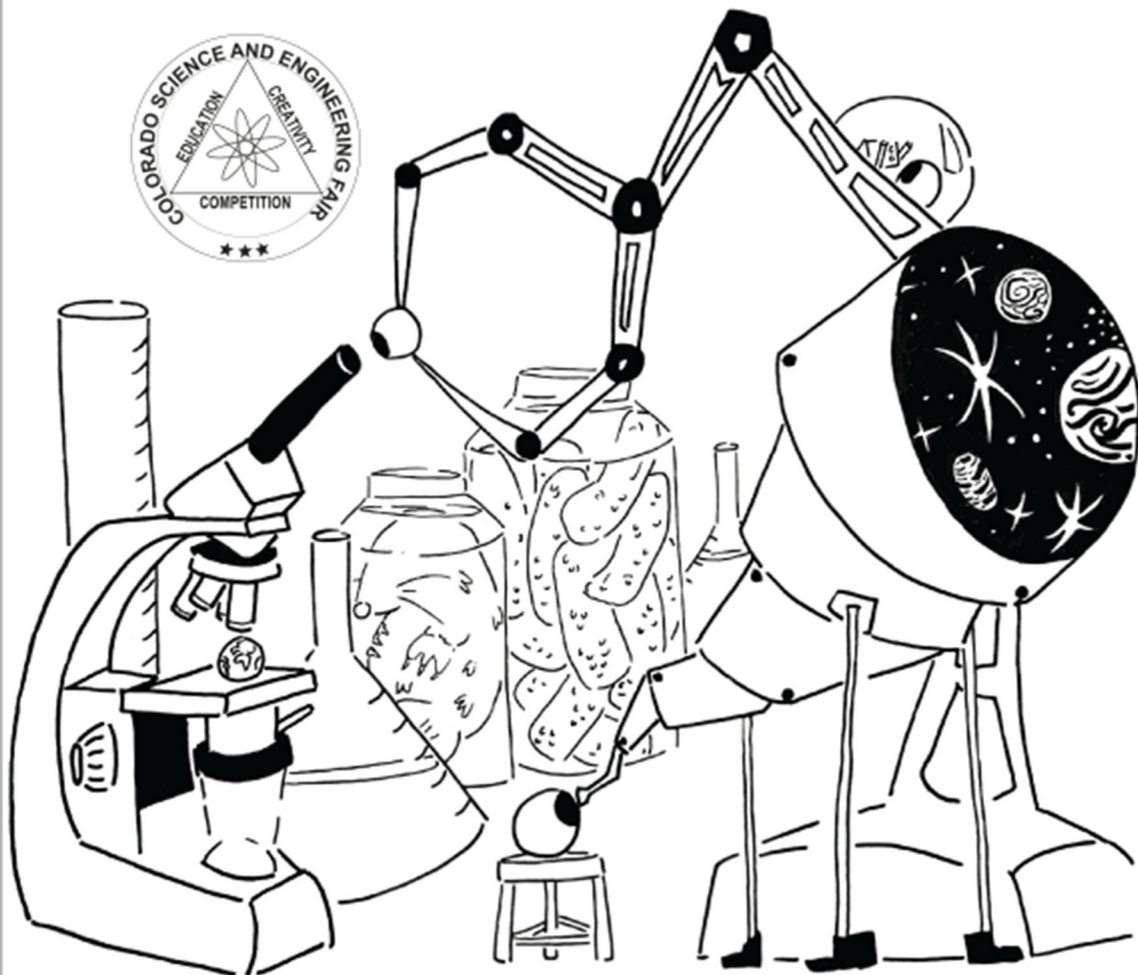


# Colorado Science and Engineering Fair

Hosted by the Natural Sciences Education & Outreach Center  
for Colorado students in grades 6 - 12



at Colorado State University - Fort Collins  
April 11 - 13, 2024

Colorado State Science Fair, Inc.

## 2024 ANNUAL REPORT

The highly successful Colorado Science & Engineering Fair was enabled once again by the infrastructure, coordination, and management resources provided by the Natural Sciences Education & Outreach Center (NSEOC) of Colorado State University. The NSEOC is a center with the mission of improving teaching and enhancing learning for all students, K-16, by developing high quality programs, and dynamic partnerships with K-12 schools, higher education, government, and business. We are most grateful for the roles of the NSEOC for making both talented people and logistics available to the Colorado Science & Engineering Fair.



The Board of Directors  
CSSE, Inc.

August 31, 2024  
Colorado State Science Fair, Inc.  
Natural Sciences Education & Outreach Center  
Colorado State University  
Campus Delivery 1802  
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<https://csef.natsci.colostate.edu>

Executive Director and Registered Agent:  
Courtney Gooding Butler, (970) 491-7716

## 2024 ANNUAL REPORT

The Colorado State Science Fair, Inc. was established in 1977 as a private, non-profit organization to run the Colorado Science & Engineering Fair (CSEF). The CSEF has actually been held annually since 1955 and is the state-level event in a year-long process of local and regional science fairs. Around five thousand students participate in science fair programs state-wide each year. The purpose of the CSEF is to stimulate student interest and encourage students in science and engineering through recognition of their research knowledge, ability and achievement.

Each year, a number of experiences are made available to the student finalists who participate in the CSEF. The CSEF invites a Guest Speaker to give a keynote talk to the students, teachers and families and the CSEF arranges tours of university research facilities, providing opportunities for students and their families to see research in action. The CSEF projects are also open to the public for viewing on Friday and Saturday of the fair.

CSEF finalists compete for awards in the categories of Animal Sciences; Behavioral & Social Sciences; Biomedical & Health Sciences; Chemistry; Earth & Environmental Sciences; Energy; Engineering; Environmental Engineering; Mathematics & Computer Sciences; Micro & Molecular Biology; Physics & Astronomy; and Plant Sciences – either as an individual or as a team project. The

CSEF also has a robust special awards program where around 50 organizations, businesses, and individuals present awards to students based on criteria that are important to them. The judges' interviews allow the finalists a chance to interact with professional scientists and engineers. Over the years, many students have said that having the chance to meet and speak with their peers about their science projects is the most beneficial aspect of the Colorado Science & Engineering Fair.

Recognition for outstanding research in each of the 12 categories as well as an award for technical writing are presented each year at the CSEF Awards Ceremony. The top 24 Junior Division projects are nominated for the Thermo Fisher Scientific Junior Innovators Challenge national competition for middle school students. The top five Senior Division projects are awarded trips to compete at the Regeneron International Science and Engineering Fair (Regeneron ISEF) for high school students each year.

*From start to finish, and at all levels of participation, the science fair experience is one not only of competition, but also of camaraderie, creativity, cooperation, and education. This is the essence of the logo for the Colorado Science and Engineering Fair.*

## 2024 COLORADO SCIENCE AND ENGINEERING FAIR

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The sixty-ninth Colorado Science and Engineering Fair was held at the Lory Student Center of the Colorado State University campus in Fort Collins Thursday, April 11, 2024 to Saturday, April 13, 2024.

Thanks to in-kind support from the University of Colorado, Denver's College of Liberal Arts & Sciences, we were able to continue to require that students submit a digital version of their project board through Symposium to aid Grand and Special Award judges in their pre-interview review (<https://symposium.foragerone.com/2024-csef>)

This year, CSEF winners were chosen from among 259 projects represented by 290 finalists from 98 schools and 13 regions. More than 125 professional scientists, engineers and mathematicians interviewed the students and evaluated their projects before selecting the Grand Award winners. In addition, over 50 businesses, professional societies, government agencies and individuals provided more than 130 of their own representatives to interview students and conferred Special Awards to those that represented an aspect of the bestowing organization's focus. These included college scholarships, summer employment, field trips, cash, and scientific equipment. Over 1,000 people attended the Awards Ceremony.

The 2024 Colorado Science and Engineering Fair had 17 sponsors. Sponsors included 4 Diamond Sponsors (providing over \$10,000), 3 Platinum Sponsors (providing between \$5,000 - \$9,999), 3 Gold Sponsor (providing between \$2,500 - \$4,999), 6 Silver Sponsors (providing between \$1,000 - \$2,499), 1 Bronze Sponsor (providing between \$750 - \$999) and 7 Copper Sponsors (providing between \$500 - \$749). In addition, there were 35 Individual Contributors.

The Colorado School of Mines awarded eight \$1,000 renewable tuition scholarships to eligible 11<sup>th</sup> grade students. Also, the Colorado State University, College of Agricultural Sciences awarded two \$1,000 non-renewable scholarships to students planning on studying agricultural sciences in college. And a \$5,000 non-renewable scholarship was awarded to the best senior division project in the area of CO<sub>2</sub>/greenhouse gas reduction.

This year, the CSEF was honored to have Bryan Willson, Executive Director of the Energy Institute at Colorado State University as the guest speaker. He spoke about *Empowering Future Change-Makers to Help Drive the Transition to a Cleaner, Brighter Future*.



(See Appendix 1 – 2024 CSEF Schedule)

## 2024 CSEF GENDER RATIOS

The Colorado State Science Fair, Inc. collects and reports on the gender and ethnicity of its participants to look for trends. The goal is to ensure that the students who participate are a reflection of the student population from across Colorado. It is our mission is to make the CSEF accessible to all of Colorado's students regardless of gender and ethnicity.

(Please note that team projects are identified by the gender & ethnicity of the Team Leader.)

### **% of Projects**

Male – 43.2%  
Female – 56.4%  
Non-binary – 0.4%

### **% of Projects by Category**

Animal Sciences  
Male – 18%  
Female – 82%

Behavioral & Social Sciences  
Male – 30%  
Female – 70%

Biomedical & Health Sciences  
Male – 36%  
Female – 64%

Chemistry  
Male – 36%  
Female – 64%

Earth & Environmental Sciences  
Male – 26%  
Female – 74%

Energy  
Male – 50%  
Female – 50%

Engineering  
Male – 83%  
Female – 17%

Environmental Engineering  
Male – 70%  
Female – 30%

Mathematics & Computer Sciences  
Male – 53%  
Female – 47%

Micro & Molecular Biology  
Male – 32%  
Female – 68%

Physics & Astronomy  
Male – 67%  
Female – 33%

Plant Sciences  
Male – 41%  
Female – 55%  
Non-Binary – 4%

### **% of Awards**

Male – 47%  
Female – 52%  
Non-binary – 1%

### **% of Awards by Category**

Animal Sciences (15)  
Male – 20%  
Female – 80%

Behavioral & Social Sciences (16)  
Male – 25%  
Female – 75%

Biomedical & Health Sciences (22)  
Male – 27%  
Female – 73%

Chemistry (28)  
Male – 32%  
Female – 68%

Earth & Environmental Sciences (31)  
Male – 22%  
Female – 78%

Energy (18)  
Male – 39%  
Female – 61%

Engineering (26)  
Male – 85%  
Female – 15%

Environmental Engineering (13)  
Male – 77%  
Female – 23%

Mathematics & Computer Sciences (19)  
Male – 37%  
Female – 63%

Micro & Molecular Biology (19)  
Male – 37%  
Female – 63%

Physics & Astronomy (19)  
Male – 58%  
Female – 42%

Plant Sciences (23)  
Male – 35%  
Female – 61%  
Non-Binary – 4%

## 2024 CSEF ETHNICITY RATIOS

(Please note that team projects are identified by the ethnicity of the Team Leader.)

### % of Projects

Caucasian – 64%  
Hispanic/Latinx – 8%  
Asian – 12%  
African American – 0%  
Native American – 2%  
Multiracial/Other/Unknown – 14%

### % of Awards (257)

Caucasian – 58%  
Hispanic – 6%  
Asian – 16%  
African American – 0%  
Native American – 2%  
Multiracial/Other/Unknown – 18%

## 2024 CSEF GRADE LEVEL RATIOS

(Please note that team projects are identified by the grade level of the Team Leader.)

### % of Students

Junior Division – 53%  
6<sup>th</sup> grade – 12%  
7<sup>th</sup> grade – 16%  
8<sup>th</sup> grade – 25%  
  
Senior Division – 47%  
9<sup>th</sup> grade – 6%  
10<sup>th</sup> grade – 11%  
11<sup>th</sup> grade – 13%  
12<sup>th</sup> grade – 17%

### % of Projects

Junior Division – 55%  
6<sup>th</sup> grade – 12%  
7<sup>th</sup> grade – 17%  
8<sup>th</sup> grade – 26%  
  
Senior Division – 45%  
9<sup>th</sup> grade – 7%  
10<sup>th</sup> grade – 10%  
11<sup>th</sup> grade – 14%  
12<sup>th</sup> grade – 14%

### % of Grand Awards per Division

Junior Division  
6<sup>th</sup> grade – 9/57 awards – 16%  
7<sup>th</sup> grade – 16/57 awards – 28%  
8<sup>th</sup> grade – 32/57 awards – 56%  
  
Senior Division  
9<sup>th</sup> grade – 6/57 awards – 11%  
10<sup>th</sup> grade – 10/57 awards – 17%  
11<sup>th</sup> grade – 24/57 awards – 42%  
12<sup>th</sup> grade – 17/57 awards – 30%

### % of Students Winning Grand Awards

Junior Division  
6<sup>th</sup> grade – 10/33 students – 30%  
7<sup>th</sup> grade – 18/47 students – 38%  
8<sup>th</sup> grade – 31/72 students – 43%  
  
Senior Division  
9<sup>th</sup> grade – 6/18 students – 33%  
10<sup>th</sup> grade – 9/33 students – 27%  
11<sup>th</sup> grade – 23/38 students – 61%  
12<sup>th</sup> grade – 23/48 students – 48%

### % of Special Awards per Division

Junior Division – 53%  
6<sup>th</sup> grade – 29/252 awards – 12%  
7<sup>th</sup> grade – 41/252 awards – 16%  
8<sup>th</sup> grade – 63/252 awards – 25%  
  
Senior Division – 47%  
9<sup>th</sup> grade – 12/252 awards – 5%  
10<sup>th</sup> grade – 25/252 awards – 10%  
11<sup>th</sup> grade – 46/252 awards – 18%  
12<sup>th</sup> grade – 36/252 awards – 14%

### % of Students Winning Special Awards

Junior Division  
6<sup>th</sup> grade – 21/33 students – 64%  
7<sup>th</sup> grade – 24/47 students – 51%  
8<sup>th</sup> grade – 35/72 students – 49%  
  
Senior Division  
9<sup>th</sup> grade – 8/18 students – 44%  
10<sup>th</sup> grade – 13/33 students – 39%  
11<sup>th</sup> grade – 25/38 students – 66%  
12<sup>th</sup> grade – 24/48 students – 50%

## 2024 COLORADO SCIENCE AND ENGINEERING FAIR AWARDS

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The top five Senior Division project exhibitors won a trip to compete in the Regeneron International Science & Engineering Fair held in Los Angeles, CA May 12 - 17, 2024. First place went to **Haydan Drullinger**, Liberty School, grade 10, for the project *Is It Clogged? Productions of an Instrument to Detect Clogged Sprinkler Heads and Notify a Cellular Device*. Second place went to **Shrey Rohilla**, The Classical Academy, grade 11, for the project *Waste to Watts: Converting Locally Sourced Organic Waste Material into Activated Carbon-Based Supercapacitors*. Third place went to **Naomi Kruse**, Schullandheim Home School, grade 10, for the project *Paper for the Planet: Development of a Novel Paper Inoculated with Wildflower Seed and Carbon Sequestering Fungi*. Fourth place went to **Lydia Mekelberg**, Yuma High School, grade 11, for the project *Spatial Analysis of Deer Populations in Northeastern Colorado*. Fifth place went to **Julia Gao** and **Om Vegesna**, Fairview High School, grade 9, for the project *G.L.O.W.: A Novel Hybrid Network Approach for Glioblastoma Localization Using Carcinogenic Oxidative Stress Biomarkers*.

The top three Junior Division project exhibitors won cash awards. First Place went to **Finnley Reitz**, Alta Vista Charter School, grade 6, for the project *Sumac Shindig: An Investigation into Scarification*. Second Place went to **Carson Stone**, grade 8, and **Connor Stone**, grade 6, Brush Middle School, for the project *Shake Rattle and Roll - Washboard Phenomenon: The Effect of Wheel Velocity on a Roadbed*. Third place went to **Cuinn Archer**, Mancos Middle School, grade 8, for the project *Automatic Water Vol. 2*.

The winners of the Ralph F. Desch Memorial Technical Writing Award were **Julia Gao** and **Om Vegesna**, Fairview High School, grade 9, for the project *G.L.O.W.: A Novel Hybrid Network Approach for Glioblastoma Localization Using Carcinogenic Oxidative*

*Stress Biomarkers*. Receiving honorable mentions were **Elton Cao**, Fairview High School, grade 12, for the project *National Ground-Level NO2 Predictions Via Satellite Imagery Driven Hybrid Neural Networks* and **Kelly Yang**, Fairview High School, grade 11, for the project *Enhancing Dry Cooling in Power Plants through High Conductivity Thermal Ground Planes*.

The winner of the Elemer Bernath Technical Writing Award was **Kaycee Clark**, Wray Middle School, grade 8, for the project *What Lies Beneath: A Study on the Effects of Grazing Intensities on the Nutrients in the Soil*. Receiving honorable mention was **Sophia Bronstein**, Summit Middle Charter School, grade 8, for the project *The Vanishing Palette: Comparing the Fading Rates of Different Oil-Based Paints*.

The winner of the Senior Division Student Choice Award was **Amy Zhang**, Lakewood High School, grade 9, for the project *Feel the Ball: Convert Ball Motion to Touch for Sport Audiences with Vision/Hearing Impairments*. The Junior Division Student Choice winner was **Julia Muro**, North Middle School, grade 7, for the project *The Effect of Various Vinegar Rinse Concentrations on the Shelf Life of Strawberries*.

The winners of the Pioneers of Science Awards were **Natalie Romero**, Justice & Heritage Academy, grade 7, for the project *Attachment Issues*; **Asha Jeter Patel**, Sacred Heart of Jesus Catholic School, grade 8, for the project *Conversation Topics*; **Omar Manshad**, West Ridge Academy, grade 6, for the project *Beyond Pegs & Holes: Building an Improved Chessboard for Blind and Low Vision Chess Players*; **Sunand Bhandaram**, Campus Middle School, grade 8, for the project *Artificial Intelligence Assisted Deployment of Emergency Resources for Natural Disasters*; **Fallyn Gregersen**, Wiggins Middle School, grade 7, for the project *Purifying Water with Activated Charcoal*; **Tejas Raman**, Boulder Country Day School, grade 8, for the project *Pattern-Based Seismology*; **Neave Henschel**, Hi-Plains School, grade 6, for the project *Hold the Heat*; **Morgan Drullinger**, Liberty School, grade 7, for the project *Comparing the Accuracy of 3D*

*Printed Airsoft BB's*; **Ripley Goode**, Boulder Country Day School, grade 8, for the project *Wax: Not Cool Dude*; **Ian Pfenning**, Flagstaff Academy, grade 8, for the project *AI Powered Pet Feeder*; **Cynthia Stevens**, Risley International Academy of Innovation, grade 8, for the project *Mouthwash vs. Bacteria*; **Emmett Wiedenheft**, Southern Hills Middle School, grade 6, for the project *The Change in Energy of Bouncing Balls*; and **Gabriel Ferguson**, Craver Middle School, grade 6, for the project *Thriving Waters*.



## 2024 REGENERON INTERNATIONAL SCIENCE & ENGINEERING FAIR

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The Regeneron International Science & Engineering Fair, the world's largest pre-college science fair, brings together more than 1,700 of the most curious and capable young science pioneers from about 60 countries to share ideas, showcase cutting-edge science and compete for over \$3 million in awards and scholarships. The Regeneron ISEF is the world's only international science fair representing all sciences for students in grades 9 through 12. The Regeneron ISEF has been coordinated for 72 years by Society for Science one of the most respected non-profit organizations advancing the cause of science.

Colorado students from around the state were among the award winners at the 72<sup>nd</sup> Regeneron ISEF held in Los Angeles, CA, May 12 – 17, 2024.

### GRAND AWARDS

**Elton Cao**, from Fairview High School, won \$500 (4<sup>th</sup> Place) in the Earth & Environmental Sciences category.

### SPECIAL AWARDS

**Claire Huang** and **Sophia Zhang**, from Fairview High School, won \$750 from the United States Air Force.

**Elton Cao** won \$750 from the United States Air Force. He also won an award from the National Geographic Society.

**Shrey Rohilla**, from The Classical Academy, won a scholarship from Arizona State University (worth \$58,000).

**Maria Sears**, from Monte Vista High School, won a scholarship from Arizona State University (worth \$58,000).

## ORGANIZATION

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The success of the yearly Colorado Science and Engineering Fair is directly dependent upon the support of public and private organizations, government agencies, school districts and universities, as well as the efforts of hundreds of committed volunteers. It is no exaggeration to say that CSEF volunteers indeed make the event possible. At the state level, there is the Board of Directors (which is comprised of volunteers from the sponsoring organizations and oversees the operation of the CSEF and the non-profit organization); the Advisory Council (volunteers from around the state who are on the CSEF Working Committees to make sure everything operates smoothly at the event); judges (both for Grand and Special Awards who interview the finalists and choose the winners); and hundreds of on-site volunteers who do the actual work of the CSEF. Prior to the state event, thirteen regional science fairs and a large number of local school science fairs are conducted throughout the state, and each of these is supported and promoted by hardworking and dedicated educators. And before a student's project even makes it to a local science fair, it requires the encouragement and support from individual teachers, adult sponsors, and parents to help students see their projects through from inception to finished exhibit. The Colorado Science and Engineering Fair is a product of all of these people.

## MISSION STATEMENT

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*The Colorado State Science Fair, Inc. provides a dynamic platform through the Colorado Science and Engineering Fair, to honor students' excellence in science, technology, engineering and mathematics; providing opportunities for students from all regions of the state to create and showcase their research in settings that nurture interest in science and technology. CSEF promotes critical thinking, professional skills, high ethical standards, and life-long learning in an environment of diversity, equity, inclusion, and accessibility.*

## GOALS AND OBJECTIVES

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The Colorado State Science Fair, Inc. is an organization that:

- Organizes the infrastructure of the Colorado Science and Engineering Fair for students from all regions of the state of Colorado to present science projects to judges, representatives of scientific organizations, the public and their peers;
- Honors winners from Colorado regional science fairs at the annual Colorado Science and Engineering Fair;
- Sends finalists from the state of Colorado to the Regeneron International Science and Engineering Fair (Regeneron ISEF);
- Provides experiences for Colorado students to interact with their peers, Colorado science teachers and Colorado scientists and engineers in professional and social settings;
- Promotes science, engineering and technology as careers, inspiring excellence, high ethical standards and emphasizing the immense satisfaction that comes from confronting and solving intellectual problems that serve societal needs;
- Reinforces in students the wonder nature instills, wherever and however possible, empowering them to follow their questions and dreams; and
- Encourages a culture that values and nurtures diversity.

We support regional science fairs by:

- Acting as an alternative to the Science Service affiliation as a means of attending the Regeneron ISEF;
- Providing a forum where regional science fairs can influence policies, rules and by-laws for the state science fair;
- Providing rules and requirements for participation in the Colorado Science and Engineering Fair;
- Facilitating communication, where practical, between regional science fairs and their participants;
- Providing information and resources to the regional fair directors, teachers and students which will promote interest in science, engineering and technology, and excellence in scientific research;
- Increasing public awareness and appreciation of science, engineering and technology in the schools.



## CSEF SPONSORS

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### DIAMOND SPONSORS

(Providing over \$10,000 in support of CSEF)

Colorado State University  
College of Agricultural Sciences  
College of Natural Sciences  
Natural Sciences Education & Outreach  
Center

Bayswater Exploration & Production, LLC

Broadcom Foundation

The Sara Volz Family

### PLATINUM SPONSORS

(Providing \$5,000 - \$9,999 in support of CSEF)

Keysight Technologies

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### GOLD SPONSORS

(Providing \$2,500 - \$4,999 in support of CSEF)

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### SILVER SPONSORS

(Providing \$1,000 - \$2,499 in support of CSEF)

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Peter Laird

SalesForce

Dr. Larry & Carol Sveum

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### BRONZ SPONSORS

(Providing \$750 - \$999 in support of CSEF)

Galvanic Engineering

### COPPER SPONSORS

(Providing \$500 - \$749 in support of CSEF)

Katie Kowal

San Luis Valley Regional Science Fair, Inc

Scriber Family

Society of Women Engineers,  
Rocky Mountain Section

Sundyne Corporation

US Department of Commerce/NOAA

### COMPANY CONTRIBUTORS

(Providing up to \$500 in support of CSEF)

Colorado Chemistry Teachers Association

INDIVIDUAL CONTRIBUTORS

Lucy Adams

Jeff Bangert

Tyler Benton

Gregory Biesecker

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RedLion York

ENDOWMENT CONTRIBUTORS

Peter Laird

SalesForce

Larry Sveum

Thank you so much to the incredible donors who make  
this event possible!

(See Appendix 3 – CSEF Income-Expense Report)

## CSEF ADVISORY COUNCIL

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The CSEF Advisory Council is comprised of the Board of Directors, the Regional Fair Directors and Assistant Directors, and many at-large members.

## CSSF BOARD OF DIRECTORS

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**Executive Committee:**

*President- James Sipes*

*Vice President- Peter Laird*

*Treasurer- Dan Kowal*

*Secretary- Kristen Rasmussen*

*Past President- Josh Redmore*

*Executive Director- Courtney Gooding Butler*

*CableLabs*

Josh Redmore

John Bahr

*San Luis Valley Regional Sciences Fair*

Dr. David Holm

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*Denver Health Pediatric Dentistry*

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*Society of Petroleum Engineers,*

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Jim Sipes

Jeff Hardy

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Dr. Erin Golden

Kayla Ahr

*Katie Kowal*

Peter Teasdale

*US Department of Commerce/NOAA*

Dan Kowal

*Lockheed Martin*

Dr. Adam Pender

*The Sara Volz Family*

Sara Volz

*Sales Force*

Peter Laird

*Associate/Alternative Members*

Erin Comstock – CSEF Assistant Director

Jody Oaks - SRC Chair

Judy Prester - Dr. Larry Sveum

## REGIONAL FAIR DIRECTORS

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*Arkansas Valley Regional Science Fair*  
Brian Beyerl & Warren McClure

*Boulder Valley Regional Science Fair*  
Cameo DeDominices

*Denver Metro Regional Science Fair*  
Erin Golden, Kayla Ahr

*East Central Regional Science Fair*  
William Mallory  
Ellen Emmerling

*Longs Peak Regional Science Fair*  
Victoria Duncan

*Morgan/Washington Regional Science Fair*  
Darline Miner

*Northeast Regional Science Fair*  
Sonya Shaw

*Pikes Peak Regional Science Fair*  
Nancy Hampson  
Carol Bach

*San Juan Basin Regional Science Fair*  
Lucy Perry

*San Luis Valley Regional Science Fair*  
Lucy Adams

*Southeast Regional Science Fair*  
Terri Lira

*Southern Colorado Regional Science Fair*  
Mary Jose

*Western Regional Science Fair*  
Kevin Hoskin

## MEMBERS AT LARGE

---

|                |              |
|----------------|--------------|
| Carol Bach     | Loree Harvey |
| Steve Hiebert  | Steve Iona   |
| Rodney Simpson | Tracy Webb   |
| Lynne Williams |              |

## CSEF DIRECTORS

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\* *Charles Bragaw*  
1956 – 1967

\* *Calvin Fisher*  
1968 – 1974

\* *Sam Shushan*  
1975 – 1977

*Gordon Moore*  
1978 – 1979

\* *Russell B. Stoner*  
1979 – 1981

*Virgil A. Sandborn*  
1982 – 1983

*James R. Sites*  
1984 – 1985

*Lloyd Walker*  
1986 – 1988

*Connie Vader-Lindholm*  
1989 – 1990

*Lynn Butler*  
1991 – 1992

*Kate Taylor*  
1992 – 1994  
1997 - 1998

*Christal McDougall*  
1995 – 1996

*Lucy Adams*  
1999

*Courtney Butler*  
2000 – present

\**Director Emeritus for outstanding contributions to CSEF and more than two years of service as CSEF Director.*

Appendix 1

# 69<sup>th</sup> Annual Colorado Science & Engineering Fair

## Thursday, April 11, 2024

### Finalist Schedule

There will be NO on-site SRC interviews or paperwork fixes.

|                        |  |                             |
|------------------------|--|-----------------------------|
| 9:00 a.m. – 12:00 p.m. | Staggered Junior and Senior Division Finalist Check-In<br>(your region’s check-in time will be emailed to you) | 3 <sup>rd</sup> Floor Foyer |
|------------------------|--|-----------------------------|

***Finalists MUST stay with their exhibit until Display & Safety Inspection has been done and an Official Photo has been taken. Finalists must be out of the exhibit areas by 12 noon***

|                        |  |          |
|------------------------|--|----------|
| 9:00 a.m. – 11:30 a.m. | Tour Ticket Pick-Up<br>Students must pre-order tour tickets. | Room 322 |
|------------------------|--|----------|

|                        |  |                |
|------------------------|--|----------------|
| 12:45 p.m. – 5:00 p.m. | Judging – <b><i>Students must be at their exhibits for interviews.</i></b> | Grand Ballroom |
|------------------------|--|----------------|

### Adult Schedule

|                       |   |          |
|-----------------------|---|----------|
| 1:00 p.m. – 2:00 p.m. | CSEF Scientific Review Committee Debrief and Discussion | Room 322 |
|-----------------------|---|----------|

|                       |   |          |
|-----------------------|---|----------|
| 2:30 p.m. – 4:30 p.m. | Mathematical & Scientific Modeling Professional Development | Room 322 |
|-----------------------|---|----------|

### Judging Schedule

|           |  |             |
|-----------|--|-------------|
| 9:45 a.m. | Grand Awards Judge Captains/Assistant Captains’ Briefing | LSC Theater |
|-----------|--|-------------|

|            |                               |             |
|------------|-------------------------------|-------------|
| 11:00 a.m. | Grand Awards Judges’ Briefing | LSC Theater |
|------------|-------------------------------|-------------|

|            |                               |                      |
|------------|-------------------------------|----------------------|
| 11:45 a.m. | Grand Awards Judges’ Luncheon | LSC Theater<br>Lobby |
|------------|-------------------------------|----------------------|

|                        |                                |                |
|------------------------|--------------------------------|----------------|
| 12:45 p.m. – 4:30 p.m. | Grand Award Judging Interviews | Grand Ballroom |
|------------------------|--------------------------------|----------------|

|                       |                                  |                |
|-----------------------|----------------------------------|----------------|
| 1:15 p.m. – 5:00 p.m. | Special Award Judging Interviews | Grand Ballroom |
|-----------------------|----------------------------------|----------------|

|           |  |  |
|-----------|--|--|
| 5:15 p.m. | Exhibit area is locked. Final judging continues.<br><b><i>Only Judging Captains and SRC Members are permitted in the exhibit area.</i></b> |  |
|-----------|--|--|

## Friday, April 12, 2024

|                       |   |                |
|-----------------------|---|----------------|
| 9:00 a.m. – 5:00 p.m. | CSEF Finalist Exhibits Open to the Public and the Media | Grand Ballroom |
|-----------------------|---|----------------|

|                        |   |             |
|------------------------|---|-------------|
| 9:00 a.m. – 10:30 a.m. | Guest Speaker – Bryan Willson, Colorado State University Energy Institute | LSC Theater |
|------------------------|---|-------------|

|                        |  |  |
|------------------------|--|--|
| 11:00 a.m. – 3:00 p.m. | Tours – <i>Registration is required.</i> |  |
|------------------------|--|--|

|           |   |                    |
|-----------|---|--------------------|
| 4:00 p.m. | Finalist Ballots for Student Choice and Poster Contest are due. | Registration Booth |
|-----------|---|--------------------|

|                       |                  |                |
|-----------------------|------------------|----------------|
| 5:00 p.m. - 6:00 p.m. | Project Teardown | Grand Ballroom |
|-----------------------|------------------|----------------|

## Saturday, April 13, 2024

|           |                 |                   |
|-----------|-----------------|-------------------|
| 9:00 a.m. | Awards Ceremony | Timberline Church |
|-----------|-----------------|-------------------|

|                        |                 |          |
|------------------------|-----------------|----------|
| 12:00 p.m. – 2:00 p.m. | Project Pick-Up | Room 322 |
|------------------------|-----------------|----------|

## 2024 Colorado Science and Engineering Fair Grand Awards Press Release

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### Junior Best of CSEF Projects

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**First Place**

|   |           |
|---|-----------|
| Finnley Reitz   | 6th grade |
| <i>Sumac Shindig: An Investigation into Scarification</i> |           |
| Alta Vista Charter School                                 | Lamar     |

**Second Place**

|  |           |
|--|-----------|
| Carson Stone   | 8th grade |
| Connor Stone   | 6th grade |
| <i>Shake Rattle and Roll - Washboard Phenomenon: The Effect of Wheel Velocity on a Roadbed</i> |           |
| Brush Middle School  | Brush     |

**Third Place**

|                               |           |
|-------------------------------|-----------|
| Cuinn Archer                  | 8th grade |
| <i>Automatic Water Vol. 2</i> |           |
| Mancos Middle School          | Mancos    |

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### Senior Best of CSEF Projects

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**First Place**

|   |            |
|---|------------|
| Haydan Drullinger   | 10th grade |
| <i>Is It Clogged? Productions of an Instrument to Detect Clogged Sprinkler Heads and Notify a Cellular Device</i> |            |
| Liberty School  | Joes       |

**Second Place**

|  |                  |
|--|------------------|
| Shrey Rohilla  | 11th grade       |
| <i>Waste to Watts: Converting Locally Sourced Organic Waste Material into Activated Carbon-Based Supercapacitors</i> |                  |
| The Classical Academy  | Colorado Springs |

**Third Place**

|  |                  |
|--|------------------|
| Naomi Kruse  | 10th grade       |
| <i>Paper for the Planet: Development of a Novel Paper Inoculated with Wildflower Seed and Carbon- Sequestering Fungi</i> |                  |
| Schullandheim Home School  | Colorado Springs |

**Fourth Place**

|  |            |
|--|------------|
| Lydia Mekelburg  | 11th grade |
| <i>Spatial Analysis of Deer Populations in Northeastern Colorado</i> |            |
| Yuma High School   | Yuma       |

**Fifth Place**

|   |           |
|---|-----------|
| Julia Gao & Om Vegesna  | 9th grade |
| <i>G.L.O.W.: A Novel Hybrid Network Approach for Glioblastoma Localization Using Carcinogenic Oxidative Stress Biomarkers</i> |           |
| Fairview High School  | Boulder   |

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### Junior Animal Sciences

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**First Place**

|                              |              |
|------------------------------|--------------|
| Sienna Harden & Vivian Bozek | 6th grade    |
| <i>We Got GOOD Milk!</i>     |              |
| St. Joseph's Catholic School | Fort Collins |

**Second Place**

|   |                  |
|---|------------------|
| Vivian Wolkow   | 7th grade        |
| <i>Can Planaria Distinguish One Color from Another?</i> |                  |
| North Middle School                                     | Colorado Springs |

**Third Place**

|                          |           |
|--------------------------|-----------|
| Jessa Wilson             | 7th grade |
| <i>Equine Heart Rate</i> |           |
| Wiggins Middle School    | Wiggins   |

**Honorable Mention**

|                               |            |
|-------------------------------|------------|
| Kellen McClure                | 6th grade  |
| <i>My Pogo Project</i>        |            |
| Jefferson Intermediate School | Rocky Ford |

**Honorable Mention**

|   |           |
|---|-----------|
| Priya Mayjoy  | 8th grade |
| <i>Monitoring Apis Mellifera Linnaeus for Winter Survival</i> |           |
| Lamar Middle School   | Lamar     |

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### Senior Animal Sciences

---

**First Place**

|  |            |
|--|------------|
| Lydia Mekelburg  | 11th grade |
| <i>Spatial Analysis of Deer Populations in Northeastern Colorado</i> |            |
| Yuma High School   | Yuma       |

**Second Place**

|  |                 |
|--|-----------------|
| Hansini Mudumala   | 11th grade      |
| Aryana Havash  | 12th grade      |
| <i>The Effect of Microplastics on Neocaridina davidi</i> |                 |
| SkyView Academy  | Highlands Ranch |

**Third Place**

|   |            |
|---|------------|
| Maggie Anderson   | 10th grade |
| <i>Analysis of Expected Progeny Difference: Predictability in Beef Cattle</i> |            |
| Yuma High School  | Yuma       |

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### Junior Behavioral & Social Sciences

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**First Place**

|                                       |           |
|---------------------------------------|-----------|
| Asha Jeter Patel                      | 8th grade |
| <i>Conversation Topics</i>            |           |
| Sacred Heart of Jesus Catholic School | Boulder   |

**Second Place**

|  |           |
|--|-----------|
| Zoe Smith                                | 7th grade |
| <i>Journey to the Center of the Mind</i> |           |
| Loveland Classical School                | Loveland  |

**Third Place**

|   |           |
|---|-----------|
| Zadira McGee  | 8th grade |
| <i>The Effects of Stimulants and Depressants on the Heart Rate of Daphnia</i> |           |
| Summit Middle Charter School  | Boulder   |

## Appendix 2

### Honorable Mention

Juliet Huckabay 7th grade  
*The Influence of Persuasive Language on Long Term Memory*  
 Skinner Middle School Denver

### Senior Behavioral & Social Sciences

#### First Place

Kenedy Jiron-Baker 12th grade  
*Income and the Environment*  
 Evergreen High School Evergreen

#### Second Place

Zoey Montoya 11th grade  
 Everett Ediger 12th grade  
*Determining Prosodic Patterns in the Speech of Online Science Communication*  
 La Junta Jr/Sr High School La Junta

#### Third Place

Alexander Zhang 11th grade  
*Multi-Layer Structural Equation Modeling of Behavioral Traits and Entrepreneurial Interest*  
 Fairview High School Boulder

#### Honorable Mention

Ethan Wang, Vincentius Aaron Chen, & James Kerrane 12th grade  
*Liminal Spaces and the Uncanny Valley: An Interdisciplinary Virtual Reality and Psychology Experimental Research Design*  
 Peak to Peak Charter School Lafayette

### Junior Biomedical & Health Sciences

#### First Place

Kapil Bhandaram 8th grade  
*What Model Performs the Best When Using Artificial Intelligence to Detect Pneumonia Using Chest Radiographs*  
 Campus Middle School Englewood

#### Second Place

Maya Rokhlenko & Olive Spohn 8th grade  
*All Boxed Up: The Effects of Prescription Eyewear on Peripheral Vertigo*  
 Flagstaff Academy Longmont

#### Third Place

Vedanth Raju 6th grade  
*Curcuza: A Nanogel Antibiotic Using Neem and Turmeric Nanoparticles to Help Tackle Antibiotic Resistance - A Global Health Threat*  
 Aurora Quest K-8 School Aurora

#### Honorable Mention

Jade Howell 8th grade  
*Inheriting Blood Types*  
 Ignacio Middle School Ignacio

#### Honorable Mention

Devon Mahorney 8th grade  
*A Spoonful of Sugar*  
 West Grand Middle School Kremmling

### Senior Biomedical & Health Sciences

#### First Place

Julia Gao & Om Vesegna 9th grade  
*G.L.O.W.: A Novel Hybrid Network Approach for Glioblastoma Localization Using Carcinogenic Oxidative Stress Biomarkers*  
 Fairview High School Boulder

#### Second Place

Ashley Acton 12th grade  
*The Effects of Caffeine on Stem Cells and Skeletal Muscle Regeneration*  
 Fairview High School Boulder

#### Third Place

Vanya Lavu 11th grade  
*Healthy Gut! Healthy You!: Using *Dorotocephala Dactyligera* as a Model to Treat Gastrointestinal and Psychological Disorder with Novel Regenerative Enzymes*  
 The Classical Academy Colorado Springs

#### Honorable Mention

Logan Futrell 9th grade  
*Stabilizing Sugars: The Impacts of Food Choice on Glucose Levels During Athletic Performance*  
 Monte Vista High School Monte Vista

#### Honorable Mention

Amy Xia 10th grade  
*Determining Whether the PTPN2 Gene Plays a Role in the Development of Type 1 Diabetes*  
 Cherry Creek High School Greenwood Village

#### Honorable Mention

Garrett Rymer 11th grade  
*Windlass Tourniquets: Using Medical Instructions to Prepare for Massive Hemorrhage*  
 Cherry Creek High School Greenwood Village

### Junior Chemistry

#### First Place

Sophia Bronstein 8th grade  
*The Vanishing Palette: Comparing the Fading Rates of Different Oil-Based Paints*  
 Summit Middle Charter School Boulder

#### Second Place

Tess Price 8th grade  
*Polymerization Using Alginate Spherification*  
 Ken Caryl Middle School Littleton

#### Third Place

Varun Velmurugan 8th grade  
*Water Purification: A Solution for Fluoride Contamination*  
 Campus Middle School Englewood

#### Honorable Mention

Marin Cantrell 8th grade  
*Toilet Talk*  
 Cardinal Community Academy Keensburg

## Appendix 2

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### Senior Chemistry

#### First Place

|   |            |
|---|------------|
| Claire Huang  | 11th grade |
| Sophia Zhang  | 10th grade |
| <i>Natural Eutectogels as a Novel Material for Green Wearable Electronics</i> |            |
| Fairview High School  | Boulder    |

#### Second Place

|   |            |
|---|------------|
| Katherine Zheng   | 11th grade |
| <i>Visible Light Photocatalytic Degradation of Congo Red Using LaFeO<sub>3</sub> Nanofibers</i> |            |
| Fairview High School  | Boulder    |

#### Third Place

|   |            |
|---|------------|
| Helena Borsholm & Charlotte Harrigton   | 12th grade |
| <i>Tuning the Concentration of Active Sites on the Surface of Heterogeneous Catalysts Using Self-Assembled Monolayers</i> |            |
| Monarch High School   | Louisville |

#### Honorable Mention

|                                       |            |
|---------------------------------------|------------|
| Cole Randolph                         | 12th grade |
| <i>Calcium Carbonate Cooling Caps</i> |            |
| Green Mountain High School            | Lakewood   |

#### Honorable Mention

|   |                   |
|---|-------------------|
| Mariami Zhuzhunashvili  | 12th grade        |
| <i>Producing Biodiesel from Spent Coffee Grounds: Traditional vs. In situ Transesterification</i> |                   |
| Cherry Creek High School  | Greenwood Village |

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### Junior Earth & Environmental Sciences

#### First Place

|   |                  |
|---|------------------|
| Cameron Kempisty  | 7th grade        |
| <i>To Grow or Not to Grow: Testing Biomass-based Alternatives for a Greener World</i> |                  |
| Eagleview Middle School   | Colorado Springs |

#### Second Place

|   |                  |
|---|------------------|
| Elise Gavin                                 | 7th grade        |
| <i>Biodegradable or Not? Trial by Fire!</i> |                  |
| The Classical Academy                       | Colorado Springs |

#### Third Place

|  |           |
|--|-----------|
| Kaycee Clark   | 8th grade |
| <i>What Lies Beneath: A Study on the Effects of Grazing Intensities on the Nutrients in the Soil</i> |           |
| Wray Junior High School  | Wray      |

#### Honorable Mention

|   |                  |
|---|------------------|
| Lucia Montello  | 6th grade        |
| <i>Snow Force: Testing Which Avalanche Control Method Is Most Effective</i> |                  |
| Eagleview Middle School   | Colorado Springs |

#### Honorable Mention

|                          |           |
|--------------------------|-----------|
| Colter Dennison          | 8th grade |
| <i>Toxic Tributaries</i> |           |
| Mancos Middle School     | Mancos    |

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### Senior Earth & Environmental Sciences

#### First Place

|   |            |
|---|------------|
| Zachariah Nagle   | 11th grade |
| <i>Testing Pollution and Radioactivity Levels Near Suncor's Petrochemical Refinery in Commerce City, Colorado</i> |            |
| Fairview High School  | Boulder    |

#### Second Place

|   |            |
|---|------------|
| Hannah Shelton  | 11th grade |
| <i>Applied Mycology: Do Fungal Endophyte Communities Differ Between Western Spruce Budworm Infested Douglas Fir and Uninfested Douglas Fir?</i> |            |
| Centauri High School  | La Jara    |

#### Third Place

|   |            |
|---|------------|
| Elizabeth Vossler   | 11th grade |
| <i>Detention Basin Systems: Mitigating Stormwater in Hampden Heights and Its Implications on Cherry Creek Water Quality</i> |            |
| Denver School of the Arts   | Denver     |

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### Junior Energy

#### First Place

|                           |             |
|---------------------------|-------------|
| Rylen Ross                | 7th grade   |
| <i>Cooling for Solar</i>  |             |
| Monte Vista Middle School | Monte Vista |

#### Second Place

|  |               |
|--|---------------|
| Madison Kirchhoff  | 8th grade     |
| <i>Can I Break the Law of Conservation of Energy by Making a Magnetic Motor Run on Magnetic Potential Energy</i> |               |
| Craver Middle School   | Colorado City |

#### Third Place

|                          |           |
|--------------------------|-----------|
| Paisley Wiersma          | 7th grade |
| <i>Biomass to Biogas</i> |           |
| Genoa-Hugo School        | Hugo      |

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### Senior Energy

#### First Place

|  |                  |
|--|------------------|
| Shrey Rohilla  | 11th grade       |
| <i>Waste to Watts: Converting Locally Sourced Organic Waste Material into Activated Carbon-Based Supercapacitors</i> |                  |
| The Classical Academy  | Colorado Springs |

#### Second Place

|  |                  |
|--|------------------|
| Natalie Muro   | 10th grade       |
| <i>Effects of Mooring Systems on Submerged Point Absorber Wave Energy Converters</i> |                  |
| Palmer High School   | Colorado Springs |

#### Third Place

|  |            |
|--|------------|
| Kelly Yang   | 11th grade |
| <i>Enhancing Dry Cooling in Power Plants through High-Conductivity Thermal Ground Planes</i> |            |
| Fairview High School   | Boulder    |

#### Honorable Mention

|  |            |
|--|------------|
| Anna Kumar   | 12th grade |
| <i>Glucose Fuel Cells Made from Graphene Membranes</i> |            |
| Fairview High School                                   | Boulder    |



## Appendix 2

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### Junior Engineering

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**First Place**

|                               |           |
|-------------------------------|-----------|
| Cuinn Archer                  | 8th grade |
| <i>Automatic Water Vol. 2</i> |           |
| Mancos Middle School          | Mancos    |

**Second Place**

|                                   |           |
|-----------------------------------|-----------|
| Vaughn Bankston                   | 8th grade |
| <i>Can You Truss-t the Truss?</i> |           |
| Mancos Middle School              | Mancos    |

**Third Place**

|   |                  |
|---|------------------|
| Laurel Amber Kent   | 6th grade        |
| <i>Cool Running: A Heat Stroke's Downfall - Using a Peltier Module to Prevent Heat Stroke</i> |                  |
| Eagleview Middle School   | Colorado Springs |

**Honorable Mention**

|   |           |
|---|-----------|
| Junyao Yin  | 8th grade |
| <i>Aerodynamics and Downforce: The Leading Edge in Formula One Racing</i> |           |
| Summit Middle Charter School  | Boulder   |

**Honorable Mention**

|                   |           |
|-------------------|-----------|
| Tidus Overkill    | 8th grade |
| <i>Cheap ROV</i>  |           |
| Genoa-Hugo School | Hugo      |

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### Senior Engineering

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**First Place**

|   |            |
|---|------------|
| Haydan Drullinger   | 10th grade |
| <i>Is It Clogged? Productions of an Instrument to Detect Clogged Sprinkler Heads and Notify a Cellular Device</i> |            |
| Liberty School  | Joes       |

**Second Place**

|  |                   |
|--|-------------------|
| Ersel Serdar   | 11th grade        |
| <i>Bending Fire: A New Approach to Steer Rockets Using Electric Fields</i> |                   |
| Cherry Creek High School   | Greenwood Village |

**Third Place**

|   |                  |
|---|------------------|
| Geo Raguraman   | 12th grade       |
| <i>InvisiEye 2.0: A Compact, Modernized Solution to Aid the Blind and Visually Impaired</i> |                  |
| Discovery Canyon High School  | Colorado Springs |

**Honorable Mention**

|   |            |
|---|------------|
| Denton Peil                                   | 12th grade |
| <i>Gutter Guardian: Gutter Cleaning Drone</i> |            |
| Yuma High School                              | Yuma       |

**Honorable Mention**

|                     |            |
|---------------------|------------|
| Kenneth Zittel      | 12th grade |
| <i>Arc Drift</i>    |            |
| Central High School | Pueblo     |

**Honorable Mention**

|  |            |
|--|------------|
| Malcolm Smith  | 11th grade |
| <i>Unfurl: A Physical Reservoir Computing Algorithm for Deploying Complex Origami Structures</i> |            |
| Niwot High School  | Niwot      |

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### Junior Environmental Engineering

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**First Place**

|  |                 |
|--|-----------------|
| Anirudh Rao                            | 6th grade       |
| <i>An Early Tornado Warning System</i> |                 |
| STEM School                            | Highlands Ranch |

**Second Place**

|  |           |
|--|-----------|
| Miles Stelzer                                | 8th grade |
| <i>Drone Fire Detection and Firefighting</i> |           |
| Summit Middle Charter School                 | Boulder   |

**Third Place**

|  |           |
|--|-----------|
| Andrew Kohler  | 8th grade |
| <i>Blade Types and Quantity vs. Blade Efficiency for Wind Turbines</i> |           |
| Blessed Sacrament Catholic School                                      | Denver    |

**Honorable Mention**

|                            |           |
|----------------------------|-----------|
| Ripley Goode               | 8th grade |
| <i>Wax: Not Cool Dude</i>  |           |
| Boulder Country Day School | Boulder   |

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### Senior Environmental Engineering

---

**First Place**

|   |                  |
|---|------------------|
| Naomi Kruse   | 10th grade       |
| <i>Paper for the Planet: Development of a Novel Paper Inoculated with Wildflower Seed and Carbon-Sequestering Fungi</i> |                  |
| Schullandheim Home School   | Colorado Springs |

**Second Place**

|   |            |
|---|------------|
| Will Thompson & Dmitriy Kazantsev       | 12th grade |
| <i>Sustainability That Grows on You</i> |            |
| Centaurus High School                   | Lafayette  |

**Third Place**

|   |            |
|---|------------|
| Will Livingood  | 12th grade |
| <i>Monitoring Utilities for Wildfire Containment and Prevention</i> |            |
| Green Mountain High School  | Lakewood   |

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### Junior Mathematics & Computer Sciences

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**First Place**

|                              |           |
|------------------------------|-----------|
| Ian Pfenning                 | 8th grade |
| <i>AI Powered Pet Feeder</i> |           |
| Flagstaff Academy            | Longmont  |

**Second Place**

|  |           |
|--|-----------|
| Lucy Brittain                          | 7th grade |
| <i>Mosquito Bite: West Nile Fright</i> |           |
| Creede Schools                         | Creede    |

**Third Place**

|  |           |
|--|-----------|
| Ellery Kallal  | 8th grade |
| <i>MisinformAtIon: How AI Can Create Realistic Misinformation That Humans Read as Fact</i> |           |
| Flagstaff Academy  | Longmont  |

## Appendix 2

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### Senior Mathematics & Computer Sciences

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#### First Place

Michael Gao 11th grade  
*ADMM-FBA: Novel High-Level, Robustly Convergent Flux Balance Analysis Using Dual Anderson-ADMM*  
 Fairview High School Boulder

#### Second Place

Stella Laird 11th grade  
*A Study of Numerical Machine Learning Approaches to Tennis Swing Analysis*  
 Fairview High School Boulder

#### Third Place

Elton Cao 12th grade  
*National Ground-Level NO<sub>2</sub> Predictions Via Satellite Imagery Driven Hybrid Neural Networks*  
 Fairview High School Boulder

#### Honorable Mention

Maria Sears 11th grade  
*Help! I Need Somebody: An Assistive Device That Notifies Emergency Services Once a Fall Has Been Detected*  
 Monte Vista High School Monte Vista

#### Honorable Mention

Christina Abraham 11th grade  
*Optimizing Sustainable Fisheries with Machine Learning: Analyzing Ecosystem-friendly Fishing in the Coral Triangle*  
 Mountain Vista High School Highlands Ranch

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### Junior Micro & Molecular Biology

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#### First Place

Espen Plotkin 8th grade  
*How Different Substances Effect the Zone of Inhibition of Bacteria*  
 Vail Mountain School Vail

#### Second Place

Rylie Harmon 7th grade  
*Safe to Drink?*  
 Sargent Junior High School Monte Vista

#### Third Place

Julia Muro 7th grade  
*The Effect of Various Vinegar Rinse Concentrations on the Shelf Life of Strawberries*  
 North Middle School Colorado Springs

#### Honorable Mention

Izzy Barter 8th grade  
*The Effect of Heat on Bacterial Evolution*  
 Denver Jewish Day School Denver

#### Honorable Mention

Bella Maze 8th grade  
*Warehouse Worries*  
 Sargent Junior High School Monte Vista

#### Honorable Mention

Ainsley Lehman & Jocelyn Demster 7th grade  
*Save Our Sandwiches*  
 Firestone Charter Academy Firestone

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### Senior Micro & Molecular Biology

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#### First Place

Angelina Wang 11th grade  
*Toxin-like Microproteins: A Novel Approach to Unveil the Intricacies of Acetylcholine Receptors*  
 Fairview High School Boulder

#### Second Place

Ayush Vispute 9th grade  
*ProteinFlow: A Novel Biocomputational Approach to Discovering Bacteria with Applications to Global Issues Using Protein Sequence*  
 Rampart High School Colorado Springs

#### Third Place

Armaan Gill 11th grade  
*Exploring the Antimicrobial Effects of Phenethyl Isothiocyanate*  
 Lamar High School Lamar

#### Honorable Mention

Kyra Jordan 12th grade  
*The Measurement of Expelled Zooxanthellae Using Sensor and Data Fusion to Predict Heat Waves*  
 Golden High School Golden

#### Honorable Mention

Zechariah Dilley 10th grade  
*The Effects of Potential Antibiotics Against Antibiotic Bacteria*  
 South High School Pueblo

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### Junior Physics & Astronomy

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#### First Place

Carson Stone 8th grade  
 Connor Stone 6th grade  
*Shake Rattle and Roll - Washboard Phenomenon: The Effect of Wheel Velocity on a Roadbed*  
 Brush Middle School Brush

#### Second Place

Evelyn Lapp 7th grade  
*Refraction in Action*  
 Brush Middle School Brush

#### Third Place

Lane Mattive 7th grade  
*Just Wingin' It*  
 Sargent Junior High School Monte Vista

#### Honorable Mention

Brady Woods 6th grade  
*Getting Traction*  
 Turner Middle School Berthoud

## Appendix 2

### Honorable Mention

|   |           |
|---|-----------|
| Jacob Kossler                                       | 8th grade |
| <i>Seeing Radiation To Find Out How To Block It</i> |           |
| Turner Middle School                                | Berthoud  |

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### Senior Physics & Astronomy

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#### First Place

|  |            |
|--|------------|
| Tristan Cao  | 10th grade |
| <i>Toward Realization of Novel Quantum Materials via Magneto-Synthesis</i> |            |
| Stargate Charter School  | Thornton   |

#### Second Place

|   |            |
|---|------------|
| Elsie Thompson                                  | 10th grade |
| <i>Does Tee Height Affect Driving Distance?</i> |            |
| Limon School                                    | Limon      |

#### Third Place

|  |                   |
|--|-------------------|
| Vikram Raju  | 9th grade         |
| <i>A Novel Way to Significantly Improve TEM Efficiency by Altering Hologram Interference</i> |                   |
| Cherry Creek High School   | Greenwood Village |

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### Junior Plant Sciences

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#### First Place

|   |           |
|---|-----------|
| Finnley Reitz   | 6th grade |
| <i>Sumac Shindig: An Investigation into Scarification</i> |           |
| Alta Vista Charter School                                 | Lamar     |

#### Second Place

|                            |             |
|----------------------------|-------------|
| Elaina Consaul             | 7th grade   |
| <i>Boost the Roots!</i>    |             |
| Sargent Junior High School | Monte Vista |

#### Third Place

|   |             |
|---|-------------|
| Jossilyn Wagar  | 8th grade   |
| <i>Rotten Project: How Effective Are Fungicides That Prevent Post-Harvest Potato Rot?</i> |             |
| Sargent Junior High School  | Monte Vista |

#### Honorable Mention

|  |           |
|--|-----------|
| Gabe Carr & Jax Poss                               | 7th grade |
| <i>Does the Height of Grass Effect Its Growth?</i> |           |
| Genoa-Hugo School                                  | Hugo      |

#### Honorable Mention

|  |           |
|--|-----------|
| Andrew Dube  | 8th grade |
| <i>The Effect of Acidification on the Health of Elodea</i> |           |
| Aspen Middle School  | Aspen     |

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### Senior Plant Sciences

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#### First Place

|   |             |
|---|-------------|
| Jordan Rockey   | 12th grade  |
| <i>Effectiveness of Insect Management Practices on the Spread of Potato Virus Y</i> |             |
| Monte Vista High School   | Monte Vista |

#### Second Place

|   |            |
|---|------------|
| Siena Parr  | 11th grade |
| <i>The Effect of Gray Water on Soil Composition and Growth of Phaseolus coccineus</i> |            |
| Dolores High School   | Dolores    |

#### Third Place

|  |                   |
|--|-------------------|
| Amanda Castillo-Lopez & Caitlin Dong         | 12th grade        |
| <i>Biodegradation by Pleurotus Ostreatus</i> |                   |
| Cherry Creek High School                     | Greenwood Village |

#### Honorable Mention

|   |            |
|---|------------|
| Jann Angelli Bacolod  | 12th grade |
| <i>Wi-Fry: Detrimental Impacts of Wi-Fi Router Radiation on Crop Seed Viability and Vigor</i> |            |
| Rocky Ford Jr/Sr High School  | Rocky Ford |

#### Honorable Mention

|  |           |
|--|-----------|
| Jaden DePue  | 9th grade |
| <i>Roots of Success: Investigating the Optimal Water Conditions for Corn Root Growth</i> |           |
| Wray High School   | Wray      |

## 2024 Colorado Science and Engineering Fair Special Awards Press Release

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### Colorado Science & Engineering Fair

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#### *Poster Art Contest*

Amy Xia 10th grade  
\$100, certificate  
Cherry Creek High School Greenwood Village

#### *Student Choice Award*

Julia Muro 7th grade  
\$100, certificate  
North Middle School Colorado Springs  
*The Effect of Various Vinegar Rinse Concentrations on the Shelf Life of Strawberries*

Amy Zhang 9th grade  
\$100, certificate  
Lakewood High School Lakewood  
*Feel the Ball: Convert Ball Motion to Touch for Sport Audiencences with Vision/Hearing Impairments*

#### *Elemér Bernath Memorial Technical Writing Award*

Sophia Bronstein 8th grade  
certificate  
Summit Middle Charter School Boulder  
*The Vanishing Palette: Comparing the Fading Rates of Different Oil-Based Paints*

Kaycee Clark 8th grade  
\$100, certificate  
Wray Junior High School Wray  
*What Lies Beneath: A Study on the Effects of Grazing Intensities on the Nutrients in the Soil*

#### *Ralph Desch Memorial Technical Writing Award*

Kelly Yang 11th grade  
certificate  
Fairview High School Boulder  
*Enhancing Dry Cooling in Power Plants through High-Conductivity Thermal Ground Planes*

Elton Cao 12th grade  
certificate  
Fairview High School Boulder  
*National Ground-Level NO<sub>2</sub> Predictions Via Satellite Imagery Driven Hybrid Neural Networks*

Julia Gao 9th grade  
Om Vegesna 9th grade  
\$100, certificate  
Fairview High School Boulder  
*G.L.O.W.: A Novel Hybrid Network Approach for Glioblastoma Localization Using Carcinogenic Oxidative Stress Biomarkers*

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### Pioneers of Science

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#### *Dian Fossey Animal Sciences Award*

Natalia Romero 7th grade  
\$50, certificate  
Justice & Heritage Academy Antonito  
*Attachment Issues*

#### *Mary Ainsworth Behavioral & Social Sciences Award*

Asha Jeter Patel 8th grade  
\$50, certificate, poster of pioneer scientist  
Sacred Heart of Jesus Catholic School Boulder  
*Conversation Topics*

#### *Leon Festinger Behavioral & Social Sciences Award*

Omar Manshad 6th grade  
\$50, certificate, poster of pioneer scientist  
West Ridge Academy Greeley  
*Beyond Pegs & Holes: Building an Improved Chessboard for Blind and Low Vision Chess Players*

#### *Elizabeth Helen Blackburn Biomedical & Health Sciences Award*

Sunand Bhandaram 8th grade  
\$50, certificate  
Campus Middle School Englewood  
*Artificial Intelligence Assisted Deployment of Emergency Resources for Natural Disasters*

#### *John Goodenough Chemistry Award*

Fallyn Gregersen 7th grade  
\$50, certificate, poster of pioneer scientist  
Wiggins Middle School Wiggins  
*Purifying Water with Activated Charcoal*

#### *Wangari Muta Maathai Earth & Environmental Sciences Award*

Tejas Raman 8th grade  
\$50, certificate, poster of pioneer scientist  
Boulder Country Day School Boulder  
*Pattern-Based Seismology*

#### *Burt Ratan Energy Award*

Neave Henschel 6th grade  
\$50, certificate, poster of pioneer scientist  
Hi-Plains School Seibert  
*Hold the Heat*

## Appendix 2

### *Steven Chu Engineering Award*

Morgan Drullinger 7th grade  
 \$50, certificate, poster of pioneer scientist  
 Liberty School Joes  
*Comparing the Accuracy of 3D Printed Airsoft BB's*

### *George Tchobanoglous Environmental Engineering Award*

Ripley Goode 8th grade  
 \$50, certificate, poster of pioneer scientist  
 Boulder Country Day School Boulder  
*Wax: Not Cool Dude*

### *Jack Kilby Mathematics & Computer Sciences Award*

Ian Pfenning 8th grade  
 \$50, certificate, poster of pioneer scientist  
 Flagstaff Academy Longmont  
*AI Powered Pet Feeder*

### *James Patrick Allison Micro & Molecular Biology Award*

Cynthia Stevens 8th grade  
 \$50, certificate, poster of pioneer scientist  
 Risley International Academy of Innovation Pueblo  
*Mouthwash vs. Bacteria*

### *Donna Theo Strickland Physics & Astronomy Award*

Emmett Wiedenheft 6th grade  
 \$50, certificate, poster of pioneer scientist  
 Southern Hills Middle School Boulder  
*The Change in Energy of Bouncing Balls*

### *Luther Burbank Plant Sciences Award*

Gabriel Ferguson 6th grade  
 \$50, certificate, poster of pioneer scientist  
 Craver Middle School Colorado City  
*Thriving Waters*

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## Military

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### **United States Air Force Reserve Officer Training Corps**

#### *Air Force ROTC Award*

MaKenna McCoy 6th grade  
 certificate, sling pack, power bank, USB flash memory drive,  
 USB car charger  
 Alta Vista Charter School Lamar  
*A Safer Landing*

Quinlan Childs 8th grade  
 certificate, sling pack, power bank, USB flash memory drive,  
 USB car charger  
 Summit Middle Charter School Boulder  
*Dynamics of Flight: Testing Airplane Wings to Demonstrate Efficiency Using a Wind Tunnel*

Emilio Martinez 11th grade  
 certificate, sling pack, power bank, USB flash memory drive,  
 USB car charger  
 Alamosa High School Alamosa  
*F.A.L.L. (Falling Avionic Light Landing): Analysis of Control Surfaces Upon Atmospheric Re-entry*

Tynan Lohman 8th grade  
 certificate, sling pack, power bank, USB flash memory drive,  
 USB car charger  
 Liberty School Joes  
*Stealth Aircraft Aerodynamics*

### **United States Navy & Marine Corps Navy Science & Engineering Award**

Laurel Amber Kent 6th grade  
 certificate, letter of congratulations, ONR medallion  
 Eagleview Middle School Colorado Springs  
*Cool Running: A Heat Stroke's Downfall - Using a Peltier Module to Prevent Heat Stroke*

Anirudh Rao 6th grade  
 certificate, letter of congratulations, ONR medallion  
 STEM School Highlands Ranch  
*An Early Tornado Warning System*

Cuinn Archer 8th grade  
 certificate, letter of congratulations, ONR medallion  
 Mancos Middle School Mancos  
*Automatic Water Vol. 2*

Junyao Yin 8th grade  
 certificate, letter of congratulations, ONR medallion  
 Summit Middle Charter School Boulder  
*Aerodynamics and Downforce: The Leading Edge in Formula One Racing*

Ersel Serdar 11th grade  
 certificate, letter of congratulations, ONR medallion, \$75 gift card  
 Cherry Creek High School Greenwood Village  
*Bending Fire: A New Approach to Steer Rockets Using Electric Fields*

Haydan Drullinger 10th grade  
 certificate, letter of congratulations, ONR medallion, \$75 gift card  
 Liberty School Joes  
*Is It Clogged? Productions of an Instrument to Detect Clogged Sprinkler Heads and Notify a Cellular Device*

## Appendix 2

Emilio Martinez 11th grade  
 certificate, letter of congratulations, ONR medallion, \$75 gift  
 card  
 Alamosa High School Alamosa  
*F.A.L.L. (Falling Avionic Light Landing): Analysis of Control  
 Surfaces Upon Atmospheric Re-entry*

Tess Price 8th grade  
 certificate, \$200  
 Ken Caryl Middle School Littleton  
*Polymerization Using Alginate Spherification*

Mariami Zhuzhunashvili 12th grade  
 certificate, \$150  
 Cherry Creek High School Greenwood Village  
*Producing Biodiesel from Spent Coffee Grounds: Traditional  
 vs. In situ Transesterification*

Anna Kumar 12th grade  
 certificate, \$200  
 Fairview High School Boulder  
*Glucose Fuel Cells Made from Graphene Membranes*

### Organizational

#### Air & Waste Management Association, Rocky Mountain States Section Air & Waste Management Award

Paisley Wiersma 7th grade  
 certificate, \$100  
 Genoa-Hugo School Hugo  
*Biomass to Biogas*

Taelynn Rojas 8th grade  
 certificate, \$200  
 Liberty School Joes  
*Using Microbes to Solve the Microplastic Problem*

Shrey Rohilla 11th grade  
 certificate, \$100  
 The Classical Academy Colorado Springs  
*Waste to Watts: Converting Locally Sourced Organic Waste  
 Material into Activated Carbon-Based Supercapacitors*

Elton Cao 12th grade  
 certificate, \$200  
 Fairview High School Boulder  
*National Ground-Level NO<sub>2</sub> Predictions Via Satellite Imagery  
 Driven Hybrid Neural Networks*

#### American Association of University Women AAUW Colorado Award for Women in STEM

Samantha Goetz 7th grade  
 certificate, \$250  
 St. Peter's Catholic School Monument  
*Is There a Medication Bottle That Senior Citizens Can Open  
 and Children Cannot?*

Amy Zhang 9th grade  
 certificate, \$250  
 Lakewood High School Lakewood  
*Feel the Ball: Convert Ball Motion to Touch for Sport Audi-  
 ences with Vision/Hearing Impairments*

#### American Institute of Chemical Engineers, Rocky Mountain Section Excellence in Chemical Engineering Award

Fallyn Gregersen 7th grade  
 certificate, \$150  
 Wiggins Middle School Wiggins  
*Purifying Water with Activated Charcoal*

#### American Statistical Association, Colorado/Wyoming Chapter David Young Memorial Award

Cameron Kempisty 7th grade  
 certificate, \$200, student membership in the ASA, acknowl-  
 edgement at the chapter's spring meeting and on the chapter  
 website  
 Eagleview Middle School Colorado Springs  
*To Grow or Not to Grow: Testing Biomass-based Alternatives  
 for a Greener World*

Julia Gao 9th grade  
 Om Vegesna 9th grade  
 certificate, \$200, student membership in the ASA, acknowl-  
 edgement at the chapter's spring meeting and on the chapter  
 website  
 Fairview High School Boulder  
*G.L.O.W.: A Novel Hybrid Network Approach for Glioblastoma  
 Localization Using Carcinogenic Oxidative Stress Biomarkers*

#### American Vacuum Society, Rocky Mountain Chapter Excellence in Physical Sciences & Engineering Award

Collin Richardson 7th grade  
 certificate, \$100, matching award to teacher/sponsor  
 Wiggins Middle School Wiggins  
*Which Fuel Is More Efficient?*

Fallyn Gregersen 7th grade  
 certificate, \$200, matching award teacher/sponsor  
 Wiggins Middle School Wiggins  
*Purifying Water with Activated Charcoal*

Helena Borsholm 12th grade  
 Charlotte Harrington 12th grade  
 certificate, \$100, matching award for teacher/sponsor  
 Monarch High School Louisville  
*Tuning the Concentration of Active Sites on the Surface of Het-  
 erogeneous Catalysts Using Self-Assembled Monolayers*

## Appendix 2

Ersel Serdar 11th grade  
certificate, \$200, matching award for teacher/sponsor  
Cherry Creek High School Greenwood Village  
*Bending Fire: A New Approach to Steer Rockets Using Electric Fields*

### ASM International

#### *ASM Materials Education Foundation Award*

Kenneth Zittel 12th grade  
certificate, \$100  
Central High School Pueblo  
*Arc Drift*

Karissa Freund 8th grade  
certificate, \$150  
Stratton School Stratton  
*The Corrosion of Steel*

### Broadcom Foundation

#### *Broadcom Coding with Commitment Award*

Tejas Raman 8th grade  
certificate, \$250 gift certificate, Raspberry Pi Pico Kit  
Boulder Country Day School Boulder  
*Pattern-Based Seismology*

### Colorado Biology Teachers Association

#### *CBTA Best Biology Project Award*

Finnley Reitz 6th grade  
certificate, \$100  
Alta Vista Charter School Lamar  
*Sumac Shindig: An Investigation into Scarification*

Vedanth Raju 6th grade  
certificate, \$150  
Aurora Quest K-8 School Aurora  
*Curcuza: A Nanogel Antibiotic Using Neem and Turmeric Nanoparticles to Help Tackle Antibiotic Resistance - A Global Health Threat*

Elizabeth Vossler 11th grade  
certificate, \$150  
Denver School of the Arts Denver  
*Detention Basin Systems: Mitigating Stormwater in Hampden Heights and Its Implications on Cherry Creek Water Quality*

Amy Xia 10th grade  
certificate, \$200  
Cherry Creek High School Greenwood Village  
*Determining Whether the PTPN2 Gene Plays a Role in the Development of Type 1 Diabetes*

### Colorado BioScience Institute

#### *Future of Life Sciences Award*

Jade Howell 8th grade  
certificate, \$25  
Ignacio Middle School Ignacio  
*Inheriting Blood Types*

Angelina Wang 11th grade  
certificate, \$75, feature in the Institute's "Success Stories"  
Fairview High School Boulder  
*Toxin-like Microproteins: A Novel Approach to Unveil the Intricacies of Acetylcholine Receptors*

### Colorado Chemistry Teachers Association

#### *CCTA Chemistry Award*

Reuben Friedlander 7th grade  
certificate, \$150  
Denver Jewish Day School Denver  
*Endothermic Chemical Reaction to Make a Colder More Efficient and Affordable Ice Pack Making a Better More Efficient and Cheaper Cold Pack*

Cole Randolph 12th grade  
certificate, \$150  
Green Mountain High School Lakewood  
*Calcium Carbonate Cooling Caps*

### Colorado Environmental Health Association

#### *Environmental Health Award*

Tymbri Priestley 7th grade  
certificate, \$75  
Mancos Middle School Mancos  
*The Effects of Antibacterial Soap on Abilities to Kill Bacteria*

Kenedy Jiron-Baker 12th grade  
certificate, \$150, invitation to exhibit at the CEHA Annual Educational Conference (valued at \$400)  
Evergreen High School Evergreen  
*Income and the Environment*

### Colorado Foundation for Agriculture

#### *Jack Fenwick Award for Agricultural Science*

Maya Calle 8th grade  
certificate, \$50  
Aspen Middle School Aspen  
*How Nitrites Affect the Growth of Algae*

Jossilyn Wagar 8th grade  
certificate, \$50  
Sargent Junior High School Monte Vista  
*Rotten Project: How Effective Are Fungicides That Prevent Post-Harvest Potato Rot?*

Haydan Drullinger 10th grade  
certificate, \$50  
Liberty School Joes  
*Is It Clogged? Productions of an Instrument to Detect Clogged Sprinkler Heads and Notify a Cellular Device*

Maggie Anderson 10th grade  
certificate, \$50  
Yuma High School Yuma  
*Analysis of Expected Progeny Difference: Predictability in Beef Cattle*

## Appendix 2

### Colorado Medical Society

#### *CMS Education Foundation Award*

Maya Rokhlenko 8th grade  
 Olive Spohn 8th grade  
 certificate, \$100, invitation to the winners and their parents to exhibit at the CMS Annual Meeting and attend the Presidential Inaugural Dinner with a paid overnight stay  
 Flagstaff Academy Longmont  
*All Boxed Up: The Effects of Prescription Eyewear on Peripheral Vertigo*

Ashley Acton 12th grade  
 certificate, \$100, invitation to the winners and their parents to exhibit at the CMS Annual Meeting and attend the Presidential Inaugural Dinner with a paid overnight stay  
 Fairview High School Boulder  
*The Effects of Caffeine on Stem Cells and Skeletal Muscle Regeneration*

### Colorado Mineral Society

#### *Best Earth Science-related Project*

Kendyl Osborn 6th grade  
 certificate, mineral specimen, book, \$35  
 La Junta Intermediate School La Junta  
*Shells to Cells*

### Colorado Mycological Society

#### *Excellence in Mycological Research Award*

Amanda Castillo-Lopez 12th grade  
 Caitlin Dong 12th grade  
 certificate, \$25, society membership, signed copy of Vera Evenson's "Rocky Mountain Mushrooms" book  
 Cherry Creek High School Greenwood Village  
*Biodegradation by Pleurotus Ostreatus*

Naomi Kruse 10th grade  
 certificate, \$50, society membership, signed copy of Vera Evenson's "Rocky Mountain Mushrooms" book  
 Schullandheim Home School Colorado Springs  
*Paper for the Planet: Development of a Novel Paper Inoculated with Wildflower Seed and Carbon-Sequestering Fungi*

Hannah Shelton 11th grade  
 certificate, \$100, society membership, signed copy of Vera Evenson's "Rocky Mountain Mushrooms" book  
 Centauri High School La Jara  
*Applied Mycology: Do Fungal Endophyte Communities Differ Between Western Spruce Budworm Infested Douglas Fir and Uninfested Douglas Fir?*

### Colorado Native Plant Society

#### *Colorado Native Plant Society Award*

Finnley Reitz 6th grade  
 certificate, \$100, 1-year membership to Colorado Native Plant Society, book on Colorado native plants  
 Alta Vista Charter School Lamar  
*Sumac Shindig: An Investigation into Scarification*

Jordan Rockey 12th grade  
 certificate, \$200, 1-year membership to Colorado Native Plant Society, book on Colorado native plants  
 Monte Vista High School Monte Vista  
*Effectiveness of Insect Management Practices on the Spread of Potato Virus Y*

### Colorado Section of the American Chemical Society

#### *ACS Chemistry Award*

Sophia Bronstein 8th grade  
 certificate, \$50  
 Summit Middle Charter School Boulder  
*The Vanishing Palette: Comparing the Fading Rates of Different Oil-Based Paints*

Marin Cantrell 8th grade  
 certificate, \$50  
 Cardinal Community Academy Keensburg  
*Toilet Talk*

Tess Price 8th grade  
 certificate, \$75  
 Ken Caryl Middle School Littleton  
*Polymerization Using Alginate Spherification*

Varun Velmurugan 8th grade  
 certificate, \$125  
 Campus Middle School Englewood  
*Water Purification: A Solution for Fluoride Contamination*

Tyson Montague 8th grade  
 certificate, \$150  
 Centauri Middle School La Jara  
*Orange Juice: The Sunshine in Your Cup*

Mariami Zhuzhunashvili 12th grade  
 certificate, \$50  
 Cherry Creek High School Greenwood Village  
*Producing Biodiesel from Spent Coffee Grounds: Traditional vs. In situ Transesterification*

Cole Randolph 12th grade  
 certificate, \$75  
 Green Mountain High School Lakewood  
*Calcium Carbonate Cooling Caps*

Katherine Zheng 11th grade  
 certificate, \$125  
 Fairview High School Boulder  
*Visible Light Photocatalytic Degradation of Congo Red Using LaFeO<sub>3</sub> Nanofibers*

Claire Huang 11th grade  
 Sophia Zhang 10th grade  
 certificate, \$300  
 Fairview High School Boulder  
*Natural Eutectogels as a Novel Material for Green Wearable Electronics*



## Appendix 2

### Colorado State University College of Agricultural Sciences

#### *Innovations in the Science of Agriculture Award*

|  |                                   |
|--|-----------------------------------|
| Julia Muro<br>certificate, \$500<br>North Middle School<br><i>The Effect of Various Vinegar Rinse Concentrations on the Shelf Life of Strawberries</i> | 7th grade<br><br>Colorado Springs |
| Kendyl Osborn<br>certificate, \$500<br>La Junta Intermediate School<br><i>Shells to Cells</i>  | 6th grade<br><br>La Junta         |
| Asha Thompson<br>certificate, \$500<br>Limon School<br><i>Rain, Rain, Don't Go Away</i>  | 10th grade<br><br>Limon           |
| Jessa Book<br>certificate, \$500<br>Miami-Yoder High School<br><i>Strength of EMF Waves Radiating from High Powered Electric Lines</i>                 | 10th grade<br><br>Rush            |
| Siena Parr<br>certificate, \$500<br>Dolores High School<br><i>The Effect of Gray Water on Soil Composition and Growth of Phaseolus coccineus</i>       | 11th grade<br><br>Dolores         |

### Colorado State University Colorado Natural Heritage Program

#### *Colorado Natural Heritage Program Conservation Award*

|   |                            |
|---|----------------------------|
| Jessie Stong<br>certificate, pint glass, Wetlands of Colorado guidebook<br>Green Mountain High School<br><i>Botanic Panic at Welchester Tree Grant Park</i> | 12th grade<br><br>Lakewood |
|---|----------------------------|

### Colorado State University Department of Agricultural Biology

#### *Agricultural Biology Award*

|  |                                   |
|--|-----------------------------------|
| Elaina Consaul<br>certificate, \$100<br>Sargent Junior High School<br><i>Boost the Roots!</i>  | 7th grade<br><br>Monte Vista      |
| Cameron Kempisty<br>certificate, \$100<br>Eagleview Middle School<br><i>To Grow or Not to Grow: Testing Biomass-based Alternatives for a Greener World</i> | 7th grade<br><br>Colorado Springs |
| Jordan Rockey<br>certificate, \$100<br>Monte Vista High School<br><i>Effectiveness of Insect Management Practices on the Spread of Potato Virus Y</i>      | 12th grade<br><br>Monte Vista     |

|   |                       |
|---|-----------------------|
| Jaden DePue<br>certificate, \$100<br>Wray High School<br><i>Roots of Success: Investigating the Optimal Water Conditions for Corn Root Growth</i> | 9th grade<br><br>Wray |
|---|-----------------------|

### Colorado State University Department of Chemistry *Excellence in Chemistry Award*

|   |  |
|---|--|
| Marin Cantrell<br>certificate, \$75<br>Cardinal Community Academy<br><i>Toilet Talk</i>   | 8th grade<br><br>Keensburg                 |
| Eli Harrison<br>certificate, \$125<br>Home School<br><i>The Effect of the Amount of Sugar in Kombucha Leather</i>   | 6th grade<br><br>Erie                      |
| Katelyn Marquez<br>certificate, \$75<br>Miami-Yoder High School<br><i>Effects of Acids on Alloy Metals of Costume Jewelry: A Way to Improve Appearance</i>  | 10th grade<br><br>Rush                     |
| Helena Borsholm<br>Charlotte Harrington<br>certificate, \$125<br>Monarch High School<br><i>Tuning the Concentration of Active Sites on the Surface of Heterogeneous Catalysts Using Self-Assembled Monolayers</i> | 12th grade<br>12th grade<br><br>Louisville |

### Colorado State University Department of Horticulture & Landscape Architecture

#### *Excellence in Horticulture Award*

|   |                               |
|---|-------------------------------|
| Ashton Power<br>certificate, \$100<br>Heritage Heights Academy<br><i>The Impact of Stem Length and Humidity on Transpiration of Flowers</i>                     | 6th grade<br><br>Aurora       |
| Jossilyn Wagar<br>certificate, \$100<br>Sargent Junior High School<br><i>Rotten Project: How Effective Are Fungicides That Prevent Post-Harvest Potato Rot?</i> | 8th grade<br><br>Monte Vista  |
| Jordan Rockey<br>certificate, \$100<br>Monte Vista High School<br><i>Effectiveness of Insect Management Practices on the Spread of Potato Virus Y</i>           | 12th grade<br><br>Monte Vista |
| Jessie Stong<br>certificate, \$100<br>Green Mountain High School<br><i>Botanic Panic at Welchester Tree Grant Park</i>  | 12th grade<br><br>Lakewood    |

## Appendix 2

### **Colorado State University, Energy Institute** *Excellence in Energy Achievement Award*

Natalie Muro 10th grade  
certificate, \$250  
Palmer High School Colorado Springs  
*Effects of Mooring Systems on Submerged Point Absorber  
Wave Energy Converters*

### **Colorado's Electric Cooperatives** *The Colorado EnergyWise Award*

Neave Henschel 6th grade  
certificate, \$75  
Hi-Plains School Seibert  
*Hold the Heat*

Rylen Ross 7th grade  
certificate, \$175  
Monte Vista Middle School Monte Vista  
*Cooling for Solar*

Natalie Muro 10th grade  
certificate, \$75  
Palmer High School Colorado Springs  
*Effects of Mooring Systems on Submerged Point Absorber  
Wave Energy Converters*

Shrey Rohilla 11th grade  
certificate, &175  
The Classical Academy Colorado Springs  
*Waste to Watts: Converting Locally Sourced Organic Waste  
Material into Activated Carbon-Based Supercapacitors*

### **Colorado-Wyoming Society of American Foresters**

#### *Excellence in Forestry Award*

Miles Stelzer 8th grade  
certificate, \$200  
Summit Middle Charter School Boulder  
*Drone Fire Detection and Firefighting*

Aspen Fisher 12th grade  
certificate, \$200  
Evergreen High School Evergreen  
*Comparing Pygmy Nuthatch Population Size Between Thinned  
and Unthinned Forests*

### **Department of Commerce Boulder Laboratories** *Award for Excellence in Science and Engineering*

Hannah McClintock 12th grade  
certificate, alternate for summer internship at the DOC labs in  
Boulder  
Strasberg High School Strasburg  
*The Effects of Recycled Calcium Hydroxide on the Average  
Growth and Mortality Rate of an Ecosystem Affected by Ocean  
Acidification*

Elton Cao 12th grade  
certificate, summer internship offer at the DOC labs in Boul-  
der  
Fairview High School Boulder  
*National Ground-Level NO<sub>2</sub> Predictions Via Satellite Imagery  
Driven Hybrid Neural Networks*

### **Gromko Family** *Gerald Gromko Memorial Award*

Ersel Serdar 11th grade  
certificate, \$250  
Cherry Creek High School Greenwood Village  
*Bending Fire: A New Approach to Steer Rockets Using Electric  
Fields*

### **Institute of Electrical and Electronics Engineers** **High Plains Section** *IEEE Award*

Anirudh Rao 6th grade  
certificate, \$125 Amazon gift card  
STEM School Highlands Ranch  
*An Early Tornado Warning System*

Shrey Rohilla 11th grade  
certificate, \$175 Amazon gift card  
The Classical Academy Colorado Springs  
*Waste to Watts: Converting Locally Sourced Organic Waste  
Material into Activated Carbon-Based Supercapacitors*

### **Little Shop of Physics** *Matthew McCausland Memorial Award*

Pake VanderLinden 6th grade  
certificate, science equipment/instruments  
West Grand Middle School Kremmling  
*Using Mechanical Advantage to Lift*

Ansley Martin 7th grade  
certificate, science equipment/instruments  
Challenge School Denver  
*Making a Leather Substitute Out of Kombucha SCOBY*

Madison Kirchhoff 8th grade  
certificate, science equipment/instruments  
Craver Middle School Colorado City  
*Can I Break the Law of Conservation of Energy by Making a  
Magnetic Motor Run on Magnetic Potential Energy*

Zachary Carr 10th grade  
certificate, science equipment/instruments  
Limon School Limon  
*The Simulation of Gravity Waves*

Teagan Archer 11th grade  
certificate, science equipment/instruments  
Mancos High School Mancos  
*The Perfect Pan II*

## Appendix 2

|  |                                     |   |   |
|--|-------------------------------------|---|---|
| Natalie Muro<br>certificate, science equipment/instruments<br>Palmer High School<br><i>Effects of Mooring Systems on Submerged Point Absorber<br/>Wave Energy Converters</i>       | 10th grade<br><br>Colorado Springs  | Humza Asif Memon<br>certificate, \$100<br>Crescent View Academy<br><i>From Batter to Biofuel: Exploring Microbial Magic</i>   | 6th grade<br><br>Aurora                 |
| <b>Lockheed Martin</b>   |                                     |   |   |
| <i>Lockheed Martin Aerospace Award</i>   |                                     |   |   |
| Quinlan Childs<br>certificate, \$150<br>Summit Middle Charter School<br><i>Dynamics of Flight: Testing Airplane Wings to Demonstrate Ef-<br/>ficiency Using a Wind Tunnel</i>      | 8th grade<br><br>Boulder            | Claire Huang<br>Sophia Zhang<br>certificate, \$50<br>Fairview High School<br><i>Natural Eutectogels as a Novel Material for Green Wearable<br/>Electronics</i>  | 11th grade<br>10th grade<br><br>Boulder |
| Ersel Serdar<br>certificate, \$350<br>Cherry Creek High School<br><i>Bending Fire: A New Approach to Steer Rockets Using Electric<br/>Fields</i>                                   | 11th grade<br><br>Greenwood Village | Mariami Zhuzhunashvili<br>certificate, \$100<br>Cherry Creek High School<br><i>Producing Biodiesel from Spent Coffee Grounds: Traditional<br/>vs. In situ Transesterification</i>                         | 12th grade<br><br>Greenwood Village     |
| <b>Matt Hannifin - CO2/Greenhouse Gas Reduction</b>  |                                     |   |   |
| <i>CO2 &amp; Greenhouse Gas Reduction Award</i>  |                                     |   |   |
| Priya Mayjoy<br>certificate, \$50<br>Lamar Middle School<br><i>Monitoring Apis Mellifera Linnaeus for Winter Survival</i>  | 8th grade<br><br>Lamar              | Cameron Kempisty<br>certificate, \$150<br>Eagleview Middle School<br><i>To Grow or Not to Grow: Testing Biomass-based Alternatives<br/>for a Greener World</i>  | 7th grade<br><br>Colorado Springs       |
| Hayden Forst<br>certificate, \$100<br>Dove Creek Middle School<br><i>How Does a Cow's Digestive System Work?</i>   | 7th grade<br><br>Dove Creek         | Miles Rutledge<br>certificate, \$150<br>Yuma High School<br><i>Comparison of Canola, Sunflower, Soybean and Used Fryer Bi-<br/>odiesels on Their Engine and Emission Properties</i>                       | 11th grade<br><br>Yuma                  |
| Maggie Anderson<br>certificate, \$50<br>Yuma High School<br><i>Analysis of Expected Progeny Difference: Predictability in Beef<br/>Cattle</i>                                      | 10th grade<br><br>Yuma              | Paisley Wiersma<br>certificate, \$300<br>Genoa-Hugo School<br><i>Biomass to Biogas</i>  | 7th grade<br><br>Hugo                   |
| Robert Horner<br>certificate, \$100<br>Monte Vista High School<br><i>Fin-Tastic Harmony: Aquaponics with Betta</i>   | 10th grade<br><br>Monte Vista       | Ansley Martin<br>certificate, \$150<br>Challenge School<br><i>Making a Leather Substitute Out of Kombucha SCOBY</i>   | 7th grade<br><br>Denver                 |
| Kenedy Jiron-Baker<br>certificate, \$300<br>Evergreen High School<br><i>Income and the Environment</i>   | 12th grade<br><br>Evergreen         | Haydan Drullinger<br>certificate, \$50<br>Liberty School<br><i>Is It Clogged? Productions of an Instrument to Detect Clogged<br/>Sprinkler Heads and Notify a Cellular Device</i>                         | 10th grade<br><br>Joes                  |
| Claire Seger<br>certificate, \$300<br>Monte Vista High School<br><i>An Analysis of Spaceflight-Induced Osteopenia and Muscular<br/>Atrophy Over Extended Zero Gravity Missions</i> | 11th grade<br><br>Monte Vista       | Ruolin Hai<br>certificate, \$100<br>Campion Academy<br><i>HarvestSpectra: An Enhanced Crop Spectral Analysis Using a<br/>Novel Vertical Take-off Fixed Wing Structure for Precision Ag-<br/>riculture</i> | 11th grade<br><br>Loveland              |
| Azucena Perez<br>certificate, \$50<br>Lamar Middle School<br><i>Corrosion Conundrum</i>  | 6th grade<br><br>Lamar              | Galileo Hannigan<br>certificate, \$100<br>Centaurus High School<br><i>Theat's So F.I.R.E.! The Forefront in Inferno Research Equip-<br/>ment</i>  | 12th grade<br><br>Lafayette             |
|  |                                     | Naomi Kruse<br>certificate, \$200<br>Schullandheim Home School<br><i>Paper for the Planet: Development of a Novel Paper Inoculated<br/>with Wildflower Seed and Carbon-Sequestering Fungi</i>             | 10th grade<br><br>Colorado Springs      |

## Appendix 2

|   |   |
|---|---|
| Christina Abraham<br>certificate, \$100<br>Mountain Vista High School<br><i>Optimizing Sustainable Fisheries with Machine Learning: Analyzing Ecosystem-friendly Fishing in the Coral Triangle</i>    | 11th grade<br>Highlands Ranch                       |
| Elton Cao<br>certificate, \$200<br>Fairview High School<br><i>National Ground-Level NO<sub>2</sub> Predictions Via Satellite Imagery Driven Hybrid Neural Networks</i>                                | 12th grade<br>Boulder                               |
| Julia Muro<br>certificate, \$150<br>North Middle School<br><i>The Effect of Various Vinegar Rinse Concentrations on the Shelf Life of Strawberries</i>  | 7th grade<br>Colorado Springs                       |
| Ayush Vispute<br>certificate, \$150<br>Rampart High School<br><i>ProteinFlow: A Novel Biocomputational Approach to Discovering Bacteria with Applications to Global Issues Using Protein Sequence</i> | 9th grade<br>Colorado Springs                       |
| Sydney Curtis<br>certificate, \$150<br>Sargent Junior High School<br><i>Sail Your Ship to Positivity: A Comparison of Sail Shape and Material</i>   | 7th grade<br>Monte Vista                            |
| Alexander Diener<br>certificate, \$150<br>Fairview High School<br><i>An Analysis of the Coronal Temperature Spike using Solar Spectroscopy</i>  | 11th grade<br>Boulder                               |
| Quorra Benally<br>certificate, \$50<br>Mancos Middle School<br><i>Bombs Away</i>  | 6th grade<br>Mancos                                 |
| Andrew Dube<br>certificate, \$100<br>Aspen Middle School<br><i>The Effect of Acidification on the Health of Elodea</i>  | 8th grade<br>Aspen                                  |
| Jessie Stong<br>certificate, \$50<br>Green Mountain High School<br><i>Botanic Panic at Welchester Tree Grant Park</i>   | 12th grade<br>Lakewood                              |
| Abby Mirsky<br>Dylan Greco<br>Sasha Trask<br>certificate, \$100<br>Centaurus High School<br><i>Sustainable Synergy: The Greenhouse Revolution Towards Self Sufficiency</i>                            | 12th grade<br>12th grade<br>12th grade<br>Lafayette |

### **Morrow Family** *Dental & Forensics Award*

|  |                             |
|--|-----------------------------|
| Kinleigh Hathorn<br>certificate, \$50<br>Sargent Junior High School<br><i>Return from the Brink: The Effect of Slurry on the Natural Environment</i> | 8th grade<br>Monte Vista    |
| Varun Velmurugan<br>certificate, \$100<br>Campus Middle School<br><i>Water Purification: A Solution for Fluoride Contamination</i>                   | 8th grade<br>Englewood      |
| Hayden Eubanks<br>certificate, \$50<br>West Grand High School<br><i>Real vs Fake Blood Splatter</i>  | 10th grade<br>Kremmling     |
| Destiny Cornelius<br>certificate, \$100<br>Plainview School<br><i>Slobbers and Saliva</i>  | 11th grade<br>Sheridan Lake |

### **National Centers for Environmental Information** *NCEI Award for Scientific Achievement*

|  |                               |
|--|-------------------------------|
| Lucia Montello<br>certificate, cash award from anonymous donor<br>Eagleview Middle School<br><i>Snow Force: Testing Which Avalanche Control Method Is Most Effective</i> | 6th grade<br>Colorado Springs |
|--|-------------------------------|

### **National Security Agency** *NSA Special Award*

|  |                                |
|--|--------------------------------|
| Anirudh Rao<br>certificate, 3D pen with stencils<br>STEM School<br><i>An Early Tornado Warning System</i>  | 6th grade<br>Highlands Ranch   |
| Ellery Kallal<br>certificate, wooden models<br>Flagstaff Academy<br><i>MisinformAtIon: How AI Can Create Realistic Misinformation That Humans Read as Fact</i>                                       | 8th grade<br>Longmont          |
| Bode Monahan<br>certificate, digital microscope with LCD display<br>Liberty School<br><i>Learning the Lie: Coding a Machine Learning Algorithm to Analyze Brain Activity for Lie Detection</i>       | 7th grade<br>Joes              |
| Natalie Muro<br>certificate, wooden models<br>Palmer High School<br><i>Effects of Mooring Systems on Submerged Point Absorber Wave Energy Converters</i>   | 10th grade<br>Colorado Springs |
| Amy Zhang<br>certificate, AI puppy and digital microscope with LCD<br>Lakewood High School<br><i>Feel the Ball: Convert Ball Motion to Touch for Sport Audiences with Vision/Hearing Impairments</i> | 9th grade<br>Lakewood          |

## Appendix 2

Pablo Becerra  
certificate, 3D printer  
Yuma High School  
*Use of Artificial Intelligence for Cancer Diagnosis*

12th grade  
Yuma

### Platte River Power Authority

#### *PRPA Special Award for Energy Efficiency and Innovation*

Rylen Ross  
certificate, \$200  
Monte Vista Middle School  
*Cooling for Solar*

7th grade  
Monte Vista

Kelly Yang  
certificate, \$300  
Fairview High School  
*Enhancing Dry Cooling in Power Plants through High-Conductivity Thermal Ground Planes*

11th grade  
Boulder

#### *PRPA Special Award for Environmental Responsibility*

Benjamin Knight  
certificate, \$200  
Corwin International Magnet School  
*Keeping Cool: What Is the Best House Color to Save on Air Conditioning*

6th grade  
Pueblo

Alex Nuzzo  
certificate, \$300  
South High School  
*Which Windmill Blade Type Works Best?*

11th grade  
Pueblo

### Rocky Mountain Association of Geologists

#### *Excellence in Earth Science Award*

Ansley DePue  
certificate, \$200  
Wray Junior High School  
*Republican Ripples: Investigating Water of the Republican River*

7th grade  
Wray

Tejas Raman  
certificate, \$400  
Boulder Country Day School  
*Pattern-Based Seismology*

8th grade  
Boulder

Elizabeth Vossler  
certificate, \$400  
Denver School of the Arts  
*Detention Basin Systems: Mitigating Stormwater in Hampden Heights and Its Implications on Cherry Creek Water Quality*

11th grade  
Denver

### Rocky Mountain Water Environment Association

#### *Water Research Award*

Marin Cantrell  
certificate, \$50  
Cardinal Community Academy  
*Toilet Talk*

8th grade  
Keensburg

Taelynn Rojas  
certificate, \$75  
Liberty School  
*Using Microbes to Solve the Microplastic Problem*

8th grade  
Joes

Augustus Miller  
certificate, \$50  
Monte Vista High School  
*Synthesizing Cellulose Acetate-Polyurethane for the Removal of Heavy Metal Ions from Water via Adsorption*

12th grade  
Monte Vista

Elizabeth Vossler  
certificate, \$75  
Denver School of the Arts  
*Detention Basin Systems: Mitigating Stormwater in Hampden Heights and Its Implications on Cherry Creek Water Quality*

11th grade  
Denver

### Science Toy Magic

#### *Physics Classroom Demonstration Award*

Quinlan Childs  
certificate, \$150  
Summit Middle Charter School  
*Dynamics of Flight: Testing Airplane Wings to Demonstrate Efficiency Using a Wind Tunnel*

8th grade  
Boulder

Lucia Nuel  
certificate, \$150  
Fairview High School  
*Using Entanglement Entropy to Make a Solid Substance Out of Staples*

11th grade  
Boulder

### Society for Mining, Metallurgy, and Exploration Colorado Section

#### *Award for Excellence in Mineral Science & Engineering*

Gwendolyn Hohl  
plaque, \$200  
Genoa-Hugo School  
*Does pH Affect the Rate of Corrosion on Steel*

8th grade  
Hugo

Ansley DePue  
plaque, \$200  
Wray Junior High School  
*Republican Ripples: Investigating Water of the Republican River*

7th grade  
Wray

Kinleigh Hathorn  
plaque, \$200  
Sargent Junior High School  
*Return from the Brink: The Effect of Slurry on the Natural Environment*

8th grade  
Monte Vista

Juakin Sawatzky  
plaque, \$300  
Liberty School  
*The Effects of the Run-Off from Mine Tailings on Daphnia Magna*

9th grade  
Joes

## Appendix 2

### Society of Manufacturing Engineers Colorado Chapter 354

#### *Andy Keller Memorial Award*

Cuinn Archer 8th grade  
certificate, \$100, recognition by local chapter  
Mancos Middle School Mancos  
*Automatic Water Vol. 2*

Tidus Overkill 8th grade  
certificate, \$150, recognition by the local chapter  
Genoa-Hugo School Hugo  
*Cheap ROV*

Natalie Muro 10th grade  
certificate, \$200, recognition by the local chapter  
Palmer High School Colorado Springs  
*Effects of Mooring Systems on Submerged Point Absorber  
Wave Energy Converters*

### Society of Women Engineers Rocky Mountain Section

#### *SWE Award*

Lucia Montello 6th grade  
certificate, \$75  
Eagleview Middle School Colorado Springs  
*Snow Force: Testing Which Avalanche Control Method Is Most  
Effective*

Laurel Amber Kent 6th grade  
certificate, \$100  
Eagleview Middle School Colorado Springs  
*Cool Running: A Heat Stroke's Downfall - Using a Peltier Mod-  
ule to Prevent Heat Stroke*

Maria Sears 11th grade  
certificate, \$75  
Monte Vista High School Monte Vista  
*Help! I Need Somebody: An Assistive Device That Notifies  
Emergency Services Once a Fall Has Been Detected*

Natalie Muro 10th grade  
certificate, \$100  
Palmer High School Colorado Springs  
*Effects of Mooring Systems on Submerged Point Absorber  
Wave Energy Converters*

### Soil & Water Conservation Society

#### *Natural Resource Conservation Award*

Cameron Kempisty 7th grade  
certificate, \$100  
Eagleview Middle School Colorado Springs  
*To Grow or Not to Grow: Testing Biomass-based Alternatives  
for a Greener World*

Valerie Goodland 12th grade  
certificate, \$100  
Monte Vista High School Monte Vista  
*Hidden Fragments: Isolating and Detecting Microplastics in  
Rivers and Municipal Water Supplies*

### State of Colorado: Division of Reclamation, Min- ing & Safety

#### *DRMS Outstanding Science Exhibit Award*

Colter Dennison 8th grade  
certificate, gift bag, \$100  
Mancos Middle School Mancos  
*Toxic Tributaries*

Augustus Miller 12th grade  
certificate, gift bag, \$100  
Monte Vista High School Monte Vista  
*Synthesizing Cellulose Acetate-Polyurethane for the Removal  
of Heavy Metal Ions from Water via Adsorption*

### STEMgirls, LLC

#### *STEMgirls Middle School Rising Star Award*

Layla Mitchell 7th grade  
certificate, \$100  
Mancos Middle School Mancos  
*Serving Under Pressure*

### The Sara Volz Family

#### *Best Contribution to Fundamental Science*

Michael Gao 11th grade  
certificate, \$300  
Fairview High School Boulder  
*ADMM-FBA: Novel High-Level, Robustly Convergent Flux  
Balance Analysis Using Dual Anderson-ADMM*

Angelina Wang 11th grade  
certificate, \$300  
Fairview High School Boulder  
*Toxin-like Microproteins: A Novel Approach to Unveil the In-  
tricacies of Acetylcholine Receptors*

### The Warnock Family

#### *Warnock Family Award*

Ashley Acton 12th grade  
certificate, \$100  
Fairview High School Boulder  
*The Effects of Caffeine on Stem Cells and Skeletal Muscle Re-  
generation*

Tristan Cao 10th grade  
certificate, \$100  
Stargate Charter School Thornton  
*Toward Realization of Novel Quantum Materials via Magneto-  
Synthesis*

### Trout Unlimited

#### *Trout Unlimited River Conservation Award*

Anya Wieder 11th grade  
Taryn McDermid 12th grade  
certificate, \$75  
St. Vrain Valley Innovation Center Longmont  
*Application of eDNA and qPCR Techniques for Detecting  
Northern Redbelly Dace in Aquatic Environments*

## Appendix 2

Ansley DePue  
certificate \$125  
Wray Junior High School  
*Republican Ripples: Investigating Water of the Republican River*

7th grade  
Wray

Colter Dennison  
certificate, \$200  
Mancos Middle School  
*Toxic Tributaries*

8th grade

Mancos

### **Wilkins Family** *Young Entrepreneur's Award*

Haydan Drullinger  
certificate, \$750  
Liberty School  
*Is It Clogged? Productions of an Instrument to Detect Clogged Sprinkler Heads and Notify a Cellular Device*

10th grade

Joes

### **Wojtaszek Family** *Paul Wojtaszek Award*

Maria Horn  
certificate, \$500  
Yuma High School  
*Sorry, I Didn't See You: Testing the Effects of Photosensitive Medications on Crystallin Alpha to Study the Development of Cataracts*

12th grade

Yuma

### **Zonta Club of Boulder County** *Amelia Earhart Award*

MaKenna McCoy  
certificate, \$100  
Alta Vista Charter School  
*A Safer Landing*

6th grade

Lamar

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## **Scholarships**

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### **Colorado School of Mines**

#### *Colorado School of Mines CSEF Scholarships*

Vanya Lavu  
certificate, \$1,000 scholarship, renewable for up to 3 additional years for use towards an undergraduate degree at CSM  
The Classical Academy  
*Healthy Gut! Healthy You!: Using *Dorotocephala Dactyligeria* as a Model to Treat Gastrointestinal and Psychological Disorder with Novel Regenerative Enzymes*

11th grade

Colorado Springs

Katherine Zheng  
certificate, \$1,000 scholarship, renewable for up to 3 additional years for use towards an undergraduate degree at CSM  
Fairview High School  
*Visible Light Photocatalytic Degradation of Congo Red Using LaFeO<sub>3</sub> Nanofibers*

11th grade

Boulder

Zachariah Nagle  
certificate, \$1,000 scholarship, renewable for up to 3 additional years for use towards an undergraduate degree at CSM  
Fairview High School  
*Testing Pollution and Radioactivity Levels Near Suncor's Petrochemical Refinery in Commerce City, Colorado*

11th grade

Boulder

Shrey Rohilla  
certificate, \$1,000 scholarship, renewable for up to 3 additional years for use towards an undergraduate degree at CSM  
The Classical Academy  
*Waste to Watts: Converting Locally Sourced Organic Waste Material into Activated Carbon-Based Supercapacitors*

11th grade

Colorado Springs

Ersel Serdar  
certificate, \$1,000 scholarship, renewable for up to 3 additional years for use towards an undergraduate degree at CSM  
Cherry Creek High School  
*Bending Fire: A New Approach to Steer Rockets Using Electric Fields*

11th grade

Greenwood Village

Stella Laird  
certificate, \$1,000 scholarship, renewable for up to 3 additional years for use towards an undergraduate degree at CSM  
Fairview High School  
*A Study of Numerical Machine Learning Approaches to Tennis Swing Analysis*

11th grade

Boulder

Michael Gao  
certificate, \$1,000 scholarship, renewable for up to 3 additional years for use towards an undergraduate degree at CSM  
Fairview High School  
*ADMM-FBA: Novel High-Level, Robustly Convergent Flux Balance Analysis Using Dual Anderson-ADMM*

11th grade

Boulder

Claire Huang  
certificate, \$1,000 scholarship, renewable for up to 3 additional years for use towards an undergraduate degree at CSM  
Fairview High School  
*Natural Eutectogels as a Novel Material for Green Wearable Electronics*

11th grade

Boulder

### **Colorado State University** **College of Agricultural Sciences**

#### *Excellence in Agricultural Innovation Scholarship*

Maggie Anderson  
certificate, \$1,000 scholarship for the 1st semester of attendance at CSU while enrolled in a College of Ag Sciences major  
Yuma High School  
*Analysis of Expected Progeny Difference: Predictability in Beef Cattle*

10th grade

Yuma

Jordan Rockey  
certificate, \$1,000 scholarship for the 1st semester of attendance at CSU while enrolled in a College of Ag Sciences major  
Monte Vista High School  
*Effectiveness of Insect Management Practices on the Spread of Potato Virus Y*

12th grade

Monte Vista

## Appendix 2

### **Matt Hannifin**

#### *Reduction of CO<sub>2</sub> & Greenhouse Gases Scholarship*

Alexander Diener 11th grade  
certificate, \$5,000 non-renewable scholarship  
Fairview High School Boulder  
*An Analysis of the Coronal Temperature Spike using Solar Spectroscopy*

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### **Society**

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#### **American Psychological Association**

#### *APA Achievement in Research in Psychological Science Award*

Samantha Goetz 7th grade  
certificate, 1-year affiliate student membership in the APA  
St. Peter's Catholic School Monument  
*Is There a Medication Bottle That Senior Citizens Can Open and Children Cannot?*

Madelynn Sellers 9th grade  
certificate, 1-year affiliate student membership in the APA  
Green Mountain High School Lakewood  
*How Does How Much Sleep You Get Affect Your Short Term Memory?*

#### **Association for Women Geoscientists**

#### *AWG Excellence in the Geosciences Award*

Taelynn Rojas 8th grade  
certificate, honorary AWG membership  
Liberty School Joes  
*Using Microbes to Solve the Microplastic Problem*

Ria Rajasekharan 9th grade  
certificate, honorary AWG membership  
Fossil Ridge High School Fort Collins  
*Anthropogenic Impacts on Rainfall: A Data Science Approach*

#### **Lemelson Foundation**

#### *Lemelson Early Inventor Prize*

Parker Mitchell 8th grade  
\$100 (response required from winner to process), certificate  
Sargent Junior High School Monte Vista  
*Lure Launcher*

### **NASA**

#### *NASA Earth System Science Award*

Madison Kirchhoff 8th grade  
certificate  
Craver Middle School Colorado City  
*Can I Break the Law of Conservation of Energy by Making a Magnetic Motor Run on Magnetic Potential Energy*

Claire Seger 11th grade  
certificate  
Monte Vista High School Monte Vista  
*An Analysis of Spaceflight-Induced Osteopenia and Muscular Atrophy Over Extended Zero Gravity Missions*

### **National Oceanic and Atmospheric Administration**

#### *Taking the Pulse of the Planet Award*

Taelynn Rojas 8th grade  
certificate  
Liberty School Joes  
*Using Microbes to Solve the Microplastic Problem*

Ria Rajasekharan 9th grade  
certificate  
Fossil Ridge High School Fort Collins  
*Anthropogenic Impacts on Rainfall: A Data Science Approach*

### **Regeneron**

#### *Regeneron Biomedical Science Award*

Naomi Kruse 10th grade  
certificate, \$375 (response required from winner to process payment)  
Schullandheim Home School Colorado Springs  
*Paper for the Planet: Development of a Novel Paper Inoculated with Wildflower Seed and Carbon-Sequestering Fungi*

### **Ricoh**

#### *Ricoh Sustainable Development Award*

Cameron Kempisty 7th grade  
certificate  
Eagleview Middle School Colorado Springs  
*To Grow or Not to Grow: Testing Biomass-based Alternatives for a Greener World*

Abby Mirsky 12th grade  
Dylan Greco 12th grade  
Sasha Trask 12th grade  
certificate  
Centaurus High School Lafayette  
*Sustainable Synergy: The Greenhouse Revolution Towards Self Sufficiency*

### **Society for In Vitro Biology**

#### *Outstanding Achievement in In Vitro Biology Award*

Claire Seger 11th grade  
certificate, membership in the Society, recognition in Society's newsletter and on website  
Monte Vista High School Monte Vista  
*An Analysis of Spaceflight-Induced Osteopenia and Muscular Atrophy Over Extended Zero Gravity Missions*

Angelina Wang 11th grade  
certificate, membership in the Society, recognition in Society's newsletter and on website  
Fairview High School Boulder  
*Toxin-like Microproteins: A Novel Approach to Unveil the Intricacies of Acetylcholine Receptors*



## Appendix 2

### United States Agency for International Development

#### *USAID Science Champion Award*

Ayra Asif Memon 8th grade  
certificate, invitation to participate in a virtual conversation  
with USAID leaders in summer 2024  
Crescent View Academy Aurora  
*From Bioluminescence to Global Warming: Unveiling the  
Glow*

Valerie Goodland 12th grade  
certificate, invitation to participate in a virtual conversation  
with USAID leaders in summer 2024  
Monte Vista High School Monte Vista  
*Hidden Fragments: Isolating and Detecting Microplastics in  
Rivers and Municipal Water Supplies*

### United States Metric Association

#### *Outstanding Achievement in the Use of the Interna- tional System Award*

Quinlan Childs 8th grade  
certificate, membership in the US Metric Association  
Summit Middle Charter School Boulder  
*Dynamics of Flight: Testing Airplane Wings to Demonstrate Ef-  
ficiency Using a Wind Tunnel*

Jaden DePue 9th grade  
certificate, membership in the US Metric Association  
Wray High School Wray  
*Roots of Success: Investigating the Optimal Water Conditions  
for Corn Root Growth*

### Yale Science & Engineering Association

#### *Outstanding Achievement in Science & Engineering Award*

Ruolin Hai 11th grade  
certificate, E-book (response required from winner to be  
processed)  
Campion Academy Loveland  
*HarvestSpectra: An Enhanced Crop Spectral Analysis Using a  
Novel Vertical Take-off Fixed Wing Structure for Precision Ag-  
riculture*

### Society for Science

#### *Thermo Fisher Junior Innovators Challenge*

Sienna Harden 6th grade  
Vivian Bozek 6th grade  
certificate, nomination to enter the 2024 Junior Innovators  
Challenge (deadline is June 12, 2024)  
St. Joseph's Catholic School Fort Collins  
*We Got GOOD Milk!*

Asha Jeter Patel 8th grade  
certificate, nomination to enter the 2024 Junior Innovators  
Challenge (deadline is June 12, 2024)  
Sacred Heart of Jesus Catholic School Boulder  
*Conversation Topics*

Kapil Bhandaram 8th grade  
certificate, nomination to enter the 2024 Junior Innovators  
Challenge (deadline is June 12, 2024)  
Campus Middle School Englewood  
*What Model Performs the Best When Using Artificial Intelli-  
gence to Detect Pneumonia Using Chest Radiographs*

Sophia Bronstein 8th grade  
certificate, nomination to enter the 2024 Junior Innovators  
Challenge (deadline is June 12, 2024)  
Summit Middle Charter School Boulder  
*The Vanishing Palette: Comparing the Fading Rates of Differ-  
ent Oil-Based Paints*

Cameron Kempisty 7th grade  
certificate, nomination to enter the 2024 Junior Innovators  
Challenge (deadline is June 12, 2024)  
Eagleview Middle School Colorado Springs  
*To Grow or Not to Grow: Testing Biomass-based Alternatives  
for a Greener World*

Rylen Ross 7th grade  
certificate, nomination to enter the 2024 Junior Innovators  
Challenge (deadline is June 12, 2024)  
Monte Vista Middle School Monte Vista  
*Cooling for Solar*

Cuinn Archer 8th grade  
certificate, nomination to enter the 2024 Junior Innovators  
Challenge (deadline is June 12, 2024)  
Mancos Middle School Mancos  
*Automatic Water Vol. 2*

Anirudh Rao 6th grade  
certificate, nomination to enter the 2024 Junior Innovators  
Challenge (deadline is June 12, 2024)  
STEM School Highlands Ranch  
*An Early Tornado Warning System*

Ian Pfenning 8th grade  
certificate, nomination to enter the 2024 Junior Innovators  
Challenge (deadline is June 12, 2024)  
Flagstaff Academy Longmont  
*AI Powered Pet Feeder*

Espen Plotkin 8th grade  
certificate, nomination to enter the 2024 Junior Innovators  
Challenge (deadline is June 12, 2024)  
Vail Mountain School Vail  
*How Different Substances Effect the Zone of Inhibition of Bac-  
teria*

Carson Stone 8th grade  
Connor Stone 6th grade  
certificate, nomination to enter the 2024 Junior Innovators  
Challenge (deadline is June 12, 2024)  
Brush Middle School Brush  
*Shake Rattle and Roll - Washboard Phenomenon: The Effect of  
Wheel Velocity on a Roadbed*

## Appendix 2

Finnley Reitz 6th grade  
 certificate, nomination to enter the 2024 Junior Innovators  
 Challenge (deadline is June 12, 2024)  
 Alta Vista Charter School Lamar  
*Sumac Shindig: An Investigation into Scarification*

Vivian Wolkow 7th grade  
 certificate, nomination to enter the 2024 Junior Innovators  
 Challenge (deadline is June 12, 2024)  
 North Middle School Colorado Springs  
*Can Planaria Distinguish One Color from Another?*

Zoe Smith 7th grade  
 certificate, nomination to enter the 2024 Junior Innovators  
 Challenge (deadline is June 12, 2024)  
 Loveland Classical School Loveland  
*Journey to the Center of the Mind*

Maya Rokhlenko 8th grade  
 Olive Spohn 8th grade  
 certificate, nomination to enter the 2024 Junior Innovators  
 Challenge (deadline is June 12, 2024)  
 Flagstaff Academy Longmont  
*All Boxed Up: The Effects of Prescription Eyewear on Peripheral Vertigo*

Tess Price 8th grade  
 certificate, nomination to enter the 2024 Junior Innovators  
 Challenge (deadline is June 12, 2024)  
 Ken Caryl Middle School Littleton  
*Polymerization Using Alginate Spherification*

Elise Gavin 7th grade  
 certificate, nomination to enter the 2024 Junior Innovators  
 Challenge (deadline is June 12, 2024)  
 The Classical Academy Colorado Springs  
*Biodegradable or Not? Trial by Fire!*

Madison Kirchhoff 8th grade  
 certificate, nomination to enter the 2024 Junior Innovators  
 Challenge (deadline is June 12, 2024)  
 Craver Middle School Colorado City  
*Can I Break the Law of Conservation of Energy by Making a  
 Magnetic Motor Run on Magnetic Potential Energy*

Vaughn Bankston 8th grade  
 certificate, nomination to enter the 2024 Junior Innovators  
 Challenge (deadline is June 12, 2024)  
 Mancos Middle School Mancos  
*Can You Truss-t the Truss?*

Miles Stelzer 8th grade  
 certificate, nomination to enter the 2024 Junior Innovators  
 Challenge (deadline is June 12, 2024)  
 Summit Middle Charter School Boulder  
*Drone Fire Detection and Firefighting*

Lucy Brittain 7th grade  
 certificate, nomination to enter the 2024 Junior Innovators  
 Challenge (deadline is June 12, 2024)  
 Creede Schools Creede  
*Mosquito Bite: West Nile Fright*

Rylie Harmon 7th grade  
 certificate, nomination to enter the 2024 Junior Innovators  
 Challenge (deadline is June 12, 2024)  
 Sargent Junior High School Monte Vista  
*Safe to Drink?*

Evelyn Lapp 7th grade  
 certificate, nomination to enter the 2024 Junior Innovators  
 Challenge (deadline is June 12, 2024)  
 Brush Middle School Brush  
*Refraction in Action*

Elaina Consaul 7th grade  
 certificate, nomination to enter the 2024 Junior Innovators  
 Challenge (deadline is June 12, 2024)  
 Sargent Junior High School Monte Vista  
*Boost the Roots!*

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### Teacher

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#### Colorado Association of Science Teachers *CAST Teacher Award*

Brady Archer  
 certificate, \$150, one-year free membership in CAST  
 Mancos Middle School Mancos

Loree' Harvey  
 certificate, \$150, one-year free membership in CAST  
 Monte Vista High School Monte Vista

#### Colorado Science & Engineering Fair *Doug Steward Memorial Teacher Award*

Allison Hellman  
 certificate, \$275  
 South High School Pueblo

Angie Grimes  
 certificate, \$275  
 Miami-Yoder School Rush

Brady Archer  
 certificate, \$275  
 Mancos Middle School Mancos

#### Lockheed Martin *CSEF Teacher of the Year Award*

Angie Grimes  
 certificate, \$3,000 grant to the school to support student re-  
 search facilitated by them and/or to fund programs in their  
 district that would best enhance instruction in the sciences and  
 engineering  
 Miami-Yoder School Rush

Appendix 3

**2023/2024 Expense Report**

| <b>Category Descriptions</b>       | <b>Budget</b>       | <b>Actual</b>       | <b>Difference</b>   |
|------------------------------------|---------------------|---------------------|---------------------|
| <b>INCOME</b>                      |                     |                     |                     |
| Sponsorships                       | \$69,700.00         | \$57,439.40         | (\$12,260.60)       |
| Contributions                      | \$8,000.00          | \$8,322.95          | \$322.95            |
| General Income                     |                     |                     |                     |
| <i>Interest</i>                    | \$200.00            | \$113.44            | (\$86.56)           |
| <i>Matching Gifts</i>              | \$1,500.00          | \$823.19            | (\$676.81)          |
| <i>Sales</i>                       | \$1,200.00          | \$999.00            | (\$201.00)          |
| <i>Scholarships/Special Awards</i> | \$16,425.00         | \$28,122.75         | \$11,697.75         |
| TOTAL General Income               | \$19,325.00         | \$30,058.38         | \$10,733.38         |
| Grants                             | \$0.00              | \$5,900.00          | \$5,900.00          |
| In-Kind                            | \$7,000.00          | \$4,845.48          | (\$2,154.52)        |
| Registrations                      | \$10,400.00         | \$10,200.00         | (\$200.00)          |
| <b>TOTAL INCOME</b>                | <b>\$114,425.00</b> | <b>\$116,766.21</b> | <b>\$2,341.21</b>   |
| <b>EXPENSES</b>                    |                     |                     |                     |
| Awards                             |                     |                     |                     |
| Grand Awards                       | \$10,625.00         | \$10,700.00         | (\$75.00)           |
| CSEF Special Awards                | \$1,100.00          | \$1,250.00          | (\$150.00)          |
| Other Special Awards               | \$15,825.00         | \$27,675.00         | (\$11,850.00)       |
| Non-Cash Awards                    | <u>\$1,450.00</u>   | <u>\$1,074.08</u>   | <u>\$375.92</u>     |
| TOTAL Awards                       | \$29,000.00         | \$40,699.08         | (\$11,699.08)       |
| Board Expenses                     |                     |                     |                     |
| Communications                     | \$825.00            | \$744.70            | \$80.30             |
| Meetings                           | \$1,000.00          | \$675.91            | \$324.09            |
| Operations                         | <u>\$13,305.00</u>  | <u>\$13,952.02</u>  | <u>(\$647.02)</u>   |
| TOTAL Board Expenses               | \$15,130.00         | \$15,372.63         | (\$242.63)          |
| ISEF                               |                     |                     |                     |
| Affiliation                        | \$1,300.00          | \$1,250.00          | \$50.00             |
| Travel                             | <u>\$17,150.00</u>  | <u>\$13,375.46</u>  | <u>\$3,774.54</u>   |
| TOTAL ISEF                         | \$18,450.00         | \$14,625.46         | \$3,824.54          |
| Outreach                           | \$0.00              | \$1,038.77          | (\$1,038.77)        |
| CSEF Expenses                      |                     |                     |                     |
| Adult Sponsors                     | \$100.00            | \$105.00            | (\$5.00)            |
| Advisory Council                   | \$0.00              | \$0.00              | \$0.00              |
| Finalist Activities                | \$8,500.00          | \$6,303.15          | \$2,196.85          |
| Finalist Registration              | \$8,250.00          | \$4,380.88          | \$3,869.12          |
| Fund Raising                       | \$650.00            | \$418.50            | \$231.50            |
| Judging                            | \$6,500.00          | \$7,100.23          | (\$600.23)          |
| Personnel                          | \$20,430.00         | \$20,430.00         | \$0.00              |
| Publications                       | \$1,500.00          | \$1,483.31          | \$16.69             |
| Regional Fair Directors            | \$0.00              | \$0.00              | \$0.00              |
| Scientific Review Committee        | \$0.00              | \$0.00              | \$0.00              |
| Supplies                           | \$1,500.00          | \$395.97            | \$1,104.03          |
| Volunteers                         | <u>\$2,500.00</u>   | <u>\$1,765.50</u>   | <u>\$734.50</u>     |
| TOTAL CSEF Expenses                | \$49,930.00         | \$42,382.54         | \$7,547.46          |
| <b>TOTAL EXPENSES</b>              | <b>\$112,510.00</b> | <b>\$114,118.48</b> | <b>(\$1,608.48)</b> |
| <b>OVERALL TOTAL</b>               | <b>\$1,915.00</b>   | <b>\$2,647.73</b>   | <b>\$732.73</b>     |

