



The 57<sup>th</sup> Annual Denver Metro Regional Science & Engineering Fair  
**February 28<sup>th</sup> and March 1<sup>st</sup>, 2020**  
University of Colorado Denver

The Denver metro region includes Adams, Arapahoe, Broomfield, Clear Creek, Denver, Douglas, Jefferson, and Summit counties. The DMRSEF is open to students in 6<sup>th</sup> through 12<sup>th</sup> grade who are enrolled in public, charter, private or parochial schools, or who are home schooled within the fair territory. In general, the DMRSEF follows the same rules as the Colorado Science & Engineering Fair (CSEF) established by the International Science & Engineering Fair (ISEF). These universal rules are published by the Society for Science and the Public, Washington, D.C. in the **Regeneron International Science and Engineering Fair Rules & Guidelines**.

The top 2 projects in Junior Division categories and top 3 projects in Senior Divisions categories advance to compete at the Colorado Science and Engineering Fair on April 2<sup>nd</sup>-4<sup>th</sup>, 2020 in Fort Collins, CO. Additionally, the 3 Senior Best in Fair projects advance with a sponsored trip to compete at the Regeneron International Science and Engineering Fair in Anaheim, California, May 10<sup>th</sup> – 15<sup>th</sup>, 2020.

**CONGRATULATIONS TO ALL OF THIS  
YEAR'S PARTICIPANTS!!!**

## SENIOR BEST IN FAIR:

**1<sup>ST</sup> PLACE:** Krithik Ramesh Cherry Creek High School 12<sup>th</sup> Grade  
*Determining Gene Interactions in Congenital Heart Disease as a Diagnostic Aid for Fetal Surgery*

**2<sup>nd</sup> PLACE:** Siddarth Ijju Cherry Creek High School 12<sup>th</sup> Grade  
*Predicting the Progression of Alzheimer's Disease using Graph Neural Networks and Diffusion MRI*

**3<sup>rd</sup> PLACE:** Gitanjali Rao STEM School Highlands Ranch 9<sup>th</sup> Grade  
*A novel approach to early directional diagnosis of prescription opioid addiction*

**ALTERNATE:** Reese Titensor  
Reagan Oates Rock Canyon High School 11<sup>th</sup> Grade  
*Identifying Stress Indicators in Adolescent Teens*

**ALTERNATE:** Leah Clayton Evergreen Senior High School 12<sup>th</sup> Grade  
*Climate is Changing & Permafrost is Thawing*

## JUNIOR BEST IN FAIR:

**1<sup>ST</sup> PLACE:** Rithvik Ijju Challenge Middle School 8<sup>th</sup> Grade  
*Neuroplasticity: Enabling Stroke Patients to Repair Motor Skills by Imitating Motion Between Hands*

**2<sup>nd</sup> PLACE:** Ayan Vaishnav Campus Middle School 8<sup>th</sup> Grade  
*What's Up Th-air? Utilizing a Simulation to Design the Impeccable Airfoil for a Commercial Airliner*

**3<sup>rd</sup> PLACE:** Diego Gutierrez-Raghunath Escuela de Guadalupe 7<sup>th</sup> Grade  
*Turning Heat into Electricity*

**ALTERNATE:** Ella Barrett  
Angela Wong Challenge Middle School 8<sup>th</sup> Grade  
*Effects of Illicit Substances on Zebra Danio Fish*

# SENIOR CATEGORY AWARDS:

## SENIOR ANIMAL SCIENCES:

**1<sup>ST</sup> PLACE:** Charleton LeMieux  
Sarah Lombardi  
Srishti Jerath  
Rock Canyon High School  
11th Grade  
***Effect of Ethanol on Heart Morphology and Brain Malformation in Danio rerio in Embryonic Period***

**2<sup>nd</sup> PLACE:** Anna Meunier  
Olivia Gibson  
Rock Canyon High School  
11th Grade  
***Drosophila melanogaster as a Model Organism for CBD Research Indicated by Anxious Behavior***

## SENIOR BEHAVIORAL SCIENCES:

**1<sup>ST</sup> PLACE:** Aryan Roy  
Cherry Creek High School  
10th Grade  
***Creating Meaningful Gene Networks in Mice to Predict Behavioral Anxiety Traits***

## SENIOR BIOLOGICAL SCIENCES:

**1<sup>ST</sup> PLACE:** Gitanjali Rao  
STEM School Highlands Ranch  
9th Grade  
***A novel approach to early directional diagnosis of prescription opioid addiction***

**2<sup>nd</sup> PLACE:** Sarah Bian  
Cherry Creek High School  
11th Grade  
***Targeting Theonine Kinases in Branhamella Catarrhalis and Serratia Marcescens Using CRISPRcas9***

## SENIOR CHEMISTRY:

**1<sup>ST</sup> PLACE:** Colin Phoebe  
Evergreen Senior High School  
12th Grade  
***Carbon Capture Through Amine Solvents***

## SENIOR COMPUTER SCIENCES & MATHEMATICS:

**1<sup>ST</sup> PLACE:** Siddarth Ijju  
Cherry Creek High School  
12th Grade  
***Predicting the Progression of Alzheimer's Disease using Graph Neural***

**2<sup>nd</sup> PLACE:** Ibrohim Nosirov SkyView Academy 12th Grade  
**A Numerical Investigation of the Minimum Width of a Neural Network**

**3<sup>rd</sup> PLACE:** Austen Mazenko Cherry Creek High School 12th Grade  
**Feasibility of Determining Markov Model Dynamics from Equilibria**

## **SENIOR EARTH & ENVIRONMENTAL SCIENCE:**

**1<sup>ST</sup> PLACE:** Leah Clayton Evergreen Senior High School 12<sup>th</sup> Grade  
**Climate is Changing & Permafrost is Thawing**

**2<sup>nd</sup> PLACE:** Gabriel Lorenz SkyView Academy 11th Grade  
**Using Machine Learning to Analyze Imagery of Mangroves to Measure The Impact of Climate Change**

## **SENIOR ENERGY:**

**1<sup>ST</sup> PLACE:** Ryan Stone Evergreen Senior High School 12th Grade  
**High Schools: Reducing Energy & Saving Money**

## **SENIOR ENGINEERING:**

**1<sup>ST</sup> PLACE:** Nicole Hankovszky Cherry Creek High School 12th Grade  
**Optimizing Metal Detection Capabilities in a Pulse Induction Circuit**

**2<sup>nd</sup> PLACE:** Matthew Anderson Cherry Creek High School 10th Grade  
**Real-Time Seizure Forecasting for Epileptics on a Consumer Product**

## **SENIOR MATERIAL SCIENCE:**

**1<sup>ST</sup> PLACE:** Peyton Leyendecker  
Hunter Leyendecker SkyView Academy 12th Grade  
**Enriched Cyanoacrylate as a Transdermal Nutrient Transfer and Attachment Method for Gracilaria sp.**

## SENIOR MICROBIOLOGY:

**1<sup>ST</sup> PLACE:** Chloe Henry Golden High School 12th Grade  
**Using Bioreactors to Eliminate Hazards to Coral Reefs**

**2<sup>nd</sup> PLACE:** Riley England  
Camryn Allen  
Shelbie Johnson Rock Canyon High School 12th Grade  
**The Effects of Polystyrene on the India Ink Uptake of Tetrahymena Thermophila**

## SENIOR MEDICINE & HEALTH SCIENCES:

**1<sup>ST</sup> PLACE:** Krithik Ramesh Cherry Creek High School 12<sup>th</sup> Grade  
**Determining Gene Interactions in Congenital Heart Disease as a Diagnostic Aid for Fetal Surgery**

**2<sup>nd</sup> PLACE:** Evelyn Bodoni Cherry Creek High School 12th Grade  
**Novel Preventative Strategies for Acute Kidney Injury & Chronic Kidney Disease**

## SENIOR PHYSICS & ASTRONOMY:

**1<sup>ST</sup> PLACE:** Wilson Moyer Lakewood High School 9th Grade

## SENIOR PLANT SCIENCES:

**1<sup>ST</sup> PLACE:** Derek Fearon  
Sage Wheeler  
Hope James Rock Canyon High School 12th Grade  
**Nitrogen Fixation Efficacy of Trifolium repens with Various Rhizobia Inoculant Treatments**

## SENIOR SOCIAL SCIENCES:

**1<sup>ST</sup> PLACE:** Reese Titensor  
Reagan Oates Rock Canyon High School 11<sup>th</sup> Grade  
**Identifying Stress Indicators in Adolescent Teens**

# JUNIOR CATEGORY AWARDS:

## JUNIOR ANIMAL SCIENCE:

**1<sup>ST</sup> PLACE:** Deena Safiulla Challenge Middle School 8th Grade  
***The Mightiest Creatures of All***

## JUNIOR BEHAVIORAL SCIENCES:

**1<sup>ST</sup> PLACE:** Grace Farrell Good Shepherd Catholic School 8th Grade  
***Call Me Maybe?***

**2<sup>ND</sup> PLACE:** Dakota Cheesman Bromley East Charter School 8th Grade  
***Case of Mistaken Identity***

**3<sup>RD</sup> PLACE:** Kanshita Dam  
Caitlyn Chin  
Mila Vigil-Schreder Challenge Middle School 7th Grade  
***Group vs. Individual Morality***

## JUNIOR BIOLOGICAL SCIENCES:

**1<sup>ST</sup> PLACE:** Chloe Pennington Friends Middle School 6th Grade  
***Baffling Bacteria***

**2<sup>ND</sup> PLACE:** Elizabeth Vossler Skinner Middle School 7th Grade  
***The Effect of Different Wavelengths of Light on Bacterial Colonies***

## JUNIOR CHEMISTRY:

**1<sup>ST</sup> PLACE:** Addysen Carlson Heritage Heights Academy 6th Grade  
***Rainbow Flames***

**2<sup>ND</sup> PLACE:** Annie Kozlevchar Christ the King Roman Catholic School 8th Grade  
***Do Laundry Pretreatments Really Work?***

**3<sup>RD</sup> PLACE:** Elijah Castro Free Horizon Montessori 6th Grade  
***The Seebeck Effect***

## **JUNIOR COMPUTER SCIENCES & MATHEMATICS:**

**1<sup>ST</sup> PLACE:** Nathan Yang Challenge Middle School 8th Grade  
**Prioritization of Type 2 Diabetes Genetic Risk Factors Based on Functional Relevance**

**2<sup>ND</sup> PLACE:** Shourya Hooda  
Abhinav Krishna Challenge Middle School 7th Grade  
**You Sunk My Battleship! Examining Probability Density in Battleship**

## **JUNIOR EARTH & ENVIRONMENTAL SCIENCE:**

**1<sup>ST</sup> PLACE:** Ella Barrett  
Angela Wong Challenge Middle School 8th Grade  
**Effects of Illicit Substances on Zebra Danio Fish**

**2<sup>ND</sup> PLACE:** Amanda Castillo-Lopez Challenge Middle School 8th Grade  
**Comparing Lead Removal by Hydroxide Precipitation vs Fruit Waste Adsorption**

**3<sup>RD</sup> PLACE:** Fatimah Hirbo Crescent View Academy 6th Grade  
**Are There Dangerous Levels of Lead in Local Soil?**

## **JUNIOR ENERGY:**

**1<sup>ST</sup> PLACE:** Diego Gutierrez-Raghunath Escuela de Guadalupe 7th Grade  
**Turning Heat into Electricity**

**2<sup>ND</sup> PLACE:** Victoria DeWitt Academy Charter School 6th Grade  
**Is Colorado Ready To Only Use Renewable Energy?**

**3<sup>RD</sup> PLACE:** Kieran Curtin Frassati Catholic Academy 7th Grade  
**What Materials Conduct Electricity the Best?**

## **JUNIOR ENGINEERING:**

**1<sup>ST</sup> PLACE:** Rithvik Ijju Challenge Middle School 8th Grade  
**Neuroplasticity: Enabling Stroke Patients to Repair Motor Skills by Imitating Motion Between Hands**

**2<sup>ND</sup> PLACE:** Sam Forsberg Good Shepherd Catholic School 8th Grade

**3<sup>RD</sup> PLACE:** Mohammad Bathhef  
Crescent View Academy 8th Grade  
**Hydropower Solutions in Rivers and Streams**

## JUNIOR MATERIAL SCIENCE:

**1<sup>ST</sup> PLACE:** Taryn Limke  
Ellery McDaniel Skinner Middle School 7th Grade  
**The Effects of Various Materials on the Durability of Paper**

**2<sup>ND</sup> PLACE:** Marianna O'Connor  
Escuela de Guadalupe 6th Grade  
**How Can Nanotechnology Clean Up Oil Spills Faster?**

**3<sup>RD</sup> PLACE:** Lucas Dunn  
Good Shepherd Catholic School 7th Grade  
**The "Reel" Truth**

## JUNIOR MICROBIOLOGY:

**1<sup>ST</sup> PLACE:** Nishita Kotlapati  
Challenge Middle School 8th Grade  
**Hydrogen Peroxide for Prevention of Bacteria on Polymer Biomaterials**

**2<sup>ND</sup> PLACE:** Sarah Ketchel  
Frassati Catholic Academy 8th Grade  
**How Much Bacteria After Filtration?**

**3<sup>RD</sup> PLACE:** Maliyah Peters  
Girls Athletic Leadership School 8th Grade  
**Essential Oils Vs. Medicine**

## JUNIOR MEDICINE & HEALTH SCIENCES:

**1<sup>ST</sup> PLACE:** Elena Medina  
Michelle Grado Escuela de Guadalupe 8th Grade  
**How Much Fat is in your Next Cheeseburger Meal?**

**2<sup>ND</sup> PLACE:** Devin Farahani  
Cedar Wine Friends Middle School 8th Grade  
**The Purr-fect Pet; The Relationship Between Pet and Human Blood Pressure**

**3<sup>RD</sup> PLACE:** Julian Kramer  
Good Shepherd Catholic School 7th Grade  
**Beyond the Neutral Zone**



**4<sup>th</sup> PLACE:** Sofia Leone Skinner Middle School 7th Grade  
**Deep Breathing vs. Stress Balls to Reduce Heart Rate when Stressed**

## **JUNIOR PHYSICS & ASTRONOMY:**

**1<sup>ST</sup> PLACE:** Ayan Vaishnav Campus Middle School 8th Grade  
***What's Up Th-air? Utilizing a Simulation to Design the Impeccable Airfoil for a Commercial Airliner***

**2<sup>nd</sup> PLACE:** Dominic Moser Notre Dame Catholic School 7th Grade  
**A Kinetic Catastrophe**

## **JUNIOR PLANT SCIENCES:**

**1<sup>ST</sup> PLACE:** Hiba Aryan Crescent View Academy 7th Grade  
**Effects Of Orsythia On Plants**

**2<sup>nd</sup> PLACE:** Abigail Stelman  
Lola Goldman Skinner Middle School 7th Grade  
**The Effects of Albuterol Sulfate and Famotidine on the Growth of a Spathiphyllum Plant.**

## **JUNIOR SOCIAL SCIENCES:**

**1<sup>ST</sup> PLACE:** Manishasri Kaliaperumal  
Shreya Sethuramalingam Challenge Middle School 7th Grade  
**Heterogeneous Pedagogies for Pursuers of Knowledge**

# SPECIAL AWARDS:

## **The American Meteorological Society**

Outstanding achievement for creative scientific endeavor in the areas of atmospheric and related oceanic and hydrologic sciences. Award winners receive a certificate and their names published in the December issue of the Bulletin of the American Meteorological Society (BAMS).

Leah Clayton

Gabriel Lorenz

## **The American Psychological Association**

Certificate of Achievement in Research in Psychological Science

Keira Benjamin & Zora Eckert

## **The American Statistical Association, CO/WY Chapter**

Awards a Junior and Senior project for the Best Use of Statistics. Winners receive a certificate and a copy of *The Cartoon Guide to Statistics*.

Ismoil Nosirov

Nikhila Narayana

## **The ASM Materials Education Foundation**

Award for the Most Outstanding Exhibit in Materials Science. The winner receives a certificate and ribbon.

Amanda Castillo-Lopez

## **The Association for Women Geoscientists**

Student Award for Geoscience Excellence

Leah Clayton

## **The Aurora Water Quality Award**

The winner receives a certificate and \$100

Aleena Modak

## **Cherry Creek Basin Water Quality Award**

The winner receives a certificate and \$150

Deena Safiulla

### **The Denver Water Quality Team**

Award for the best contribution to water quality. Winners receive a certificate and \$100

Louis Calkin

Marianna O'Connor

### **Stormwater Permittees for Local Awareness of Stream Health (SPLASH)**

Winners receive a certificate and \$100

Ella Barrett & Angela Wong

### **CBS4 (KCND-TV Denver)**

Award for best environmental or meteorological project. The winner receives a tour of CBS4 and gets to watch a live broadcast at the station.

Louis Calkin

### **The Colorado Chapter of the Soil and Water Conservation Society**

Award for Excellence in Natural Resource Conservation. First place winners receive a certificate and \$30. Second place winners receive a certificate and \$20.

Junior 1<sup>st</sup> Place: Fatimah Hirbo

Junior 2<sup>nd</sup> Place: Lina Belaissaoui

Senior 1<sup>st</sup> Place: Leah Clayton

Senior 2<sup>nd</sup> Place: Emma Carillion, Sam Isert & Roshni Philip

### **CoorsTek Materials Science Award**

Winners receive a \$300 and a tour of the CoorsTek Center for Advanced Materials with CoorsTek Research & Development Engineers.

Rithvik Ijju

Ethan Eliason

### **University of Colorado Anschutz Neuroscience Graduate Program**

Award for best neuroscience-related project. Winners receive a certificate and \$50

Rithvik Ijju

Ibrahim Mohammed & Roshan Kern

### **CU Science Discovery Anschutz Life Science Award**

The winner receives a gift certificate to the CU Science Discovery camps at CU Anschutz.

Emma Kostelecky

## **CU Denver Mathematics and Statistical Sciences award**

Winners receive a certificate and \$100

Siddarth Ijju

Austen Mazenko

## **Denver Mensa Award**

Winners receive a certificate and a \$200 cash prize

Grace Farrell

Nikhila Narayana

## **The Denver Museum of Nature & Science**

Award for best science presenter. The winner receives a certificate and a DMNS Swag Bag.

Chloe Henry

## **The Lemelson Early Inventor Prize**

Awarded by the Lemelson Foundation. The winner receives a certificate and \$100

Ethan Eliason

## **Leyendecker & Lemire, LLC**

Award for the Most Inventive Project.

Junior Division (\$100): Rithvik Ijju

Senior Division (\$200): Matthew Anderson

Junior Honorable Mention (\$25): Trinity Doyle

Senior Honorable Mention (\$50): Gitanjali Rao

Senior Honorable Mention (\$50): Nicole Hankovszky

## **Mu Alpha Theta Award**

Winners receive a certificate and a letter from Mu Alpha Theta.

Ibrahim Mohammed & Roshan Kern

## **The NASA Earth System Science Award**

The winner receives a certificate and a letter from NASA Physical Science

Remi Gucker

## **The National Oceanic and Atmospheric Administration Office of Education**

2020 Taking the Pulse of the Planet Award. The winner receives a certificate and a letter from NOAA.

Leah Clayton

## **The National Security Agency (NSA) Colorado Award.**

The National Security Agency/Central Security Service (NSA/CSS) leads the U.S. Government in cryptology that encompasses both signals intelligence (SIGINT) and cybersecurity products and services. NSA enables computer network operations (CNO) in order to gain a decision advantage for the Nation and our allies under all circumstances.

Senior Division 1<sup>st</sup> Place receives an ActivityBot 360 Robot and Wifi Kit: Siddarth Ijju

Senior Division 2<sup>nd</sup> Place receives a Cyberbot Robot Kit: Victoria Donoho

Senior Division 3<sup>rd</sup> Place receives a Raspberry Pi 3: Ibrahim Mohammed & Roshan Kern

Junior Division Honorable Mention receives a Cyberbot Robot Kit: Morgan Cragin

## **The Office of Naval Research Science Awards**

All winners receive a certificate of achievement, letter of congratulations, medallion. Senior winners receive an additional \$50.

Junior Winners: Elizabeth Clement

Louis Calkin

Rithvik Ijju

Liliana Echevarria

Senior Winners: Alex Frachetti

Tia Abraham

Christie Tran

## **Ricoh USA, Inc. Sustainable Development Award**

The winner receives a certificate and a letter from Ricoh.

Remi Gucker

## **The Rocky Mountain Section of the American Water Works**

Award winner receives a certificate and \$50

Amanda Castillo-Lopez

## **The Rocky Mountain Water Environment Federation**

Award winner receives a certificate and \$50

Chloe Henry

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

Certificate of Outstanding Achievement for Ability and Creativity in In Vitro Biology. The winner receives a certificate, congratulatory letter, and their name published in the fall newsletter.

Akber Shaikh

## **The United States Agency for International Development**

Science Champion Award. The winner receives a certificate and a letter from USAID.

Derek Fearon & Sage Wheeler

## **The United States Air Force**

Award winners receive a Certificate of Achievement and a swag bag from the Air Force.

Junior Division: Ayan Vaishnav

Ryan Calabrese

Mihika Devireddy

Senior Division: Nicole Hankovszky

## **U.S. Metric Association**

Award for Best Use of the International System of Units

Zachary Chapman

## **SIWI Stockholm Junior Water Prize**

Regional Water Prize Award winners receives a Certificate, Free 1-yr student WEF membership & entry in the SJWP State competition.

Chloe Henry

Leah Clayton

Bryne Knowles

## **Yale Science and Engineering Association**

Award for Most Outstanding Exhibit in Computer Science, Engineering, Physics, or Chemistry. The winner receives a Formal Certificate and medallion.

Rahul Thomas

## **Teacher of the Year, Junior Division**

Receives a Lunchbox Microscope provided by Lake Region Optics. Lunchbox Microscope provides a new perspective on microscopy for educators. It was developed by researchers at the Mayo Clinic. This microscope allows students to share images digitally with teachers and peers, empowers students in the lab and is an affordable option for schools with exceptional performance.

Amy Winter – Skinner Middle School

## **Teacher of the Year, Senior Division**

Receives a one-year membership to the Colorado Association of Science Teachers (CAST) and 12 tickets to the Denver Museum of Nature & Science.

Susanne Petri – Rock Canyon High School