Forty-seventh Annual

Colorado Science and Engineering Fair

Science is Life

Colorado Science and Engineering Fair
Colorado Students Grade 6 - 12
April 11 - 13, 2002
Colorado State University Lory Student Center

CSEF 2002
April 11 - 13
Lory Student Center
Colorado State University
Fort Collins, Colorado
THURSDAY, APRIL 11, 2002

8:30 - 9:00 AM  Photography and Display & Safety Committee Meetings:  Main Ballroom
9:00 - 11:00 AM  **FINALIST CHECK-IN:**  Exhibit Areas Open for Set-Up.

*Finalists MUST stay with exhibit until Exhibit Safety Check-Off Sheet is signed by a Display & Safety Committee Member and an Official Photo has been taken.  Finalists must be out of the Exhibit Areas by noon.*

10:30 - 11:00 AM  Grand Awards Judge Captain's Briefing:  Cherokee Park Room
11:00 - 11:30 AM  Grand Awards Judge's Briefing:  Cherokee Park Room
11:30 AM - 12:30 PM  Grand Awards Judge's Luncheon:  North Ballroom
12:30 - 1:00 PM  Special Awards Judge's Briefing:  Room 228
12:00 - 5:00 PM  **JUDGING**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
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<tbody>
<tr>
<td>12:00 - 1:00 PM</td>
<td>Grand Awards Judges only in exhibit areas.</td>
</tr>
<tr>
<td>1:00 - 2:00 PM</td>
<td>Special Awards Judges may enter exhibit areas.  <strong>Judges only</strong> in exhibit areas.</td>
</tr>
<tr>
<td>2:00 - 5:00 PM</td>
<td>Students must be at their exhibits for interviews.</td>
</tr>
<tr>
<td>5:30 PM</td>
<td>EXHIBIT AREAS ARE LOCKED:  Final Grand Awards Judging continues</td>
</tr>
</tbody>
</table>

No one else is permitted in the exhibit areas at this time.

1:45 - 2:00 PM  **Finalist Orientation Meeting:**  CSU Theatre -- *Mandatory for all exhibitors.*
2:00 - 5:00 PM  Parent/Teacher/Sponsor's Lounge:  Refreshments in Room 203/205
2:00 - 4:00 PM  Regional Fair Director's Meeting:  Room 224/226
4:00 PM        **All ISEF Adult Delegates Meeting:**  Room 224/226

FRIDAY, APRIL 12, 2002

9:00 AM - 5:00 PM  **CSEF OPEN TO PUBLIC:**  Main Ballroom

9:00 - 9:50 AM  **Guest Speaker:**  Dr. Carl Wieman, 2001 Nobel Laureate:  CSU Theatre
10:00 AM - 4:00 PM  **Special Presentation:**  Ryan Patterson, the 2001 CSEF and ISEF winner will be giving a special presentation on his award winning project and highlights of his exciting year.  Room 230 LSC
10:30 AM – 11:30 AM  **Tours:**  Students, their sponsors, family, and judges are invited to participate in the tours by pre-registering on Thursday morning.
7:00 PM  **AWARDS CEREMONY:**  Thompson Valley High School

SATURDAY, APRIL 13, 2002

8:00 – 9:00 AM  Intel/ISEF trip winners and teachers must meet with CSEF Director to go over paperwork and travel arrangements:  2nd Floor Lobby LSC
9:00 - 11:00 AM  **CSEF OPEN TO PUBLIC:**  *Finalists must be at their exhibits.*
9:00 - 11:00 AM  **Advisory Council Meeting:**  Room 224/226

**PIZZA PARTY:**  North Ballroom

11:00 AM - 12:00 PM  Sponsored by *Dominoes of Fort Collins* for finalists, their sponsors and families.  **Finalists must be present to win door prizes!**
12:30 - 2:00 PM  CSSF, Inc. Board of Director's Meeting:  Room 224/226
12:00 - 2:00 PM  **Exhibit Dismantling:**  *Everything must be removed by 2:00 PM.*

**Upcoming Intel/International Science and Engineering Fair, Louisville, KY, May 12 - 18, 2002.**
**NEXT YEAR'S COLORADO SCEINCE AND ENGINEERING FAIR:**  **APRIL 10 - 12, 2003.**
Welcome to the Colorado Science and Engineering Fair

On behalf of the Colorado State Science Fair, Inc. Board of Directors and Colorado State University, I'd like to welcome all of you - students, parents, educators, and volunteers - to the 47th annual Colorado Science and Engineering Fair.

As they say, practice makes perfect. This is my third year as CSEF Director. I know CSEF isn't perfect yet, but I am striving each year to make changes that make sense and are in the best interest of the students who work very hard to make it as finalists at the state science fair. I am hoping that those students, parents, and teachers who may have suggestions, will feel comfortable in expressing those ideas either to me, one of the advisory council and/or board of directors members.

Of course, the Colorado Science and Engineering Fair is not a one person show. It would not be possible to hold the science fair if it were not for all those involved - the students who do the research and put together the exhibits; the parents and educators who encourage and sponsor the students throughout the whole process; the volunteers who spend many hours helping set up the fair and aid the students when they arrive on campus; and the financial and resource contributors who donate the money and supplies that allow us to put together such a wonderful event. Please take the time to view the lists of these different groups of people that are mentioned in this program and make a point to thank them if the opportunity arises.

If you've taken part in CSEF in previous years, you already know that every year this fair exhibits the projects of over 250 scientifically talented youth from twelve regions around Colorado. If the CSEF experience is new to you, you may not be aware that in addition to the Grand Awards, there are special awards given by professional organizations, governmental agencies, and industries for exhibits that best represent their particular emphasis or philosophies. The top two winners in the Senior Division, at the state level are awarded a trip to compete in the Intel International Science and Engineering Fair held in Louisville, KY May 12 - 18, 2002.

The dedication displayed by Colorado Science and Engineering Fair participants is commendable. Each exhibitor is already a winner, having successfully initiated and completed their outstanding research projects, and winning the opportunity to represent their region at the state level. We celebrate the success of all these students and applaud their parents and teachers for their enthusiastic support. From start to finish, and at all levels of participation, the science and engineering fair experience is one of not only competition, but also of camaraderie, creativity and education. Well done, participants!

The unsung heroes of the Science and Engineering Fair are the volunteers who make this event possible. There are those who serve on the Colorado Science and Engineering Fair Advisory Council and its numerous working committees. They and other volunteers from the scientific community serve as fair judges. Prior to the state fair, there are thirteen regional fairs, and a large number of school fairs that are conducted through the voluntary efforts of educators in our state.

So take pride in the Colorado Science and Engineering Fair and your part in it. Thanks to each and every one of you. Your involvement shows your support for the scientific development of our youth. Congratulations to all of the participants and may you continue to succeed in all of your endeavors.

Sincerely,

Courtney Butler
CSEF Director
The Colorado State Science Fair, Inc. is an independent, nonprofit organization. For this reason, CSSF, Inc. is totally dependent on the generous financial and resource support of those private businesses, organizations, and individuals that provide prize money, the ISEF trip, and cover fair expenses.

There are several levels of financial participation in the CSSF, Inc. Contributors provide financial support up to $500. Fair Sponsors provide $500 or more to financially support the CSEF, and are invited to provide up to two volunteers to serve on the CSSF, Inc. Board of Directors. These dedicated board members represent the non-profit corporation and set fair policy. They are part of the overall Advisory Council that provides the volunteer staff and working committees that produce this valuable event.

**PLATINUM SPONSORS** provide $2500 or more in support, and up to two dedicated volunteers to serve on the CSSF, Inc. Board of Directors.

**GOLD SPONSORS** provide from $1000 to $2500 in support, and up to two dedicated volunteers to serve on the CSSF, Inc. Board of Directors.

**SILVER SPONSORS** provide from $750 to $1000 in support, and up to two dedicated volunteers to serve on the CSSF, Inc. Board of Directors.

**REGULAR SPONSORS** provide from $500 to $750 in support, and up to two dedicated volunteers to serve on the CSSF, Inc. Board of Directors.

**CONTRIBUTORS** provide financial support up to $500.
Colorado Science and Engineering Fair
Financial Contributors
The thanks of everyone who participates in science fair goes to these private organizations, corporations, government agencies, universities, and individuals that encourage Colorado's young scientists, engineers, and mathematicians through their generous support of the CSEF.

Platinum Sponsors
Colorado State University – Office of the Provost & College of Engineering
Hach Scientific Foundation

Gold Sponsors
Agilent Technologies
Ball Corporation
Colorado Medical Society Education Foundation
Kodak Colorado Division
LSI Logic
Seagate Technology
US Department of Commerce/NTIA
Anheuser-Busch, Inc.
Colorado Dental Association
Dominoes of Fort Collins
Lockheed Martin
Safe Sites of Colorado, LLC
StorageTek Foundation

Silver Sponsors
US Department of Commerce/NIST

Regular Sponsors
Amgen
Colorado Engineering Council
Hewlett-Packard Company
Norgren
Washington Group International
Denver Chapter of the IEEE Lasers and Electro-Optics Society
National Renewable Energy Laboratory/Midwest Research Institute/Battelle/Bechtel
Reid & Helen Cameron
Forest Oil Corporation
Kaiser-Hill Company
San Luis Valley Regional Science Fair, Inc.
US Department of Commerce/NOAA
CSU - Center for Science, Mathematics & Technology Education
University of Colorado – College of Engineering & Applied Science

Contributors
Ed & Lucy Adams
Dan & Carole Blake
Denver Nuggets
King Soopers
Sigma Xi – CSU Chapter
Tracy Teyler Memorial
Walmart
Xcel Energy Foundation – Dollars for Doing Program
Albertson’s
Book Center of the Rockies
Gina Holland
Robert & Dolly Morrow
Target
URS Corporation
Xcel Energy Foundation – Matching Gifts Program

And many federal employees contributed through the Combined Federal Campaign.
Colorado Science and Engineering Fair
Volunteers

The following list of people deserve our most sincere thanks for volunteering their time to do a variety of jobs during the fair. When you see a person wearing a green “Volunteer” name badge, please take a moment to thank them for their efforts. The Colorado Science and Engineering Fair would not be possible without their dedication.

Kerry Adams  Lucy Adams  Ray Alvarado
Amanda Baker  Sam Bartlett  Al Bedard
Elemer Bernath  Michael Blenden  Peggy Blenden
Tim Butler  Helen Cameron  Ried Cameron
Rachel Cannon  Jean Carpenter  Brad Charles
Paul Cheng  Dave Clark  Alison Cofer
Erin Comstock  Kevin Comstock  Erin Crosthwait
Nathan Davidson  Carol Denning  Kristen Emmons
Phil Friedman  Nancy Gettman  Colby Gooding
Don Gooding  Eileene Gooding  Daphne Grant
Joel Gray  Bonnie Hames  Jeanne Hoag
Gina Holland  David Holm  Jeni Jack
Larry Jakel  Charles Johnson  Jerry Johnson
Mark Kao  Myayyad Karadadsheh  Krystal Kramer
Terri Lira  Eddie Lobato  Paul Lukosi
Sharon Manley  Jeff McClain  Audrey McConnell
John McConnell  Robert Morrow  Teresa Norick
Meg O’Meara  Amy Oaks  Jody Oaks
Jackie Pacheco  John Parker  Randy Patterson
Sherry Patterson  Kim Poore  Stacey Potts
Judy Prester  Katie Propst  Keri Propst
Brianne Rael  Jesse Ramirez  Kelly Reed
Sonja Ringen  Ashley Ross  Pat Ryan
Deanna Schrock  Zeke Sisneros  Jim Sites
Ty Smith  Gina Solanyk  Robin Staker
Jim Stevens  Doug Steward  Harvey Teyler
Tom Tichy  Rachel Torgerson  Laura Ussery
Dan Van Gorp  Amy Weich  Erin Wilkinson
Gary Wilson  Amber Wolf  Tricia Wright
What To Do At The CSEF!

Many educational experiences are available to participants of CSEF, including tours of Colorado State University and local corporate research facilities. This series of tours, both on and off campus, gives students, their sponsors and families an opportunity to see research in action.

Purchase tour tickets during Thursday's registration at the Tour Table in Room 224/226 of the Lory Student Center from 9 – 11 AM. Some tours fill up early so stop by the Tour Ticket Sales room as soon as possible.

Friday, April 12th

Tours such as the CSU Campus Nature Walk

Thursday, April 11th

Thursday, April 11th

Judging

Friday, April 12th

Awards Ceremony

Friday, April 12th

Project Set-Up

Saturday, April 13th

Dominoes of Fort Collins generously sponsors the CSEF Pizza Party as a final celebration for exhibitors, teachers and parents.

Door Prize Donors:
Black Canyon National Park
Center for Science, Mathematics & Technology Education
College of Natural Sciences Dean's Office
Colorado Geological Survey
Colorado State University Bookstore
Finest CD’s-Tapes-LP’s
Great Sand Dunes
Mesa Verde Museum Association, Inc.
National Geophysical Data Center
Vectra Bank of Alamosa
Walrus Ice Cream Company

Finalists MUST be present to win door prizes.

2001 Senior Division
All Fair Winner
Ryan Patterson
Guest Speaker
Dr. Carl Wieman - Nobel Laureate

Dr. Carl Wieman with Dr. Eric Cornell

Bose-Einstein Condensation:
Quantum weirdness at the lowest temperature in the universe.

Carl Wieman is a Distinguished Professor of Physics at the University of Colorado in Boulder, Colorado. He is also a Fellow of JILA, an institute operated jointly by the University of Colorado and the National Institute of Standards and Technology.

Dr. Wieman was born on March 26, 1951 in Corvallis, Oregon. He spent most of his youth deep in the forests of the coastal mountains of Oregon. He left there to attend the Massachusetts Institute of Technology, graduating with a Bachelor of Science degree in 1973. He received his Ph.D. from Stanford University in 1977 and an honorary doctorate from the University of Chicago in 1997.

Wieman became interested in cooling and trapping atoms using laser light in the 1980s and pioneered the use of inexpensive semiconductor diode lasers, the type used in compact disc players, for this purpose. In 1988, his group cooled atoms to 100 millionths of a degree above absolute zero, the coldest temperature ever achieved.

In the late 1980's, Wieman began to investigate the basic processes that limited the temperature to which atoms could be cooled. That program of research evolved into a collaboration with Eric Cornell in 1990 to create a new form of matter proposed by Einstein known as Bose-Einstein condensation (BEC). They and their students carried out extensive development of novel cooling techniques that allowed them to cool atoms to a few billionths of a degree above absolute zero. This resulted in the first Bose-Einstein condensate in 1995. BEC research has now become a major international field of physics research. Currently Wieman is studying the properties of this bizarre and novel form of matter.

Professor Wieman has also carried out other research on laser spectroscopy of atoms, most notably on the measurement of the tiny lack of mirror reversal symmetry ("parity violation") in atoms. This work resulted in "table-top" experiments that probe the fundamental forces of nature in ways that are competitive with those carried out at the largest particle accelerators.

Dr. Wieman's work has been recognized by many awards, including the DOE Lawrence Prize in Physics, the Davisson-Germer Prize in Atomic Physics of the American Physical society, the F. London Prize for Low Temperature Physics, the Schawlow Prize for Laser Science, the Lorentz medal of the Netherlands Royal Academy, the Richtmyer award of the American Association of Physics Teachers, the King Faisal International Prize in Science, and the Benjamin Franklin Medal in Physics. He has been elected to the National Academy of Sciences and the American Academy of Arts and Sciences.

In addition to his research activities, Wieman has been involved in innovations in science education, and has given many presentations to high school classes and general audiences. Currently he is a member of the National Task Force on Undergraduate Physics Revitalization. He is also a member of the National Academy of Sciences Board on Physics and Astronomy.
## 2002 Colorado Science and Engineering Fair Tours

**Friday, April 12, 2002**

### Morning Tours

<table>
<thead>
<tr>
<th>Morning Tours</th>
<th>Cost</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A  CSU – CHILL Radar Facility</td>
<td>$1.00</td>
<td>11</td>
</tr>
<tr>
<td>Leaves at 10:00 AM from Room 205 LSC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arrives back at CSU about 12:30 PM</td>
<td></td>
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</tr>
<tr>
<td>2A  Heska Corporation</td>
<td>$1.00</td>
<td>11</td>
</tr>
<tr>
<td>Leaves at 10:15 AM from Room 228 LSC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arrives back at CSU about 11:45 AM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3A  CSU – Anatomy/Physiology Lab</td>
<td>$0.50</td>
<td>30</td>
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<tr>
<td>(Senior Division Student Tour ONLY)</td>
<td></td>
<td></td>
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<tr>
<td>Leaves at 10:00 AM from Room 203 LSC</td>
<td></td>
<td></td>
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<tr>
<td>Tour is from 10:05 AM – 11:00 AM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4A  CSU Electron Microscopy Center</td>
<td>$0.50</td>
<td>10</td>
</tr>
<tr>
<td>Leaves at 10:15 AM from Room 205 LSC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tour is from 10:20 AM – 11:20 AM</td>
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<tr>
<td>5A  National Center for Genetic Resources Preservation</td>
<td>$0.50</td>
<td>15</td>
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<tr>
<td>Leaves at 10:15 AM from Room 203 LSC</td>
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</tr>
<tr>
<td>Tour is from 10:20 AM – 11:20 AM</td>
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<tr>
<td>6  CSU – College of Engineering</td>
<td>$0.50</td>
<td>25</td>
</tr>
<tr>
<td>Leaves at 10:30 AM from Room 203 LSC</td>
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<tr>
<td>Tour is from 10:35 AM – 11:35 AM</td>
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<tr>
<td>7A  Atrix Laboratories</td>
<td>$1.00</td>
<td>11</td>
</tr>
<tr>
<td>Leaves at 10:15 AM from Room 230 LSC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arrives back at CSU about 11:45 AM</td>
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</tr>
<tr>
<td>8A  CIRA</td>
<td>$1.00</td>
<td>11</td>
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<tr>
<td>(Junior Division Student Tour ONLY)</td>
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<tr>
<td>Leaves at 10:00 AM from Room 230 LSC</td>
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<td></td>
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<tr>
<td>Arrives back at CSU about 12:00 Noon</td>
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</tr>
<tr>
<td>10A CSU Engineering Research Center</td>
<td>$1.00</td>
<td>11</td>
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<tr>
<td>Leaves at 10:00 AM from Room 228 LSC</td>
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<tr>
<td>Arrives back at CSU about 12:00 Noon AM</td>
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<tr>
<td>11A Forensic Sciences</td>
<td>$0.50</td>
<td>30</td>
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<tr>
<td>Meets at 11:00 AM in Room 228 LSC</td>
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<tr>
<td>Presentation is from 11:00 AM – 12:00 PM</td>
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<tr>
<td>12 CSU Campus Nature Walk</td>
<td>$0.50</td>
<td>30</td>
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<tr>
<td>Meets at 10:30 AM in Room 228 LSC</td>
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<tr>
<td>Tour is from 10:30 AM – 12:00 PM</td>
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### Afternoon Tours

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<tr>
<th>Afternoon Tours</th>
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<tr>
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<tr>
<td>Tour is from 1:05 PM – 2:00 PM</td>
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<tr>
<td>4B  CSU – Electron Microscopy Center</td>
<td>$0.50</td>
<td>10</td>
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<td>Leaves at 1:15 PM from Room 205 LSC</td>
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<tr>
<td>Tour is from 1:20 PM – 2:20 PM</td>
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<tr>
<td>5B  National Center for Genetic Resources Preservation</td>
<td>$0.50</td>
<td>15</td>
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<tr>
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</tr>
<tr>
<td>7B  Atrix Laboratories</td>
<td>$1.00</td>
<td>11</td>
</tr>
<tr>
<td>Leaves at 1:15 PM from Room 230 LSC</td>
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<td></td>
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<tr>
<td>Arrives back at CSU about 2:45 PM</td>
<td></td>
<td></td>
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<tr>
<td>8B  CIRA</td>
<td>$1.00</td>
<td>11</td>
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<tr>
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</tr>
<tr>
<td>11B Forensic Sciences</td>
<td>$0.50</td>
<td>30</td>
</tr>
<tr>
<td>Meets at 2:00 PM in Room 228 LSC</td>
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<tr>
<td>Presentation is from 2:00 PM – 3:00 PM</td>
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<tr>
<td>13 Geologic History of the Front Range</td>
<td>$0.50</td>
<td>20</td>
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<tr>
<td>Tour is from 1:30 PM – 2:30 PM</td>
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</tbody>
</table>

### Special Presentation

Ryan Patterson  
Friday, April 13th 10:30 – 11:30 AM  
Room 230 Lory Student Center

Ryan Patterson is the Intel/ISEF 2001 top winner from Grand Junction, Colorado. Ryan will give a presentation on his award winning project (The Sign Translator) and give an account of his adventures this past year. CSEF Finalists are encouraged to visit with Ryan and learn from his accomplishments on how science fair projects can lead to great opportunities.

### Fort Collins Area Self-Guided Tours!

There are lots of interesting things to do and see while you are visiting the Fort Collins area. These attractions include historical sites, sculpture gardens, the Swetsville Zoo and museums. For more information, please check out the Fort Collins Visitor’s guide provided by the Fort Collins Visitor’s Bureau. These guides are available to you at the tour ticket sales desk or the CSEF Headquarters.
Options:

**Option 1**
From I-25, take either the Highway 402 exit or the Highway 34 exit and head west toward Loveland.
Turn onto North Taft Avenue (right from Highway 402 or left from Highway 34).
Take North Taft Avenue until you reach Carlisle Drive.

**Option 2**
From Fort Collins, take Shields Street (this road turns into Taft Avenue in Loveland) past 1st Street to Carlisle Drive.
From Elizabeth Street in Fort Collins to Carlisle Drive in Loveland, it is approximately 13 miles.

**For both Option 1 & 2**
Carlisle and Taft is the first traffic light intersection past 1st with Hewlett Packard and open fields off to the East.
Turn West onto Carlisle until reaching Eagle Drive. This will be the third right.
Eagle Drive will curve around until you are heading west again and Thompson Valley High School will be to the north.
You may park in the lot that is on the east side of the building and enter the on that side.
Signs inside will direct you to the auditorium.

If you would like specific directions from your location, visit [http://www.mapquest.com/directions/](http://www.mapquest.com/directions/) and enter Thompson Valley High School’s address as 1669 Eagle Drive Loveland, CO.
2002 CSEF Awards Ceremony  
Friday, April 12, 2002 - 7:00 PM

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

Special Awards Announcer .................................................................Mr. Kelly Reed, Monte Vista High School

Air and Waste Management Association, Rocky Mountain States Section
American Institute of Chemical Engineers, Rocky Mountain Section
American Vacuum Society, Rocky Mountain Chapter
Analex Corporation
ASM International, Rocky Mountain Chapter
Colorado Association of Science Teachers
Colorado Dental Association
Colorado Foundation for Agriculture
Colorado Medical Society Education Foundation
Colorado Mycological Society
Colorado Section of the American Chemical Society
Colorado Veterinary Medical Association
CSU, Department of Biochemistry and Molecular Biology
CSU, Department of Horticulture and Landscape Architecture
Discovery Communications, Inc.
Fort Collins Soil Conservation District
Intel Corporation
Lockheed Martin Astronautics
National Geophysical Data Center
Rocky Mountain Association of Geologists
Rocky Mountain Inventors and Entrepreneurs Congress
Rocky Mountain Section of the American Chemical Society
Scientific American
Society of Manufacturing Engineers, Chapter 354, Electro-Mechanical
Soil and Water Conservation Society, Colorado Chapter
United States Air Force ROTC
United States Department of Commerce
United States Metric Association
United States Public Health Service
Yale University Science and Engineering Association

Special Awards

American Association of University Women
American Meteorological Society, Denver/Boulder Chapter
American Welding Society, Colorado Section
ASM International Foundation
Association for Women Geoscientists, Denver Chapter
Colorado Bootstrap, Inc.
Colorado Division of Wildlife
Colorado Geological Survey
Colorado Mineral Society
Colorado Scientific Society
Colorado Sustainability Project
Conservation International
CSU, Department of Chemistry
Denver Chapter of the IEEE Laser and Electro-Optics Society
Eastman Kodak Company
Herbert Hoover Presidential Library Association
Kodak Colorado Division
NACE International
National Renewable Energy Laboratory
Rocky Mountain Goats Foundation
Rocky Mountain Section of the American Water Works Association
Rocky Mountain Water Environment Association
Society for In Vitro Biology
Society of Women Engineers, Rocky Mountain Section
UC, Health Sciences Center Medical Scientist Training Program
United States Army
United States Geological Survey
United States Navy and United States Marine Corps
Water Environment Federation
Zonta Club of Boulder County

Grand Awards and Scholarships

Grand Awards Announcer .................................................................Ms. Bonnie Hames, NREL

Grand Awards Presenter .................................................................Mr. Harvey Teyler, President, Colorado State Science Fair, Inc.

Junior and Senior Division Category Awards:

Botany
Earth and Space Sciences
Engineering
Environmental Sciences
Health Behavioral Sciences

Mathematics and Computer Sciences
Microbiology
Physical Sciences
Zoology
Team Interdisciplinary

Adams State College Scholarship .......................................................Dr. Larry Sveum
Colorado School of Mines Scholarship .............................................Dr. John Speer
Colorado State University Scholarship ...........................................Ms. Andrea Moss
Ryan Patterson Scholarship ............................................................Mr. Ryan Patterson
Ralph F. Desch Memorial Technical Writing Award ..........................Mr. Russell Stoner
Junior Division All Fair Awards .......................................................Mr. Stan Matsunaka
Senior Division All Fair Awards .....................................................Ms. Sharon Manley
More than 110 professional scientists and engineers volunteer to judge Finalists for the CSEF Grand Awards. Judging teams are made up of these volunteers to judge each of the categories in both divisions. The captains of each judging team form the All Fair award team which determines the Top of Fair winners in each division. In addition, a Grand Awards judging team determines the winner of the Ralph Desch Memorial Technical Writing Award. Grand Awards judging team lists are available at the CSEF headquarters on Thursday.

Dr. Robert T. Anselmi, Ph.D
Chemistry
Lockheed Martin - Retired

Laura Austgen, B.S.
Microbiology/Biology
Colorado State University

David Banas, M.S.
Electrical Engineering
Tao of Digital

Natalie Bauer, Ph.D.
Pharmacology
UC Health Sciences Center

Michael Bemski, B.A.
Geology
Rocky Mountain Remediation Services

Stephen Bernard, B.S.
Engineering/EH&S
AT&T

James Boaz, B.S.
Geology
Self-employed

Paul J. Bradley, B.S.
Engineering
Northrop Grumman

Donald Brehm, B.S.
Aeronautical Engineering
Lockheed Martin Astronautics

Dewayne A. Campbell, Ph.D., P.E.
Civil Engineering
USDI Bureau of Reclamation

Russell B. Chadwick, Ph.D.
Electrical Engineering
NOAA

J. Wey Chen, Ph.D.
Computer Sciences
University of Northern Colorado

Tim Davis, M.S.
Electrical Engineering
Aspen Logic

Susan Deines, M.S.
Microbiology/Medtech
Colorado State University

Jerry Duggan, M.S.
Mathematics/Computer Science
Hewlett-Packard

Michael R. Durnam, Ph.D.
General Experimental Psychology
Adams State College

Nancy DuTeau, Ph.D.
Chemistry/Genetics
Colorado State University

Carl Edstrom, M.S.
Engineering/Industrial Management
Montason Technologies

Dean Ehn, M.S.
Chemical Engineering/CIS
Retired

Steven Michael Elias, Ph.D.
Applied Social Psychology
Colorado State University

Debra Elliott, M.S.
Mechanical Engineering
Agilent Technologies

John Emery, B.S.
Mechanical Engineering
Sundyne

Barry Eppler, B.S.
Mechanical Engineering
Agilent Technologies

Lane Eskew, M.S.
Technical Journalism
USDA Forest Service

Benjamin Espinosa, M.S.
Biology/Microbiology
Colorado State University

Doug Everett, Ph.D.
Physiology
National Jewish Medical Center

Charles A. Ferguson, Ph.D.
Neuroscience
University of Colorado

Karl Fleischer, M.E.
Mechanical Engineering/Systems
ALCOA

Jenni Ford, B.S.
Environmental Health
Agilent Technologies

Karl Ford, Ph.D.
Environmental Health
US Bureau of Land Management

Trudy Forsyth, M.S.
Mechanical Engineering
National Renewable Energy Lab

Charles Fraser, M.D.
Medicine
Retired

Sarah Gebb, Ph.D.
Pharmaceutical Sciences
UC Health Sciences Center

Daniel Gessler, Ph.D.
Civil Engineering/Hydraulics
Musseter Engineering

Sandeep Kohli, Ph.D.
Physics/Electronics
Colorado State University

Ron Kollars, D.V.M.
Veterinary Medicine
Self-employed

Marc Laforest, Ph.D.
Applied Mathematics
Colorado State University

Alan Lembitz, M.B.A., M.D.
Medicine/Chemical Engineering
Self-employed
<table>
<thead>
<tr>
<th>Name</th>
<th>Field</th>
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<td>Brad Lindsey, M.B.A., M.S.</td>
<td>Computer Science</td>
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<td>Ping Liu, Ph.D.</td>
<td>Chemistry</td>
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<td>Byron Lopez, B.S.</td>
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<td>Donna McDonnell, R.N.</td>
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<td>Bruce McDonnell, P.E., L.S.</td>
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<tr>
<td>Marge McLellan, B.S.</td>
<td>Science Education</td>
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<td>Bill Moninger, Ph.D.</td>
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<td>Thomas C. Nolan, B.S., M.A.</td>
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<td>Los Alamos Technical Associates</td>
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<td>Kevin Roy Nunn, B.S.</td>
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<td>Masahiko Oka, M.D.</td>
<td>Medicine</td>
<td>UC Health Sciences Center</td>
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<td>Cheryl Oliver-Pickett, B.A., M.P.A.</td>
<td>Psychology/Health Policy</td>
<td>UC Health Sciences Center</td>
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<td>Bruce Osborn, B.S.</td>
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<td>Cator, Ruma and Associates</td>
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<td>Stephen Osborn, B.S., M.B.A.</td>
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<td>Vitesse Semiconductor</td>
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<td>Dr. Don Ostwald, D.V.M.</td>
<td>Veterinary Medicine</td>
<td>Wheat Ridge Animal Hospital</td>
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<td>Gary Overgard, B.S.</td>
<td>Computer Science/Mathematics</td>
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<td>Kathy Partin, Ph.D.</td>
<td>Anatomy/Neurobiology</td>
<td>Colorado State University</td>
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<td>Joyce C. Pennycooke, M.S.</td>
<td>Agronomy/Horticulture</td>
<td>Colorado State University</td>
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<td>Randy S. Price, B.S.</td>
<td>Geology</td>
<td>CGRS</td>
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<td>DeAnna Raines, B.S.</td>
<td>Computer Science Engineering</td>
<td>Agilent Technologies</td>
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<td>Bryan Rappolt, B.S.</td>
<td>Atmospheric Science</td>
<td>HDR Engineering</td>
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<tr>
<td>John Redman, M.S.</td>
<td>Physics/Electrical Engineering</td>
<td>Hewlett-Packard</td>
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<tr>
<td>Suzette Riddle, Ph.D.</td>
<td>Chemistry/Biochemistry</td>
<td>Artisan Integrated Systems</td>
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<td>Mike Rider, M.S.</td>
<td>Civil/Mechanical Engineering</td>
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<td>James Rubin, M.S.</td>
<td>Environmental Health</td>
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<td>Dr. James C. Schatzman, Ph.D.</td>
<td>Applied Mathematics</td>
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<td>Winston W. Scott, B.S.</td>
<td>Electrical Engineering</td>
<td>Precision Technology</td>
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<td>Deidre Sewell, B.S.</td>
<td>Photolithography/Kinesology</td>
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<td>Neil R. Sherrod, M.S.</td>
<td>Geology</td>
<td>Terracon - Retired</td>
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<td>Fred Smigiel, B.S.</td>
<td>Civil Engineering</td>
<td>Lockheed Martin Astronautics</td>
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<td>John Spencer, Ph.D.</td>
<td>Microbiology</td>
<td>Colorado State University</td>
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<td>Alberto Squassabia, M.S., P.E.</td>
<td>Civil Engineering</td>
<td>Hewlett-Packard</td>
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<tr>
<td>Russell B. Stoner, Ph.D.</td>
<td>Technical Writing</td>
<td>Metro State College of Denver-Emeritus</td>
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<tr>
<td>Martha H. Stoner, R.N., Ph.D.</td>
<td>Nursing</td>
<td>UC School of Nursing-Emeritus</td>
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<tr>
<td>Erica Suchman, Ph.D.</td>
<td>Biochemistry/Molecular Biology</td>
<td>Colorado State University</td>
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<tr>
<td>Ron Takata, Ph.D.</td>
<td>Chemistry</td>
<td>Honolulu Community College</td>
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<tr>
<td>Elissa Teel-Duggan, D.V.M.</td>
<td>Veterinary Medicine</td>
<td>Colorado State University</td>
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<tr>
<td>Stephen Thompson</td>
<td>Chemistry</td>
<td>Colorado State University</td>
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<tr>
<td>Scott Toro-Allen, B.S.</td>
<td>Electrical Engineering</td>
<td>Lockheed Martin Astronautics</td>
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<tr>
<td>Roger L. Torres, M.S., D., P.E.</td>
<td>Engineering</td>
<td>USDA National Seed Storage Lab</td>
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<tr>
<td>Harry Valenta, Ph.D.</td>
<td>Medical Electronics</td>
<td>Self-Employed</td>
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<tr>
<td>Hana VanCampen, Ph.D., D.V.M.</td>
<td>Veterinary Medicine</td>
<td>Colorado State University</td>
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<tr>
<td>Maxine P. Verbit, A.A.S.</td>
<td>Electronics/Computer Technology</td>
<td>Agilent Technologies</td>
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<tr>
<td>Gayle Volk, Ph.D.</td>
<td>Plant Physiology/Horticulture</td>
<td>USDA National Seed Storage Lab</td>
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<td>J. J. Wagner, B.S.</td>
<td>Mechanical Engineering</td>
<td>Lockheed Martin Astronautics</td>
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<td>David J. Warren, B.S.</td>
<td>Business</td>
<td>Coldwell Banker</td>
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<td>William G. Weist, Jr., M.S.</td>
<td>Geology</td>
<td>Colorado State University</td>
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<tr>
<td>Andrew Wheeler, M.S.</td>
<td>Electrical Engineering</td>
<td>Hewlett-Packard</td>
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<td>Martina G. Wilkinson, M.S.</td>
<td>Civil Engineering</td>
<td>Sar-Brown</td>
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<tr>
<td>Mike Wilkinson, B.S.</td>
<td>Mechanical Engineering/Pilot</td>
<td>United Airlines</td>
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<tr>
<td>Victor Wisdom, B.S.</td>
<td>Manufacturing Engineering</td>
<td>Wisdom Industries</td>
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<tr>
<td>Paul A. Wojtaszek, Ph.D.</td>
<td>Physics/Toxicology</td>
<td>Canberra Industries</td>
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<tr>
<td>Susan Wollenweber, B.S.</td>
<td>Biology/Sports Medicine</td>
<td>United Health Care</td>
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<tr>
<td>Jim Zumbrunnen, M.S.</td>
<td>Statistics/Mathematics</td>
<td>Colorado State University</td>
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</tbody>
</table>
2002 CSEF Special Awards Organizations and Judges

Adams State College Foundation
Dr. Rob Benson
Dr. Michael Drunam
Dr. Larry Sweum
Dr. Randall Emmons
Dr. Guy Farish

Air and Waste Management Association, Rocky Mountain States Section
Peter Miller
Raul Victor
Lori Swadley

American Association of University Women
Mary Shultz
Paula Cady

American Institute of Chemical Engineers, Rocky Mountain Section
Natalie Van Tyne

American Meteorological Society, Denver/Boulder Chapter
Ben Hendrickson

American Vacuum Society, Rocky Mountain Chapter
J. Grant Armstrong
Tim Gessert
Sally Asher
Richard Adams

American Welding Society, Colorado Section
Elemer Bernath
Penny Propst

Analex Corporation
Suzanne Weston

Association for Women Geoscientists, Denver Chapter
Katie Keller-Lynn
Elizabeth Pottieff
Nora Hill

Colorado Association of Science Teachers
Elemer Bernath
Penny Propst

Colorado Dental Association
Dr. Bob Morrow
Carol Morrow
Dolly Morrow

Colorado Division of Wildlife
Lisa Evans

Colorado Foundation for Agriculture
Wayne F. Kein
Andy Hernuno

Colorado Geological Survey
T. C. Wait
Peter Barkmann
Jim Soule

Colorado Medical Society Education Foundation
A. Bill Kieger, MD
Parker Preble, MD

Colorado Mineral Society
Jerry Kiefer
Dr. Ray Horton
Thomas Kohnen
Paul Ralston
Eve Siemonsma

Colorado Mycological Society
Dr. Robert Reinsvold

Colorado Scientific Society
Chuck Weisenberg
Eric Ensliev
Tom Sutton

Colorado Section of the American Chemical Society
Dr. Christopher Rithner
Jackie Dano
Kristen Kull
Lisa Geisier

Colorado Sustainability Project
Jon R. Schulz
Dr. Ron Larson
Carol Maclennan
Dr. Dennis Lamm
David Allen
June Brennan
John Offerson
Henry Fowler
Martin Stenflo

Colorado Veterinary Medical Association
Dr. Charles Johnson, DVM
Dr. Donald Owen, DVM

CSU, Department of Biochemistry and Molecular Biology
Dr. Paul Laybourn
Dr. Cathy Radebaugh
Dr. Scott Summers
Dr. Norm Curthoys

CSU, Department of Chemistry
Dr. Christopher Rithner
Jacki Dano
Kristen Kull
Lisa Geisier

CSU, Department of Horticulture and Landscape Architecture
Dr. Stephen J. Wallner
Dr. Steven E. Newman
Dr. Jorge Vivanco

Denver Chapter of the IEEE Laser and Electro-Optics Society
J. Andrew Aust
Gregory A. Smith

Fort Collins Soil Conservation District
Troy Seaworth
Todd Boldt

Kodak Colorado Division
Ray Alvarado

Lockheed Martin Astronautics
Gary Krause
James Miles
Dr. Paul Cheng

National Geophysical Data Center
Kimberly Nye
Mark Eakin
David Cole
George Sharman

National Renewable Energy Laboratory
Eric Hass
Doug Hooker
Linda Lung
Robi Robichaud

Rocky Mountain Association of Geologists
Susan R. Wagner
Pete Varney

Rocky Mountain Goats Foundation
Glenn Montague
Areh Andrews

Rocky Mountain Inventors and Entrepreneurs Congress
Rob Earhart
James K. Poole, Esq.
Bonnie Griffin Kaake
Tom Lincoln

Rocky Mountain Section of the American Chemical Society
Vincent S. Hart
Darin Brickman
Lela Parsons

Rocky Mountain Section of the Optical Society of America
Laurel Mayhew
Bob Zimmer

Rocky Mountain Water Environment Association
Larry DeMers
Mike Schoengerg
Dennis Schump
Tom Dingemenn
Bob Alberts
Lynn Roberts

Society of Manufacturing Engineers, Chapter 354, Electro-Mechanical
Charles McCarthy
Jim Leonardi
Andrew D. Keller
Bruce Osmun

Society of Women Engineers, Rocky Mountain Section
Beth Boaz

Soil and Water Conservation Society, Colorado Chapter
Tatrescia Wesley
Jon Wicke
Raymond Mowery

UC, Health Sciences Center Medical Scientist Training Program
Enrique Alvarez
Audrey Brumback
Melissa Piller
Michelle Slater

United States Air Force
SSgt. Philip A. Couch
MSgt. Stacey Adams

United States Army
SPC Todd L. Kurkoski
CPT Kent R. Wiley

United States Department of Commerce
Al Bedard
Dave Clark
Sonja Ringen

United States Geological Survey
Dr. John Gray

United States Navy and United States Marine Corp
CAPT Dorthy Nazarenus
CDR Mark Flora
LT Joe Gress
CWO-4 John Lytle

Yale University Science and Engineering Association
Atul Goel
Jason McDonough

Zonta Club of Boulder County
Debbie Squires
Helen Coffey
2002 CSEF Adult Sponsor Honor Roll
Schools, Teachers and Adult Sponsors Supporting 2002 Finalists

Akron High School
Deanna Schrock
Arickaree Unidivided High School
Donald Myers
Arriba-Flagler Middle School
Allen Bell
Battle Mountain High School
Jason Jackson
Bayfield Middle School
Victor Pennell
Berry Creek Middle School
Brynn Manzella
Blended Home School
Peggy Blenden
Boltz Junior High School
Brad Blank
Bookcliff Middle School
William Rettalack
Boulder High School
Mike Fuchs
Branson Elementary School
Charlotte Auferheide
Branson Unidivided High School
Troy Mayfield
Broomfield High School
Marc Goulet
Brush High School
David Miner
Burbank Middle School
Sandra Lehman
Burlington Middle School
Cherie Wyatt
Canon City Middle School
Alice Milburn
Centauri Middle School
Lynn Sutphen
Centaurus High School
Abby Scott
Challenger Middle School
Josina O'Connell
Cherry Creek High School
Brian Daly
Christian Fellowship School
Chris Powers
Coronado High School
Lynee Williams
Crawford Elementary School
Robert Reed
Creekside Middle School
Karla Balk
Del Norte High School
Kristin Emmons
Laura Stuemky
Del Norte Middle School
Jenny Knoblauch
Del Norte Schools
Julie Schrader
Eads Junior High School
Debby Fox-Ixton
East Middle School
Linda Shearer
Eliott Middle School
Suzanne Blau
Evangelical Christian Academy
Karen Leidecker
Evergreen Mountain School
Lisa Finiol
Fairview High School
Mark Chavez
Tammy Van Meter
Fleming High School
Linda Nicoll
Fort Lupton Middle School
Robin Johnson
Mike Swanson
Frontier Academy
Casey Dukeman
Gardner Elementary School
Kevin Crosson
Genoa-Hugo High School
Marguerite Yowell
Genoa-Hugo Middle School
William Mallory
George Washington High School
Jyoti More
Gilpin County School
Debra Benitez
Haxtun Middle School
Cathy Starkebaum
Hi-Plains High School
Trish McArthur
Hoehne High School
Beth Kreutzer
Holy Family Catholic School
Tori Hallmann
Hotchkiss High School
Douglas Horton
Jefferson Academy-Junior High School
Ember Babcock
La Junta Middle School
Rocky McVicker
Lamar Middle School
Terri Lira
Liberty High School
Renny James
Limon High School
Amy Phillip
Merino Jr/Sr High School
Penny Propst
Miller Middle School
Mark Pastore
Suzanne Wickman
Moffat High School
Klara Chase
Monte Vista High School
Doug Steward
Gary Wilkinson
Mountain Ridge Middle School
Mary Kovac
Mountain Valley Middle School
Katherine Hill
North Middle School
Martha Alvarez
Greg Busby
O'Connell Middle School
Teresa Norick
Orchard Mesa Middle School
Connie Turner
Pagosa Springs Intermediate School
Tracy Schenk
Pagosa Springs Junior High School
Cindy Nobles
Palisade High School
Matt Lisenby
Palmer High School
Larry Bartel
Ann Bernhard
Brad Bogard
Rita Clarke
Platt Middle School
Tricia Carpenter
Rick's Center for Gifted Children
Mark Gatlin
Rifle High School
Anthony Rossili
Rocky Mountain Hebrew Academy
Melanie Knowles
Rocky Mountain School
John Martin
Sabín Middle School
Connie Law
Sargant Elementary School
Barbara Deacon
Sargant Junior High School
Terri Paulson
Sierra Grande High School
Judy Lopez
Springfield Jr/Sr High School
Tamara Piper
St. John the Evangelist School
Laura Ward
St. Mary's School of Littleton
Amy Brady
Summit Middle School
Stephanie Donovan
Haydee Phelps
Trinity Lutheran School of Fort Morgan
Sharon Kembel
Union Colony Preparatory School
Catherine Hoyt
Ussery Home School
Laura Ussery
Walsh Elementary School
Steven Doner
Walsh High School
Robert Lancaster
Ward Middle School
Jennifer Gray
West Jefferson Middle School
Sandra Davidson
Wiggins Elementary School
Sammi Swennes
Wiggins Jr/Sr High School
Mary Linton
Woodlin Unidivided High School
Nancy Gettman
Yuma Middle School
Robby Johnson

Parents & Other Adult Sponsors
Tami Alley
Pamela Batterton
Donald Beard
Jeff Beckvermit
Shanna Brennan
Sandy Craig
Vic Dunivan
Becky Dziarnowski
Edward Edwards
Randall Emmons
Skip Garcia
Shannon Gerber
Bonnie Grahn
Lewis Griffin
Karl Hermann
Robert Jenison
Amy Ann Kemper
Kathryn MacGregor
Don May
B. Murugavel
Jacquelyn O'Neil
Kae Rosgen
Steven Schumacher
Nancy Gettman
JoEllen Shepard
Victor Solanyk Jr.
Bob Swanson
Susan Spaulding
Larry Bartel
Harry Valenta Jr.
Connie Law
Carol Way
Rita Clarke
Jenny Knoblauch
Linda Nicoll
Mary Kovac
Tracy Schenk
Mary Linton
Robby Johnson

15
CSEF Exhibit Hall
Junior Exhibits

Open to the Public
Friday 9 AM - 5 PM
Saturday 9 AM - 11 AM
### 2002 CSEF Finalist Statistics

#### 289 Finalist Participants with 259 Exhibits from 12 Regional Science Fairs
115 Senior Division Finalists with 105 Exhibits
174 Junior Division Finalists with 154 Exhibits

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<th>Category</th>
<th>Overall</th>
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#### Schools/Teachers-
At least 85 schools from throughout the state were represented, and over 135 teachers and adults sponsored the students’ projects. There were 31 high schools represented.

#### Judges-
More than 110 professional scientists and engineers volunteered to judge the Finalists for the Grand Awards.

#### Special Awards-
At least 50 organizations offered Special Awards to the finalists, judged by more than 100 professionals from those organizations.

#### Sponsorship-
The 2002 Colorado Science and Engineering Fair had 30 sponsors. Sponsors include 2 Platinum Sponsor (providing over $2500 of support), 13 Gold Sponsors ($1000 or more of support each), 1 Silver Sponsor ($750 or more of support), and 14 Regular Sponsors ($500 or more of support each). In addition, there were 15 Financial Contributors (less than $500 each). In addition, several individuals donated through the Denver Combined Federal Campaign.

## CSEF Junior Division Finalists

### Botany

<table>
<thead>
<tr>
<th>Entry</th>
<th>Title</th>
<th>Student</th>
<th>Grade</th>
<th>School</th>
<th>City</th>
<th>Teacher</th>
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<tbody>
<tr>
<td>1-01-001</td>
<td>Effects Of Trimethylxanthine (caffeine) On Plant Growth</td>
<td>Kyle Bernhardt</td>
<td>6th</td>
<td>Wiggins Elementary School</td>
<td>Wiggins, CO</td>
<td>Mrs. Sammi Swennes</td>
</tr>
<tr>
<td>1-01-002</td>
<td>This Is My Space - The Impact Of Allelopathy</td>
<td>Mathew Brennan</td>
<td>7th</td>
<td>St. Columba School</td>
<td>Durango, CO</td>
<td>Mrs. Shanna Brennan</td>
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<tr>
<td>1-01-003</td>
<td>Don't Invade My Space</td>
<td>Ashley Button</td>
<td>6th</td>
<td>Fort Lupton Middle School</td>
<td>Fort Lupton, CO</td>
<td>Mr. Mike Swanson</td>
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<td>1-01-004</td>
<td>The Color Of Photosynthesis</td>
<td>John Christensen</td>
<td>6th</td>
<td>Miller Middle School</td>
<td>Durango, CO</td>
<td>Ms. Suzanne Wickman</td>
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<td>1-01-005</td>
<td>The Plant Project</td>
<td>Katy Clagett</td>
<td>7th</td>
<td>North Middle School</td>
<td>Colorado Springs, CO</td>
<td>Mrs. Martha Alvarez</td>
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<td>1-01-006</td>
<td>The Affects Of Different Solutions On Roses</td>
<td>Heather Hartley</td>
<td>8th</td>
<td>Boltz Junior High School</td>
<td>Fort Collins, CO</td>
<td>Ms. Denise Spraker</td>
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<td>1-01-007</td>
<td>The Role Of Polymers In Crop Drought Tolerance</td>
<td>Bradley Hertneky</td>
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<td>Burlington Middle School</td>
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<td>Ms. Cherie Wyatt</td>
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<tr>
<td>1-01-008</td>
<td>Jack, Check Your Soil's pH before You Plant Your Beans!</td>
<td>Kevin Hurd</td>
<td>7th</td>
<td>Holy Family Catholic School</td>
<td>Grand Junction, CO</td>
<td>Mrs. Tori Hellmann</td>
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### Earth & Space Sciences

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<td>1-02-001</td>
<td>Coloring In The Sky</td>
<td>Katherine Adams</td>
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<td>Monte Vista, CO</td>
<td>Mrs. Terri Paulson</td>
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<td>1-02-002</td>
<td>Which Combination Of Materials Are Best For Mars Temperature?</td>
<td>Danielle Garcia</td>
<td>6th</td>
<td>St. Columba School</td>
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<td>Mr. Skip Garcia</td>
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<td>1-02-003</td>
<td>Dinosaur Tracks</td>
<td>Jeffrey Hmcir</td>
<td>7th</td>
<td>East Middle School</td>
<td>Grand Junction, CO</td>
<td>Mrs. Linda Sheader</td>
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<td>1-02-004</td>
<td>Time: Sun vs. Clock</td>
<td>Lena Martin</td>
<td>7th</td>
<td>Genoa-Hugo Middle School</td>
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<td>Mr. William Mallory</td>
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<td>1-02-005</td>
<td>Aerodynamics Of Modern Rocketry</td>
<td>Annie Sandner</td>
<td>8th</td>
<td>St. Columba School</td>
<td>Durango, CO</td>
<td>Mr. Steven Sandner</td>
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<tr>
<td>1-02-006</td>
<td>Which Helicopter Floats Slowest?</td>
<td>Will Scripps</td>
<td>6th</td>
<td>Evergreen Mountain School</td>
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### Engineering

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<td>1-03-001</td>
<td>The Battle In Distance - 2 Piece vs. 3 Piece</td>
<td>Kendall Murphy</td>
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<td>Yuma Middle School</td>
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<td>Mr. Roby Johnson</td>
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<td>1-03-002</td>
<td>An Investigation Of Automated Highways</td>
<td>Maxwell Van Pelt</td>
<td>7th</td>
<td>Rocky Mountain School</td>
<td>Boulder, CO</td>
<td>Mr. John Martin</td>
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<td>1-03-003</td>
<td>Why Are Bridges Made Different?</td>
<td>Korrie Dilka</td>
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<td>Wiggins Elementary School</td>
<td>Wiggins, CO</td>
<td>Mrs. Sammi Swennes</td>
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<tr>
<td>1-03-004</td>
<td>Crumbling Concrete</td>
<td>Tucker Dunivan</td>
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<td>Walsh Elementary School</td>
<td>Walsh, CO</td>
<td>Mr. Vic Dunivan</td>
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<tr>
<td>1-03-005</td>
<td>I Hear A Robot</td>
<td>Josh Ferguson</td>
<td>8th</td>
<td>Woodlin Undivided High School</td>
<td>Woodrow, CO</td>
<td>Mrs. Nancy Gettman</td>
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<td>1-03-006</td>
<td>Potato Balistics</td>
<td>Matt Holling</td>
<td>7th</td>
<td>North Middle School</td>
<td>Colorado Springs, CO</td>
<td>Mrs. Martha Alvarez</td>
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<td>1-03-007</td>
<td>How Well Does A Directional Antenna Concentrate Radio Energy?</td>
<td>Joseph Kelly</td>
<td>7th</td>
<td>St. John the Evangelist School</td>
<td>Loveland, CO</td>
<td>Mrs. Laura Ward</td>
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<td>1-03-008</td>
<td>A Comparison Of Tensile Strength Of Various Materials</td>
<td>Molly May</td>
<td>6th</td>
<td>St. Columba School</td>
<td>Durango, CO</td>
<td>Mr. Don May</td>
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<td>1-03-009</td>
<td>How Safe Are We?</td>
<td>Alyssa Mitson-Salazar</td>
<td>6th</td>
<td>Centauri Middle School</td>
<td>Manassa, CO</td>
<td>Mrs. Lynn Sutphen</td>
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<td>1-03-010</td>
<td>Holy Hovercraft</td>
<td>Steven Mitton</td>
<td>7th</td>
<td>Mancos Middle School</td>
<td>Mancos, CO</td>
<td>Mr. James Verghis</td>
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</table>
CSEF Junior Division Finalists

Engineering cont.

1-03-011 Floating On Air - David Montoya - 7th grade - Springfield Jr/Sr High School - Springfield, CO - Ms. Tamara Piper
1-03-012 Concrete - Jess Sowczak - 7th grade - St. John the Evangelist School - Berthoud, CO - Mrs. Laura Ward
1-03-013 Solar Robots Under Varying Light Conditions - Ryan Rinkel - 8th grade - Rick's Center for Gifted Children - Denver, CO - Mr. Mark Gattin
1-03-016 Into The Wind: Wind Powered Cars - Daniel Weidlein - 6th grade - Summit Middle School - Boulder, CO - Ms. Haydee Phelps
1-03-017 How Much Pressure Can You Take? "Designing A Hydrostatic Pressure Chamber To Simulate Water Pressure" - Brent Shepard - 8th grade - Brentwood Middle School - Greeley, CO - Mrs. JoEllen Shepard
1-03-018 Rocket Roughness - Zac Zillmann - 7th grade - Jefferson Academy Junior High School - Parker, CO - Ms. Ember Babcock
1-03-019 Architectural Structures Under Pressure - Alexander Spence - 7th grade - Orchard Mesa Middle School - Grand Junction, CO - Ms. Connie Turner
1-03-020 Which Bridge Holds More Weight - An Arch Bridge Or A Beam Bridge? - David Wallisch - 6th grade - St. John the Evangelist School - Loveland, CO - Mrs. Laura Ward
1-03-021 A Hot Idea For A Cool Computer - Devin Adam - 8th grade - Crawford Elementary School - Crawford, CO - Mr. Robert Reed
1-03-022 Take On A Shake - The Use Of Base Isolators To Prevent Earthquake Damage - Ross Brunkhardt - 7th grade - Merino Jr/Sr High School - Sterling, CO - Mrs. Penny Probst
1-03-023 Wind Turbine Design - Adam Sidman - 8th grade - North Middle School - Colorado Springs, CO - Mr. Greg Busby

Environmental Sciences

1-04-001 Do You Drink Undrinkable Water? - Jacquie Beckvermit - 8th grade - Turner Middle School - Berthoud, CO - Mr. Jeff Beckvermit
1-04-002 The Effect Of Wood Extracts On The Germination Of Seeds - Laura Biggins - 8th grade - Boltz Junior High School - LaPorte, CO - Mr. Brad Blank
1-04-003 Local Lake Quality = Happy pHish - Stacy Dominguez - 6th grade - Pagosa Springs Intermediate School - Pagosa Springs, CO - Mrs. Tracy Schenk
1-04-004 Under The Stream: Using Aquatic Insects To Determine Water Quality - Anna Hermann - 6th grade - Summit Middle School - Louisville, CO - Ms. Stephanie Donaton
1-04-005 Does pH Affect Seed Germination And Growth Rate? - Caitlin Hladky - 6th grade - Fort Lupton Middle School - Fort Lupton, CO - Mr. Mike Swanson
1-04-006 Bioremediation - Britney Hladky - 8th grade - Fort Lupton Middle School - Fort Lupton, CO - Mr. Mike Swanson
1-04-007 "Black Gold" Particles: Comparing Particles Of Fuel Sources - Lyle Hoffschneider - 7th grade - Pagosa Springs Junior High School - Pagosa Springs, CO - Mrs. Cindy Nobles
1-04-008 Snow 'n Ice 'n Everything Not So Nice - Melissa Kanack - 7th grade - St. John the Evangelist School - Loveland, CO - Mrs. Laura Ward
1-04-009 To Corrode Or Not To Corrode: Preventing Microbiologically Influenced Corrosion (MIC) On Steel Using A Polyurethane Coating - Tyler Keck - 8th grade - Monte Vista Middle School - Monte Vista, CO - Mr. Doug Steward
1-04-010 Go With The Flow - A Study Of Water Quality In The Upper Colorado River Basin - Audrey Keenan - 6th grade - Holy Family Catholic School - Grand Junction, CO - Mrs. Tori Hellmann
1-04-011 Paper Or Plastic? - Meaghan Kormondy - 8th grade - St. Mary's School of Littleton - Highlands Ranch, CO - Mrs. Amy Brady
1-04-012 Fascination Of Insulation - Joshua Metherd - 6th grade - Wiggins Elementary School - Wiggins, CO - Mrs. Sammi Swennes
1-04-013 The Effect Of Magnesium Chloride On Decomposition - Maggie Reinsvold - 8th grade - Frontier Academy - Greeley, CO - Mr. Casey Dukeman
1-04-014 Does Pollution Affect Oxygen Production In Aquatic Plants? - Cacia Steensen - 7th grade - West Jefferson Middle School - Pine, CO - Ms. Sandra Davidson
1-04-015 Will Size Affect The Amount Of Soil Blown Away? - Jeffrey West - 7th grade - Lamar Middle School - Lamar, CO - Mrs. Terri Lira
1-04-016 Hot News . . . Cool Insulation - Chad Price - 8th grade - Sargent Junior High School - Monte Vista, CO - Mrs. Terri Paulson
### Health & Behavioral Sciences

<table>
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<td>Fluoride: When Is Enough</td>
<td>Andrea Buxton</td>
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<td>Eads Junior High School, Lamar, CO</td>
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<td>Is What You See What You Get?</td>
<td>Kelly Cook</td>
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<td>Stop In The Name Of The Law</td>
<td>Kelly Dimmen</td>
<td>6th</td>
<td>Sabin Middle School, Colorado Springs, CO</td>
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<td>How's Your Memory?</td>
<td>Elizabeth Fleagle</td>
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<td>Summit Middle School, Boulder, CO</td>
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<td>Soap! Seife! El Jabon! Savon!</td>
<td>Emily Harmon</td>
<td>7th</td>
<td>Fort Lupton Middle School, Brighton, CO</td>
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<td>Ultraviolet Radiation - Are You Using The Best Protection?</td>
<td>Ashley Howard</td>
<td>7th</td>
<td>Fort Lupton Middle School, Brighton, CO</td>
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<td>Pick Up The Beat</td>
<td>Jeff Loewe</td>
<td>8th</td>
<td>Evangelical Christian Academy, Colorado Springs, CO</td>
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<td>Type A GPA - Are They Synonymous?</td>
<td>Hannah Lowinger</td>
<td>8th</td>
<td>Rocky Mountain Hebrew Academy, Englewood, CO</td>
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<tr>
<td>A Comparison Of Theoretical And Observational Trajectories</td>
<td>Greg DeMaria</td>
<td>8th</td>
<td>Boltz Junior High School, Fort Collins, CO</td>
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<td>The Effects Of Gravity And Air Resistance On The Trajectory Of A Bullet</td>
<td>Alissa Schunter</td>
<td>8th</td>
<td>Boltz Junior High School, Fort Collins, CO</td>
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<tr>
<td>The Race Is On!</td>
<td>Alex Rounds</td>
<td>8th</td>
<td>Sargent Junior High School, Center, CO</td>
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<tr>
<td>Ratios And Rectangles: Are They The Golden Rule?</td>
<td>Debbie Ortega</td>
<td>8th</td>
<td>Mountain Valley Middle School, Saucache, CO</td>
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<tr>
<td>Football Phenomenon</td>
<td>Nick Newby</td>
<td>8th</td>
<td>La Junta Middle School, La Junta, CO</td>
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<tr>
<td>The Effect Of Salinity On The Effectiveness Of Bioremediation Of Oil Spills Utilizing Pseudomonas And Penicillin</td>
<td>Michael Dango</td>
<td>9th</td>
<td>Challenger Middle School, Colorado Springs, CO</td>
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<tr>
<td>Bacteria Blasters</td>
<td>Helen Elizabeth Fowler</td>
<td>7th</td>
<td>Holy Family Catholic School, Grand Junction, CO</td>
</tr>
<tr>
<td>Little Warm Fuzzies</td>
<td>Kelly Houghlin</td>
<td>7th</td>
<td>Trinity Lutheran School of Fort Morgan, Brush, CO</td>
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<tr>
<td>Freezing Cold</td>
<td>Kaitlyn Lingus</td>
<td>6th</td>
<td>Branson Elementary School, Branson, CO</td>
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<tr>
<td>Glow In The Dark - Will Bacteria Accept A Gene From A Jellyfish?</td>
<td>Ashley Maddux</td>
<td>7th</td>
<td>Pagosa Springs Junior High School, Pagosa Springs, CO</td>
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### Mathematics & Computer Sciences

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<tr>
<td>A Comparison Of Theoretical And Observational Trajectories</td>
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<td>8th</td>
<td>Boltz Junior High School, Fort Collins, CO</td>
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<td>Football Phenomenon</td>
<td>Nick Newby</td>
<td>8th</td>
<td>La Junta Middle School, La Junta, CO</td>
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<td>Investigation Of Prime Numbers</td>
<td>Nathan McNew</td>
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<td>Jefferson Academy Junior High School, Arvada, CO</td>
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<td>Good To The Last Drop: The World Oil Shortage Simulator</td>
<td>Max Krakauer</td>
<td>8th</td>
<td>North Middle School, Colorado Springs, CO</td>
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<tr>
<td>Never Blinking, Never Sleeping: Image Preparation Improves Machine Vision</td>
<td>Robert Glissmann</td>
<td>8th</td>
<td>Summit Middle School, Boulder, CO</td>
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<td>Programmable Vacuum Cleaner</td>
<td>Timothy Schneider</td>
<td>6th</td>
<td>Miller Middle School, Durango, CO</td>
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### Microbiology

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<td>Branson Elementary School, Branson, CO</td>
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<tr>
<td>Glow In The Dark - Will Bacteria Accept A Gene From A Jellyfish?</td>
<td>Ashley Maddux</td>
<td>7th</td>
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### CSEF Junior Division Finalists

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<td>The Mozart Effect</td>
<td>Morgan Potts</td>
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<td>Jefferson Middle School, Conifer, CO</td>
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<td>Into Thin Air</td>
<td>Allison Qubain</td>
<td>8th</td>
<td>Gardner Elementary School, Gardner, CO</td>
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<td>Who's Quicker?</td>
<td>Tim Roth</td>
<td>8th</td>
<td>Sargent Junior High School, Monte Vista, CO</td>
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<td>Are You Left Or Right Brained?</td>
<td>Wiggins Jr/Sr High School, Wiggins, CO</td>
<td>7th</td>
<td>Mrs. Mary Linton</td>
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<tr>
<td>What's At School With You</td>
<td>Nicholas Salter</td>
<td>6th</td>
<td>Miller Middle School, Durango, CO</td>
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</table>

**Medicine & Health Sciences**

**Mathematics & Computer Sciences**

**Microbiology**
CSEF Junior Division Finalists

Physical Sciences

1-08-001 Let Wind Do The Work - Mark Allis - 7th grade - Genoa-Hugo Middle School - Huga, CO - Mr. William Mallory

1-08-002 Plop-Plop, Fizz-Fizz, Down The Hatch - A. J. Allumbaugh - 6th grade - Ward Middle School - Sugar City, CO - Ms. Jennifer Gray

1-08-003 Inductrack Maglev Phase III - Robin Blenden - 8th grade - Blenden Home School - Monte Vista, CO - Ms. Peggy Blenden

1-08-004 Gear Power - Joe Boerner - 8th grade - Haxtun Middle School - Haxtun, CO - Mrs. Cathy Starkebaum

1-08-005 Behold The Power Of The Nut - Emily Boerner - 7th grade - Haxtun Middle School - Haxtun, CO - Mrs. Cathy Starkebaum

1-08-006 The Fastest Power - April Brooks - 8th grade - O'Connell Middle School - Lakewood, CO - Ms. Teresa Norick

1-08-007 Shake It Up: A Study On Size Separation - Adreanne Brungardt - 7th grade - Brush Middle School - Brush, CO - Mr. David Miner

1-08-008 Thrust Generation From Electromagnetic Principles, Anti-gravity: Fact Or Fantasy? - Iain Cruickshank - 8th grade - North Middle School - Colorado Springs, CO - Mrs. Martha Alvarez

1-08-009 Friction Over Tribology - Megan Emmons - 7th grade - Del Norte Middle School - Alamosa, CO - Dr. Randall Emmons

1-08-010 "Snuggle" With Fire - Daniel Fagerlund - 8th grade - Arriba-Flagler Middle School - Flagler, CO - Mr. Allen Bell

1-08-011 Heartburn - Devin Hamon - 7th grade - Gardner Elementary School - Gardner, CO - Mr. Kevin Crosson

1-08-012 Force - Wilson Henry - 7th grade - Yuma Middle School - Yuma, CO - Mr. Roby Johnson

1-08-013 Catalysts, The Chemical Matchmakers - Tyler Hutchinson - 6th grade - Holy Family Catholic School - Grand Junction, CO - Mrs. Tori Hellmann

1-08-014 The Truth Behind Jurassic Park - Alex Lande - 7th grade - Ignacio Junior High School - Ignacio, CO - Mrs. Becky Dziarnowski

1-08-015 Salt Water Conductivity - Rosie Li - 7th grade - North Middle School - Colorado Springs, CO - Mr. Greg Busby

1-08-016 Avalanche! A Search For Self-Organized Criticality - Meredith MacGregor - 7th grade - Burbank Middle School - Boulder, CO - Mrs. Kathryn MacGregor

1-08-017 How Does Temperature Effect Magnetism? - Morgan Medbery - 6th grade - St. John the Evangelist School - Loveland, CO - Mrs. Laura Ward

1-08-018 Which Liquid Melts The Fastest? - Brooklyn Mitchek - 8th grade - Arriba-Flagler Middle School - Flagler, CO - Mr. Allen Bell

1-08-019 Predicting UHF Radio Range From Antenna Height - Matt Zubiel - 6th grade - Creekside Middle School - Monument, CO - Mrs. Karla Balk

1-08-020 Electric Fruits - Jasmine Park - 8th grade - Mancos Middle School - Mancos, CO - Mrs. Sandy Craig

1-08-021 The Skid To Stop Formula - Jessica Pierce - 6th grade - Haxtun Middle School - Haxtun, CO - Mrs. Cathy Starkebaum

1-08-022 Sodium Bicarbonate And pH: What Can It Lead To? - Rebecca Richardson - 7th grade - Berry Creek Middle School - Avon, CO - Ms. Brynn Manzella

1-08-023 Crackle, Pop, Burn - Matt Rusch - 7th grade - Trinity Lutheran School of Fort Morgan - Fort Morgan, CO - Mrs. Sharon Kembel

1-08-024 Irradiated Fruit Effects The Mold Time Equation - Megan Straw - 8th grade - East Middle School - Grand Junction, CO - Mr. Mike Warner

1-08-025 Marble Velocity In Oil Viscosity - Gregg Washam - 7th grade - St. John the Evangelist School - Loveland, CO - Mrs. Laura Ward

1-08-026 Which Children's Multi-Vitamin Disintegrates The Most In 30 Minutes? - Mikaila Way - 6th grade - West Jefferson Middle School - Evergreen, CO - Mrs. Carol Way

1-08-027 Solubility - Travis Whitham - 8th grade - Lamar Middle School - Lamar, CO - Mrs. Terri Lira

1-08-028 Bright Connections - Andrea Wilcox - 6th grade - Haxtun Middle School - Haxtun, CO - Mrs. Cathy Starkebaum

1-08-029 Sailing With Wind Power! - John Wilkinson Jr. - 8th grade - Mountain Ridge Middle School - Colorado Springs, CO - Mrs. Mary Kovac

1-08-030 Electromagnet Strengths - Ashlee O'Neil - 8th grade - Bill Reed Middle School - Loveland, CO - Mrs. Jacquelyn O'Neil
CSEF Junior Division Finalists

Zoology

1-09-001 The Five Senses Of Training A Dog - Nicholas Edwards - 7th grade - Juniper Drive Middle School - Colorado Springs, CO - Mr. Edward Edwards
1-09-002 Cryonics-The Fountain Of Youth Or A Frozen Pond? - Katanna Ellis - 6th grade - La Junta Middle School - La Junta, CO - Mr. Rocky McVicker
1-09-003 A Hare Raising Tale - Jenna Gerber - 7th grade - Walsh Junior High School - Two Buttes, CO - Mrs. Shannon Gerber
1-09-004 Pupation Creation - Travis Justin Garoutte - 6th grade - Centauri Middle School - Antonito, CO - Mrs. Lynn Sutphen
1-09-005 Got Silk? - Lisa Harms - 7th grade - Haxtun Middle School - Haxtun, CO - Mrs. Cathy Starkebaum

1-09-006 Scrapies: Bubonic Plague Of The 21st Century - Carly Larson - 7th grade - Haxtun Middle School - Haxtun, CO - Mrs. Cathy Starkebaum
1-09-007 The Effect Of Variable Paper Food Sources On The Growth Of Mealworms - Forrest Rackham - 6th grade - Pagosa Springs Intermediate School - Pagosa Springs, CO - Mrs. Tracy Schenk
1-09-008 Rat Race - Marty Sandberg - 8th grade - St. Mary's School of Littleton - Littleton, CO - Mrs. Amy Brady
1-09-009 Oh, Rats! - Timothy Sauer - 8th grade - St. Mary's School of Littleton - Littleton, CO - Mrs. Amy Brady

Team Projects

1-10-001 Spaced Out - Jessica Nygren & Caresse Wagner - 8th grade - St. Mary's School of Littleton - Littleton, CO - Mrs. Amy Brady
1-10-002 A-Maze-ing Plants - Mindy Schiffers & Mindy Witt - 7th grade - Arriba-Flagler Middle School - Arriba, CO - Mr. Allen Bell
1-10-003 Does Body Shape Affect Flexibility In Ballet Dancers? - Katelyn Chapman & Roxanne Edge - 8th grade - Boltz Junior High School - Fort Collins, CO - Ms. Denise Spraker
1-10-004 How Does Music Affect Concentration And Performance Of Mice - John Michael Dibble & Sarah Rosendale - 8th grade - Bookcliff Middle School - Grand Junction, CO - Mr. William Rettalack
1-10-005 Erosion And The Formation Of Alluvial Fans - Danika Friedley & Whitney Howard - 7th grade - Bayfield Middle School - Bayfield, CO - Mr. Victor Pennell
1-10-006 All Fired Up - Meghan Gabriel & Sarah Wright - 7th grade - St. Mary's School of Littleton - Littleton, CO - Mrs. Amy Brady
1-10-007 Kids Don't Bounce - Noah Husek & Jonathan Wolfe - 8th grade - Burbank Middle School - Boulder, CO - Ms. Sandra Lehman
1-10-008 Smile - Kayla Kinch & Britney Bunker - 6th grade - Ellicott Middle School - Calhan, CO - Ms. Suzanne Blau
1-10-009 Vitamin C: The Controversy Continues - Kindra Kukus & Andrea Noletubby - 8th grade - Woodlin Undivided High School - Woodrow, CO - Mrs. Nancy Gettman
1-10-010 Tongue Teasers - Ryan Belew & Nathan Mueller - 6th grade - La Junta Middle School - La Junta, CO - Mr. Rocky McVicker
1-10-011 What's In Your Water? - Joshua Machone & Thomas Bossenger - 6th grade - Lamar Middle School - Lamar, CO - Mrs. Terri Lira
1-10-012 What Effects Does Ephedra Have On Daphnia Heart Rate? - Kyra Matzdorf, Miranda Montoya, & Katelynn Little - 7th grade - Pagosa Springs Junior High School - Pagosa Springs, CO - Mrs. Cindy Nobles
1-10-013 The Breaking Capacity Of Four Bridge Types - Alex Nestor & John Christensen - 7th grade - Arriba-Flagler Middle School - Flagler, CO - Mr. Allen Bell
1-10-014 Burning Up - Hannah Schumacher & Erin Luck - 7th grade - Burbank Middle School - Boulder, CO - Mr. Steven Schumacher
1-10-016 H2O - Which Type Of Water Helps Bean Plants Grow? - Tiffany Poet & Beth Hubbell - 7th grade - Arriba-Flagler Middle School - Flagler, CO - Mr. Allen Bell
1-10-017 The Golden Bridge - Michael Rime & John McKinley - 6th grade - Walsh Elementary School - Walsh, CO - Mr. Steven Doner
1-10-018 The Effect Of Various Materials On The Deceleration Of A Wheel - Travis Bruce & Patch Mahnke - 6th grade - Miller Middle School - Durango, CO - Ms. Suzanne Wickman
1-10-019 I'm Exhausted - Alex West - 6th grade - West Jefferson Middle School - Conifer, CO - Mr. Ronald West
1-10-020 Does Genetically Engineering Plant Seeds Affect Their Growth Rate? - Alex Lauderdale & Ryan Knaub - 8th grade - Union Colony Preparatory School - Greeley, CO - Mrs. Catherine Hoyt
CSEF Senior Division Finalists

Botany

2-01-001 UV, Infrared, And Toxic Gases: Friend Or Foe? - Beth Buckner - 12th grade - Branson Undivided High School - Branson, CO - Mr. Troy Mayfield

2-01-002 Turning The Red Planet Green - Julie Ann Chelewski - 9th grade - Rifle High School - Silt, CO - Mr. Anthony Rossilli

2-01-003 A Study On The Interaction Between Blackleg And PVY On Potatoes - Jacqueline Consaul - 11th grade - Del Norte High School - Center, CO - Mrs. Kristin Emmons

2-01-004 Glycolysis In Isoprene-Emitting Chloroplasts - Wumesh Khatri - 12th grade - Boulder High School - Boulder, CO - Mr. Mike Fuchs

2-01-005 Selecting For Salt Tolerance In 5 Varieties Of Wheat - Levi Klausner - 11th grade - Woodlin Undivided High School - Woodrow, CO - Mrs. Nancy Gettman


2-01-007 WNC 230-14RU Resistant Or Immune To Potato Leaf Roll Virus - Nicole Thomas - 10th grade - Sierra Grande High School - Blanca, CO - Mrs. Judy Lopez

2-01-008 River Banks - Nature's Erodible Boundaries - Brandon Rosgen - 11th grade - Pagosa Springs High School - Pagosa Springs, CO - Mrs. Kae Rosgen

Earth & Space Sciences

2-02-001 The Cosmic Early Warning - Adam Curry - 12th grade - Palisade High School - Palisade, CO - Mr. Matt Lisenby

2-02-002 Rainbow Lightning? - Renee Musgrave - 9th grade - Liberty High School - Yuma, CO - Mr. Renny James

2-02-003 Vulcan Block II - Craig Bryan - 11th grade - Sargent High School - Monte Vista, CO - Mrs. Terri Paulson

2-02-004 Autonomous UAV Design - Robert Usery - 10th grade - Woodlin Undivided High School - Akron, CO - Mrs. Nancy Gettman

2-02-005 Improving Automobile Emissions Using Photocatalytic Titanium Dioxide (TiO2) - Ben Olsen - 12th grade - Cherry Creek High School - Englewood, CO - Dr. T. J. Donahue

2-02-006 Operation: Voice Control - Eric Doner - 12th grade - Walsh High School - Walsh, CO - Mr. Robert Lancaster

2-02-007 Thermal Degradation Of Josephon Junctions - Justin Migacz - 11th grade - Cherry Creek High School - Englewood, CO - Mr. Brian Daly

2-02-008 Propeller Shape vs. Lift And Sound - Joseph Kavasek - 10th grade - Cherry Creek High School - Englewood, CO - Mr. Steve Lantz

2-02-009 If I Only Had A Heart (Valve) - Eddie Kreimier - 9th grade - Rifle High School - Rifle, CO - Mr. Anthony Rossili

2-02-010 The Best Superinsulator - Leyton Laybourn - 10th grade - Arickaree Undivided High School - Cope, CO - Mr. Donald Myers

Engineering

2-03-001 Rarr - An Alternative To Human Reconaisance - Michael Yurkoski - 11th grade - Broomfield High School - Broomfield, CO - Mr. Marc Goulet

2-03-002 Designing A Linear Peristaltic Pump Using Ferrofluids - Craig Wright - 10th grade - Woodlin Undivided High School - Akron, CO - Mrs. Nancy Gettman

2-03-003 Vulcan Block II - Craig Bryan - 11th grade - Sargent High School - Monte Vista, CO - Mrs. Terri Paulson

2-03-004 Autonomous UAV Design - Robert Usery - 10th grade - Usery Home School - Fort Collins, CO - Mrs. Laura Usery

2-03-005 Improving Automobile Emissions Using Photocatalytic Titanium Dioxide (TiO2) - Ben Olsen - 12th grade - Cherry Creek High School - Englewood, CO - Dr. T. J. Donahue

2-03-006 Operation: Voice Control - Eric Doner - 12th grade - Walsh High School - Walsh, CO - Mr. Robert Lancaster

2-03-007 Thermal Degradation Of Josephon Junctions - Justin Migacz - 11th grade - Cherry Creek High School - Englewood, CO - Mr. Brian Daly

2-03-008 Propeller Shape vs. Lift And Sound - Joseph Kavasek - 10th grade - Cherry Creek High School - Englewood, CO - Mr. Steve Lantz

2-03-009 If I Only Had A Heart (Valve) - Eddie Kreimier - 9th grade - Rifle High School - Rifle, CO - Mr. Anthony Rossili

2-03-010 The Best Superinsulator - Leyton Laybourn - 10th grade - Arickaree Undivided High School - Cope, CO - Mr. Donald Myers

2-03-011 The Effects Of Landscaping On Energy Consumption - Glen Marquez - 11th grade - Monte Vista High School - Monte Vista, CO - Mr. Gary Wilkinson

2-03-012 Is Your Roof Snow Proof? - Emma McArldle - 11th grade - Monte Vista High School - Monte Vista, CO - Mr. Gary Wilkinson

2-03-013 Alternate Heat For Your House - Jessica Grahn - 9th grade - Walsh High School - Two Buttes, CO - Mrs. Bonnie Grahn

2-03-014 From Prickly To Paper Part II - Lindy Dodridge - 12th grade - Liberty High School - Kirk, CO - Mr. Renny James

2-03-015 The Modification Of An Egyptian Lift - Jimmy Paquette - 9th grade - Christian Fellowship School - Lakewood, CO - Mr. Chris Powers

2-03-016 Ramjet Propulsion For High Altitude Launch And Research - Dak Steiert - 11th grade - Battle Mountain High School - Edwards, CO - Mr. Jason Jackson

2-03-017 Effects Of Specific Design Modifications On The Capabilities Of Airfoils - Nolan Cmerek - 11th grade - Hotchkiss High School - Hotchkiss, CO - Mr. Douglas Horton

2-03-018 The Aerodynamic Benefits Of Automated Vehicles And Training - Matthew Wiener - 11th grade - Brush High School - Brush, CO - Mr. David Miner

2-03-019 Renewable Protection: The Solar And Hydrogen Approach To Pipeline Cathodics - Chris Anderson - 12th grade - Merino Jr/Sr High School - Merino, CO - Mrs. Penny Propst
CSEF Senior Division Finalists

Environmental Sciences

2-04-001 An Evaluation Of The Effectiveness Of Reformulated Gasoline In Reducing Urban Benzene Concentrations - Benjamin Howard - 12th grade - Fairview High School - Boulder, CO - Mr. Mark Chavez

2-04-003 Want Hot? Waste Not. - Jeremiah Johnson - 10th grade - Limon High School - Limon, CO - Mrs. Amy Phillip


2-04-005 Where's It Coming From? - Christine Knoblauch - 12th grade - Monte Vista High School - Del Norte, CO - Mrs. Jenny Knoblauch

2-04-007 Non-Native Noxious Nuisances 2: Alien Invaders - Irina Hardesty - 9th grade - Gilpin County School - Black Hawk, CO - Ms. Debra Benitez

2-04-008 Predicting Water Quality With Landscape Metrics - Katherine Hermann - 9th grade - Boulder High School - Louisville, CO - Mr. Karl Hermann

2-04-009 The Viability Of Anaerobic Digesters for Agriculture Applications - Mary Grace Beard - 12th grade - Walsh High School - Walsh, CO - Mr. Donald Beard

2-04-010 Prevention Of Soil Salinization From A Rising Water Table - Stephen Canham - 12th grade - Cherry Creek High School - Greenwood Village, CO - Dr. T. J. Donahue

2-04-011 Water: A Source Of Life Or A Source Of Fear? - Jamie Dickenson - 12th grade - Walsh High School - Walsh, CO - Mr. Robert Lancaster

2-04-012 2,4-D Friend Or Foe? - Cristopher Kuehl - 10th grade - Fleming High School - Haxtun, CO - Mrs. Linda Niccoli

2-04-013 Basic Solution To Acid Rain - Elisa Park - 9th grade - Palmer High School - Manitou Springs, CO - Mrs. Ann Bernhard

2-04-015 H2uh-O - Tyler Stuart - 9th grade - Palmer High School - Manitou Springs, CO - Ms. Rata Clarke

Health & Behavioral Sciences

2-05-001 Flatulence??? - Sarah Alley - 10th grade - Walsh High School - Campo, CO - Mrs. Tami Alley

2-05-002 Can The Sense Of Smell Really Affect The Things We Taste? - Robyn Bitner - 10th grade - Springfield Jr/Sr High School - Springfield, CO - Ms. Tamara Piper

2-05-003 Coloring Memory: A Study In Color's Effect On Short-Term Visual Memory - Weston Brownlee - 9th grade - Frontier Academy - Greeley, CO - Mr. Casey Dukeman


2-05-005 Characterization Of MMPs and TIMPs In Two Types Of Arthritis In A Rural Population - Kelly Haller - 11th grade - Woodlin Undivided High School - Woodrow, CO - Mrs. Nancy Gettman


2-05-007 A Promising Cancer Treatment: Tumor Suppression Using The Synergism Of NSAID And Aloe - April Mertens - 12th grade - Merino Jr/Sr High School - Merino, CO - Mrs. Penny Propst

2-05-008 Memory - Scholastic Achievement Correlation - Dominick Christopher Leo - 9th grade - Rifle High School - Rifle, CO - Mr. Anthony Rossilli

2-05-009 Remembered And Forgotten: An Examination Of Autobiographical Memory, Reminiscence, And Cultural Influences On Memory - Michelle Keck - 12th grade - Monte Vista High School - Monte Vista, CO - Mr. Gary Wilkinson

2-05-010 Mutations In The Antioxidant Enzyme MnSOD Associated With Cancer - Amy Liu - 12th grade - Cherry Creek High School - Aurora, CO - Mr. Brian Daly

2-05-011 Hydroxyl Radical Neutralization By Non-Steroidal Anti-Inflammatory Drugs Related To Alzheimer's Prevention - Jeff Marlow - 11th grade - Cherry Creek High School - Englewood, CO - Mr. Brian Daly

2-05-012 Manipulation Of The Kreb's Cycle - Jamie Junge - 11th grade - Cherry Creek High School - Englewood, CO - Mr. Steve Lantz


2-05-014 Double Take - Josh Robinson - 9th grade - Palmer High School - Colorado Springs, CO - Ms. Rata Clarke

2-05-015 Feeling Smart - Krista Schroeder - 9th grade - Palmer High School - Colorado Springs, CO - Ms. Rata Clarke

2-05-016 The Effect Of Antioxidant Ascorbic Acid On The Nucleosides Of Call Thymus DNA - Balaji Sridhar - 9th grade - Graland Country Day School - Denver, CO - Dr. B. Murugaveri
CSEF Senior Division Finalists

Mathematics & Computer Sciences

2-06-001 Do You Really Need That Much Resolution? - Michael Deen - 10th grade - Christian Fellowship School - Littleton, CO - Mr. Chris Powers

2-06-002 Like A Mouse To Cheese - Pascal Getreuer - 12th grade - Palmer High School - Colorado Springs, CO - Ms. Rata Clarke

2-06-003 Ups & Downs: Simulated Elevator Control - Lila Hickey - 12th grade - Brush High School - Hillrose, CO - Mr. David Miner

2-06-004 Light-Operated Logic - Colin Oldberg - 9th grade - Coronado High School - Colorado Springs, CO - Ms. Lynne Williams

2-06-005 Not So Perfect Sine Waves: A Fourier Analysis Of An Audio Oscillator - Amanda Parker - 9th grade - Cherry Creek High School - Centennial, CO - Mr. Aaron DeBuhr

2-06-006 Picture This! The Effects Of Compression On A Computer Image - Ryan Polei - 10th grade - Christian Fellowship School - Littleton, CO - Mr. Chris Powers

2-06-007 Knotty Knumbers: Calculating Alexander's Polynomial - Paul Scott - 10th grade - Woodlin Undivided High School - Akron, CO - Mrs. Nancy Gettman


Microbiology

2-07-001 Antioxidants: Youth At Your Fingertips - Lauryn Etl - 10th grade - Fleming High School - Fleming, CO - Mrs. Linda Niccoli

2-07-002 UV Radiation Exposure Results In Increased Resistance In Bacteria To Antibiotics - Christa Goldsborough - 9th grade - Palmer High School - Colorado Springs, CO - Ms. Rata Clarke


2-07-004 WGA Amplification And Thin Film Detection Of Methicillin Resistant/Sensitive Staphylococcus aureus - Josh Haimes - 12th grade - Boulder High School - Boulder, CO - Dr. Robert Jenison

2-07-005 The Effect Of Triclosan On Antibiotic Resistance - Sara McFarland - 11th grade - Hoehne High School - Trinidad, CO - Mrs. Beth Kreutzer

2-07-006 Guess What's For Lunch? - Darrick Ohr - 9th grade - Woodlin Undivided High School - Lindon, CO - Mrs. Nancy Gettman

Physical Sciences

2-08-001 Trebuchet Ballistics - Kyle Atwater - 10th grade - Woodlin Undivided High School - Genoa, CO - Mrs. Nancy Gettman

2-08-002 Keepin' Warm - Loydene Batterton - 10th grade - Walsh High School - Holly, CO - Mrs. Pamela Batterton

2-08-003 I Am Stuck On Band-Aid - Tanya Jaques - 11th grade - Limon High School - Limon, CO - Mrs. Amy Phillip

2-08-004 Rust, Proof! - Tommy Day - 10th grade - Del Norte High School - Del Norte, CO - Mrs. Laura Stuemky

2-08-005 An Algorithm Demonstrating Impact Splatter Pattern Due To Angle Of Incidence Using A Dichotomous Key - Amber Henry - 10th grade - Hi-Plains High School - Joes, CO - Mrs. Deanna Schrock

2-08-006 Metallurgical Characteristics Of The Sacagawea Dollar - William Eucker - 10th grade - George Washington High School - Denver, CO - Dr. Jyoti More

2-08-007 Spinning Samaras: A Study Into Seed Distribution - Adam Brungardt - 11th grade - Brush High School - Brush, CO - Mr. David Miner

2-08-008 An Investigation Into The Weissenberg Phenomenon - Leota McDaniel - 11th grade - Brush High School - Brush, CO - Mr. David Miner

2-08-009 A Comparison Of The Effeciencies Of Tracking Photovoltaic Cells vs. Mounted Photovoltaic Cells - Megan Quick - 12th grade - Palmer High School - Colorado Springs, CO - Mr. Larry Bartel
CSEF Senior Division Finalists

Zoology

2-09-001  **In Vivo PLA2 Inhibition** - Robert Bernton - 9th grade - Rocky Mountain Hebrew Academy - Littleton, CO - Ms. Melanie Knowles

2-09-002  **Using Forensic Entomology To Determine Drug Toxicity** - Janice Bowers - 11th grade - Woodlin Undivided High School - Woodrow, CO - Mrs. Nancy Gettman

2-09-003  **Holistic Healing: Crystals Are A Chick's Best Friend** - Courtney Eichengreen - 9th grade - Palmer High School - Colorado Springs, CO - Mrs. Ann Bernhard

2-09-004  **Factors Affecting Life Span** - Kinsey Freeman - 9th grade - Palmer High School - Colorado Springs, CO - Ms. Rata Clarke

2-09-005  **Investigations Of Capricious Gene Expression In Drosophila Wing Development: Year 2** - Michelle Itano - 12th grade - Fairview High School - Boulder, CO - Ms. Tammy Van Meter

2-09-006  **The Squeeze Is On: Overcoming Overpopulation** - Trixie Lee - 12th grade - Fleming High School - Crook, CO - Mrs. Linda Niccoli

2-09-007  **Genetics Through Fingerprints?** - Michael Paul Macklin - 9th grade - Springfield Jr/Sr High School - Springfield, CO - Ms. Tamara Piper

2-09-008  **Comparing Extracted And Amplified Mitochondrial DNA** - Holly McGuire - 11th grade - Woodlin Undivided High School - Lindon, CO - Mrs. Nancy Gettman


2-09-010  **The Effect Of Ephedra On A Daphnia Fresh-Water Flea** - Janel Schrader - 11th grade - Del Norte High School - Del Norte, CO - Mrs. Julie Schrader

2-09-011  **Relative Abundance Of Ponderosa Pine Bird Species Along An Elevational Gradient** - Matthew Simes - 12th grade - Centaurus High School - Lafayette, CO - Mrs. Abby Scott

2-09-012  **Determining Failure Of Passive Transfer In Neonatal Bovine Based On Immunoglobulin G Levels** - Kori Tagtmeyer - 9th grade - Hi-Plains High School - Seibert, CO - Ms. Trish McArthur

2-09-013  **The Effects Of Light Pollution On Macrosiphum euphorhiae** - Phillip Torres - 10th grade - Cherry Creek High School - Englewood, CO - Mr. Steve Lantz

Team Projects

2-10-001  **The Effect Of Various Types Of Eye Drops On Polymer Crystals** - Lisa Markle & Becky Ravenkamp - 9th grade - Genoa-Hugo High School - Hugo, CO - Mrs. Marguerite Yowell

2-10-002  **Stress And Immunity: Qualification Of Immunoglobulin G And Leucocytes** - Brittani Cliff & Breanna Anderson - 10th grade - Akron High School - Akron, CO - Mrs. Deanna Schrock

2-10-003  **The Effect Of Grease On Lubrication As Shown By Extreme Loads** - Joel Martin & Douglas Cody Jolly - 9th grade - Genoa-Hugo High School - Genoa, CO - Mrs. Marguerite Yowell

2-10-004  **Classical Music's Effect On Short Term Memory** - Lacy Kemper & Samantha Wood - 9th grade - Springfield Jr/Sr High School - Springfield, CO - Mrs. Amy Ann Kemper

2-10-005  **Significant Factors That Affect Perception Of Location** - Eric King & David Van Wagener - 12th grade - Cherry Creek High School - Englewood, CO - Mr. Steve Lantz

2-10-006  **Aircraft Icing: Why Does It Happen?** - Aaron Burgess & Kristen Rasmussen - 11th grade - Fairview High School - Boulder, CO - Mr. Mark Chavez

2-10-007  **Computer Simulation Of Stability Of The Orbits In A Multi-Planet System** - David Sanford & Adam Ginsberg - 11th grade - Cherry Creek High School - Englewood, CO - Mr. Steve Lantz

2-10-008  **Does Pre-Soaking Seeds Effect The Germination Process?** - Peggy Tormohlen & Michaela Strand - 9th grade - Brush High School - Brush, CO - Mr. David Miner

2-10-009  **The Collatz Code** - David Wacker & Curtis Larimer - 10th grade - Palmer High School - Colorado Springs, CO - Mr. Brad Bogard

2-10-010  **Stereotypical, Aren't We?** - Melissa Garlock Ursula Janikowski - 10th grade - Palmer High School - Colorado Springs, CO - Mr. Brad Bogard
## Alphabetical Listing of Finalists

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<tr>
<th>Name</th>
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<td>Devin Adam</td>
<td>1-03-021</td>
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<td>Michael Deen</td>
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<td>Mark Allis</td>
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<td>A. J. Allumbaugh</td>
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<td>Breanna Anderson</td>
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<td>Chris Anderson</td>
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<td>Mary Grace Beard</td>
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<td>Jacquie Beckbermit</td>
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<td>Eric Doner</td>
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**2002 CSEF Advisory Council**

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<td>President</td>
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<td>Mr. Harvey Teyler</td>
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<td>Mr. Samuel Bartlett</td>
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<td>Mr. David Holm</td>
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For other questions about the Colorado Science and Engineering Fair please contact:

Courtney Butler, CSEF Director
P O Box 1465
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Phone: (970) 491-7716; FAX: (970) 491-2005; e-mail: courtney@csmate.colostate.edu