



49th Annual
CSEF Awards Ceremony
April 9, 2004

Introductions and Welcome Ms. Courtney Butler, CSEF Director

Special Awards

Announcer..... Mr. John Parker, Lockheed Martin Space Systems Company

Agilent Technologies
 American Association of University Women
 American Chemical Society
 American Institute of Chemical Engineers
 American Vacuum Society
 American Water Works Association
 Analex Corporation
 ASM International
 Association for Women Geoscientists
 Colorado Association of Science Teachers
 Colorado Biology Teachers Association
 Colorado Dental Association
 Colorado Division of Wildlife
 Colorado Environmental Health Association
 Colorado Foundation for Agriculture
 Colorado Geological Survey/Division of Minerals & Geology
 Colorado Medical Society
 Colorado Mineral Society
 Colorado Mycological Society
 Colorado Scientific Society
 Colorado Sustainability Project
 Colorado Veterinary Medical Association
 CSU, Department of Biochemistry and Molecular Biology

CSU, Department of Chemistry
 CSU, Department of Horticulture and Landscape Architecture
 Fort Collins Soil Conservation District
 Kodak Colorado Division
 Lockheed Martin Space Systems Company
 National Geophysical Data Center
 National Renewable Energy Laboratory
 Optical Society of America
 Rocky Mountain Association of Geologists
 Rocky Mountain Inventors and Entrepreneurs Congress
 Rocky Mountain Water Environment Association
 Society of Manufacturing Engineers
 Society of Women Engineers
 Soil and Water Conservation Society
 Tektronix
 United State Air Force ROTC, Colorado State University
 United States Army
 United States Department of Commerce
 United States Navy and United States Marine Corps
 UCHSC Medical Scientist Training Program
 United States Geological Survey
 Yale University Science and Engineering Association
 Zonta Club of Boulder County

Grand Awards

Announcer..... Dr. Bonnie Hames, NREL

Presenter..... Mr. Al Bedard, President, Colorado State Science Fair, Inc.

Junior and Senior Division Individual Project Category Awards

Botany
 Chemistry
 Earth & Space Sciences

Engineering
 Environmental Sciences
 Health & Behavioral Sciences
 Mathematics & Computer Sciences

Microbiology
 Physics
 Zoology

Science Service Awards
 Poster Art Contest
 Student Choice Awards
 Ralph F. Desch Memorial Technical Writing Award

Scholarships

Adams State College..... Dr. Larry Sveum
 Colorado School of Mines Dr. David Holm
 University of Colorado Mr. Ryan Patterson
 The Ryan Patterson Scholarship Mr. Ryan Patterson

Team Project Nominations
 Junior and Senior Division Best Team Project Awards
 Junior and Senior Division Best Individual Project Awards
 Teacher of the Year Award

Colorado ISEF Finalist Presentation & Closing Remarks Ms. Courtney Butler

Special Award Organizations

Adams State College Foundation

A scholarship has been established by the Adams State College Foundation, Board of Directors. 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 and will be awarded to one student in each of the following Senior Division categories: Botany, Chemistry, Earth & Space Sciences, Engineering, Environmental Sciences, Health & Behavioral Sciences, Mathematics & Computer Sciences, Microbiology, Physics, and Zoology.

Agilent Technologies

Agilent Technologies manufactures electronics equipment for test and measurement, communications, life sciences, chemical analysis and other applications. Agilent has several sites within Colorado including Loveland, Ft. Collins, and Colorado Springs. Agilent is a major sponsor of the CSEF, ISEF and a variety of science education programs.

American Association of University Women

The American Association of University Women (AAUW) promotes equity for all women and girls, life-long education, and positive societal change. In principle and practice, the American Association of University Women values and seeks a diverse membership. There shall be no barriers to members to full participation in this organization on the basis of gender, race, creed, age, sexual orientation, or disability. The American Association of University women has been in existence for over a hundred years and is found worldwide. The Association's interest in presenting an award to girls in middle school in the fields of mathematics and science came about when our studies showed that girls were falling behind in these two fields.

American Chemical Society, Colorado Section

The Colorado Section of the American Chemical Society was founded 100 years ago. It is an organization of professional chemists and chemical engineers. One of the major aims of the American Chemical Society is to encourage and stimulate an interest in the chemical sciences in our young people.

American Institute of Chemical Engineers Rocky Mountain Section

The Rocky Mountain Section of the American Institute of Chemical Engineers contains nearly 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 Vacuum Society Rocky Mountain Chapter

The American Vacuum Society 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

The Rocky Mountain Section of the American Water Works Association (RMSAWWA) is a group of highly motivated water professionals that participate at a regional level to improve the quality and supply of drinking water. The Section includes the states of Colorado, Wyoming and New Mexico, and is part of a much larger organization (AWWA) which has over 50,000 members throughout the world. The Rocky Mountain Section of the American Water Works Association strives to be the pre-eminent resource for education, training, information, and research for the water industry in the Rocky Mountain region. The Rocky Mountain Section of the American Water Works Association, Research Committee, is proud to be part of the Colorado Science and Engineering Fair.

Analex Corporation

Analex Corporation designs, develops, and tests aerospace and medical products and systems, analyzes and supports defense systems, and develops medical defenses and treatments for toxic agents used in biological warfare. For almost twenty years, the Colorado division has supported the successful development and operation of launch vehicles that place critical communications satellites in orbit for military and government use. Today, the division also provides advanced software engineering support to highly technical medical device programs. An award certificate and \$100.00 are presented by Analex to the individual who most clearly demonstrates an understanding of good software development methodologies.

ASM International, Rocky Mountain Chapter

ASM International is a professional society of materials scientists and engineers, who design, develop, produce, apply and manufacture products and systems with engineering materials such as metals, plastics, ceramics, semi-conductors, etc. ASM International distributes materials information to society members. ASM International was formed during the 1920's as an outgrowth of the Heat Treating Society. The Rocky Mountain Chapter was founded in 1941 and has over 450 members.

Special Award Organizations

Association for Women Geoscientists Denver Chapter

The goals of the Association for Women Geoscientists, Denver 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 Association for Women Geoscientists, Denver Chapter, awards a \$50 check and rock sample for the best Senior and Junior Earth Science Project by a female student.

Colorado Association of Science Teachers

The Colorado Association of Science Teachers represents educators from elementary and secondary schools, colleges, and universities. Members of the Colorado Association of Science Teachers are dedicated to the superior teaching of science. The awards presented by the Colorado Association are given on the basis of the teaching value of the exhibit display to the general public. Two awards are given in both the Junior and Senior Divisions in recognition of those who show excellence in the use of the scientific method.

Colorado Biology Teacher's 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 Convention 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 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 participants whose exhibits best relate to dental technology.

Colorado Division of Wildlife

The mission of the Colorado Division of Wildlife is to perpetuate the wildlife resources of the state and to provide people the opportunity to enjoy them. We manage the state's 960 wildlife species. The Division regulates hunting and fishing activities by issuing licenses and enforcing regulations. We also manage more than 230 wildlife areas for public recreation, conduct research to improve wildlife management activities, provide technical assistance to private and other public landowners concerning wildlife and habitat management, and develop programs to protect and recover threatened and endangered species. We provide wildlife recreation opportunities for residents and visitors, including hunting, fishing and wildlife viewing.

Colorado Environmental Health Association

The Colorado Environmental Health Association (CEHA) is a non-profit professional organization that has 300 members comprised of local and state health department professionals and industry representatives. CEHA is an educational structured association which provides scholarships, one-day workshops and the Annual Educational Conference to educate and inform people with an interest or career in environmental health as well as to build contacts, exchange information and discover new and practical solutions to environmental health issues. Issues relating to Environmental Health include onsite wastewater treatment, food borne illness, drinking water, zoonosis diseases (plague, encephalitis, rabies and tularemia), bioterrorism, air quality, and disease prevention in childcare, hazardous waste and environmental planning.

Colorado Foundation for Agriculture "Agriculture in the Classroom"

The "Agriculture in the Classroom" Task Force was organized in 1983 at the national level. The purpose is to bring to focus the role of agriculture in the lives of all of us through educational programs. The Colorado "Task Force" chapter has been busy providing information on agriculture to grade school, middle school and high school teachers. To this end, the "Agriculture in the Classroom" Task Force gives Special Awards at the Colorado Science and Engineering Fair for the best exhibits related to agricultural sciences in both the Junior and Senior Divisions.

Colorado Geological Survey & Division of Minerals and Geology

The Colorado Geological Survey serves and informs the people of Colorado by providing sound geologic information and evaluation and educates the public about the important role of earth sciences in everyday life in Colorado. The Colorado Geological Survey presents awards for the best Earth Science exhibit in both the Junior and Senior Divisions. We congratulate all the students who participated in this year's Colorado Science and Engineering Fair, and encourage you all to continue your studies in science and engineering.

Special Award Organizations

Colorado Medical Society

The Colorado Medical Society is a 133-year-old professional society of 5,500 physician members dedicated to providing excellence in healthcare to all Coloradoans. The Colorado Medical Society Educational 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 Colorado Science and Engineering Fair. The Colorado Medical Society Education Foundation presents awards to winners in both the Senior and Junior Divisions for the best projects in Health and Behavioral sciences. Also, the winners are invited to exhibit their projects at the Annual meeting of the Colorado Medical Society and to attend the Presidential Inaugural Dinner with paid overnight stay.

Colorado Mineral Society

The Colorado Mineral Society is the only private organization that has presented Special Awards during the entire 48-year history of the Colorado State Science and Engineering Fair. The Colorado Mineral Society is an educational society of professionals and amateurs with an interest in the earth sciences.

Colorado Mycological Society

The Colorado Mycological Society was founded in 1966 to stimulate interest in and advance the understanding of the field of mycology. The Society's major emphasis is the study of wild mushrooms. The Colorado Mycological Society presents a Special Award for the best Project relating to fungi.

Colorado School of Mines

The Colorado School of Mines together with the CSM Alumni Association in making available a total of five scholarships for Colorado Science and Engineering Fair winners in five specified categories for high school seniors who graduated in May 2003. These scholarships are for full-resident tuition for four years. These specified categories are Earth & Space Science, Engineering, Mathematics and Computer Science, Physical Science and Environmental Science.

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 the Earth Sciences.

Colorado Veterinary Medical Association

The Colorado Veterinary Medical Association 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 1,600 professional representing clinical practice, public health, academia, industry and military. Special awards are presented at the Colorado Science and Engineering Fair for the best Junior and Senior Division projects related to the Veterinary Medical profession.

Department of Chemistry, CSU

The faculty of the Department of Chemistry at Colorado State University is committed to excellence in chemical education and research. In that spirit, the department of Chemistry wishes to recognize excellence in chemistry research by presenting awards to the two individuals, one from the Senior Division and one from the Junior Division, judged to have represented the best exhibits in the area of chemistry.

Department of Biochemistry and Molecular Biology, CSU

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, your 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. Dedicated modern laboratories with state-of-the-art instrumentation ensure that our students receive the best possible training. More than 25% of the 180 biochemistry majors are participants in the university honors program, the largest representation from any major. Most of our majors engage in independent research projects under the guidance of one of our 13 faculty members. 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.

Special Award Organizations

Department of Horticulture and Landscape Architecture, CSU

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 turf grass. The major requires a strong grounding in botany, chemistry, horticulture and business. There are five concentrations in the horticulture major – floriculture, horticulture, business management, horticulture food crops and horticulture science. The Department of Horticulture and Landscape Architecture awards prizes to the best horticulture related projects in both the Junior and Senior Divisions of the Botany category.

Fort Collins Conservation District

The Fort Collins Conservation District was formed in 1945, along with many Districts across Colorado and the United States, to assist landowners heal the scars of the Dust Bowl days. The Districts 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. The Fort Collins Conservation District gives awards to the best exhibit in Junior and Senior Divisions with a soil or water conservation theme.

Kodak Colorado Division

The Eastman Kodak Company, a sponsor of the Colorado Science and Engineering Fair, contributes from its Colorado Division and Corporate Division to award students who make the most effective use of photography in a Science Fair project in both Senior and Junior Divisions. The project itself need not be concerned directly with the science of photography.

Lockheed Martin

Headquartered in Bethesda, Maryland, Lockheed Martin employs about 130,000 people worldwide and is principally engaged in the research, design, development, manufacture and integration of advanced technology systems, products and services. The Corporation reported 2003 sales of \$31.8 billion. Lockheed Martin Space Systems Company, headquartered near Denver, CO, 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 include space launch systems, defense systems, interplanetary and science spacecraft, spacecraft for commercial and government customers, fleet ballistic missiles and missile defense systems.

National Geophysical Data Center

The National Geophysical Data Center is a Federal Agency in charge of managing and distributing data related to the earth's physical environment. Every day, organizations throughout the world produce large volumes of data from observations of the solid earth, ocean, atmosphere and sun. The National Geophysical Data Center, which is part of the National Oceanic and Atmospheric Administration (NOAA), brings order and ingenuity to the work of managing and distributing this great mass of data to the researchers that use it.

National Renewable Energy Laboratory

The National Renewable Energy Laboratory (NREL), located in Golden, Colorado is a contractor-operated national laboratory owned by the U.S. Department of Energy. The laboratory is managed by the Midwest Research Institute (MRI), Battelle, and Bechtel. The laboratory is a leading center for research into photovoltaics, wind energy, plant-and waste-derived fuels and chemicals, energy-efficient buildings, advanced vehicle design, geothermal energy and hydrogen fuel cells. The National Renewable Energy Laboratory develops renewable energy and energy efficiency technologies and practices, advances related science and engineering, and transfers knowledge and innovations to address the nation's energy and environmental goals.

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 along the Front Range. For our meeting schedule and other information, please check our website at <http://www.osa.org/localsections/rmosa/>.

Rocky Mountain Association of Geologists

The Rocky Mountain Association of Geologists is a non-profit organization whose purposes are to promote interest in geology and allied sciences and their practical applications, to foster scientific research, and to encourage fellowship and cooperation among its members. Founded in 1922, 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. The Rocky Mountain Association of Geologists supports professional exchange and education through sponsorship of events, publications, training, and seminars. The Rocky Mountain Association of Geologists publishes a monthly newsletter, the Outcrop; a quarterly scientific journal, The Mountain Geologist; and regular guidebooks on a variety of subjects.

Special Award Organizations

Rocky Mountain Inventors and Entrepreneurs Congress

The Rocky Mountain Inventors and Entrepreneurs Congress is a Colorado non-profit corporation organized in 1978. It is dedicated to the education, professional growth, and success of people involved in all aspects of the innovation process. The Rocky Mountain Inventors and Entrepreneurs Congress presents awards for two Senior and one Junior Division exhibits for outstanding innovations and educational applications.

Rocky Mountain Water Environment Association

The Rocky Mountain Water Environment Association is pleased to provide awards for science and engineering projects completed on water quality subjects, particularly water quality monitoring, water pollution, and water and wastewater treatment. The Rocky Mountain Water Environment Association is affiliated with the Water Environment Federation recognized as the worldwide organization dedicated to the preservation and enhancement of the global water environment.

Society of Manufacturing Engineers Chapter 354, Electro-Mechanical

The Society of Manufacturing Engineers 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 or supporting manufacturing. Chapter 354, Electro-mechanical, emphasizes electrical and electronics and mechanical manufacturing.

To this purpose, SME, Chapter 354 presents US Savings Bonds to the Senior and Junior Division exhibitors whose exhibits best exemplify manufacturing principles.

Society of Women Engineers

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. To learn more about SWE go to www.societyofwomenengineers.org.

Soil and Water Conservation Society Colorado Chapter

The Soil and Water Conservation Society (SWCS) is dedicated to advancing the science and art of good land and water use world-wide to the end that soil, water, air, wildlife and vegetation in abundance may be used and enjoyed by all mankind.

Tektronix

Tektronix manufactures a variety of test and measurement equipment including oscilloscopes. Tektronix is presenting this award of a 4-channel digital oscilloscope to the Sr. Division project showing the best use of electrical/electronic measurement. Tektronix hopes that this oscilloscope will be useful in the student's future projects and studies.

United States Air Force ROTC

Air Force ROTC provides motivation, leadership development, training, education and recruiting for the world's greatest air and space force. With over 17,500 cadets nationwide, Air Force ROTC shapes the leaders of tomorrow and provide top-notch support to the technological advances and development in support of the defense of our nation. Detachment 90 has over 200 of the finest cadets in one of top ten largest detachments in the nation. They proudly recognize the efforts and creativity of all young Americans and encourage them to pursue careers in scientific disciplines, which promote personal growth and development.

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 2004 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. The categories the U.S. Army has recognized are Engineering, Earth and Environmental Sciences, Health and Behavioral Sciences, Mathematics and Computer Science and Physical Sciences in the Senior Division. The winners in each of the 5 categories will receive a certificate of achievement with a presentation folder. Four of the five category winners will each receive a \$50 U.S. savings bond. The most outstanding of the five will receive a \$100 U.S. savings bond and the Army's silver medallion for science/engineering excellence.

Special Award Organizations

United States Department of Commerce

The U.S. 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 major sponsorship of the Colorado Science and Engineering Fair. The Department 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 United States Geological Survey (USGS) is a science research organization established by Congress in 1879 and is responsible for providing the nation with reliable and impartial research of the earth science problems relevant to society. The United States Geological Survey is organized into four Divisions including geologic, water resources, mapping, and biological resources. There are over 300 USGS field offices. The USGS produces geologic and topographic maps, databases, and research reports of earth sciences, all of which are available to the general public.

The United States Geological Survey will be presenting one Special Award to each Division for earth science projects relating to geological, hydrological, biological or environmental studies.

United States Navy and Marine Corps

The Office of Naval Research has relentlessly pursued 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.

University of Colorado, Health Sciences Center Medical Scientist Training Program

At the University of Colorado School of Medicine, the Medical Scientist Training Program (MSTP) is a seven to eighth year program for highly motivated students interested in a career in academic medicine. Our program excels in preparing students for such career by having students complete a Medical Degree (M.D.) and a Doctorate in Philosophy (Ph.D.). This program in the biomedical sciences combines graduate training in basic research skills with outstanding clinical preparation. To learn more about our program, please check us out on the web at <http://www.uchsc.edu/ssm/mstp/>. Our program will award a certificate and a \$50 check to each of the top two biomedical science projects.

Yale University Science and Engineering Association

Yale University in an outstanding educator in the sciences and engineering. The Yale Science and Engineering Award is given to a 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. The list of winners is forwarded to the Yale Admissions Office.

Zonta Club of Boulder County

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

The Amelia Earhart Award is presented to a young women in Junior High School for the best aerospace-engineering related exhibit.