



*56th Annual
CSEF Awards Ceremony
April 8, 2011*

Colorado Science and Engineering Fair

2011 Awards Ceremony

Welcome

Ms. Courtney Butler, CSEF Director

Announcer.....Jody Oaks, San Luis Valley RSF

Presentation of Signature Special Awards

Lockheed Martin Teacher of the Year Award..... Larry Knauer

Presentation of Special Awards

Air & Waste Management Association	Colorado-Wyoming Society of American Foresters
American Association of University Women	Comstock Family
American Chemical Society	Division of Reclamation Mining and Safety
American Institute of Chemical Engineers	Eppler Family
American Meteorological Society	Fort Collins Conservation District
American Statistical Association	Hands and Minds, Inc.
American Vacuum Society	Human Factors and Ergonomics Society
American Water Works Association & Rocky Mountain Water Environment Association	Institute of Electrical and Electronics Engineers
Armbruster Associates	Little Shop of Physics
ASM International	Lockheed Martin
Association for Women Geoscientists	MWH Americas, Inc.
Boulder Flycasters – Trout Unlimited	National Geophysical Data Center
Colorado Association of Meat Processors	Optical Society of America
Colorado Association of Science Teachers	Rawat Family
Colorado Biology Teachers' Association	Rio Tinto Minerals, Inc.
Colorado Dental Association	Rocky Mountain Association of Geologists
Colorado Environmental Health Association	SACNAS
Colorado Foundation for Agriculture	Science Toy Magic, LLC
Colorado Geographic Alliance	Society for Mining, Metallurgy & Exploration
Colorado Medical Society	Society of Manufacturing Engineers
Colorado Mineral Society	Society of Women Engineers
Colorado River Watch	SPIE – The International Society for Optics & Photonics
Colorado Scientific Society	The Inventors' Roundtable
Colorado State University College of Agricultural Sciences	United States Department of Commerce
Colorado State University Department of Biochemistry & Molecular Biology	United States Geological Survey
Colorado State University Department of Chemistry	University of Colorado, Denver
Colorado State University Department of Horticulture & Landscape Architecture	University of Northern Colorado
Colorado Veterinary Medical Association	Wojtaszek Family
	Xcel Energy
	Yale University Science & Engineering Association
	Zonta Club of Boulder County

Presentation of Military Special Awards

United States Air Force.....Sam Bartlett, CSEF

United States Army.....Sam Bartlett, CSEF

United States Navy & United States Marine Corps..... Captain Bill Emslie, USNR-R

Colorado Science and Engineering Fair

2011 Awards Ceremony

Announcer.....Laura Roberts, Xcel Energy

Presentation of Grand Awards

Junior and Senior Division Individual and Team Project Category Awards

Animal Sciences	Energy & Transportation	Medicine & Health
Behavioral & Social Sciences	Engineering	Microbiology
Chemistry	Environmental Sciences	Physics
Earth & Space Sciences	Math & Computer Sciences	Plant Sciences

Presentation of CSEF Special Awards

Pioneers of Science Awards

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

Poster Art Contest

Student Choice Awards

Ralph F. Desch Memorial Technical Writing Award

Society for Science & the Public Awards

American Psychological Society

Intel Corporation

Mu Alpha Theta

National Oceanic and Atmospheric Administration

National Society of Professional Engineers

Ricoh Americas Corporation

Society for In Vitro Biology

United States Metric Association

Water Environment Federation

Yale University Science & Engineering Association

Presentation of Scholarships

Adams State College Foundation.....	Dr. Larry Sveum
Colorado School of Mines	Bruce Goetz
Fort Lewis College.....	Dr. Maureen Brandon
Ryan Patterson Scholarship.....	Ryan Patterson
Propst Medicine & Health Scholarship.....	Penny Propst
Propst Moving Science Forward Scholarships.....	Penny Propst

Presentation of CSEF Top Awards

Junior and Senior Division Best Team Project Awards

Junior and Senior Division Best Individual Project Awards

PACE Teacher Awards

Colorado ISEF Finalist Recognition & Closing Remarks

Ms. Courtney Butler

Special Awards Organizations

Air & Waste Management Association Rocky Mountain States Section

The Air & Waste Management Association, Rocky Mountain States Section is a non-profit professional organization whose mission is to provide a forum for the discussion of technical concepts and issues related to complex air quality and waste management problems. The membership is comprised of local, state, and federal government employees, industry representatives, private consultants, environmental activists, and students.

American Association of University Women

The American Association of University Women became interested in presenting an award to girls in middle school in the fields of math and science when our studies showed that girls were falling behind in these two fields. In principle and in practice, AAUW values and seeks a diverse membership. There shall be no barrier to full participation in this organization based on gender, race, creed, age, sexual orientation, national origin, or disability.

American Chemical Society, Colorado Local Section

The Colorado Section of the American Chemical Society was founded over 100 years ago as an organization to support and promote the profession and interest of chemists and chemical engineers. One major aim of the Society is to encourage an interest in the chemical sciences in the young people of Colorado.

American Institute of Chemical Engineers Rocky Mountain Section

The Rocky Mountain Section of the American Institute of Chemical Engineers contains over 500 members in a geographic area that includes Colorado and Wyoming as well as parts of South Dakota and New Mexico. Its members are involved in the petroleum, energy services, chemical and environmental industries, and are well represented in both academia and government.

American Meteorological Society, Denver/Boulder Chapter

The American Meteorological Society is an organization whose membership is open to anyone who has an interest in meteorological matters. The aims of the American Meteorological Society are to promote the development and dissemination of knowledge of meteorology in all its phases and the advancement of its professional ideals. To this end, the American Meteorological Society awards certificates for outstanding achievement, ability and creativity in an atmospheric, oceanic or hydrologic science project in both divisions.

American Statistical Association Colorado/Wyoming Chapter

The American Statistical Association is a scientific and educational society founded in 1839 with the mission to promote excellence in the application of statistical science across the wealth of human endeavor. This award is named after David Young (1945 – 2007) 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. The Colorado/Wyoming Chapter of the ASA organizes local activities for members in the Rocky Mountain regions. Members include statisticians from a variety of backgrounds such as biostatistics, bioinformatics, pharmaceutical statistics, environmental statistics, quality control statistics and much more.

American Vacuum Society, Rocky Mountain Chapter

The American Vacuum Society (AVS) is a member society of the American Institute of Physics. We promote 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 Rocky Mountain Chapter of the AVS is made up of several hundred scientists, engineers, technicians, and others involved with the use of vacuum in their work in the Rocky Mountain Region.

American Water Works Association Rocky Mountain Section & Rocky Mountain Water Environment Association

The Rocky Mountain Section of the American Water Works Association (RMSAWWA) and the Rocky Mountain Water Environment Association (RMWEA) are the leading organizations of dedicated and knowledgeable professionals collectively working together to preserve and enhance the watershed environments originating in the states of Colorado, Wyoming, and New Mexico. The RMWEA is affiliated with the Water Environment Federation, the United States national sponsor of the Stockholm Junior Water Prize, which is the most prestigious international youth award for a high school water science research project. The awards are open to projects aimed at improving the quality of life through improvement of water quality, water resources management, water protection, or water and wastewater treatment.

Armbruster Associates

Armbruster Associates is an organization which designs, develops, and markets motivational products for use in learning. The Charles 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.

ASM International

ASM International is a professional society of materials scientists and engineers, who develop materials for engineering or functional purposes, or help materials to be selected or manufactured for use in society. It was formed during the 1920's as an outgrowth of the Heat Treating Society. The Rocky Mountain Chapter was founded in 1941 and has about 450 members. The materials engineering "family" plays a critical role in society, and serves nearly every industry, from basic manufacturing to nanotechnology and biomaterials.

Association for Women Geoscientists, Laramide Chapter

The goals of the Association for Women Geoscientists, Laramide Chapter, are to encourage the participation of women in the geosciences; to exchange education, technical and professional information; and to enhance the professional growth and advancement of women in the geosciences. To this end, the Laramide Chapter, awards a cash prize and an engraved achievement medal for the most interesting senior and junior division Earth Science projects by female students. Interesting is defined by our special award judges and can change yearly!

Boulder Flycasters – Trout Unlimited

Boulder Flycasters, a local chapter of Trout Unlimited, is a non-profit volunteer organization that is dedicated to improving Boulder County's fishing habitats and the preservation of their cold water ecosystems. The national Trout Unlimited actively works to conserve, protect and restore North America's coldwater fisheries and their watersheds. Conserving wild trout and salmon begins with conserving the watersheds that gave us our native coldwater fish stocks, and today support a bounty of native and wild fish.

Colorado Association of Meat Processors

It is the mission of the Colorado Association of Meat Processors to advance and improve the meat and related food industry through various channels; to collect information about the industry or areas impacting upon it and communicating it promptly and clearly to the membership and the community it serves; to provide members with formal and informal opportunities for education and information exchange; to serve as a forum and resource for discussion and development of industry positions and courses of action on any matter affecting the industry or its consuming public; to encourage the principles of efficiency and effectiveness, while supporting the humane treatment and handling of animals and livestock; and to 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 (CAST) represents educators from elementary and secondary schools, colleges and universities. They are dedicated to superior teaching. These awards are given on the basis of the teaching value of the exhibit display to the general public in both divisions.

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 Newsletter to keep teachers informed about a variety of activities designed to improve teaching.

Colorado Dental Association

The Colorado Dental Association is the largest professional association of dentists in Colorado, representing over 80 percent of the licensed dentists in the state. The Colorado Dental Association is actively involved in public education projects promoting oral hygiene and care. To this purpose, the Colorado Dental Association awards, at the Colorado Science and Engineering Fair, prizes and plaques to the senior and junior division participants whose projects best relate to dental technology.

Colorado Environmental Health Association

Colorado Environmental Health Association is a non-profit professional organization whose mission is to promote environmental health as a profession which strives for continual improvement in environmental health quality and the growth of individual professionalism. CEHA has over 250 members comprised of local and state health department professionals and industry representatives. 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 purpose of the "Agriculture in the Classroom" Task Force is to educate food, fiber, bio-fuels and nutritional supplement consumers on the importance of agriculture in our daily lives through educational programs.

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. Our 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 is a 133 year-old professional organization of 5,500 physician members dedicated to providing excellence in healthcare to all Coloradans. The Colorado Medical Society Education Foundation is a non-profit, tax-exempt charitable foundation established primarily to support educational and charitable programs in Colorado. It has dedicated itself to funding first-year medical student scholarships and educational programs such as the CSEF.

Colorado Mineral Society

The Colorado Mineral Society is an educational society of professionals and amateurs with an interest in the earth sciences. The Society promotes the study of minerals and other geologic materials, encourages mineral collecting as a hobby, and conducts public meetings, lectures, and field trips. In addition, the society engages in a number of other activities which relate to the society's purposes. The Colorado Mineral Society is the only private organization that has presented special awards during the entire 56-year history of the state science fair.

Colorado River Watch

River Watch is a statewide volunteer water quality-monitoring program operated by Colorado Watershed Assembly in cooperation with the Colorado Division of Wildlife. Our mission is to work with voluntary stewards to monitor water quality and other indicators of watershed health, and utilize this high quality data to educate citizens and inform decision makers about the condition of Colorado's waters. This program is unique in its statewide focus and frequency of data collection. We applaud the discipline required to conduct honest scientific research. We make this investment in order to encourage students to continue their valuable studies.

Colorado Scientific Society

The Colorado Scientific Society was founded in 1882 to promote the interchange of information among Colorado scientists. The Society seeks to stimulate the interest of young people, and to educate the general public, in areas relating to earth sciences. The Colorado Scientific Society awards cash prizes to a 1st and 2nd place winner in both the senior and junior division in fields relating to geology and the Earth Sciences.

Colorado State University College of Agricultural Sciences

The College of Agricultural Sciences is dedicated to training men and women in the sciences of tomorrow's agriculture. It is the science of agriculture that will meet future global challenges of producing safe food, protecting the environment and landscape, providing biofuels and energy sources as well as meeting the economic challenges of change. By the year 2050, the world population will have increased from 6 billion to 9 billion. In order to feed those global masses, we must increase our global food production by 70%. We must increase food production with less land, less water and less resources. Existing technology cannot meet this challenge, so new science and technology needs to be developed. Young scientists need to be attracted into the fields of agriculture to create new ideas and ways of thinking to increase food production safely in a harmonious fashion with our environment. These young men and women are the key to our future and the College of Agricultural Sciences is educating them for jobs that address today's needs and tomorrow's challenges!

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. A strong, well-balanced background in the biological, physical, and mathematical sciences is provided. 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. Our 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. Several opportunities for experiential learning and working closely with our faculty are provided. For outstanding undergraduates, the Department offers the opportunity to do a semester abroad, funded by a grant from the National Science Foundation, the only such program in biosciences in the United States. A local internship program providing our students with work experience in our Macromolecular Resource Facility or in industrial laboratories is also available.

Colorado State University Department of Chemistry

The faculty and students of the Department of Chemistry at Colorado State University are committed to excellence in chemical education and research. Research at all levels promotes the practice of the scientific method. In that spirit, the Department of Chemistry recognizes through financial awards the excellence in chemistry research at the science fair by presenting awards for two projects - one from the senior division and one from the junior division - judged to have represented the best exhibits in the area of chemistry.

Colorado State University Department of Horticulture & Landscape Architecture

Horticulture is the application of scientific principles in the growing, developing, marketing, processing and utilizing of fruits, vegetables, flower and foliage plants, trees, shrubs, and turfgrasses. The major requires a strong grounding in botany, chemistry, horticulture, and business. There are four concentrations in the horticulture major - floriculture, horticultural business management, horticultural food crops, and horticultural science.

**Colorado Veterinary Medical Association,
CVMA Auxiliary, & Auxiliary to the AVMA**

The Colorado Veterinary Medical Association's and its auxiliary's mission is to enhance animal health and welfare and the status of the veterinary profession, through advocacy, education, and increased public awareness of the value of veterinary medicine. It is a proactive group of more than 1,500 professionals from every region of the state representing clinical practice, public health, academia, industry, and the military.

Colorado-Wyoming Society of American Foresters

The Society of American Foresters, Colorado-Wyoming State Society, is a nonprofit professional organization whose mission is 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. The membership is comprised of local, state and federal government employees, industry representatives, private consultants, and students.

Comstock Family

The Heather Comstock Memorial Award is sponsored by the Comstock family in remembrance of Heather Comstock. Before her untimely death, Heather was an honor student at the University of Michigan. She was a biology major studying stem cell research. She had a real zest for life and those who knew her said she was going to save the world.

Division of Reclamation Mining & Safety

The Division Reclamation Mining and Safety serves the people of Colorado by regulating mining and reclamation activities at coal, metal, aggregate and other minerals mines. The Division also reclaims and safeguards abandoned mine sites that are dangerous and environmentally hazardous, and provides safety training for mine operators and employees.

Eppler Family

The Eppler family of Berthoud, Colorado supports general and science education through teaching, volunteering, and donations. This award is intended to give deserving science students both recognition and the tools they need to continue their work on future projects. This year's award is for outstanding use of electrical measurement and/or control and consists of a microprocessor development kit and a digital multimeter.

Fort Collins Conservation District

The Fort Collins Conservation district was formed in 1945 along with many Districts across Colorado and across the Nation to assist landowners heal the scars of the Dust Bowl days. The District's boundaries contain irrigated and non-irrigated cropland, range land, forest land, and urban areas. The purpose of the Conservation District is to deal with soil and water conservation problems through a cooperative effort with landowners, State and Federal Agencies, and other groups and organizations concerned with water and soil conservation issues. The Fort Collins Conservation district gives awards to the best project in both divisions with a soil or water conservation theme.

Hands and Minds, Inc.

The Anatomy in Clay® System engages students hands-on to learn anatomy by building human body systems with modeling clay - eliminating rote memorization. The outcomes are that student retention improves, comprehension is real and higher test scores are achieved. Recently published academic research by City University of New York and Penn State University document these results.

**Human Factors and Ergonomics Society
Rocky Mountain Chapter**

The Human Factors and Ergonomics Society, Rocky Mountain Chapter, promotes the discovery and exchange of knowledge concerning the characteristics of human beings that apply to the design of systems and devices of all kinds. In other words, we help to ensure that systems are well suited to their human audience. Our chapter offers 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 Engineers
Centennial Subsection**

The Institute of Electrical and Electronics Engineers is a non-profit professional organization that supports the advancement of technology. Its mission is to promote the development and application of electrical and electronics engineering concepts for the benefit of humanity.

Little Shop of Physics

The Little Shop of Physics is a hands-on science outreach program at Colorado State University. Our focus is using everyday objects in new ways to help the next generation learn and explore the wonders of the world. The Matthew McCausland Memorial Award recognizes the spirit of this kind-hearted inventor, and is given to the project which displays the most creativity and "out of the box" thinking.

Lockheed Martin

Headquartered in Bethesda, Maryland, Lockheed Martin employs over 140,000 people worldwide and is principally engaged in the research, design, development, manufacture and integration of advanced technology systems, products and services. The Corporation reported 2008 sales of \$42.7 billion. Lockheed Martin Space Systems Company is one of the major operating units of Lockheed Martin Corporation. Space Systems Company designs, develops, tests and manufactures a variety of advanced technology systems for space and defense. Chief products includes interplanetary and science spacecraft, advanced instruments such as LADAR based systems, spacecraft for commercial and government customers, fleet ballistic missiles and missile defense systems.

MWH Americas, Inc.

MWH, based in Broomfield, CO, is a global leader in providing knowledge-driven services in wet infrastructure and natural resources. Our 7,000 professionals in over 35 countries have proven expertise in a wide array of integrated solutions, including environmental engineering, power generation, facilities development, laboratory services, construction, multi-sector program management, asset management, financial services, IT consulting, government relations and applied sciences. From Boston to Beijing, Melbourne to Mexico City, clients rely on MWH to optimize their operations' overall performances, forecast future needs, address regulatory concerns, satisfy diverse stakeholders, manage complex programs and achieve maximum benefit from capital investments in wet infrastructure and natural resources to "BUILD A BETTER WORLD" sustainably and in the face of the uncertainty of climate change. MWH congratulates the winners of the Sustainable Future Award.

National Geophysical Data Center

The National Geophysical Data Center provides scientific stewardship, products and services for geophysical data describing the solid earth, marine and solar-terrestrial environment, as well as earth observations from space.

Optical Society of America, Rocky Mountain Section

The Rocky Mountain Section of the Optical Society of America fosters interest in optics and seeks to advance the study and practice of optical science and engineering.

Rawat Family

The Rawat family presents this award to ignite passion and inspire the spirit of innovation. These leaders will reach remarkable milestones: earn Nobel Prizes, launch the Googles of tomorrow, and discover ways to save the Earth. The Champion of Scientific Innovation award is presented in honor of Dr. and Dr. (Mrs.) Rawat, who were visionary mentors to their family and students alike. This award embodies their spirit to congratulate outstanding youth vision, and it applauds the unsung heroes behind their work: parents who never let their children down, teachers who never give up on their students, and mentors who never let their champions quit.

Rio Tinto Minerals, Inc.

Rio Tinto Mineral's talc and sodium borate deposits provide benefit to a wide range of products in the agricultural, paper, plastic, and personal care industries. Rio Tinto Minerals supplies twenty-five percent of the world's talc consumption and nearly half the global demand for refined borates, key ingredients in fiberglass, glass, ceramics, fertilizers and wood preservatives. Worldwide headquarters is located in Greenwood Village, CO.

Rocky Mountain Association of Geologists

The Rocky Mountain Association of Geologists is one of the largest associations of geologists in the United States. The RMAG is composed of earth scientists from industry, government, and academia, encompassing a wide spectrum of backgrounds. All share a common interest in the geology of our Rocky Mountain area. Founded in 1922, the RMAG is one of the most active geological societies in the country. 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. For additional information about the Rocky Mountain Association of Geologists, visit www.rmag.org.

SACNAS, Colorado State University Chapter

SACNAS, Colorado State University Chapter is a society of scientists dedicated to advancing Hispanic/Chicanos and Native Americans in science. SACNAS CSU is a non-profit organization of individuals and organizations interested in quality science, technology, engineering and mathematics (STEM) research, teaching, leadership and policy. The mission of SACNAS is to foster the success of Hispanic/Chicano and Native American scientists, from college students to professionals, to attain advanced degree, careers, and positions of leadership in science. The SACNAS CSU chapter was founded in 2007 with the following purpose: 1) to CONNECT people from all racial, ethnic and professional backgrounds who are passionate about working with diverse populations in the science and engineering fields and 2) to ENCOURAGE ethnically diverse students to pursue graduate education and obtain advanced degrees needed for science and engineering research, leadership and teaching careers.

Science Toy Magic, LLC

Science Toy Magic is a science retail store in Old Town Square, Fort Collins where all of the toys in some dramatic way demonstrate principles of science as if by magic, are durable and the best made of their kind and demonstrated for you. Dozens of science toys were sold here first in the US.

Society for Mining, Metallurgy & Exploration Colorado Section

The Society for Mining, Metallurgy, and Exploration, Inc. is a professional society of geoscientists, engineers, and other professionals involved in the exploration, mining, beneficiation, and production of metals, industrial minerals, and energy minerals worldwide. It is the principal publisher of textbooks and handbooks for the mineral industry and establishes the standards of ethics and engineering practice in the United States for mining and mineral processing engineers.

Society of Manufacturing Engineers, Colorado Chapter 354

The Society of Manufacturing Engineers (SME) is a non-profit professional organization that serves the technical and professional growth of its members by providing a variety of information resources and seeks to increase the image and public awareness of manufacturing. Its membership consists of engineers, scientists, technicians and students engaged in supporting manufacturing. Colorado Chapter (354) serves all of Colorado and adjoining states. Our programs and activities emphasize electrical and electronics and mechanical manufacturing. The special award(s) are given to finalist(s) whose project(s) best exemplify manufacturing principles, processes, or preparation for manufacturing.

Society of Women Engineers, Rocky Mountain Section

The Society of Women Engineers is a nonprofit educational service organization. It 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 education goals. The national organization of SWE was founded in 1950. The Denver Section was chartered in 1954 and renamed the Rocky Mountain Section in 1986. One of SWE's goals is to inform young women, their parents, counselors and the general public of the qualifications and achievements of women engineers and the opportunities open to them. To fulfill this mission, the Rocky Mountain Section provides outreach and career guidance activities in math, science and engineering at the elementary, middle, high school and college levels. In addition to participation in events such as the CSEF, SWE has college scholarship programs at both the local and national levels.

SPIE – The International Society for Optics & Photonics

SPIE is the international society for optics and photonics founded in 1955 to advance light-based technologies. Serving more than 188,000 constituents from 138 countries, the Society advances emerging technologies through interdisciplinary information exchange, continuing education, publications, patent precedent, and career and professional growth. The Society provided over \$3 million in support of scholarships, education outreach grants, and other education programs around the world.

The Inventors' Roundtable

The Inventors' Roundtable is an innovative, safe and free forum, where talented inventors and value-driven service providers can meet, connect and share experiences, insights and wisdom. At the Inventors' Roundtable, experienced inventors mentor beginners and we all work to "get it right." The ultimate goal of the Inventors' Roundtable is to help the inventor find the information and support needed to go through the invention process successfully. The Inventors' Roundtable is co-sponsored by the Denver Metro Chamber of Commerce and the Colorado Small Business Development Centers.

United States Department of Commerce

The US Department of Commerce, through its agencies, the National Institute of Standards and Technology, the National Ocean and Atmospheric Administration, and the National Telecommunications and Information Administration, provides a major sponsorship of the Colorado Science and Engineering Fair. The DOC research laboratories in Boulder, Colorado, serve as a center around which a major technological complex has developed in the Boulder Area. The Department of Commerce awards an opportunity for summer employment for a graduating student in a research environment with professional scientists. This offer also provides a possibility for future continuing employment with the Department of Commerce.

United States Geological Survey

The USGS National Research Program conducts basic and problem-oriented scientific investigations in support of the mission of the USGS and to assist the nation in solving its water problems. The NRP is designed to encourage pursuit of diverse research topics aimed at providing new knowledge and insights into complex biogeochemical and hydrologic processes that affect water issues across the globe. NRP scientists specialize in long-term, interdisciplinary studies related to water chemistry, ground- and surface-water hydrology, geomorphology, sediment transport, and ecology. Our principle research centers are located in Reston, VA, Denver, CO, and Menlo Park, CA. With this award, the USGS wishes to honor the pursuit of environmental and water-related research, and to encourage the next generation of scientists and leaders to value the importance of our nation's water resources.

University of Colorado, Denver Medical Scientist Training Program

At the University of Colorado Denver, Anschutz Medical Campus, the Medical Scientist Training Program is a 7 to 8-year program for highly motivated students interested in a career in academic medicine. Our program excels in preparing students for such a career by having students complete a Medical Doctor Degree (M.D.) and a Doctorate in Philosophy Degree (Ph.D.). This program in the biomedical sciences combines graduate training in basic research skills with outstanding clinical preparation.

University of Northern Colorado, MAST Institute

The MAST Institute, within the College of Natural & Health Sciences at the University of Northern Colorado, is committed to equitable and systemic reform in the teaching and learning of science, mathematics and technology education. The MAST Institute provides leadership and coordination for projects and programs to improve mathematics and science education, within the University, the State and nationally.

Wojtaszek Family

The Paul Wojtaszek Memorial Award is given to the project deemed to be the foremost study in the field of Medicine and 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.

Yale University Science & Engineering Association

Yale University is a well known educator in the sciences and engineering. The Yale Science and Engineering Award is given to an 11th grade student for the most outstanding exhibit at a state or regional high school science fair in computer science, engineering, physics, or chemistry. The Award consists of the YSEA medal and a formal certificate. Each winner also receives a brochure about undergraduate studies in Engineering at Yale and the list of winners is forwarded to the Yale Admissions Office.

Xcel Energy

Our company thrives on doing what we do best, and growing by finding ways to do it even better. We are committed to operational excellence and providing our customers reliable energy at a greater value. We are dedicated to improving our environment and providing the leadership to make a difference in the communities we serve.

Zonta Club of Boulder County

Zonta International, founded in 1919, is an organization of executive and professional women. Amelia Earhart was one of its most famous members, and this award is given in her memory.

Special Awards Military Organizations

United States Air Force

Air Force ROTC, Detachment 90, at Colorado State University is the tenth largest AFROTC 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 UNC and prepare them to lead in the world's greatest air and space force.

United States Army

The U.S. Army and the Fort Collins U.S. Army Recruiting station would like to recognize and congratulate all of the participants involved with the 2011 Colorado State Science Fair. The U.S. Army understands the importance of these events and the effects they can have on an individual's academic record.

United States Navy & United States Marine Corps

The Office of Naval Research encourages the study of science and technology. Research initiatives undertaken by Naval scientists and engineers have enabled the extremely capable Naval forces we depend upon today. Science is a central aspect of our society and economic productivity. Advancement in science and technology helps us maintain the military advantage that is vital to our national security.

Scholarship Providers

Adams State College

A scholarship has been established by Adams State College. The Scholarship is intended to recognize students participating in the Colorado Science and Engineering Fair who are identified as having significant performance potential in science and mathematics. The value of the scholarship will be equivalent to one-year resident tuition and fees (approximately \$5,000) and will be awarded to one student in each of the Senior Division categories as well as a team project.

Colorado School of Mines

Colorado School of Mines is a public research university devoted to engineering and applied science related to resources. CSM has dedicated itself to responsible stewardship of the earth and its resources. It is one of a very few institutions in the world having broad expertise in resource exploration, extraction, production and utilization which can be brought to bear on the world's pressing resource-related environmental problems. Colorado School of Mines is dedicated to educating students and professionals in the applied sciences, engineering, and associated fields specific to earth, energy and the environment.

Fort Lewis College

The School of Natural and Behavioral Sciences at Fort Lewis College in Durango, Colorado, consists of a diverse group of natural, physical, social and behavioral science disciplines that are characterized by the study of interactions between human and natural or physical science systems. We value innovative pedagogies that ultimately teach critical thinking and analysis, and the hands-on, real-world education that we provide in the form of laboratories, field experiences, internships, and meaningful, professional research and scholarship opportunities. Our location in the Four Corners area provides an ideal outdoor classroom for many of our educational, scholarship and personal interests, and we take advantage of them as often as possible.

Propst Scholarships

Penny Propst, a science educator from northeastern Colorado, wishes to continue the spark that CSEF gave her students as they pursued science professions. The Propst Medicine and Health Scholarship honors a student from the senior division who shows promise in medicine and health or microbiology. The \$1,000 scholarship is given to a scientist that demonstrates their knowledge with compassion and excellent communication skills. The Moving Science Forward Scholarships honor students from the senior division who demonstrate excellence in research. Two \$1,000 scholarships will be given to students that have the drive and the ability to move science forward.

Ryan Patterson Scholarships

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 top winner. The scholarship is presented to a deserving high school senior based on criteria set by CSEF.

Professional Association of Colorado Educators

The Professional Association of Colorado Educators is a Colorado-based, non-profit, professional educators association, dedicated to the academic and personal growth of every student. PACE is committed to advancing the teaching profession through personal growth, professional development, advocacy and protection, and strives to empower educators as professionals, promotes collaborative and innovative educational partnerships and helps improve Colorado's educational opportunities for teachers and students.

Pioneers of Science Awards

Category	BOD Sponsor	Pioneer
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<i>Animal Sciences</i>	<i>Jody Oaks</i>	<i>Georges L. C. F. Cuvier</i>
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Georges Leopold Chretien Fredric Cuvier (1769 - 1832) was a French naturalist who was a pioneer in the science of comparative anatomy. Georges Cuvier originated a system of zoological classification that comprised four phyla based on differences in structure of the skeleton and organs. His reconstruction of the soft parts of fossils based on skeletal remains greatly advanced the science of paleontology.

<i>Behavioral & Social Sciences</i>	<i>Dan Kowal</i>	<i>Sigmund Freud</i>
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Sigmund 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 and 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. Margaret is best known for work among the people of Oceania. Margaret rose to become the president of the World Federation for Mental Health.

<i>Chemistry</i>	<i>Amanda Parker</i>	<i>Marie Curie</i>
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Marie Curie (1867 - 1934) a chemist and physicist became the first woman Professor of General Physics in the Faculty of Sciences at the Sorbonne, in Paris, France. In 1903 she shared the Noble Prize in physics with her husband Pierre and Henri Becquerel, for their work on radioactivity; thus, becoming the first woman to win a Noble Prize. Dr. Curie went on to receive a second Nobel Prize in Chemistry in 1911 for isolating the element radium and thus became the first person to ever be awarded a second Nobel Prize.

<i>Earth & Space Sciences</i>	<i>Sam Bartlett</i>	<i>Edwin Powell Hubble</i>
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Edwin Powell Hubble (1889 – 1953) was an American astronomer best known for changing our views of the universe from being of limited size to being ever expanding and for laying the foundation for modern understanding of the cosmos. Edwin Hubble explained the “red shift” when studying stars. He also formulated Hubble’s Law: the greater the distance of a galaxy, the faster it recedes and he devised Hubble’s constant for calculating that rate. Hubble explained, “Equipped with five senses, man explores the universe around him and calls the adventure science.”

<i>Energy & Transportation</i>	<i>Russ Chadwick</i>	<i>James Prescott Joule</i>
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James Prescott Joule (1818 - 1889) was an English physicist, born in Sale, near Manchester. Joule studied the nature of heat, and discovered its relationship to mechanical work. This led to the theory of conservation of energy, which led to the development of the first law of thermodynamics. The SI unit of work, the Joule, is named after him. He worked with Lord Kelvin to develop the absolute scale of temperature, made observation on magnetostriction, and found the relationship between the flow of current through a resistance and the heat dissipated, now called Joule’s Law.

<i>Engineering</i>	<i>John Parker</i>	<i>Nicola Tesla</i>
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Nicola Tesla (1856 - 1943), a brilliant inventor, was born in Austria and migrated to the United States in 1884. Tesla pioneered the invention of the fluorescent light. AC induction motor, radio, various transformers, wireless communications, and alternating current power transmission. All of these inventions were critical to the modern industrial revolution, and are still in use today. Throughout his life, Tesla received more than 700 patents, along with the Edison Medal.

<i>Environmental Sciences</i>	<i>Laura Roberts</i>	<i>Rachel Louise Carson</i>
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Rachel Louise Carson (1907-1964) was an American writer and marine biologist. Her widely known books on sea life combined keen scientific observation with rich poetic description. Rachel Louise Carson’s book, *Silent Spring* is a provocative study of the dangers involved in the use of insecticides and is widely believed to have initiated the environmental movement in the United States.

Pioneers of Science Awards

Category	BOD Sponsor	Pioneer
<i>Environmental Sciences</i>	<i>Al Bedard</i>	<i>Rosalie Edge</i>
<p>Rosalie Edge (1877 - 1962) was a firebrand suffragette, who worked to secure women's right to vote. In the early 1900's, she used her advocacy skills to influence conservation organizations to protect and conserve wildlife and natural resources. The Audubon Society was one of her main targets because of its early reliance on gun manufacturers for financial support and its early support of unlimited hunting of predators. She appreciated raptors at a time when they were considered vermin and established the first preserve for raptors, Hawk Mountain in Pennsylvania. This woman, who learned to love birds in Central Park, became one of the most effective environmental activists in an era when women were not to engage in public controversy or challenge the establishment.</p>		
<i>Mathematics & Computer Sciences</i>	<i>Ryan Patterson</i>	<i>Grace Hopper</i>
<p>Grace Hopper (1902-1992) joined the Navy during WWII where she worked on the Navy's first modern computer. By the end of WWII she had published a 500 page manual for its use and was working on a successor. By 1953 she invented the compiler, a computer language, translating program. In 1955 she introduced FLOW-MATIC, the first business oriented programming language. Hopper returned to the Navy in 1967 to compile USA Standard COBOL, retiring from the Navy in 1986 with the rank of rear admiral. She was one of the most forward thinking computer programmers of her time.</p>		
<i>Medicine & Health</i>	<i>Bob Morrow</i>	<i>Greene Vardiman Black</i>
<p>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.</p>		
<i>Microbiology</i>	<i>Carol Morrow</i>	<i>John Edward Salk</i>
<p>Jonas Edward Salk (1914 - 1995) was an American microbiologist who was an authority on virus diseases. Jonas Edward Salk is best known for his development of the first polio vaccine. The <i>Salk vaccine</i> is made by cultivating three strains of the poliovirus separately in monkey tissue.</p>		
<i>Microbiology</i>	<i>Jody Oaks</i>	<i>Louis Pasteur</i>
<p>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 lead 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.</p>		
<i>Physics</i>	<i>Elemer Bernath</i>	<i>Max Planck</i>
<p>Max Planck (1858 – 1947), a theoretical professor of physics at the University of Berlin came from an ancient German family of great scholars, theologians and lawyers. Max Planck's curiosity about the laws of nature and thermodynamics led him to introduce a whole new realm of physics called quantum mechanics that would transform our understanding of the microscopic world of atoms and subatomic particles. Max Planck's research in thermodynamics evolved into the Quantum Theory for which he received the Nobel prize for physics in 1918.</p>		
<i>Physics</i>	<i>Keith Kasunic</i>	<i>Sir Isaac Newton</i>
<p>Sir Isaac Newton (4 January 1643 – 31 March 1727) was an English physicist, mathematician, astronomer, natural philosopher, and alchemist, regarded by many as the greatest figure in the history of science. He laid the groundwork for classical mechanics with his work on universal gravitation and the three laws of motion. He enunciated the principles of conservation of momentum and angular momentum, invented the reflecting telescope and shares credit with Gottfried Leibniz for the development of calculus. English poet Alexander Pope was moved by Newton's accomplishments to write the famous epitaph: <i>Nature and nature's laws lay hid in night; God said "let Newton be" and all was light.</i></p>		
<i>Plant Sciences</i>	<i>David Holm</i>	<i>Luther Burbank</i>
<p>Luther Burbank (1849 - 1926) was widely known as a horticulturist, botanist, and scientist. Luther only had an elementary education, but he was an avid reader. Luther 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.</p>		

Colorado Science and Engineering Fair

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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

2010 Intel ISEF Results

Grand Award Winners

- Jesse Ellison from Bayfield, CO won \$1,500 (2nd Place) in Electrical & Mechanical Engineering. Jesse took 2nd Place in Engineering at the 2010 CSEF.
- Tanya Petach from Boulder, CO won \$1,500 (2nd Place) in Earth & Planetary Sciences. Tanya took 3rd Place in Earth & Space Sciences at the 2010 CSEF.
- Ben Armstrong from Monte Vista, CO won \$1,000 (3rd Place) in Environmental Sciences. Ben took 1st Place in Environmental Sciences and was the 2nd Place Best Individual Project winner at the 2010 CSEF.
- Nikki Buhdorf from Austin, CO won \$1,000 (3rd Place) in Plant Sciences. Nikki took 1st Place in Plant Sciences and was the 1st Place Best Individual Project winner at the 2010 CSEF.
- Kelli Lynch from Fort Collins, CO won \$1,000 (3rd Place) in Microbiology. Kelli took 1st Place in Microbiology at the 2010 CSEF.
- Emily Schnoor from Alamosa, CO won \$1,000 (3rd Place) in Animal Sciences. Emily took 1st Place in Animal Sciences at the 2010 CSEF.
- Vikash Hypio from Hotchkiss, CO won \$500 (4th Place) in Behavioral & Social Sciences. Vikash took 1st Place in Behavioral & Social Sciences at the 2010 CSEF.
- John Parish IV from Colorado Springs, Co won \$500 (4th Place) in Electrical & Mechanical Engineering. John took 1st Place in Mathematics & Computer Sciences at the 2010 CSEF.
- Sara Volz from Colorado Springs, CO won \$500 (4th Place) in Energy & Transportation. Sara took 1st Place in Energy & Transportation at the 2010 CSEF.
- Tonya Pavlenko & Laura Gudvangen from Colorado Springs, CO won \$500 (4th Place) in the Team Category. Tonya and Laura were 1st Place Best Team Project winners at the 2010 CSEF.
- Kelly Christensen & Molly McMahon from Louisville, CO won \$500 (4th Place) in the Team Category.

Special & Governmental Award Winners

- Ben Armstrong from Monte Vista, CO won \$3,000 in savings bonds, a certificate and a gold medallion from the United States Army.
- Jesse Ellison from Bayfield, Co won a trip to visit CERN from the European Organization for Nuclear Research. Jesse also won \$500 (2nd Place) from the Society of Experimental Test Pilots.
- Kelli Lynch from Fort Collins, CO won \$500 (4th Place) from the American Society for Microbiology.
- John Parish IV from Colorado Springs, CO won a tuition scholarship of \$4,000 and a trip to the London International Youth Forum from the United States Navy & Marine Corps.
- Tanya Petach from Boulder, Co won \$250 (3rd Place) from the American Geological Institute. Tanya also won \$1,500 (1st Place) from the Association for Women Geoscientists.
- Radhika Rawat from Boulder, CO won a summer internship from Agilent Technologies. Radhika also won a certificate, a book on the endocrine system and a t-shirt (Honorable Mention) from the Endocrine Society.
- Diane Schulze from Denver, CO won \$500 (3rd Place) from the American Psychological Association.
- Emily Schnoor from Alamosa, CO won \$1,000 (2nd Place) from the States United for Biomedical Research.