty

6069S Callen Mayer

7017S Michael Guevara

7044S Owen Finlay

7072S Frankie Grass

7094S Anna O'Brien

6105W Isaac Stelzer



East Side Science Club

6035W Ezra Haskard

8002S Mira Seeba

8025T Maura Salchow

8080T Joe Brennan

8087T Sofia Fix



Joel Wagner Caring Bridge Award

1085S Geeta Rajamani

Controlling Noxa Protein Expression by a Novel Approach to Study its Function in Leukemic Cells: Phase II



MN Chapter of the American Fisheries Society

8050W Ilse Fredrickson

Is the Water Impaired? Testing pH, Ammonia, and Nitrate levels in a Freshwater Ecosystem?

1112T Haley Jostes

Using Natural Filtration to Improve the Water Quality of Klawitter Pond



Association of Women Geoscientists

St. Paul

8046S Zaiga Chance, Lee Tuggle
Sticky, Stinky, and Green



Association of Women Geoscientists

Twin Cities

1112T Haley Jostes

Using Natural Filtration to Improve the Water Quality of
Klawitter Pond



Association of Women Geoscientists

Western Suburbs

8050W Ilse Fredrickson

Is the Water Impaired? Testing pH, Ammonia, and Nitrate levels in a Freshwater Ecosystem?



ASU

St. Paul

1201S Emilia Topp-Johnson

Terraformation and Cultivation: Investigating Strategies to Establish Martian Agriculture

1099S Matthew Bluhm

Meteor Impact



ASU

Twin Cities

1154T Manashree Padiyath

Unleading The Way: Remediation of Lead Contaminated Water with *Coriandrum Sativum* (Cilantro) Biochar

1107T Hanna Holmstrom

A Comparison of Alternative Protein Sources and their Impact on the Environment



ASU

Western Suburbs

1073W Maya Czeneszew , Samuel Rex

Engineering a vasculature: Paving the way for successful organ regeneration



Intel Excellence in Computer Science

Twin Cities

1094T Chelsea Lai
Tooth Trauma and Protection



Intel Excellence in Computer Science

Western Suburbs

1095W Archana Murali

Window to the brain: Using retinal biomarkers to predict progression of Alzheimer's and Parkinson's disease



American Meteorological Society

St. Paul

1099S Matthew Bluhm
Meteor Impact

8064S Alice Spong
Could Crushed Shells Slow Down the Levels of Acidification in
Our Oceans?



American Meteorological Society

Twin Cities

1154T Manashree Padiyath

Unleading The Way: Remediation of Lead Contaminated Water with *Coriandrum Sativum* (Cilantro) Biochar

1107T Hanna Holmstrom

A Comparison of Alternative Protein Sources and their Impact on the Environment



American Meteorological Society

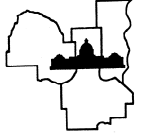
Western Suburbs

1148W Genevieve Weiler

Exploring the use of a hydrostatic transmission in a mid-size wind turbine

8050W Ilse Fredrickson

Is the Water Impaired? Testing pH, Ammonia, and Nitrate levels in a Freshwater Ecosystem?



ASM Award

St. Paul

7044S Owen Finlay
Biodiesel



ASM Award

Twin Cities

1078T Everett Kroll
3D Printable Transtibial Prosthetic

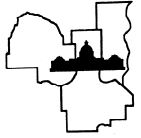


ASM Award

Western Suburbs

6051W Ryan Baird

What Is The Best Insulation Material



American Psychological Association

St. Paul

1022S Luke Chen
Operant Conditioning



American Psychological Association

Twin Cities

1032T Lauren Jensen
Blind Choices



American Psychological Association

Western Suburbs

1017W Elena Berman, Raunak Vijayakar

Hello, Stranger: A Big Data Approach to Online Dating



Mu Alpha Theta

Twin Cities

1167T Emma Martin
Font and Multiplication



Mu Alpha Theta

Western Suburbs

1095W Archana Murali

Window to the brain: Using retinal biomarkers to predict progression of Alzheimer's and Parkinson's disease



NASA Earth System Science Award

St. Paul

1109S Diane Huang
Evaluating Roof Runoff Contaminants by Age



NASA Earth System Science Award

Twin Cities

1107T Hanna Holmstrom

A Comparison of Alternative Protein Sources and their Impact on the Environment



NASA Earth System Science Award

Western Suburbs

7053W Bryan Heaton

The Effect of CO₂ Concentrations on The Growth of *Lepidium Sativum*



NOAA

St. Paul

8064S Alice Spong

Could Crushed Shells Slow Down the Levels of Acidification in Our Oceans?



NOAA

Twin Cities

1193T Abby Harrold
The Carbon Dioxide Conundrum



NOAA

Western Suburbs

6057W Charlie Shideman

Tsunamis: Effect of Water Depth on Wave Velocity



US Metric Association

St. Paul

1098S Nick Berg, Akira Callahan, James Paquet
Terra-forming Mars; one microorganism at a time.



US Metric Association

Twin Cities

1125T Claire Wentzlaff

The Effects of Bacillus Bacteria on the Invasive Species
Lemna minor (Duckweed)



US Metric Association

Western Suburbs

1169W Isabella Jennings, Melinda Samaratunga
Classification of IMP-1 β -Lactamase Inhibition and Inhibition
Mechanisms to Combat Antibiotic Resistance



Yale Science and Engineering Association

St. Paul

1086S Isabella Gillespie-Cuesta

The effect of dish soap on methane combustion



Yale Science and Engineering Association

Twin Cities

1154T Manashree Padiyath

Unleading The Way: Remediation of Lead Contaminated Water with *Coriandrum Sativum* (Cilantro) Biochar

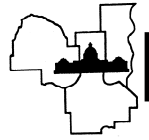


Yale Science and Engineering Association

Western Suburbs

1148W Genevieve Weiler

Exploring the use of a hydrostatic transmission in a mid-size wind turbine

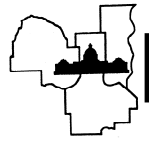


Ricoch Sustainability Development Award

St. Paul

1109S Diane Huang

Evaluating Roof Runoff Contaminants by Age

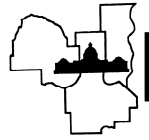


Ricoh Sustainability Development Award

Twin Cities

1124T AnneMarie Wells, Zackary Sether

Variances of Effectiveness of Limonene from Organic and Non-Organic Citrus Fruits as a Natural Alternative to Acetone in Reducing Polystyrene



Ricoh Sustainability Development Award

Western Suburbs

1148W Genevieve Weiler

Exploring the use of a hydrostatic transmission in a mid-size wind turbine



Society For In Vitro Biology

St. Paul

1201S Emilia Topp-Johnson

Terraformation and Cultivation: Investigating Strategies to Establish Martian Agriculture



Society For In Vitro Biology

Twin Cities

1125T Claire Wentzlaff

The Effects of Bacillus Bacteria on the Invasive Species
Lemna minor (Duckweed)



Society For In Vitro Biology

Western Suburbs

1075W Meghana Iyer

Bioengineering the Lung: Directed Differentiation of Human Pluripotent Stem Cells into Definitive Endoderm on a Lung Extracellular Matrix



Stockholm Junior Water Prize

St. Paul

1109S Diane Huang
Evaluating Roof Runoff Contaminants by Age

1111S Jack Indritz
Leachate Metals and Organic Compounds in Roof Runoff by
Shingle Age



Stockholm Junior Water Prize

Twin Cities

1125T Claire Wentzlaff

The Effects of Bacillus Bacteria on the Invasive Species
Lemna minor (Duckweed)

1123T Maxwell Vogel

Can a Golf Course Riparian Buffer Zone Reduce Fertilizer,
Pesticide and Sediment Runoff into the Brown's Creek
Watershed? (Year One - Phase I)



Stockholm Junior Water Prize

Twin Cities

1103T Michael Finch
To Flush or Not To Flush



Stockholm Junior Water Prize

Western Suburbs

1120W Sarah Scott, Christiana Wilke
Effect of Runoff on Water Quality



TCRSF Excellence Awards 1

- 8033T Kate Christian, Katie Magallon
- 6045W Carter Pitt
- 7059S Frances Ronning
- 8101W Julia Brouwer
- 7026S Grace Wethington
- 7092W Quentin Hughes, Vaughn Hughes



TCRSF Excellence Awards 2

- 7006W Mike Schmidt
- 7020T Teresa Le-Vu
- 6098T Ella Fix
- 6069S Callen Mayer
- 6001T Dominique Deming
- 8065S Kaeden Warnberg-Lemm



TCRSF Excellence Awards 2

8045S Edie Weinstein

8020W Alex Iliarski, Ishan Nadkarni

8091S Adeleine Cooper

8062S Elena Rosario, Jordanna Marshall, Ashley Tapia Martinez



TCRSF Excellence Awards 3

- 1004S Abigail Karan
- 1008S Isaac Vu, Kevin Yang
- 1019S John Bongabong, Marco Sandoval
- 1025T Arianna Day
- 1035T Caitlyn Kloeckl
- 1086S Isabella Gillespie-Cuesta



TCRSF Excellence Awards 3

1132T Abyan Osman

1167T Emma Martin



Top Ranked Research Paper

Middle School – Third Place

511 Julia Brouwer
Leafy Green Astronauts Year Two: How Space Radiation
Impacts Seed Germination and Subsequent Plant Growth of
Monocot Versus Dicot Seeds



Top Ranked Research Paper

Middle School – Second Place

522

Quentin Hughes, Vaughn Hughes

Can Worms Save the Planet from Plastic?



Top Ranked Research Paper

Middle School – First Place

503 Rohan Desai-Hunt
Bending Bridges



Top Ranked Research Paper

High School – Third Place

- 262 Nathaniel Farmer
Are You Protected? Wearable Mask Fit Monitor – Year II
- 177 Maya Czeneszew , Samuel Rex
Engineering a vasculature: Paving the way for successful organ regeneration



Top Ranked Research Paper

High School – Second Place

- 118 Meghana Iyer
Bioengineering the Lung: Directed Differentiation of Human Pluripotent Stem Cells into Definitive Endoderm on a Lung Extracellular Matrix
- 117 Avni Jain
Solving the hip fracture crisis: Utilizing Silica Nanoparticles to synthesize a flexible, affordable, and bio-friendly Shear Thickening Fluid based innovation



Top Ranked Research Paper

High School – First Place

136

Manashree Padiyath

Unleading The Way: Remediation of Lead Contaminated Water with *Coriandrum Sativum* (Cilantro) Biochar



ISWEEEP

St. Paul

1127S Henry Zietlow

The Effects of Ammonia on the Burrowing Habits of Plain
Pocketbook Mussels



ISWEEEP

Western Suburbs

1148W Genevieve Weiler

Exploring the use of a hydrostatic transmission in a mid-size wind turbine



ISWEEEP

Twin Cities

1154T Manashree Padiyath

Unleading The Way: Remediation of Lead Contaminated Water with *Coriandrum Sativum* (Cilantro) Biochar



ISWEEEP

Twin Cities

1107T Hanna Holmstrom

A Comparison of Alternative Protein Sources and their Impact on the Environment



Intel International Science & Engineering Fair





ISEF - International Science and Engineering Fair

Twin Cities 3rd Alternate



1138T Connor Van Dorpe, Braxton Kukulka

Increasing the Efficiency of a Photovoltaic System with a Calcium Chloride Hexahydrate Based Passive Cooling System



ISEF - International Science and Engineering Fair

Twin Cities 2nd Alternate



1142T Hannah Farmer

Investigating Flow in Rotating Cylindrical Tubes



ISEF - International Science and Engineering Fair

Twin Cities 1st Alternate



1112T Haley Jostes

Using Natural Filtration to Improve the Water Quality of Klawitter Pond



ISEF - International Science and Engineering Fair

Twin Cities Finalists



1171T Alex Li, Rebecca Li

Investigating a Green Approach for Biosynthesis of 5-Aminolevulinic Acid Using Biomass



ISEF - International Science and Engineering Fair

Twin Cities Finalists



1078T Everett Kroll

3D Printable Transtibial Prosthetic



ISEF - International Science and Engineering Fair

Twin Cities Finalists



1125T **Claire Wentzlaff**

The Effects of Bacillus Bacteria on the Invasive Species Lemna minor (Duckweed)



ISEF - International Science and Engineering Fair

Western Suburbs 3rd Alternate



1077W Harini Kethar

A Genetically Engineered Treatment for Chronic Pain and Peripheral Brain Damage through Vector-Mediated Gene Therapy



ISEF - International Science and Engineering Fair

Western Suburbs 2nd Alternate



1180W Jiaheng He, Sung Wan Huh

*From Takeout Box to Organic Laser:
Transforming the Industry by Engineering
a Transparent, Flexible Laser*



ISEF - International Science and Engineering Fair

Western Suburbs 1st Alternate



1160W Avni Jain

Solving the hip fracture crisis: Utilizing Silica Nanoparticles to synthesize a flexible, affordable, and bio-friendly Shear Thickening Fluid based innovation



ISEF - International Science and Engineering Fair

Western Suburbs Finalists



1095W Archana Murali

Window to the brain: Using retinal biomarkers to predict progression of Alzheimer's and Parkinson's disease



ISEF - International Science and Engineering Fair

Western Suburbs Finalists



1080W Gauri Binoy

Exploring the relationship between the PITX3 gene and pituitary as a site for neural regeneration for treatment of neurodegenerative diseases through blastocyst complementation of knockout brains



ISEF - International Science and Engineering Fair

Western Suburbs Finalists



1075W Meghana Iyer

Bioengineering the Lung: Directed Differentiation of Human Pluripotent Stem Cells into Definitive Endoderm on a Lung Extracellular Matrix



ISEF - International Science and Engineering Fair

St. Paul 2nd Alternate



1011S Iya Abdulkarim

*Applying the Novel Object Recognition Test in Zebrafish (*Danio rerio*)*



ISEF - International Science and Engineering Fair

St. Paul 1st Alternate



1109S Diane Huang

Evaluating Roof Runoff Contaminants by Age



ISEF - International Science and Engineering Fair

St. Paul Finalists



1076S Serena Jing

Inexpensive Glucose Monitoring Device for Diabetics Using Capillary Action of Crosslinked Sensing Fluid Year 2



ISEF - International Science and Engineering Fair

St. Paul Finalists



1085S Geeta Rajamani

Controlling Noxa Protein Expression by a Novel Approach to Study its Function in Leukemic Cells: Phase II