



**63RD ANNUAL
CSEF AWARDS CEREMONY
APRIL 6, 2018**

COLORADO SCIENCE AND ENGINEERING FAIR

2018 AWARDS CEREMONY

Welcome..... Ms. Courtney Butler, CSEF Director

Presentation of Signature Special Awards

Announcer: Courtney Butler

Teacher of the Year Nominees.....CSEF

Lockheed Martin Teacher of the Year Award.....Edwin Scholz

Presentation of Local Organizational Special Awards

Announcer: Michael Bemski & Dolly Morrow

Air & Waste Management Association	Dairy Tech, Inc.
American Association of University Women	Fort Collins Conservation District
American Chemical Society	Frank Armbruster Foundation
American Industrial Hygiene Association	Geological Society of America
American Institute of Aeronautics & Astronautics	Gromko Family
American Institute of Chemical Engineers	Human Factors & Ergonomics Society
American Institute of Professional Geologists	Institute of Electrical & Electronics Engineering
American Meteorological Society	Koppa Research, LLC
American Statistical Society	Little Shop of Physics
American Vacuum Society	Lockheed Martin
ASM International	National Centers for Environmental Information
Biomedical Engineering Society, CSU Chapter	National Defense Industrial Association
Biophysical Society	National Renewable Energy Laboratory
Colorado Association of Meat Processors	Platte River Power Authority
Colorado Association of Science Teachers	Rocky Mountain Association of Geologists
Colorado Biology Teachers' Association	Rocky Mountain Water Environment Association
Colorado BioScience Institute	SACNAS, CSU Chapter
Colorado Chemistry Teachers' Association	Science Toy Magic, LLC
Colorado Dental Association	Society for Mining, Metallurgy and Exploration
Colorado Division of Reclamation, Mining & Safety	Society of Manufacturing Engineers
Colorado Environmental Health Association	Society of Women Engineers
Colorado Foundation for Agriculture	Soil & Water Conservation Society
Colorado Geographic Alliance	SPIE-the international society for optics & photonics
Colorado Medical Society	The Inventors' Roundtable
Colorado Mineral Society	Trout Unlimited
Colorado Mycological Society	United States Air Force
Colorado Native Plant Society	United States Department of Commerce
Colorado Scientific Society	United States Geological Survey
<u>Colorado State University</u>	United States Navy & Marine Corps
College of Agricultural Sciences	University of Colorado, Denver
Department of Biochemistry & Molecular Biology	Van Gorp Family
Department of Chemistry	Vaughan Web Works, LLC
Department of Horticulture & Landscape Architecture	Wilkins Family
Energy Institute	Wojtaszek Family
Colorado Veterinary Medical Association	Women in Physics, CSU Chapter
Colorado's Touchstone Energy Cooperatives	Zonta Club of Boulder County
Colorado-Wyoming Society of American Foresters	
Comstock Family	
Consumer Energy Education Foundation	

Presentation of National Organizational Special Awards*

Announcers: Michael Bemski & Dolly Morrow

American Psychological Association	NASA	United States Metric Association
Arizona State University	National Oceanic & Atmospheric Administration	Water Environment Federation
Association for Women Geoscientists	Ricoh	Yale Science & Engineering Association
Intel Corporation	Society for In Vitro Biology	
Mu Alpha Theta		

*These awards will only be announced at the ceremony, and given to the students on Saturday.

COLORADO SCIENCE AND ENGINEERING FAIR

2018 AWARDS CEREMONY

Presentation of CSEF Special Awards

Announcer: Dr. Carol Morrow

Pioneers of Science Awards*	Sam Bartlett
Poster Art Contest.....		Courtney Butler
Student Choice Awards.....		Courtney Butler
Elemer Bernath Technical Writing Award.....		Courtney Butler
Ralph F. Desch Memorial Technical Writing Award.....		Courtney Butler

Presentation of Grand Awards

Announcer: Dr. Carol Morrow

Junior and Senior Division Category Awards.....		Nancy Vaughan
Animal Sciences	Behavioral & Social Sciences	Chemistry & Biochemistry
Earth & Space Sciences	Energy	Engineering
Environmental Sciences	Math & Computer Sciences	Medicine & Health
Microbiology & Molecular Biology	Physics	Plant Sciences

Presentation of Scholarships

Announcer: Dr. Carol Morrow

Ryan Patterson Scholarship.....		Ryan Patterson
Colorado State University, Fort Collins.....		Dr. David Holm
Colorado State University, Pueblo.....		CSEF
Adams State University.....		Dr. Larry Sveum
Colorado School of Mines.....		CSEF
University of Colorado, Boulder.....		CSEF

Presentation of CSEF Top Awards

Announcer: Dr. Carol Morrow

Junior Division Best CSEF Project Awards.....		Courtney Butler
Senior Division Best CSEF Project Awards.....		Courtney Butler

Colorado ISEF Finalist Recognition

Closing Remarks.....		Courtney Butler
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Thousands. I could see thousands of brilliant minds. I was on the stage at the awards ceremony, looking out at an ocean of people, the next generation of scientists, people who would go on to change the world. The music erupted around me, the spotlights raced about the hall, and names continued to be called; each one eliciting deafening cheers from the crowd. We were an unstoppable force gazing unflinchingly into the challenges of the future and forging ahead. With the powers of science and ingenuity, we were superhuman. Some of us developed more accurate diagnostics, others created affordable prosthetics, and still others probed the secrets of galaxies. The science fair scorched a vision of a bright tomorrow into my consciousness. As a scientist, I intend to help actualize this vision.

Logan Collins (CSEF Alumni 2013 - 2015)

*Please see pages 9 & 10 of the program for more information on these awards.

SPECIAL AWARDS ORGANIZATIONS

Air & Waste Management Association Rocky Mountain States Section

The Air & Waste Management Association is a nonprofit professional organization that enhances knowledge and expertise by providing a neutral forum for information exchange, professional development, networking opportunities, public education, and outreach to more than 8,000 environmental professionals in 65 countries. A&WMA also promotes global environmental responsibility and increases the effectiveness of organizations to make critical decisions that benefit society.

American Association of University Women

The American Association of University Women promotes equity for all women and girls, lifelong education and positive societal change. In principle and practice, AAUW values and seeks a diverse membership. There shall be no barriers to full participation in the organization on the basis of gender, race, creed, age, sexual orientation, national origin or disability.

American Chemical Society Colorado Local Section

The American Chemical Society, founded in 1876, is a congressionally chartered independent membership organization which represents professionals at all degree levels and in all fields of chemistry and sciences that involve chemistry. With more than 163,000 members, the ACS is the world's largest scientific society and one of the world's leading sources of authoritative scientific information. ACS is at the forefront of the evolving worldwide chemical enterprise and the premier professional home for chemists, chemical engineers and related professions around the globe.

American Industrial Hygiene Association Rocky Mountain Section

The Rocky Mountain Section of the American Industrial Hygiene Association (AIHA-RMS) is dedicated to the prevention of workplace-related illness and injury through the anticipation, recognition, evaluation, and control of contaminants and stressors that may cause sickness, impaired health and well-being, or significant discomfort and inefficiency among workers and the general public. Its membership is comprised of professionals working in industrial hygiene and associated fields. AIHA-RMS continually offers training events, presentations and tours, professional development courses, and mentorship opportunities to its members as well as the general public.

American Institute of Aeronautics & Astronautics Rocky Mountain Section

The American Institute of Aeronautics and Astronautics (AIAA), Rocky Mountain Section is comprised of over 1300 members in Colorado, Wyoming, and Montana. The AIAA is a group of engineers, scientists, educators, students, and others who share a passion for the aerospace engineering field. Our organization is one section of the international AIAA, which is the world's largest technical society of more than 35,000 individual and corporate members from 80 countries, who are all part of an innovative, high-value profession dedicated to the global aerospace profession. AIAA is dedicated to igniting and celebrating aerospace ingenuity and collaboration. It's all part of AIAA's shared commitment to inspire innovation and drive technological progress in the U.S. and throughout the world.

American Institute of Chemical Engineers Rocky Mountain Section

The American Institute of Chemical Engineers, created in 1908, is the world's leading organization for chemical engineering professionals, with more than 40,000 members from over 90 countries. The Rocky Mountain Section of the AIChE encompasses a broad scope of industries including energy (traditional and alternative), biotechnology, microelectronics, and environmental.

American Institute of Professional Geologists Colorado Section

The Colorado Section of the American Institute of Professional Geologists is a non-profit organization whose purposes include the advancement of the geological sciences, the promotion of high standards of ethical conduct among its members, and the representation and advocating of the geological profession before government and the public.

American Meteorological Society Denver/Boulder Chapter

The American Meteorological Society promotes the development and dissemination of information and education on the atmospheric and related oceanic and hydrologic sciences and the advancement of their professional applications. Founded in 1919, the AMS has a membership of more than 14,000 professionals, students and weather enthusiasts. AMS publishes nine atmospheric and related oceanic and hydrologic journals, sponsors more than 12 conferences annually and offers numerous programs and services.

American Statistical Association Colorado/Wyoming Chapter

The American Statistical Association is the world's largest community of statisticians. The ASA supports excellence in the development, application, and dissemination of statistical science through meetings, publications, membership services, education, accreditation, and advocacy. The ASA members serve in industry, government, and academia in more than 90 countries, advancing research and promoting sound statistical practice to inform public policy and improve human welfare. The David Young Memorial Award is named after a former professor from the University of Colorado at Denver, Department of Preventive Medicine and Biometrics. David's skills in both science and statistics allowed him to collaborate with medical investigators at the University of Colorado and help communicate research results.

American Vacuum Society Rocky Mountain Chapter

The American Vacuum Society was founded in 1953 and is organized into 10 technical divisions and 2 technical groups that encompass a range of established, as well as emerging, science and technology areas. The society promotes communication, dissemination of knowledge, recommended practices, research, and education in the use of vacuum and other controlled environments to develop new materials, process technology, devices, and related understanding of material properties for the betterment of mankind. The AVS divisions include advanced surface engineering, applied surface science, biomaterial interfaces, electronic materials and processing, magnetic interfaces and nanostructures, nanometer-scale science and technology, plasma science and technology, surface science, thin film and vacuum technology.

ASM International

ASM International was founded in 1913 as The Steel Treating Club. ASM International serves materials professionals, nontechnical personnel, and managers worldwide by providing high quality materials information, education and training, networking opportunities, and professional development resources in cost-effective and user-friendly formats. ASM is where materials users, producers and manufacturers converge to do business. The materials engineering "family" plays a critical role in society, and serves nearly every industry, from basic manufacturing to nanotechnology and biomaterials.

Biomedical Engineering Society Colorado State University Chapter

The Biomedical Engineering Society (BMES) student chapter at Colorado State University is a professional society for students interested in bioengineering, including disciplines such as tissue engineering, prostheses, medical device development, and more! Our long term goal is to promote and enhance biomedical engineering knowledge worldwide, and further its utilization for the health of humankind. Our chapters' goals are to further students socially and professionally, through tours, talks, presentations, and networking events.

Colorado Association of Meat Processors

The purpose of the Colorado Association of Meat Processors is to provide members with formal and informal opportunities for education and information exchange. Members adhere to the principles of humane treatment and handling of animals and livestock; and support full measure and full disclosure within the trade and to its community and moving toward an even safer, healthier meat and food supply for the consumer.

Colorado Association of Science Teachers

The Colorado Association of Science Teachers is a membership organization that represents educators from elementary and secondary schools, colleges and universities and informal science education. CAST provides its members with professional development opportunities, updates on science events around the state, awards for excellence in science education, and FREE memberships to the Denver Museum of Nature and Science, Dinosaur Ridge and the Alligator Farm. It also provides discounts at the Denver Zoo.

Colorado Biology Teachers' Association

The Colorado Biology Teachers' Association is dedicated to the improvement of biological science instruction at all educational levels. Our activities include a Spring Seminar and a Fall Workshop to improve teacher and student understanding of a variety of biological topics; co-sponsorship of the Colorado Science Conference for Professional Development each fall in Denver; mini-grants for the support of classroom activities; Outstanding Biology Teacher Award program; and a web site to keep teachers informed about a variety of activities designed to improve teaching.

Colorado BioScience Institute

The BioGENEius Challenge is the premier competition for high school students that recognizes outstanding research in biotechnology. The BioGENEius Challenge program promotes excellence and enables students to develop original and personalized independent research projects and compete against thousands of other distinguished students. The U. S. National and International BioGENEius Challenge is a competition comprised of more than 25 students winners from around the United States and the world. Each winner is provided an all-expense paid trip for the student and chaperone to compete at the U.S. National and International competition held in Boston, MA in June 2018.

Colorado Chemistry Teachers' Association

Colorado Chemistry Teachers Association supports over 1,100 chemistry teachers in the state of Colorado through email, newsletter, classes, etc.

Colorado Dental Association

The mission of the Colorado Dental Association is to provide CDA membership and the public with superior service and to demonstrate effective leadership in advocacy, education, communication and quality products and services that enhance member practices, professional growth and patient care. The CDA is a diverse and synergistic association, led by dynamic, "people-centered" officers and staff that proactively serve and meet professional and related personal needs of member dentists and the oral health needs of Colorado communities. The CDA is recognized as the preeminent model for state dental associations.

Colorado Division of Reclamation, Mining & Safety

The Colorado Division of Reclamation Mining and Safety is responsible for mineral and energy development, policy, regulation and planning. The division is comprised of the Office of Mined Land Reclamation and the Office of Active and Inactive Mines. The Office of Mined Land Reclamation issues reclamation permits from either the Minerals or Coal Programs. Together, these two programs regulate mining and reclamation activities at coal, metal, aggregate and other mineral mines. The Office of Active and Inactive Mines reclaims and safeguards abandoned mine sites that are dangerous and create environmental hazards. The program also provides safety training for mine operators and employees.

Colorado Environmental Health Association

The Colorado Environmental Health Association is a nonprofit professional organization that was established in 1947 as the Rocky Mountain Section of the National Association of Sanitarians and enjoys an outstanding reputation statewide as an innovative, progressive organization dedicated to advancing the cause of general, professional or technical environmental health. The CEHA is educationally structured, providing scholarships, one-day trainings, and an Annual Educational Conference to educate and inform environmental health professionals.

Colorado Foundation for Agriculture

The Colorado Foundation for Agriculture was established in 1991 to promote agricultural literacy in Colorado. CFA is governed by a nine-member board of directors that administers the Agriculture in the Classroom program in Colorado. Projects and materials developed by CFA are made available at no or minimal cost to Colorado educators and others interested in educating about agriculture. The CFA is the only organization that provides our state's educators with current information about Colorado agriculture and natural resources on a regular basis.

Colorado Geographic Alliance

The Colorado Geographic Alliance, part of a network of fifty Geographic Alliances across the country, was founded in 1989 by the National Geographic Society and geographers in Colorado. The COGA's main objective is to provide resources and professional development for elementary and secondary school teachers, ensuring the public understands the rationale behind comprehensive geography education throughout the state of Colorado. COGA is a state-wide educator's organization in which the collective knowledge of experienced teachers of geography is shared with others to strengthen the position of geography in all Colorado schools. Communication and programs supported by COGA develop and foster grassroots collaboration to facilitate interaction of teachers and to encourage conversations about geographic concepts across the state.

Colorado Medical Society

The Colorado Medical Society, founded in 1871, is an association of physicians which promotes the science and art of medicine, the betterment of public health and the welfare of the medical profession and the patients it serves. The CMS is an advocate for its physician members, acting as a conduit for continuing medical education and physician liaison with managed care and health maintenance organizations and health insurance providers. The organization works to make the physician's practice more efficient and cost effective and to help physicians navigate the rapidly evolving practice environment. The CMS Education Foundation was founded in 1982 to support educational activities in Colorado, including sponsoring the Colorado Science and Engineering Fair.

Colorado Mineral Society

The Colorado Mineral Society was founded in 1936 by a group of distinguished individuals within the mineralogical field with the purpose of promoting the study of minerals and other geologic materials, of encouraging mineral collecting as hobby, and of conducting public meetings, lectures, and field trips. The Colorado Mineral Society is the only private organization that has presented special awards during the entire 63-year history of the state science fair.

Colorado Mycological Society

The Colorado Mycological Society is a not for profit organization that was established in 1967 to advance the understanding of, and to stimulate interest in, the field of mycology. CMS members collect mushroom specimens for identification, preservation and study as well as for consumption. The CMS also provides consulting services to the Denver Botanic Gardens, the Rocky Mountain Poison Center, county agents and others.

Colorado Native Plant Society

The Colorado Native Plant Society is a non-profit organization dedicated to furthering the knowledge, appreciation and conservation of native plants and habitats of Colorado through education, stewardship and advocacy. We encourage education about plants, conservation of natural areas and good land stewardship of native plant communities and ecosystems.

Colorado Scientific Society

The Colorado Scientific Society was founded in Denver in 1882, six years after Colorado became a state. Founder S.F. Emmons of the US Geological Survey and 11 colleagues were interested in an exchange of observations and ideas on topics in earth science. The membership has since grown from the original 12 to more than 375 in 1992. Current members include representatives from many earth science organization, including Federal and State government agencies, universities throughout the region, private industry, and individuals. The society welcomes new members with a background and interest in the sciences.

Colorado State University

Department of Biochemistry & Molecular Biology

The Department of Biochemistry and Molecular Biology at CSU is committed to providing high quality undergraduate education. As a biochemistry major, a student's studies will include macromolecular structure and function; cellular biochemistry; metabolism; gene expression, structure, replication and repair; cell organization, communication, growth, aging and death with an emphasis on animal cells. The Biochemistry major is ideally suited for pursuing advanced degrees in biochemistry, molecular biology or related life sciences; for health professions; and for employment in the biotechnology industry.

Colorado State University

Department of Chemistry

The study of chemistry prepares students for a variety of careers, and the undergraduate program at Colorado State University has been designed to give graduates the background necessary to enter any one of these interesting and exciting areas. Chemists are employed in a wide array of professional fields in private industry, government and education. Chemists work in research, development, analysis and testing, consulting, industrial quality control, environmental resource management and forensics. Participation in internships, volunteer activities, and cooperative education opportunities are available to students through the department to enhance a students' practical training and development.

Colorado State University

Dept. of Horticulture & Landscape Architecture

The focus of the Department of Horticulture and Landscape Architecture is to solve problems for people, agriculture and the environment and to improve policy making and public education while developing a workplace conducive to scholarship and creativity fostered by teamwork and individual diversity. The undergraduate program at CSU includes concentrations in landscape business, landscape design and contracting, nursery and landscape management, turfgrass management, landscape architecture, floriculture, horticultural business management, horticultural food crops production, horticultural food crops seed science, horticultural science, horticultural therapy and viticulture and enology.

Colorado State University

Energy Institute

The Energy Institute is a multidisciplinary alliance that integrates experts from many fields with the goal of improving quality of life - by taking research innovations to the global marketplace more efficiently and at an accelerated pace. The Energy Institute team has the breadth, depth, and entrepreneurial drive to make a global impact. Over 160 faculty represent fields as diverse as the natural sciences, engineering, agricultural sciences, natural resources, humanities, applied human sciences, veterinary medicine, and business. In addition, a growing number of students and industry leaders are tapping into our growing network.

Colorado Veterinary Medical Association

The Colorado Veterinary Medical Association is a proactive group of more than 2,200 professionals representing each setting of veterinary medicine - clinical practice, public health, academe, corporate, and uniformed services. CVMA members are determined to work together to advance the science and art of veterinary medicine. The CVMA exists to enhance animal health and welfare; promote the human/animal bond; protect public health; advance the well-being of veterinarians; and foster excellence in veterinary medicine through education, advocacy and outreach.

Colorado-Wyoming Society of American Foresters

The Society of American Foresters is a scientific and educational organization representing the forestry profession in the United States. Founded in 1900, it is the largest professional society for foresters in the world. The mission of the society is to advance the science, education, technology, and practice of forestry; to enhance the competency of its members; to establish professional excellence; and to use the knowledge, skills and conservation ethic of the profession to ensure the continued health and use of forest ecosystems and the present and future availability of forest resources to benefit society.

Colorado's Touchstone Energy Cooperatives

Colorado's Touchstone Energy Cooperatives are the electric co-ops that provide power to 72% of the land mass of Colorado. The electric co-ops have initiated the Colorado EnergyWise Project to support and encourage greater energy efficiency by Colorado's co-op member-owners. Sponsorship of these awards is supported by CoBank, one of the primary lenders to electric co-ops across the country.

Comstock Family

The Heather Comstock Memorial Award is sponsored by the Comstock family in honored remembrance of Heather Comstock. Heather was an honor student at the University of Michigan as a biology major studying stem cell research and organ transplant engineering. Heather had a real zest for life and many say she was going to save the world. Heather Danielle Comstock was born in Ft Collins and at age 19, was taken home to heaven unexpectedly in October 2010. Heather was a very determined, hardworking person, who had a wonderful sense of humor. She was very energetic. Heather loved animals and sports; especially soccer. She was involved in many programs including the National Honor Society. She maintained a 4.0 GPA throughout her entire education career. She was a person who believed if she put her mind to something, she would achieve it. She was a very loving and accepting person who had a zest for life is greatly missed. She was a friend to everyone she met.

Consumer Energy Education Foundation

Consumer Energy Education Foundation (CEEF) is excited to provide awards to this year's CSEF winners for their hard work and success in the 63rd Colorado Science and Engineering Fair. CEEF's Energy Day Academic Program was created to engage students in STEM education and to motivate, challenge, and inspire young minds to seek careers in science and technology.

Dairy Tech, Inc.

The Dairy Tech Agricultural Focus Award is intended to reward students with projects that stem from our proud local heritage in agriculture. Our team of inventive veterinarians is proud to honor students who will come in our footsteps and lead the livestock industry into the future.

Fort Collins Conservation District

Conservation districts originated in 1937 when President Roosevelt wrote letters to every state Governor asking them to establish locally held volunteer boards that could initiate, champion and/or manage land stewardship and conservation programs. The Fort Collins Conservation district was formed in 1945 along with many Districts across Colorado and the Nation to assist landowners heal from the scars of the Dust Bowl days. The purpose of the conservation district is to deal with soil and water conservation problems through a cooperative effort with groups and organizations concerned with water and soil conservation issues.

Frank Armbruster Foundation

The Armbruster Memorial Award is given in honor of Frank Armbruster and his son Charles who were both avid inventors and dedicated to the use of their inventions to teach children the wonders of science. The Armbruster Memorial award is given for the best example by a junior division contestant for energy, creativity and enthusiasm in problem solving using readily available existing or recycled materials and/or inexpensive common objects to complete their project.

Geological Society of America

The Geological Society of America, headquartered in Boulder, supports the global community in scientific discovery, communication, and application of geoscience knowledge. The Society's membership unites thousands of earth scientists from every corner of the globe in a common purpose to study the mysteries of our planet (and beyond), advance geoscience research and discovery, share scientific findings, provide service to society and the geosciences profession, and contribute to stewardship of Earth.

Gromko Family

Mary Gromko has recently been president of the NSTA organization which represents 1000's of science teachers in the USA. She was the Science Coordinator at CDE for about 10 years. She taught chemistry for many years. When her husband Gerry passed away many science teachers donated money to this fund. The fund was set up to honor her husband Gerald who was also a strong supporter of science.

Human Factors & Ergonomics Society

Rocky Mountain Section

The Rocky Mountain Chapter of the Human Factors and Ergonomics Society was founded in 1978 as a part of what was then the Human Factors Society. The chapter offers networking opportunities and conducts professional programs of interest to human factors engineers, product designers, industrial psychologists, corporate ergonomists, software engineers, safety engineers and professionals in related fields.

Institute of Electrical & Electronics Engineering

High Plains Section

The Institute of Electrical and Electronics Engineers (IEEE), an association dedicated to advancing innovation and technological excellence for the benefit of humanity, is the world's largest technical professional society. It is designed to serve professionals involved in all aspects of the electrical, electronic and computing fields and related areas of science and technology that underlie modern civilization.

Koppa Research, LLC

Koppa Research is a private institute dedicated to expanding our understanding of the warping of space-time. In physics general relativity, explains gravity, warping of space-time, and large scale interactions, and quantum mechanics, explains particle scattering, the photoelectric effect, and interactions of the small and minute. For a century, physicists have endeavored to answer the challenging question, how to relate these two apparently divergent fields. One of the keys to better understanding the warping of space-time to understand how general relativity and quantum mechanics relate. The current focus of Koppa Research is to further explore the surface tension theory, its merits and shortfalls, and to help disseminate information regarding the theory so that others may participate in its development, refinement, and/or revision.

Little Shop of Physics

The Little Shop of Physics is a group of science educators and science students based out of Colorado State University. The mission of the LSOP is to find creative ways to share the wonder of science; to present unique hands-on science experience to diverse ranges of students; to involve undergraduates in significant and meaningful service; and to share ideas and insights with current and future teachers. The Matthew McCausland Memorial Award recognizes the spirit of this kind-hearted inventor, and is given to the student who displays the most creativity and "out of the box" thinking.

Lockheed Martin

Headquartered in Bethesda, MD, Lockheed Martin is a global security company that is principally engaged in the research, design, development, manufacturing, integration and sustainment of advanced technology systems, products and services. Lockheed's operating units are organized into the four broad business areas of aeronautics, electronic systems, information systems and global solutions, and space systems. Space Systems has major operations in Colorado and is focused on human space flight, global communications systems, commercial space, sensing and exploration systems, missile defense systems, strategic missiles, commercial launch systems, and surveillance and navigation systems.

National Centers for Environmental Information

The National Centers for Environmental Information (NCEI) is part of the US Department of Commerce, National Oceanic & Atmospheric Administration. The National Centers for Environmental Information provide stewardship, products and services for geophysical data describing the solid earth, marine and solar-terrestrial environment, as well as Earth observations from space. NCEI's data holdings currently contain more than 400 digital and analog databases, some of which are very large. As technology advances, so does the search for more efficient ways of preserving this data.

National Defense Industrial Association

The National Defense Industrial Association (NDIA) is America's leading Defense Industry association promoting national security. NDIA is proud to provide a legal and ethical forum for the exchange of information between Industry and Government on National Security issues. Our members foster the development of the most innovative and superior equipment, training and support for our warfighters and first responders through our divisions, local chapters, affiliated associations and events.

National Renewable Energy Laboratory

NREL is the only federal laboratory dedicated to the research, development, commercialization, and deployment of renewable energy and energy efficiency technologies. At NREL, we focus on creative answers to today's energy challenges. From breakthroughs in fundamental science to new clean technologies to integrated energy systems that power our lives, NREL researchers are transforming the way the nation and the world use energy.

Platte River Power Authority

Platte River Power Authority sponsors this award to recognize broad-based academic leadership concerning the improvement of environmental stewardship within electrical generation and delivery. By selecting you as our award recipient, we commend your research contributions toward the energy industry of the future.

Rocky Mountain Association of Geologists

The Rocky Mountain Association of Geologists was founded in 1922 and is one of the largest and most active associations of geologists in the United States. The Rocky Mountain Association of Geologists supports professional exchange and education through sponsorship of events, publications, training, and seminars. RMAG publishes a monthly newsletter, *The Outcrop*, a quarterly scientific journal, *The Mountain Geologist*, and regular guidebooks on a variety of subjects.

Rocky Mountain Water Environment Association

The Rocky Mountain Water Environment Association was founded in 1936 as the Rocky Mountain Sewage Association, and since that time has provided its members with the most current information on water quality issues, technology, regulatory changes, and the latest research developments. The RMWEA is affiliated with the Water Environment Federation, an international organization that sponsors the Stockholm Junior Water Prize, which is the most prestigious youth award for a high school water related research project.

SACNAS

Colorado State University Chapter

Founded in 2007, the SACNAS, Colorado State University Chapter's mission is to further the work of, improve the effectiveness of and to enhance the public understanding of and appreciation for Chicanos, Hispanics/Latinos, Native Americans, Alaska Natives, Native Hawaiians and other underrepresented minorities in the sciences; to promote the recruitment and retention of underrepresented minority students at Colorado State University; and to provide a forum for all students from the STEM disciplines to come together for academic excellence, community service, professional development, mentorship opportunities and social activities at Colorado State University.

Science Toy Magic, LLC

Matt Hannifin of Science Toy Magic gives humorous and multi-lingual science presentations to schools' world language and science departments. Matt has presented to the NASA Master's Forum, and was inducted into Who's Who among America's Teachers. Science Toy Magic congratulates every participant for changing your lives forever- prizes or no prizes. Matt learned from early unsuccessful projects. He succeeded only by persevering to become a patented inventor, commercial hot air balloon pilot, pyrotechnician, laser lightshow designer, advanced scuba diver, and holographer. Science Toy Magic encourages you to improve the ideas from this year's project. You and your families ROCK!

Society for Mining, Metallurgy & Exploration Colorado Section

A member society of the American Institute of Mining, Metallurgy and Petroleum Engineers, SME's roots date back to 1871. Since its inception, SME has continued to evolve over the years to stay abreast of industry changes and to reflect the ever-broadening interests of its members. SME is organized into eight distinct divisions: coal & energy, environmental, industrial minerals & aggregates, mineral and metallurgical processing, mining & exploration, underground construction association, the International Marine Minerals Society, and the woman's auxiliary to the AIME. More than 60 local SME sections facilitate the exchange of information and increase grassroots participation in SME programs and services.

Society of Manufacturing Engineers Colorado Chapter 354

The Society of Manufacturing Engineers is the premier source for manufacturing knowledge, education and networking. Through its local chapters, technical communities, publications, expositions and professional development resources, SME promotes an increasing awareness of manufacturing engineering and keeps manufacturing professionals up to date on leading trends and technologies. Headquartered in Michigan, the Society has members in more than 70 countries and represents manufacturing across all industries.

Society of Women Engineers Rocky Mountain Section

The Society of Women Engineers is a nonprofit educational and service organization that empowers women to succeed and advance in the field of engineering and to be recognized for their life-changing contributions as engineers and leaders. Founded in 1950, SWE is the driving force that establishes engineering as a highly desirable career for women through an exciting array of training and development programs, networking opportunities, scholarships, outreach and advocacy activities and much more. SWE consists of women and men who are graduate engineers as well as those with equivalent engineering experience and/or those interested in supporting SWE's mission. The Rocky Mountain Section along with the Pikes Peak Section work cooperatively to provide a variety of continuing development and career guidance activities to members throughout the states of Colorado and Wyoming.

Soil & Water Conservation Society Colorado Chapter

The Soil & Water Conservation Society is a nonprofit scientific and educational organization, founded in 1943, that serves as an advocate for conservation professionals and for science-based conservation practice, programs and policy. The mission of the society is to foster the science and art of natural resource conservation. The work of the society targets conservation of soil, water, and related natural resources on working land. The society also works to discover, develop, implement and constantly improve ways to use land that sustains its productive capacity and enhances the environment at the same time.

SPIE – the international society for optics & photonics

SPIE is an international society advancing an interdisciplinary approach to the science and application of light. The not-for-profit society advances emerging technologies through interdisciplinary information exchange, continuing education, publications, patent precedent, and career and professional growth.

The Inventors' Roundtable

The Inventor's Roundtable attempts to create a safe, free, innovative and open forum where talented inventors and value-driven service providers can meet, connect and share experiences, insight and wisdom. American inventors know no limits. Any age, both genders, and all races throughout history have contributed to the creative genius of American innovation. Since 1790, the US Patent and Trademark Office has granted more than 7 million patents. The number of patents issued increased dramatically during the 19th century, stimulated by the industrial revolution and further fueling it. This resulted in a golden age for American invention. The technology envisioned by American inventors has improved the standard of living and linked people across physical and cultural divides.

Trout Unlimited

Trout Unlimited is a nonprofit volunteer organization that is dedicated to improving Colorado's fishing habitats and the preservation of their cold water ecosystems. Trout Unlimited, through its state council, Colorado Trout Unlimited, along with the local chapter, Boulder Flycasters, works to conserve, protect and restore North America's cold-water fisheries and watersheds. By the next generation, Trout Unlimited will ensure the robust populations of native and wild cold-water fish once again thrive within their North American range, so that tomorrow's children can enjoy healthy fisheries in their home waters.

United States Air Force

Air Force ROTC Detachment 90 at Colorado State University is the tenth largest Air Force ROTC unit in the nation. The mission of Detachment 90 is to commission highly qualified Air Force officer candidates by recruiting, educating, training and motivating cadets at both CSU and the University of Northern Colorado and prepare them to lead in the world's greatest air, space, and cyberspace force.

United States Department of Commerce

The US Department of Commerce promotes job creation, economic growth, sustainable development and improved standards of living for all Americans by working in partnership with business, universities, communities and our nation's workers. The department touches the daily lives of the American people in many ways, with a wide range of responsibilities in the areas of trade, economic development, technology, entrepreneurship and business development, environmental stewardship, and statistical research and analysis. Cutting-edge science and technology at the department fosters innovation, and a focus on research and development that moves quickly from the lab to the marketplace generates progress and new 21st century opportunities.

United States Geological Survey

Established in 1879, the US Geological Survey is a science organization that provides impartial research on the health of our ecosystems and environment, the natural hazards that threaten us, the natural resources we rely on, the impacts of land-use change, and the core science systems that help us provide timely, relevant and useable information. As the Nation's largest water, earth and biological science and civilian mapping agency, the USGS collects, monitors, analyzes and provides scientific understanding about natural resource conditions, issues, and problems. The diversity of scientific expertise enables the USGS to carry out large-scale, multi-disciplinary investigations and provide impartial scientific information to resource managers, planners and the public.

United States Navy & Marine Corps

The Office of Naval Research is an executive branch within the Department of Defense that provides technical advice to the Chief of Naval Operations and the Secretary of the Navy. Science and technology investments enable the technical superiority of our naval forces by producing knowledge and transitions and growing a healthy science and engineering workforce. ONR has six science and technology departments that coordinate and execute the research.

University of Colorado, Denver

At the University of Colorado Denver, Anschutz Medical Campus, the Medical Scientist Training Program provides rigorous training for students interested in a career in clinical medicine and basic science research. The MST Program's mission is to provide students with the breadth and depth of training necessary to excel as clinician scientists. Colorado has strengths in molecular and cellular biology, immunology, biomedical engineering, virology, neuroscience, endocrinology, pharmacology, and cancer biology, which provide an exciting spectrum of research opportunities for MSTP students.

Van Gorp Family

Dan Van Gorp was a driving force in biology education, working tirelessly to inspire countless students to careers in science, medicine, and education. He was a mentor to his colleagues and a stalwart supporter of the Colorado Biology Teachers Association. Whatever Dan did with both students and teachers was designed to foster the love of biology in their lives. He is a legend at Cherry Creek High School as both a wonderful science teacher and chairman of the Biology Department. Dan was also a member of Denver Metro Science Education leaders providing guidance to countless aspiring science teachers. Dan always seemed to know what was needed to improve the education program and more importantly, how to implement those changes.

Wilkins Family

The Wilkins family recognizes the critical role of research and development in sparking the next generation of innovative start-up companies. The award is given to a student that has created an invention or innovation in computer science or engineering, and has undertaken further steps to realize its commercial potential.

Wojtaszek Family

The Paul Wojtaszek Memorial Award is sponsored by Paul's family and friends and given to the project deemed to be the foremost study in the field of medicine & health in the senior division. The award is named for Dr. Paul Wojtaszek, who for decades was a judge for the CSEF in the senior division for medical projects. Paul looked to not only recognize excellence, but also provide insight to students as to how to attain it. This award is intended to celebrate Paul's life in association with the science fair he loved.

Women in Physics

Colorado State University Chapter

CSU's Women in Physics group was founded a few years ago with the mission to advance the role of women in physics and other sciences through professional development, mentoring, outreach, and community involvement.

Zonta Club of Boulder County

Founded in 1919, Zonta International is a global organization of executives and professionals working together to advance the status of women worldwide through service and advocacy. With more than 30,000 members belonging to more than 1,200 Zonta Clubs in 63 countries and geographic areas, Zontians all over the world volunteer their time, talents and support to local and international service projects, as well as scholarship programs aimed at fulfilling Zonta's mission and objectives. Amelia Earhart was one of its most famous members, and this award is given in her memory.

SCHOLARSHIP PROVIDERS

Adams State University

Since its cornerstone was laid in 1923, Adams State University has grown from a teachers' college into a fine liberal arts and graduate university. Adams State was recently designated the Regional Education Provider for southern Colorado. Today, students can earn a bachelor's degree in any of 25 majors and programs with 28 minors and emphases, 11 Master's degrees in selected majors and a PhD in Counselor Education. The close-knit campus and friendly community create a supportive environment that fosters success. Adams State is a perfect fit for anyone who loves snowboarding, rock climbing, mountain biking - or the idea that professors will know them by name.

Colorado School of Mines

Colorado School of Mines is a public research university devoted to engineering and applied science. It has the highest admissions standards of any public university in Colorado and is among the highest of any public university in the country. CSM has distinguished itself by developing a curriculum and research program geared towards responsible stewardship of the earth and its resources. In addition to strong education and research programs in traditional fields of science and engineering, Mines is one of a very few institutions in the world having broad expertise in resource exploration, extraction, production and utilization. As such, Mines occupies a unique position among the world's institutions of higher education.

Colorado State University, Fort Collins

With more than 150 programs of study in eight colleges, Colorado State University offers a world-class education at one of the nation's top research universities. Academic programs at CSU are among the best in the nation in quality, innovation, and achievement, with internationally known programs in infectious disease, agriculture, cancer research, atmospheric science, sustainability and clean energy, and much more.

Colorado State University, Pueblo

Colorado State University-Pueblo is committed to excellence, setting the standard for regional comprehensive universities in teaching, research and service by providing leadership and access for its region while maintaining its commitment to diversity. Students graduate with the knowledge to enter their professions and with the learning skills (e.g. problem solving, critical thinking, research, communication) to keep current in those professions into the future. Colorado State University-Pueblo will enhance its reputation as a premier comprehensive regional university that offers a wide range of undergraduate degrees as well as specialized graduate degrees. As a federally designated Hispanic Serving Institution, CSU-Pueblo is committed to maintaining university accessibility which reflects southern Colorado's culturally and ethnically diverse student body, including first generation students. We will do so by offering excellent academics, affordable education, transformative opportunities, and supportive student life. CSU-Pueblo will be distinguished by the integration of the liberal arts and sciences with professional preparations as well as an emphasis on experiential education that reflects skills and competencies needed in a global society.

University of Colorado, Boulder

This is not your parents' engineering school. Chalk and talk, so-called gatekeeper courses, and teaching theory without practice went out years ago. In their place, CU-Boulder faculty have pioneered a new approach to engineering education that places the student's needs first. CU Engineering, Colorado's top-ranked engineering college, has a tradition of excellence in engineering education dating back to 1893, and we continually update and improve our programs to reflect the highest standards in teaching and learning, discovery and innovation, and community and culture.

Ryan Patterson Scholarship

The Colorado Science and Engineering Fair, with funds from Intel Corporation have established a nonrenewable scholarship of \$2,000 in the name of Ryan Patterson, the 2001 Intel International Science and Engineering Fair and the 2002 Intel Science Talent Search top winner from Grand Junction, CO. The scholarship is presented to a deserving high school senior based on criteria set by CSEF.

Coming from a rural farming area, I have always had an interest in crops and botany. Science fair allowed me to develop botany into a niche as well as master my speaking and writing skills. Although I often had issues conducting the complex research I had in mind without access to sophisticated technology, mentors from CSU and OSU helped me overcome those difficulties and become quite successful in science fair. As I entered college, my science fair accomplishments allowed for my selection to participate in a prestigious research program. The research professionals I have met through the program, my research background, and my communication skills greatly contributed to the success I had at CSU.

Heather Messick (CSEF Alumni 2003, 2004)

PIONEERS OF SCIENCE AWARDS

<u>Category</u>	<u>Sponsor</u>	<u>Pioneer Scientist</u>
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<i>Animal Sciences</i>	<i>Dolly Morrow</i>	<i>Temple Grandin</i>
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Mary Temple Grandin (1947 – present) was born with autism. With the help of her mother, her teachers and her mentors, she has overcome those difficulties to become a leader in the agricultural industry. Temple is now a professor at CSU and a leader in the world movement to treat all animals humanely, especially in the cattle processing industry. Temple is literally able to talk to the animals. She is also a passionate advocate for autism, using her experience to prove that people with autism can have great and productive lives.

<i>Behavioral & Social Sciences</i>	<i>Dan Kowal</i>	<i>Sigmund Freud</i>
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Sigismund Schlomo Freud (1856 – 1939) was an Austrian psychiatrist and founder of psychoanalysis. Psychoanalysis is the treatment of mental ailments by realizing that present patient symptoms are directly traceable to psychic trauma experienced earlier in life. Originally, Sigmund Freud's work was not well received by the medical profession, but is now accepted practice in treating mental patients. Freudian theory has had a wide impact, influencing anthropology, education, art and literature.

<i>Behavioral & Social Sciences</i>	<i>Karen McCarthy</i>	<i>Margaret Mead</i>
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Margaret Mead (1901 - 1978) was an American social anthropologist, receiving her Ph.D. from Columbia University in 1929. Margaret focused her studies on problems of child rearing, personality and culture. She is best known for work among the people of Oceania. Margaret also rose to become the president of the World Federation for Mental Health.

<i>Chemistry & Biochemistry</i>	<i>Linda Lung</i>	<i>John Dalton</i>
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John Dalton (1766 – 1844), a well-known teacher, is considered the Father of Chemistry. John established the modern theory of atoms and elements, and so paved the way for a huge range of scientific achievements. He was dedicated to his students and to his scientific research while living the simple life of a Quaker.

<i>Chemistry & Biochemistry</i>	<i>Ed Scholz</i>	<i>Lise Meitner</i>
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Lise Meitner (1878 – 1968) was the second woman to receive a Ph.D. in Physics from the University of Vienna, discovered that uranium atoms were split when bombarded with neutrons. While working at the Berlin Institute for Chemistry, Lise was introduced to radio-chemist Otto Hahn, starting a thirty-year partnership in experimental work on radioactive elements until Meitner was forced to flee in 1938 under the Third Reich. A Jew and a woman, Meitner was left out of the nuclear fission published findings and the 1944 Hahn Nobel Prize in Chemistry that Hahn won for his contributions in splitting the atom. Although the Nobel Prize exclusion was never acknowledged, it was partly rectified in 1966, when Hahn, Meitner, and Fritz Strassmann were awarded the U.S. Fermi Prize.

<i>Earth & Space Sciences</i>	<i>Sam Bartlett</i>	<i>Edwin Hubble</i>
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Edwin Powell Hubble (1889 - 1953) played a crucial role in establishing the fields of extragalactic astronomy and observational cosmology and is regarded as one of the most important astronomers of all time. Hubble provided evidence that the recessional velocity of a galaxy increases with its distance from the earth, a property known as "Hubble's law". Hubble's Law implies that the universe is expanding. Hubble also discovered that many objects previously thought to be clouds of dust and gas and classified as "nebulae" were actually galaxies beyond the Milky Way. Hubble's name is most widely recognized for the Hubble Space Telescope.

<i>Energy</i>	<i>Linda Lung</i>	<i>Christa McAuliffe</i>
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Sharon Christa Corrigan McAuliffe (1948 – 1986) received her bachelor's degree in education and history from Framingham State College in 1970, and also a master's in education supervision and administration from Bowie State University in 1978. She took a teaching position as a social studies teacher at Concord High School in New Hampshire in 1983. In 1985, Christa was selected from more than 11,000 applicants to participate in the NASA Teacher in Space Project and was scheduled to become the first teacher in space. As a member of mission STS-51-L, she was planning to conduct experiments and teach two lessons from Space Shuttle *Challenger*. On January 28, 1986, the shuttle broke apart 73 seconds after launch. In 2004 Christa was posthumously awarded the Congressional Space Medal of Honor.

<i>Engineering</i>	<i>Santosh Veda</i>	<i>Hedy Lamar</i>
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Hedy Lamar (1914 - 2000) was an actress who was a contract star of MGM's "Golden Age." She was also an inventor who, along with George Antheil, invented an early technique for spread spectrum communications and frequency hopping, which is necessary for wireless communication from the pre-computer age to the present day. This work was honored in 1997, when the Electronic Frontier Foundation gave Lamar a belated award for her contributions.

PIONEERS OF SCIENCE AWARDS

Category Sponsor Pioneer Scientist

Environmental Sciences

Dr. Larry Sveum

Gifford Pinchot

Gifford Pinchot (1865 - 1946) studied scientific forestry in France because there were no forestry schools in the US. Gifford created the US Forest Service in Theodore Roosevelt's administration that has managed our nations forests ever since. Gifford believed in managed forests in which the timber industry is allowed to harvest trees using sustainable methods and to protect their use for the public.

Math & Computer Sciences

Judy Prester

Alan Turing

Alan Turing (1912 – 1954) was a leading participant in the breaking of German ciphers at Bletchley Park, England during the Second World War. By using statistical techniques to optimize the trial of different possibilities in the code breaking process, Turing made this innovative contribution to mathematics and computer science. Within weeks of arriving at Bletchley Park, Turing had specified an electromechanical machine, the *bombe*, that could help break Enigma (The German secret code). The *bombe*, with an enhancement suggested by mathematician Gordon Welchman, became one of the primary tools, and the major automated one, used to attack Enigma-enciphered messages.

Math & Computer Sciences

Brian Scriber

Grace Hopper

Admiral Grace Hopper (1906 - 1992) was not only one of the first female programmers, but also the first woman to graduate from Yale with a PhD in mathematics and the first woman to reach the rank of Admiral in the U.S. Navy. Hopper invented the first computer compiler in 1952. She also popularized the idea of machine-independent programming languages, which led to the development of COBOL, one of the first modern programming languages, and was instrumental in the creation of FLOW-MATIC language for the UNIVAC I and UNIVAC II computers.

Medicine & Health

Dr. Robert Morrow

G. V. Black

Greene Vardiman Black (1836 – 1915) was an American dentist. Greene Vardiman Black rose to become the dean of the Dental School at Northwestern University. Greene Vardiman Black made large contributions to dentistry as a teacher, as an originator of dental methods and instruments, and as an author. The method of preparing amalgam alloys for fillings is still in use today.

Microbiology & Molecular Biology ***Sam Bartlett***

Louis Pasteur

Louis Pasteur (1822-1895) was a French chemistry professor. Louis Pasteur gained his first success by studying the wine making, fermentation process. Pasteur discovered that both good and bad yeasts were produced in wine making and that he could kill the bad microbes through heating, a process we now call pasteurization. Pasteur further learned that many common diseases were caused by microbes. This realization led Pasteur to develop ways of inoculating animals by injecting them with the same heat weakened microbes, thus finding vaccines for the prevention of anthrax, cholera and rabies.

Physics

Ryan Patterson

Chien-Shiung Wu

Chien-Shiung Wu (1912 – 1997) graduated from the prestigious National Central University of Nanking in 1936, after graduation she traveled to the United States to pursue graduate studies. She enrolled at the University of California, Berkeley where she studied physics and received her Ph.D. in 1940. In 1956, Wu devised an experiment with revolutionary results. Her colleagues Tsung-Dao Lee and Chen Ning Yang proposed a theory that would disprove a widely accepted law of physics at the time called the Parity Law. Parity Law stated that objects that are mirror images of each other behave in the same way. Wu's experiment spun radioactive cobalt-60 nuclei at low temperatures. If the law held, the electrons would shoot off in paired directions. Wu's experiment demonstrated that they did not.

Plant Sciences

Dr. David Holm

Luther Burbank

Luther Burbank (1849 - 1926) was widely known as a horticulturist, botanist, and scientist. Burbank only had an elementary education, but he was an avid reader. Burbank went on to become one of history's most inventive and productive plant breeders. Luther has been credited with being the "world's greatest plant breeder." Luther Burbank established a nursery garden, greenhouse and experimental farms in Santa Rosa, California that have become famous throughout the world.

Science fair introduced me to the perception that research is the combination of art and science. I discovered how to unlock my creativity and pursue my passion for research. I now have been working in the Prion Research Center at CSU for four years and am working on my senior thesis about the effects of peer supervision, with the hopes of being published in the near future. Science fair taught me valuable skills in public speaking, presenting, and thinking critically and creatively. I also learned to never give up in the pursuit of a dream – with passion, hard work and dedication, anything is possible.

Nikki Burhdorf (CSEF Alumni 2008 - 2012)

COLORADO SCIENCE AND ENGINEERING FAIR

TEACHER OF THE YEAR HONOR ROLL

Gary Wilkinson	Monte Vista High School, Monte Vista	2003
Nancy Gettman	Woodlin School, Woodrow	2004
Penny Propst	Merino Jr/Sr High School, Merino	2005
TJ Donahue	Cherry Creek High School, Greenwood Village	2006
Haydee Phelps	Summit Middle School, Boulder	2007
Doug Steward	Monte Vista High School, Monte Vista	2008
Dena Palser	Lone Star School, Otis	2009
James DePue	Wray High School, Wray	2010
Daniel Newmyer	Center High School, Center	2011
David Miner	Brush High School, Brush	2012
Candus Muir	The Classical Academy, Colorado Springs	2013
Loree' Harvey	Monte Vista Middle School, Monte Vista	2014
Diego Martinez	Center High School, Center	2015
Linda Niccoli	Liberty School, Joes	2016
Dr. Lorry Getz	Liberty Middle School, Denver	2017

2017 INTEL ISEF RESULTS

Grand Award Winners

Isabella Bowland from Fairview High School won \$5,000 (Top of Category) and \$3,000 (1st Place) in the Plant Sciences category.

Kyle Fridberg from Fairview High School won \$5,000 (Top of Category) and \$3,000 (1st Place) in the Chemistry category. Kyle also won the Intel-Indo US Science and Technology Forum Visit to India Award.

Elliot Gorokhovsky from Fairview High School won \$3,000 (1st Place) in the System Software category.

Isani Singh from Cherry Creek High School won \$1,500 (2nd Place) in the Biomedical & Health Sciences category.

Hari Sowriraiian from Cherry Creek High School won \$1,000 (3rd Place) in the Cellular & Molecular Biology category.

Jay Chandra from Fossil Ridge High School won \$500 (4th Place) in the Energy: Chemical category.

Seth Young from The Classical Academy won \$500 (4th Place) in the Microbiology category.

Cassandra Blew from La Veta Schools won \$500 (4th Place) in the Behavioral & Social Sciences category.

Special & Governmental Award Winners

Aubrey Berger from Eagle Crest High School won \$250 (2nd Place) from the American Intellectual Property Law Association.

Jay Chandra received a scholarship from Arizona State University.

Kyle Fridberg won \$750 from the US Air Force. Kyle also won \$4,000 (1st Place) from the American Chemical Society.

Elliot Gorokhovsky won \$1,000 (1st Place) from the Association for Computing Machinery. Elliot also received participation and travel to summer school "Web Valley" in Trento, Italy from Fondazione Bruno Kessler.

Isaac Jordan from Animas High School won \$2,500 (1st Place) from the Society for Experimental Mechanics. Isaac also received an Honorable Mention from NASA.

Michelle Kummel from Palmer High School received an Honorable Mention from the American Meteorological Society.

Isani Singh won \$500 (2nd Place) from the American Statistical Association.

2017 BROADCOM MASTERS RESULTS

Broadcom MASTERS, a program of Society for Science and the Public, is a national competition for middle school students. Broadcom MASTERS nominees are eligible to register and complete an online application to compete nationally for valuable prizes and awards. Nine students from Colorado were named as Semifinalists and one was chosen as a Finalist in 2017:

Kathryn Kummel, grade 8, of Colorado Springs, CO for her project *Gone with the Wind: An Investigation of the Horseshoe Vortex Behind Tree Islands on Pikes Peak and What It Means for Tree Growth*. Kathryn attended the Broadcom MASTERS competition in Washington, DC in October 2017.

COLORADO SCIENCE AND ENGINEERING FAIR

Copper Sponsors

(Sponsorships of \$500 - \$749)

Michael Bemski

Colorado Association of Science Teachers

The Colorado Association of Science Teachers is a membership organization that represents educators from elementary and secondary schools, colleges and universities and informal science education. CAST provides its members with professional development opportunities, updates on science events around the state, awards for excellence in science education, and FREE memberships to the Denver Museum of Nature and Science, Dinosaur Ridge and the Alligator Farm as well as discounts at the Denver Zoo.

Colorado BioScience Institute

The Colorado BioScience Institute (www.cobioinstitute.org) is a non-profit that provides education, workforce and career development, innovation support and resources for life science professionals, companies, students and educators related to the life science industries in Colorado.

Colorado Engineering Council

The Colorado Engineering Council (www.coloradoengineeringcouncil.org) consists of representatives from 22 professional engineering, architectural and scientific organizations. The CEC coordinates and promotes the interests of the constituent organizations by providing a unified effort devoted to the advancement of the professional, technical, educational, and ethical interests and standards of professional organizations engaged in the various branches of engineering, architecture or science.

Colorado Rural Electric Association

The Colorado Rural Electric Association (www.crea.coop) is the statewide service organization representing Colorado's electric cooperatives. CREA was organized in 1945 and today its members include 22 electric distribution cooperative and one generation and transmission cooperative. Based in Denver, CREA neither generates nor distributes power, but it represents and serves the cooperatives throughout Colorado that do provide power to nearly a million and a half rural electric consumers.

Galvanic Engineering

Galvanic Engineering, LLC is a small Colorado business that provides consulting and contracting services in the fields of electrical and software engineering. Galvanic has extensive experience in the design, manufacture and testing of electronic and electromechanical products, specializing in embedded computing and control systems.

Optimal Schedule

Optimal Schedule (www.optimalschedule.com) is a Colorado company providing advanced employee scheduling software to help our clients create more satisfied customers, more efficient managers, and happier employees. We manage the complexity of shift-scheduling, shift-trading and overtime so our clients can focus on operations and everyone works the shifts that make sense for their schedule.

San Luis Valley Regional Science Fair, Inc.

The San Luis Valley Regional Science Fair (SLV RSF) is located in the San Luis Valley of southern Colorado. The first science fair for the SLV region was held in 1949, making it the oldest science fair in Colorado and one of the oldest in the nation. The fair received nonprofit status in 1981 and today the SLV RSV has a board of directors and a paid program director.

Vaughan Web Works, LLC

Nancy Vaughan of Vaughan Web Works, LLC develops and maintains WordPress websites. For more information, please contact Nancy at nevaughan17@gmail.com or by phone at 303-817-4271. Vaughan Web Works considers supporting the Colorado Science and Engineering Fair (CSEF) an honor and a privilege.

CSEF Contributors

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COLORADO SCIENCE AND ENGINEERING FAIR

Gold Sponsors

(Sponsorships of \$2,500 – 4,999)



The Colorado Dental Association (www.cdaonline.org) is an organization, representing greater than 80% of Colorado dentists, and that strives to advance dentistry and oral health in Colorado.



Lockheed Martin Corporation (www.lockheedmartin.com), a security and aerospace company, engages in the research, design, development, manufacture, integration and sustainment of advanced technology systems and products for defense, civil and commercial applications in the US and internationally.



The Society of Petroleum Engineers is a worldwide society with over 80,000 members and locally, the Denver Section (<http://denver.spe.org>) has approximately 1,200 active members. Besides being a proud sponsor of the Denver Metro RSF and the CSEF, we also support 5 colleges and universities by providing scholarships to students of the junior and senior class level with a minimum 2.5 GPA and who participate in a Petroleum Engineering Curriculum.

Silver Sponsors

(Sponsorships of \$1,000 – 2,499)

Black & Veatch

Black & Veatch (<http://bv.com>) is an employee-owned, global leader in building Critical Human Infrastructure™ in Energy, Water, Telecommunications and Government Services. Through our *Building a World of Difference*® Foundation, Black & Veatch is able to coordinate our charitable donations with the volunteer involvement of our professionals to organizations and programs worldwide. We focus our efforts on improving the areas of education, health and human services, the environment, public safety and emergency services.

CableLabs

CableLabs (www.cablelabs.com) is a non-profit research and development consortium that is dedicated to creating innovative ideas that significantly impact our cable operator members' business. CableLabs also serves to define interoperable solutions among our members and their technology vendors in order to drive scale, reduce costs, and create competition in the supply chain.

Colorado Medical Society

The Colorado Medical Society (www.cms.org) is a nonprofit organization whose membership comprises the majority of physicians, residents, and medical students in Colorado. The Society's mission is to promote the science and art of medicine, the betterment of public health, and the welfare of Colorado physicians and their patients.

IEEE, Denver Section

The IEEE is a global organization of over 400,000 engineers and technical professionals with over 3600 members in the Denver – Boulder metropolitan area. The mission of the IEEE Denver Section is to enrich the professional and personal lives of the Rocky Mountain Region members, developing them into valued contributors to society through quality programs, continuing education, career development and community service; in collaboration with IEEE, industry, government and academia.

National Renewable Energy Laboratory

The National Renewable Energy Laboratory (www.nrel.gov) is the only federal lab dedicated to the research, development, commercialization, and deployment of renewable energy and energy efficiency technologies. NREL focuses on creative answers to today's energy challenges. From breakthroughs in fundamental science to new clean technologies to integrated energy systems that power our lives, NREL researchers are transforming the way the nation and the world use energy.

Seagate Technology

Seagate (www.seagate.com) is the world's leading provider of storage devices, providing solutions for enterprise, desktop, mobile computing, consumer electronics and retail markets. Seagate has the broadest product portfolio in the industry, offering hard disk, solid state hybrid and solid state drives.

Bronze Sponsors

(Sponsorships of \$750 - \$999)

Dr. Larry & Carol Sveum

COLORADO SCIENCE AND ENGINEERING FAIR

Diamond Sponsors

(Sponsorships of \geq \$10,000)



Colorado State University

Colorado State University (www.colostate.edu) is one of the nation's leading research universities, with world-class research in infectious disease, atmospheric science, clean energy technologies and environmental science. Founded in 1870, CSU is the "University of Choice" for Colorado residents. In addition to excellent programs in those areas, CSU offers among the very best professional programs in the US in veterinary medicine, engineering, alternative energy, occupational therapy, journalism, agriculture and construction management.

The Colorado of Natural Sciences (www.natsci.colostate.edu) comprises a dynamic community of scholars in the physical, mathematical, behavioral and life sciences. Our mission is to conduct cutting edge research in our foundational fields, to actively engage in important interdisciplinary research and to educate and inspire the next generation of scholars, researchers and professional leaders.

The College of Natural Sciences Education & Outreach Center (www.cns-eoc.colostate.edu) is an incubator for innovation in STEM education. We serve both CSU and K-12 students and faculty through a wide variety of programs. Particular emphasis is on finding new ways to promote scientific creativity and innovation, attributes essential for global competitiveness in the 21st century.



Congratulations to all participants at the Colorado Science and Engineering Fair. We know you learned a lot of new skills, had fun, and are anxious to celebrate your well-deserved success! You have all demonstrated that you can solve problems and create solutions, sticking with it despite the many challenges. At Intel, we believe that's how we all learn to be successful, and we applaud your hard work. All of us at Intel wish you the best of luck today and thank you for your participation. Please keep innovating!



Verizon Foundation, in partnership with leading nonprofits, is working to bring access to technology and hands-on learning opportunities to our youth that will prepare them for success in tomorrow's high-tech world. The Foundation's goal is to inspire tomorrow's creators to use technology to build brighter futures for themselves, their families and the world. #weneedmore

Platinum Sponsors

(Sponsorships of \$5,000 - \$9,999)



From daily weather forecasts, severe storm warnings and climate monitoring to fisheries management, coastal restoration and supporting marine commerce, NOAA's (www.noaa.gov) products and services support economic vitality and affect more than one-third of America's gross domestic product. NOAA's dedicated scientists use cutting-edge research and high-tech instrumentation to provide citizens, planners, emergency managers and other decision makers with reliable information they need, when they need it.