Colorado Science and Engineering Fair
For Colorado Students in Grades 6 - 12
Hosted by the Center for Science, Mathematics & Technology Education

April 9 - 11, 2009
in the Lory Student Center
at Colorado State University
Fort Collins, Colorado
Welcome to the 54th Annual Colorado Science and Engineering Fair

This year marks my tenth year as the Colorado Science and Engineering Fair Director. In these ten years, I have had the privilege of knowing some very talented young scientists. I am so proud of all of your accomplishments. I always refer to all of you as my kids. So, congratulations to all of the 2009 CSEF Finalists – you are joining a very special group and after this year, you can call yourselves CSEF Alumni.

I want to thank all of the CSEF Alumni who have stayed in touch over the years and have kept involved in the state science fair. I am truly blessed to have such a dedicated group of people dedicated to making sure this event is the best it can be each and every year.

The success of each year’s CSEF is also directly dependent upon the support of public and private organizations, government agencies, school districts and universities, as well as the efforts of hundreds of committed volunteers. There is the Board of Directors (volunteers from the sponsoring organizations working on overseeing the running of the CSEF and the non-profit organization); the Advisory Council (volunteers from around the state who are on the CSEF Working Committees to make sure everything runs smoothly at the event); judges (both for Grand Awards and Special Awards who interview the finalists and choose the winners); and hundreds of on-site volunteers who do the actual work of the CSEF.

I would also like to say thank you for the support given to me by my colleagues in the Center for Science, Mathematics & Technology Education (CSMATE) at CSU and the College of Natural Sciences Dean’s Office. CSEF has called CSMATE home for the past ten years and CSMATE is proud to include the state science fair as one of its many outreach endeavors in the area of science and mathematics education.

If you’ve taken part in CSEF in previous years, then you already know that every year, the science fair exhibits the projects of over 300 scientifically talented young people from thirteen 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 industry for exhibits that best represent their particular emphasis of philosophies. The top two individual project winners and the top team project winners in the Senior Division are awarded a trip to compete in the Intel International Science and Engineering Fair, being held this year in Reno, NV May 10 – 15.

The 2008/2009 year has been very exciting. CSEF has been involved in the following activities:

- In August, CSEF held a Regional Fair Director’s Retreat where we discussed many issues surrounding the success of the regional science fairs as well as the state science fair.
- Several new organizations and companies have stepped forward as new sponsors of the CSEF: Covidian and Cherry Creek Basin Water Quality Authority.
- CSEF is a member of GoodSearch. Imagine if every time you logged on and looked up the caloric content of the snack you just ate, you earned money for charity. With each search you do, about 1¢ goes to the charity (CSEF!) of your choice. You simply select CSEF from the database, then tell all your friends, tell your friends to tell their friends and so on. If 1,000 people with CSEF as their chosen charity search twice a day for a year, we could earn $7,300. Visit http://www.goodsearch.com/ to add the GoodSearch tool bar to your web browser – it’s fast, easy and free!

The dedication displayed by the Colorado Science and Engineering Fair participants is commendable. Each of you is already a winner, having successfully initiated and completed your outstanding research project, and winning the opportunity to represent your region at the state level. We are here to celebrate your success and applaud your 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!

Sincerely,

Courtney Butler
CSEF Director

CSEF Historical Items Needed

The CSEF Historian, Elemer Bernath would like to encourage anyone who may have some items from past state science fairs (programs, photos, trophies, plaques, etc.) that would be willing to part with to contact him at elemerbernath@twol.com so we can continue to add to our archives in the CSU library.
# 54th Annual Colorado Science and Engineering Fair

**Lory Student Center**

CSEF Headquarters: Registration Booth, 2nd Floor

Colorado State University

### Thursday, April 9, 2009

#### Finalist Schedule

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30 AM – 11:00 AM</td>
<td>Tour Ticket Pick-Up/Sales</td>
<td>Room 213/215</td>
</tr>
<tr>
<td>8:30 AM – 11:30 AM</td>
<td>SRC Interviews – Students requiring an interview must comply BEFORE project may be set up.</td>
<td>Room 203/205</td>
</tr>
<tr>
<td>9:00 AM – 11:00 AM</td>
<td>Finalist Check-In</td>
<td>Registration Booth</td>
</tr>
<tr>
<td>1:00 PM – 1:20 PM</td>
<td>Finalist Orientation Meeting – Mandatory for all exhibitors.</td>
<td>CSU Theater</td>
</tr>
<tr>
<td>1:30 PM – 5:00 PM</td>
<td>Judging – Students must be at their exhibits for interviews.</td>
<td>Main Ballroom</td>
</tr>
</tbody>
</table>

#### Adult Schedule

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:30 PM – 2:00 PM</td>
<td>ISEF Rules Update</td>
<td>Room 213/215</td>
</tr>
<tr>
<td>2:00 PM – 3:00 PM</td>
<td>Science Fair Adult Sponsor Workshop</td>
<td>Room 203/205</td>
</tr>
<tr>
<td>3:15 PM – 5:00 PM</td>
<td>Intro to Small-Scale Science Workshop</td>
<td>B322 NESB</td>
</tr>
</tbody>
</table>

#### Judging Schedule

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:15 AM – 11:00 AM</td>
<td>Grand Awards Judge Captains’ Briefing</td>
<td>Room 230</td>
</tr>
<tr>
<td>11:00 AM – 11:30 AM</td>
<td>Grand Awards Judges’ Briefing</td>
<td>Cherokee Park Room</td>
</tr>
<tr>
<td>11:30 AM – 12:30 PM</td>
<td>Grand Awards Judges’ Luncheon</td>
<td>North Ballroom</td>
</tr>
<tr>
<td>12:15 PM – 12:30 PM</td>
<td>Special Awards Judges’ Briefing</td>
<td>Room 228</td>
</tr>
<tr>
<td>12:00 PM – 5:00 PM</td>
<td>Judging</td>
<td>Main Ballroom</td>
</tr>
<tr>
<td>12:00 – 1:30 PM</td>
<td>Grand Awards Judges only in the exhibit room.</td>
<td>Main Ballroom</td>
</tr>
<tr>
<td>12:30 – 1:30 PM</td>
<td>Special Awards Judges may enter the exhibit area.</td>
<td>Main Ballroom</td>
</tr>
<tr>
<td>1:30 – 5:00 PM</td>
<td>Students will be at their exhibits for interviews.</td>
<td>Main Ballroom</td>
</tr>
<tr>
<td>5:30 PM</td>
<td>Exhibit area is locked. Final judging continues.</td>
<td>Main Ballroom</td>
</tr>
</tbody>
</table>

*Only Judging Captains and Scientific Review Committee Members are permitted in the exhibit area at this time.*

### Friday, April 10, 2009

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:30 AM – 5:00 PM</td>
<td>CSEF Finalist Exhibits Open to the Public and the Media</td>
<td>Main Ballroom</td>
</tr>
<tr>
<td>9:00 AM – 10:00 AM</td>
<td>Guest Speaker: Colorado State Representative, Randy Fischer</td>
<td>CSU Theater</td>
</tr>
<tr>
<td>10:30 AM – 3:00 PM</td>
<td>Tours – Finalists, Adult Sponsors, family members and judges are invited to participate in the tours and presentation.</td>
<td>Registration Booth</td>
</tr>
<tr>
<td>2:00 PM</td>
<td>Finalist Ballots for Student Choice and Poster Contest are due.</td>
<td>Registration Booth</td>
</tr>
<tr>
<td>7:00 PM</td>
<td>Awards Ceremony</td>
<td>Thompson Valley HS</td>
</tr>
</tbody>
</table>

### Saturday, April 11, 2009

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00 AM – 11:00 AM</td>
<td>CSEF Finalist Exhibits Open to the Public and the Media</td>
<td>Main Ballroom</td>
</tr>
<tr>
<td>9:00 AM – 11:00 AM</td>
<td>Advisory Council &amp; Regional Fair Directors Meeting – open to all</td>
<td>Room 213/215</td>
</tr>
<tr>
<td>11:00 AM – 12:00 PM</td>
<td>Pizza Party - Finalists, Adult Sponsors, family members and judges are invited.</td>
<td>Main Ballroom</td>
</tr>
<tr>
<td>12:00 PM – 1:00 PM</td>
<td>Exhibit Dismantling - Everything must be out by 1:00 PM.</td>
<td>Main Ballroom</td>
</tr>
<tr>
<td>12:00 PM – 2:00 PM</td>
<td>Board of Directors Meeting – open to all</td>
<td>Room 213/215</td>
</tr>
</tbody>
</table>


Next year’s Colorado Science and Engineering Fair will be April 8 – 10, 2010.

(Dates are subject to change.)
Special Features of the CSEF

Small-Scale Science
Mini-Workshop for
Teachers & Parents
Thursday, April 9, 2009
3:15 – 5:00 PM
B322 Natural & Environmental
Sciences Building

Dr. Stephen Thompson, creator of Small-Scale Science research technique and Director of the Center for Science, Mathematics & Technology Education at CSU, will give a mini-workshop for teachers and parents interested in seeing how these techniques can be used by students in their science fair research.

CSEF Pizza Party

Lockheed Martin generously sponsors the CSEF Pizza Party as a final celebration for exhibitors, teachers and parents on Saturday, April 11th. The pizza is provided by Villa Pizza & Butler Pizza Company and cookies are provided by King Soopers.

Door Prize Donors:
- Bent’s Old Fort Historical Site
- College of Natural Sciences, CSU
- Colorado Geological Survey
- CSU Bookstore
- Denver Zoo
- Fort Collins Comfort Inn
- Great Sand Dunes National Park
- Hilton Fort Collins
- It’s About Time
- Kroenke Sports Enterprise
- Mesa Verde Museum Association
- NASCO
- Steve Spangler Science
- Strategic Visions
- Texas Instruments
- The Wildlife Experience
- USGS

Finalists MUST be present to win door prizes.

CSEF Tours and Presentations

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

If you pre-registered for tour tickets, you MUST pick them up and pay for them in Room 213/215 of the Lory Student Center by 11 AM on Thursday, April 9th. Extra and unclaimed tickets will be available for sale at the CSEF Headquarters booth from 12 Noon to 5 PM on Thursday, April 9th.

Tours such as the
CSU Campus Nature Walk

Judging
# 2009 Colorado Science and Engineering Fair Tours
Friday, April 10, 2009

## Morning Tours
<table>
<thead>
<tr>
<th>Tour</th>
<th>Location</th>
<th>Cost</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A</td>
<td>CSU Anatomy/Physiology Lab&lt;br&gt;(Senior Division Student Tour ONLY!)</td>
<td>$1.00</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Leaves at 10:15 AM from Room 224 LSC&lt;br&gt;Tour is from ~ 10:30 AM – 11:30 AM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2A</td>
<td>NCGRP</td>
<td>$1.00</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Leaves at 10:15 AM from Room 228 LSC&lt;br&gt;Tour is from ~ 10:30 AM – 11:30 AM</td>
<td></td>
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</tr>
<tr>
<td>3</td>
<td>CSU College of Engineering</td>
<td>$1.00</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Leaves at 10:45 AM from Room 220 LSC&lt;br&gt;Tour is from ~ 11:00 AM – 12:00 Noon</td>
<td></td>
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<tr>
<td>5</td>
<td>Forensic Sciences</td>
<td>$1.00</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Presentation starts at 11:00 AM in Room 228 LSC</td>
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<td></td>
</tr>
<tr>
<td>6</td>
<td>Anatomy in Clay</td>
<td>$1.00</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Presentation starts at 10:30 AM in Room 205 LSC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8A</td>
<td>CSU Scanning Electron Microscopy &amp; Thermal Analysis Lab</td>
<td>$1.00</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Leaves at 10:15 AM from Room 222 LSC&lt;br&gt;Tour is from ~ 10:30 AM – 11:30 AM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10A</td>
<td>Energy and the Environment</td>
<td>$1.00</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Leaves at 10:45 AM from Room 222 LSC&lt;br&gt;Presentation is from ~ 11:00 AM – 2:00 PM</td>
<td></td>
<td></td>
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<tr>
<td>11</td>
<td>CSU Entomology</td>
<td>$1.00</td>
<td>30</td>
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<tr>
<td></td>
<td>Leaves at 10:45 AM from Room 228 LSC&lt;br&gt;Tour is from ~ 11:00 AM – 12:00 Noon</td>
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<tr>
<td>12</td>
<td>CSU Greenhouse</td>
<td>$1.00</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Leaves at 10:15 AM from Room 230 LSC&lt;br&gt;Tour is from ~ 10:30 AM – 11:30 PM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13A</td>
<td>National Renewable Energy Laboratory</td>
<td>$1.00</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Presentation starts at 10:30 AM in Room 226 LSC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16A</td>
<td>Rhizosphere Biology</td>
<td>$1.00</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Leaves at 10:45 AM from Room 224 LSC&lt;br&gt;Tour is from ~ 11:00 AM – 12:00 Noon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17A</td>
<td>Intro to Veterinary Medicine</td>
<td>$1.00</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>Leaves at 10:15 AM from Room 220 LSC&lt;br&gt;Tour is from ~ 10:30 AM – 11:30 AM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18A</td>
<td>Covidien (Electrosurgical Devices)</td>
<td>$1.00</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Presentation starts at 10:15 AM in Room 203 LSC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18B</td>
<td>Covidien (Respiratory Devices)</td>
<td>$1.00</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Presentation starts at 11:30 AM in Room 203 LSC</td>
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<td></td>
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<tr>
<td>20A</td>
<td>Journey Through Space and Time in 3D</td>
<td>$1.00</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Presentation starts at 11:00 AM in Room 230 LSC</td>
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<td></td>
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## Afternoon Tours
<table>
<thead>
<tr>
<th>Tour</th>
<th>Location</th>
<th>Cost</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1B</td>
<td>CSU Anatomy/Physiology Lab&lt;br&gt;(Junior Division Student Tour ONLY!)</td>
<td>$1.00</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Leaves at 2:00 PM from Room 224 LSC&lt;br&gt;Tour is from ~ 2:15 PM – 3:15 PM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2B</td>
<td>NCGRP</td>
<td>$1.00</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Leaves at 12:45 PM from Room 228 LSC&lt;br&gt;Tour is from ~ 1:00 PM – 2:00 PM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Anatomy in Clay</td>
<td>$1.00</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Presentation starts at 1:30 PM in Room 205 LSC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Geologic History of the Front Range</td>
<td>$1.00</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Leaves at 1:15 PM from Room 224 LSC&lt;br&gt;Presentation is from ~ 1:30 PM – 2:30 PM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8B</td>
<td>CSU Scanning Electron Microscopy &amp; Thermal Analysis Lab</td>
<td>$1.00</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Leaves at 1:45 PM from Room 222 LSC&lt;br&gt;Tour is from ~ 2:00 PM – 3:00 PM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10B</td>
<td>Energy and the Environment</td>
<td>$1.00</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Leaves at 1:15 PM from Room 222 LSC&lt;br&gt;Presentation is from ~ 1:00 PM – 2:00 PM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13B</td>
<td>National Renewable Energy Laboratory</td>
<td>$1.00</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Presentation starts at 2:00 PM in Room 226 LSC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>CSU Department of Chemistry&lt;br&gt;A (Junior Division Student Tour ONLY!)</td>
<td>$1.00</td>
<td>24</td>
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<tr>
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<td>Leaves at 2:45 PM from Room 224 LSC&lt;br&gt;Tour is from ~ 3:00 PM – 4:00 PM</td>
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</tr>
<tr>
<td>15</td>
<td>CSU Department of Civil Engineering&lt;br&gt;(Senior Division Student Tour ONLY!)</td>
<td>$1.00</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Leaves at 1:05 PM from Room 224 LSC&lt;br&gt;Tour is from ~ 1:05 PM – 2:05 PM</td>
<td></td>
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</tr>
<tr>
<td>16B</td>
<td>Rhizosphere Biology</td>
<td>$1.00</td>
<td>15</td>
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<td></td>
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<tr>
<td>17B</td>
<td>Intro to Veterinary Medicine</td>
<td>$1.00</td>
<td>35</td>
</tr>
<tr>
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<td>Leaves at 1:15 PM from Room 220 LSC&lt;br&gt;Tour is from ~ 1:30 PM – 2:30 PM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18C</td>
<td>Covidien (Oncology Devices)</td>
<td>$1.00</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Presentation starts at 1:30 PM in Room 203 LSC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18D</td>
<td>Covidien (Patient Benefits)</td>
<td>$1.00</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Presentation starts at 2:45 PM in Room 203 LSC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Medical Mysteries&lt;br&gt;A (Senior Division Student Tour ONLY!)</td>
<td>$1.00</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Both groups leave at 12:45 PM from Room 220 LSC&lt;br&gt;Presentation is from ~ 1:00 PM – 2:00 PM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20B</td>
<td>Journey Through Space and Time in 3D</td>
<td>$1.00</td>
<td>25</td>
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<td></td>
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</tbody>
</table>
Rep. Fischer is a third-generation Coloradan and has lived in Fort Collins his entire life. He and his wife, Kathy, have lived in the same home in House District 53 for over 35 years. Rep. Fischer earned a BS degree in Natural Resources Management from Colorado State University in 1976. He went on to receive a Master’s degree in Civil Engineering, also from CSU. For the past 20 years, Rep. Fischer has worked as a consulting engineer specializing in the reclamation and remediation of abandoned mine sites throughout the U.S. and around the world.

During his time in the Colorado legislature, Rep. Fischer has focused on issues related to the long-term sustainability of Colorado’s economy and environment, such as water supply and water quality, natural resource conservation, and renewable energy. He has also championed educational issues, including many current issues around early childhood, K-12, and higher education.

Rep. Fischer and Kathy enjoy spending their time outdoors, growing a big garden each year, hiking, mountaineering, and watching wildlife.
We Invite You to Help Make a Difference

There are several different ways to contribute to the Colorado Science and Engineering Fair.

Financial Sponsorship: The Colorado Science and Engineering Fair is a nonprofit organization. Because of this, the Fair is totally dependent on the sponsorship and contributions from businesses, organizations, and individuals in Colorado to cover fair expenses, to provide prize money, and to fund the trip to the Intel International Science and Engineering Fair for the top state winners. Checks may be made payable to the Colorado State Science Fair, Inc. For the IRS 501-C-3 tax exempt status number or for more information on financial sponsorship please contact:

Mike Bemski, Finance Committee Chair
AREVA Federal Services, LLC
Phone: (303) 303-705-9250; FAX: (303) 303-705-9260; e-mail: mike.bemski@areva.com

Special Awards: Sponsored Special Awards supplement the Regular Fair Awards given in each category and division. Your organization may choose to provide representatives to judge exhibits and present awards based on your own criteria. Awards may include cash, savings bonds, calculators, computers and other prizes, summer job opportunities, and college scholarships (see below). To join this prestigious group of Special Awards Presenters contact:

Sam Bartlett, Special Awards Coordinator
Colorado Engineering Council
Phone: (303) 988-2426; e-mail: samuelbartlett@aol.com

Special Sponsorships: Special Sponsorships constitute a new category of support that supplements the Financial Sponsorships to cover the full range of support needed to run the CSEF. These special sponsorships allow for support of specific activities that are a part of the CSEF and as such, present opportunities for sponsors to advertise their involvement with the CSEF. Areas that have been identified for the 2010 CSEF include: Teacher of the Year Award, pizza party, awards ceremony, awards, ISEF trips, printing, T-shirts and registration packets. To join this prestigious group of Special Sponsors, please contact:

John Parker, Outreach Coordinator
Lockheed Martin Space Systems Company (retired)
Phone: (303) 796-7904; e-mail: johnedwardparker@msn.com

Scholarships: If your organization would like to award a scholarship please contact:

David Holm, Scholarship Committee Chair
SLV Research Center - CSU
Phone: (719) 754-3594 ext. 114; FAX: (719) 754-2619; e-mail: spudmkr@lamar.colostate.edu

Judging: Judging is done by professional scientists and engineers who visit each exhibit, review the research, and interview the student exhibitors. To volunteer to become a Colorado Science and Engineering Fair judge please contact:

Gina Holland, Grand Awards Judging Coordinator
Colorado Engineering Council
Phone: (303) 987-0377; e-mail: iabritton@netzero.net or gina.holland@shawgrp.com

For other questions about the Colorado Science and Engineering Fair please contact:
Courtney Butler, CSEF Director, P O Box 1465, Fort Collins, CO 80522-1465
Phone: (970) 491-7716; FAX: (970) 491-2005; e-mail: courtney@csmate.colostate.edu
2009 Colorado Science and Engineering Fair
Financial Contributors

The Colorado State Science Fair, Inc. is an independent, nonprofit organization. For this reason, CSSF, Inc. is totally dependent upon the generous donations of those private businesses, organizations, and individuals that provide support for the prize money, the ISEF trips, and other science fair expenses. CSEF Sponsors are also 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. The thanks of everyone who participates in the Colorado Science and Engineering 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.

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Ed & Lucy Adams
Samuel & Eileen Bartlett
(in-kind – Special Awards judging supplies & coordination)
Colorado Geological Survey
(in-kind – postcards for packets)
Ryan Fisher
(in-kind - T-shirt design)
Gina Holland & Isaac Britton
David & Vonda Holm

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The many federal employees who contributed through the Combined Federal Campaign.
The many community members who use Goodsearch to raise money for CSEF with their internet searches.

Thank You
2009 CSEF Grand Awards Judges

More than 100 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 Best Individual Project award team which determines the Top of Fair individual project winners in each division. The assistant captains of each judging team form the Best Team Project award team which determines the Top of Fair team project 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 Friday.

Alicia Alberico  
Colorado State University (student)  
Microbiology

Scott Allen, BS  
Lockheed Martin  
Electrical Engineering

Robert Anselmi, PhD  
Lockheed Martin (retired)  
Chemistry

Dawn Arkin, BS  
Boulder Scientific Company  
Chemistry

Don Barnes, BS  
Colorado Department of Corrections  
Agricultural Engineering

Michael Barth, MS, MEPM  
Lockheed Martin  
Environment, Safety & Health Mgmt

Michael Bemski, BA, PMP  
AREVA Federal Services, LLC  
Geology

Stephen Bernard, MEAM, PMP  
AT & T  
Eng & Environmental Health & Safety

Kenneth Blehm, PhD, CIH  
Colorado State University  
Environmental * Occupational Health

James Boaz, BS  
Metropolitan Surveyors, LLC  
Geology

Wesley Boucher, MD  
Physician (retired)

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Northrop Grumman  
Civil & Systems Engineering

Donald Brandborg, BA, DMNS  
Union Pacific Railroad (retired)  
Anthropology & Paleontology

Elizabeth Brooks, BS  
Colorado State University  
Microbiology

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Department of Human Services  
North Central Facilities Management  
Computer Sciences

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Plant Biochemistry & Horticuture

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Computer Science & Geography

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Avago Technologies  
Electrical Engineering

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Ball Aerospace & Technologies Corp  
Chemistry, Physics & Biophysics

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Electrical Engineering

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Hewlett-Packard  
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IBM (retired)  
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Electrical & Electronic Engineering

Karl Fleischer, MS, PE  
Stolle Machinery  
Mechanical & Systems Engineering

Karl Ford, PhD  
US Bureau of Land Management  
Environmental Health & Toxicology

Charles Fraser, MD  
Physician (retired)

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Colorado State University  
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Terralliance  
Physics

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Molecular Genetics

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Hoch Company  
Computer Systems Engineering

Joann Ginal, PhD  
Bristol Myers Squibb  
Zoology & Endocrinology

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Poudre Valley Hospital  
Environmental Health & Safety

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JKG Consulting, Inc.  
Business Admin & Energy Consulting

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Comcast  
Chemical & Environmental Engineering

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Electrical Engineering & Geology (retired)

Jim Hatfield, BA  
Seagate Technology  
Mathematics & Computer Sciences

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Hewlett-Packard  
Electrical Engineering

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University of Wyoming  
Biology, Geology, & Ecology

Katrina Hernandez  
Colorado State University (student)  
Microbiology

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US Bureau of Reclamation  
Fisheries

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Colorado State University  
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Colorado State University
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Kelsey Thornburg
Colorado State University (student)
Microbiology

Brian Tooker, MS
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Microbiology & Animal Science

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The following organizations and companies have sent representatives to interview finalists and bestow special awards based on criteria that fits with the mission of the organization or company.

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Air & Waste Management Association
Rocky Mountain States Section
American Association of University Women
American Chemical Society
Colorado Local Section
American Institute of Chemical Engineers
Rocky Mountain Section
American Meteorological Society
Denver/Boulder Chapter
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Colorado/Wyoming Chapter
American Vacuum Society
Rocky Mountain Chapter
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Rocky Mountain Section &
Rocky Mountain Water Environment Association
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Colorado Association of Science Teachers
Colorado Biology Teachers' Association
Colorado Dental Association
Colorado Environmental Health Association
Colorado Foundation for Agriculture
Colorado Geographic Alliance
Colorado Geological Survey &
Division of Reclamation Mining and Safety
Colorado Mineral Society
Colorado Mycological Society
Colorado River Watch
Colorado School of Mines
Colorado Scientific Society
Colorado State University
Department of Biochemistry & Molecular Biology
Colorado State University
Department of Chemistry
Colorado State University
Dept of Horticulture & Landscape Architecture
Colorado Veterinary Medical Association &
CVMA Auxiliary & Auxiliary to the AVMA

Colorado-Wyoming Society of American Foresters
Covidien, Energy-based Devices
Eppler Family
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Optical Society of America
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Professional Association of Colorado Educators
Rocky Mountain Association of Geologists
Seagate Technology and Science Buddies
Society for Advancement of Chicanos and Native Americans in Science
Society for Mining, Metallurgy and Exploration
Colorado Section
Society of Manufacturing Engineers
Northern Colorado Chapter 354
Society of Women Engineers
Rocky Mountain Section
Soil & Water Conservation Society
Colorado Chapter
SPIE – The Int'l Society for Optics & Photonics
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United States Geological Survey
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University of Colorado Health Sciences Center
US Department of Commerce
Xcel Energy
Yale Science & Engineering Association
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# 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.

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<th>Debbie Gray</th>
<th>Dean Muir</th>
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<tbody>
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*Indicates CSEF Alumni Volunteers
## 2009 CSEF Advisory Council

The CSEF Advisory Council includes all Regional Fair Directors, the CSSF, Inc. Board of Directors and many volunteers.

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<thead>
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<th>Executive Committee</th>
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</thead>
<tbody>
<tr>
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<td>Mr. Michael Bemski</td>
</tr>
<tr>
<td>Vice President</td>
<td>Mr. Samuel Bartlett</td>
</tr>
<tr>
<td>Treasurer</td>
<td>Mr. Doug Hooker</td>
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<tr>
<td>Secretary</td>
<td>Dr. Carol Morrow</td>
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<td>Past President</td>
<td>Dr. David Holm</td>
</tr>
<tr>
<td>Recording Secretary</td>
<td>Ms. Lucy Adams</td>
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<tr>
<td>CSEF Director</td>
<td>Ms. Courtney Butler</td>
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</table>

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  - Stephanie Hooker
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- Elemer Bernath - Historian
- Russell Chadwick - NOAA

### Past CSEF Directors

<table>
<thead>
<tr>
<th>Name</th>
<th>Years</th>
<th>CSEF Directors</th>
<th>Years</th>
<th>CSEF Directors</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Courtney Butler</td>
<td>2000-present</td>
<td></td>
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</tr>
</tbody>
</table>

*Director Emeritus for outstanding contribution to the CSEF and more than two years of service as CSEF Director.

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David Pfuhl

Weldon Valley School
Brian Rosenbrock

West Jefferson Middle School
Mary Pond

Wiggins Middle School
Jordan Sonnenberg

Woodlin School
Blake Byall

Wray High School
James DePue

Yuma Middle School
Amanda Dine
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<td>2-05-006</td>
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CSEF Exhibit Hall
Junior Exhibits

Open to the Public
Friday 9 AM - 5 PM
Saturday 9 AM - 11 AM
<table>
<thead>
<tr>
<th>Alphabetical Listing of Finalists</th>
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<tbody>
<tr>
<td>Jovanny Alvarez 1-05-008</td>
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<td>Jordan Apodaca 1-06-008</td>
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<td>Isaac Aragon 1-05-301</td>
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19
### CSEF Junior Division Finalists

#### Animal Sciences

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<tr>
<th>Entry</th>
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<td>1-01-002</td>
<td>My Horse's Ultimate Exercise: Dressage vs. Recovery</td>
<td>8th</td>
<td>Challenger Middle School</td>
<td>Mrs. Sundae Stoa</td>
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<td>1-01-003</td>
<td>Swimming With Ease Could Make You Wheeze The Effect Of Chlorine On The Respiratory System</td>
<td>7th</td>
<td>Merino Jr/Sr High School</td>
<td>Mrs. Carlye Armstrong</td>
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#### Behavioral & Social Sciences

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<td>1-02-002</td>
<td>Call It Disaster: Cell Phone Use During Simulated Driving</td>
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<td>Dr. Valerie Green</td>
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<td>Think! Chew! Think!: An Investigation to Determine Whether Chewing Gum Improves Test Scores</td>
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<td>Mr. Warren Astler</td>
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<td>1-02-005</td>
<td>Music &amp; the Mind: The Effect of Music on School Work</td>
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<td>Mrs. Renee Loflin</td>
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<td>That Dam Rat</td>
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<td>Monte Vista Middle School</td>
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<td>1-02-007</td>
<td>It Pays to be Poor: The Systematic Destruction of American Dignity</td>
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<td>Mrs. Patricia Keeling</td>
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<td>1-02-008</td>
<td>Now You See It, Now You Don't</td>
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#### Chemistry

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<td>Cream of the Crop, Tip of the Top, Is Your Butterfly Hot, or Not?</td>
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<td>Mrs. Haydee Phelps Ayi-Bonte</td>
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<td>The Effects of Television on Children's Choices</td>
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<td>6th</td>
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<td>How Does The Presence of a Police Car Affect Average Car Speed?</td>
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<td>Feel the Beat</td>
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<td>Mrs. Destin Mehess</td>
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</table>
CSEF Junior Division Finalists

Chemistry continued

1-03-009  *A Model Study of Drug Intake* - **Gerri Roberts** - 8th grade - Turner Middle School - Berthoud - Mr. Kevin Gonzales

1-03-010  *pH of Bottled Water* - **Stephaney Sardello** - 6th grade - La Veta Elementary School - La Veta - Mrs. Patricia Keeling

1-03-011  *A “Well” of A Problem* - **Kole Van Treese** - 8th grade - Sargent Jr/Sr High School - Monte Vista - Mrs. Terri Paulson

1-03-012  *Pop! Goes the Hairstrand* - **Kathryn Wied** - 8th grade - Canon City Middle School - Canon City - Mrs. Glenda Macklin

1-04-001  *Weathering Degradation of Anthropogenic Formations in Marble and Granite* - **Jordan Bushnell** - 7th grade - Irving Middle School - Colorado Springs - Mrs. Sandra Bushnell

1-04-002  *Soaking It Up Soil Style* - **Linda Kolb** - 8th grade - Sargent Jr/Sr High School - Monte Vista - Mrs. Terri Paulson

1-04-003  *Cooled Fast or Cooled Slow, How Big Will The Crystals Grow?* - **Danielle Riggs** - 8th grade - Fruita 8/9 School - Fruita - Mr. Kevin Chirdon

1-04-004  *Neutralization Investigation: Battery Chemicals in Landfills* - **Sophia Schneider** - 7th grade - North Middle School - Colorado Springs - Mr. Greg Busby

1-04-005  *H20 Hurricanes are Heated by Oceans* - **Lexi Thompson** - 8th grade - Otis Jr/Sr High School - Otis - Mr. Karl Donnelson

1-04-006  *Acid Rain Effects on Cave Formation* - **Taylor Volesky** - 7th grade - Cherry Creek Challenge School - Denver - Mr. John Wiley

Earth & Space Science

1-05-001  *Water Into Electricity* - **Kurik Matties** - 6th grade - Olathe Middle/High School - Olathe - Mrs. Sara Rector

1-05-002  *H2O MPG: Does a Homemade Hydrogen Electrolyzer Really Improve Fuel Mileage?* - **Drew Auburger** - 8th grade - Springfield Jr/Sr High School - Springfield - Mr. Don Auburger

1-05-003  *Powerful Garbage* - **Alexandre Basagoitia** - 7th grade - Sargent Jr/Sr High School - Monte Vista - Mrs. Terri Paulson

1-05-004  *What’s In Your Tank* - **Olivia Charles** - 7th grade - Arriba-Flagler School - Flagler - Mr. Allen Bell

1-05-005  *Recharge and Save* - **Cellene Feathers** - 7th grade - The Classical Academy - Colorado Springs - Mrs. Candus Muir

1-05-006  *Here Comes the Sun . . .* - **Minuri Gamage** - 8th grade - Kinard Core Knowledge Junior High School - Fort Collins - Mr. Nimal Gamage

1-05-007  *A Method for Predicting Mileage vs. Tire Pressure* - **Andi Heath** - 8th grade - Blevins Junior High School - Fort Collins - Mr. Scot Heath

1-05-008  *How Many Lemons Are Needed to Light Up an LED?* - **Jovanny Alvarez** - 8th grade - Quest Academy - Dacono - Mrs. Cecilia Miranda

1-05-009  *Electricity in Fruits* - **Weston Patton** - 8th grade - Genoa-Hugo School - Hugo - Mr. Will Mallory

1-05-010  *Magnetic Electricity* - **Jacob Piper** - 8th grade - Genoa-Hugo School - Hugo - Mr. Will Mallory

1-05-011  *Do Rotating Solar Panels Create More Electricity?* - **Cora Ravenkamp** - 7th grade - Genoa-Hugo School - Hugo - Mr. Will Mallory

1-05-012  *Making Biodiesel Greener* - **Sara Volz** - 8th grade - Cheyenne Mountain Charter Academy - Colorado Springs - Dr. David Volz

1-05-013  *Go Green with Thermal Energy* - **Grant Yowell** - 7th grade - Genoa-Hugo School - Hugo - Mrs. Marguerite Yowell

1-05-014  *Immortal Power* - **Isaac Aragon** & **Breanne Buchner** - 6th grade - Fowler Elementary School - Fowler - Mr. Mike Aragon

Engineering

1-06-001  *Bear-icade* - **Kolton Miller** - 8th grade - Mancos Middle School - Mancos - Mrs. Kelly Finlay

1-06-002  *Water Purification Off The Grid, Phase II* - **Zane Willburn** - 8th grade - Mancos Middle School - Mancos - Mr. Joe Willburn

1-06-003  *How Does Right/Left Random Turn Probability Affect Time to Cover a 3.5’ Square* - **Nathan Brinks** - 8th grade - Blevins Junior High School - Fort Collins - Mr. Barry Brinks

1-06-004  *Safest Skyscraper Foundations* - **Kenna Brown** - 8th grade - East Middle School - Grand Junction - Ms. Kristen Ashbeek

1-06-005  *Roofs Roofs Everywhere!* - **Keaton Buxton** - 6th grade - Alta Vista Charter School - Lamar - Mrs. Debby Buxton

1-06-006  *Wind Powered Power* - **Cade Carlson** - 7th grade - Wiggins Middle School - Wiggins - Mr. Jordan Sonnenberg
CSEF Junior Division Finalists

Engineering continued

1-06-007 To Spin or Not to Spin: An Investigation of Fishing Lure Design - Wyatt Paiser - 8th grade - Otis Jr/St High School - Otis - Mr. Karl Donnelson
1-06-008 The Science of a Trebuchet - Jordan Apodaca - 7th grade - Corwin International Magnet School - Pueblo - Mrs. Destin Mehess
1-06-009 Why Don’t You Like RAP? Recycled Asphalt Pavement - Zachary Lamberty - 7th grade - East Middle School - Grand Junction - Mrs. Laura Lamberty
1-06-010 Get a Grip - Rachel Purswell - 7th grade - The Classical Academy - Colorado Springs - Mr. JP Purswell

1-06-011 How Does Your Spaghetti Hold Up? - Zachary Schoenherr - 7th grade - Weld Central Junior High School - Keenesburg - Mr. David Pfuhl
1-06-012 Wood Glue Hold . . . Or Not? - Patrick Telck - 6th grade - Mountain View Core Knowledge School - Canon City - Mr. Martin Telck
1-06-013 The Laser Car - Samir Berrada - 6th grade - Cortez Middle School - Cortez - Mrs. Heidi Berrada
1-06-301 The Seawall Solution - Erin McLaughlin & Jessie McLaughlin - 7th grade - Sacred Heart of Jesus School - Boulder - Mr. Don Anderson

Environmental Sciences

1-07-001 Burn Baby Burn: A Study in Forest Fuels and Humidity - Kayla Boren - 7th grade - St. Columba School - Durango - Ms. Lu Boren
1-07-002 Phytoremediation of Coal Bed Methane Produced Water - Casey Campbell - 8th grade - La Veta Jr/Sr High School - La Veta - Mrs. Patricia Keeling
1-07-003 Getting to the Root of Groundwater Pollution - Courtneyln Carpenter - 8th grade - East Middle School - Grand Junction - Mr. Clay Carpenter
1-07-004 Going Green With Water - Caleb Wright - 7th grade - Yuma Middle School – Yuma - Mrs. Amanda Dine
1-07-005 How Safe Is Your Groundwater? - Jordanne Williams - 8th grade - LW St. John Middle School - Parachute - Mrs. Manila Wise
1-07-006 Gone With the Wind - Camrey Garoutte - 8th grade - Sargent Jr/Sr High School - Monte Vista - Mrs. Terri Paulson
1-07-007 The Effects of Magnesium Chloride Road De-icer on Plants - Logan Graham - 6th grade - Miller Middle School - Durango - Mr. Mark Pastore
1-07-008 Effects of Soil on Water Quality - Craig Hayson - 7th grade - Cesar Chavez Academy - Pueblo - Mrs. Loretta Arguello
1-07-009 Natural Materials for Insulation vs. Fiberglass - Sabine Lindler - 6th grade - Miller Middle School - Durango - Mr. Bill Lindler
1-07-010 It’s A Dirty Job - Joel Lopez - 8th grade - Woodlin School - Woodrow - Mr. Blake Byall

1-07-011 Heads or Tails? The Effects of Antibiotics in Stream Water on Planaria Regeneration - Sydney Matteson - 6th grade - North Middle School - Colorado Springs - Mr. Charles Matteson
1-07-013 Health of a Stream - Ryan Parrish - 6th grade - North Middle School - Colorado Springs – Mr. Greg Busby
1-07-014 Feces to Fuel - Melissa Poet - 8th grade - Arriba-Flagler School - Flagler - Mr. Allen Bell
1-07-016 Snug as a Bug: Green Insulation - Amanda Coopersmith - 8th grade - Cherry Creek Challenge School - Denver - Mr. John Wiley
1-07-017 Give Me Oxygen! The Effects of Wastewater Treatment - Dominic Carrese - 6th grade - North Middle School - Colorado Springs - Dr. Susan Carrese
1-07-018 Toxic Waves - Allison Gudvangen & Claire Derr - 8th grade - North Middle School - Colorado Springs - Mr. Lee Derr
1-07-019 Fruit: The Greener Cleaner - Damien Ruybal & Brady Copeland - 8th grade - Pueblo School for the Arts and Sciences - Pueblo - Ms. Lori Leyh
1-07-020 Algae as a Biofuel - Bria Smith & Chelsea Jacobson - 7th grade - Cherry Creek Challenge School - Denver - Mr. John Wiley

Mathematics & Computer Sciences

1-08-001 Your’s, Mine and Our’s II: A Further Study into Modeling the Spread of Pollutants in the Atmosphere - Jessica Constant - 8th grade - Saint Joseph Catholic School - Fort Collins - Ms. Marianne Aiken
1-08-002 A Taste of Xcode: An Analysis of Security of the RSA Public-Key Encryption Algorithm - Matthew Haney - 8th grade - American Academy - Lone Tree - Mr. Warren Astler
1-08-003 Art and Nature: It All Adds Up - Kaley Kukus - 8th grade - Woodlin School - Woodrow - Mr. Blake Byall
1-08-004 Predicting the Inferno - Tucker Leavitt - 8th grade - Miller Middle School - Durango - Mr. Gregg Janus
1-08-005 Dice Probabilities - Tyler Meyer - 7th grade - Mt. Garfield Middle School - Clifton - Mrs. Kelley Meyer
### CSEF Junior Division Finalists

#### Mathematics & Computer Sciences continued

<table>
<thead>
<tr>
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<tr>
<td>1-08-006</td>
<td>The Mathematical Properties of Ferro Fluid</td>
<td>7th</td>
<td>Monte Vista Middle School</td>
<td>Mrs. Beverly Blake-O'Doherty</td>
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<tr>
<td>1-08-007</td>
<td>Spacing and Diffraction Patterns</td>
<td>8th</td>
<td>Cesar Chavez Academy</td>
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<td>1-09-001</td>
<td>Polyvinyl Chloride, Polypropylene, Polystyrene- Pick Your Poison</td>
<td>7th</td>
<td>North Middle School</td>
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<tr>
<td>1-09-006</td>
<td>Farm Fresh vs. Store Bought Eggs</td>
<td>8th</td>
<td>Genoa-Hugo School</td>
<td>Mr. Eric Oestman</td>
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<tr>
<td>1-09-002</td>
<td>The Effects of Various Liquids on Hydroxyapatite Calcium Tablets</td>
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<tr>
<td>1-09-007</td>
<td>Do Poppies Seeds Affect Drug Test</td>
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<tr>
<td>1-09-003</td>
<td>Does Teeth Whitening Toothpaste, Teeth Whitening Gum, Or Teeth</td>
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<td>Durango</td>
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<td>1-09-009</td>
<td>Water vs Gatorade - Hunter Sneller</td>
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<td>1-09-005</td>
<td>Fizz, Focus, Fuel Good . . . or Bad: The Effects of Energy Drinks</td>
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<td>1-09-0010</td>
<td>Disinfecting Wipes: Smear or Clear?</td>
<td>6th</td>
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#### Medicine & Health

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#### Microbiology

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<tr>
<td>1-10-001</td>
<td>Water, Water, Everywhere, But Not a Drop to Drink: E. coli Dangers!</td>
<td>6th</td>
<td>Eagle County Charter Academy</td>
<td>Mr. Wade Ingle</td>
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<td>1-10-002</td>
<td>Dirty Rotten Fountains - Mackenzy Becker</td>
<td>7th</td>
<td>North Middle School</td>
<td>Mr. Brian Rosenbrock</td>
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<td>1-10-003</td>
<td>&quot;MRSA!&quot;, &quot;Super Lice!&quot;, Super E. coli? - Anne Bennett</td>
<td>8th</td>
<td>Pueblo School for the Arts and Sciences</td>
<td>Mrs. Lori Leyh</td>
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<td>1-10-004</td>
<td>Your Kitchen Cleaners Might Kill E. coli But What Else Do They Kill?</td>
<td>7th</td>
<td>North Middle School</td>
<td>Mr. Erryn Tanner</td>
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<td>1-10-005</td>
<td>Bacteria: What Products Kills the Most Bacteria? - Denvir Clarke</td>
<td>8th</td>
<td>Bayfield Middle School</td>
<td>Mr. Frank Masiarz</td>
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<td>1-10-006</td>
<td>Cleaners and the Resistance Factory: The Effect of Disinfectants</td>
<td>7th</td>
<td>Merino J/Sr High School</td>
<td>Mrs. Carlye Armstrong</td>
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<td>Germphobic - Emma DiVittore</td>
<td>8th</td>
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<td>Mr. Eric Oestman</td>
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<td>1-10-008</td>
<td>Antibacterial Soap vs. Regular Soap - Michelle Dworkin</td>
<td>8th</td>
<td>Blevins Junior High School</td>
<td>Mrs. Jennifer Taylor</td>
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<td>1-10-009</td>
<td>Modern Drugs from Ancient Medicine: Finding New Antibiotics</td>
<td>8th</td>
<td>Summit Middle School</td>
<td>Mrs. Haydee Phelps Ayi-Bonte</td>
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<td>1-10-010</td>
<td>Transfer of Bacteria from a Person to a Bottle of Water</td>
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<td>1-10-011</td>
<td>Bacteria in a Clean vs. Contaminated Environment - Nadeen Ibrahim</td>
<td>8th</td>
<td>Weldon Valley School</td>
<td>Mrs. Brian Rosenbrock</td>
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<td>1-10-012</td>
<td>How Clean is Clean? - Tyler Lopez-Butynski</td>
<td>7th</td>
<td>Goodnight School</td>
<td>Mr. George Guddendorf</td>
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<td>1-10-013</td>
<td>Vitamin C: A Potential Treatment for Cold Sores? - Savannah Lyle</td>
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<td>Dr. Pamela Lyle</td>
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<td>1-10-014</td>
<td>Chocoholic: The Effect of Bacterial Ear Infection On Nerve Damage</td>
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<td>Mrs. Carlye Armstrong</td>
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<td>1-10-015</td>
<td>Mind the Zone - Krutika Patel</td>
<td>8th</td>
<td>American Academy</td>
<td>Mrs. Amanda Cline</td>
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<td>1-10-016</td>
<td>Got Sour Milk? - Ayra Saslow</td>
<td>6th</td>
<td>Miller Middle School</td>
<td>Mr. Mark Pastore</td>
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<td>1-10-017</td>
<td>To Eat, Or Not To Eat - Kristen Smith</td>
<td>8th</td>
<td>The Classical Academy</td>
<td>Mrs. Candus Muir</td>
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<td>1-10-018</td>
<td>Pure H2O : Will Solar Distillation Kill Bacteria?</td>
<td>6th</td>
<td>St Columba School</td>
<td>Mrs. Bridget Stowers</td>
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<td>1-10-019</td>
<td>&quot;How Clean is Your Mouth&quot; (The Effects of Mouthwash on Bacteria)</td>
<td>6th</td>
<td>Roncallie Middle School</td>
<td>Mrs. Sheryl Siegmann</td>
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</table>
CSEF Junior Division Finalists

Physics

1-11-001 *Double Range With Double Counterweight* - John Cheslock - 7th grade - Sargent Jr/Sr High School - Monte Vista - Mrs. Terri Paulson

1-11-002 *Does Weight Affect the Penetration of Pellets in Ballistics Gel?* - Steven Garcia - 6th grade - La Veta Elementary School - La Veta - Mrs. Patricia Keeling

1-11-003 *Hot Rods: Three Methods for Measuring the Expansion Coefficients of Metals* - Kyle Harlow - 8th grade - Mountain View Core Knowledge School - Canon City - Dr. Valerie Green

1-11-004 *The Power of Transformers* - Sami Hourieh - 8th grade - Lamar Middle School - Lamar - Ms. Robin Staker

1-11-005 *Nitinol (Memory Masters)* - Aidan Mike - 7th grade - North Middle School - Colorado Springs - Ms. Wendy Mike

1-11-006 *'Chute Me* - Andrew Perry - 8th grade - Otis Jr/Sr High School - Otis - Mr. Karl Donnelson

1-11-007 *Electromagnets II* - Kayleigh Santala - 8th grade - Arriba-Flagler School - Flagler - Mr. Allen Bell

1-11-008 *Radio Wave Roundup* - Rachel Rossi - 7th grade - Miller Middle School - Durango - Mr. Gregg Janus

1-11-009 *Txt r' Tlk: A Comparison of the Electromagnetic Fields Produced by Cell Phones When Calling and Text Messaging* - Sydney Rohlwing - 8th grade - American Academy - Lone Tree - Mr. Warren Astler

1-11-010 *An Investigation on How Applying Stress to a Fluid Effects the Fluids Ability to Disperse Force* - Srih Sharma - 8th grade - American Academy - Lone Tree - Mr. Warren Astler

1-11-011 *Convection Cells: The Saline Effect* - Isabella Soehn - 8th grade - Summit Middle School - Boulder - Ms. Karlene Soehn

1-11-012 *The Physics of Jumping* - Tyler Stratman - 8th grade - Brush Middle School - Brush - Mr. David Miner

1-11-013 *How to Make a Rheostat* - Wyatt Vick - 6th grade - Genoa-Hugo School - Hugo - Mr. Will Mallory

1-11-014 "Higher" Performance Pinewood Car - Christopher Weyer - 8th grade - Creekside Middle School - Monument - Mr. Jim Weyer

1-11-301 *The Secondary Breakpoint of a Tower* - Bret Bostrom & Ken Garcia - 8th grade - Brush High School - Brush - Mr. David Miner

Plant Sciences

1-12-001 *Green Energy! An Analysis of Biomass Energy Within Plants* - Paxton Becker - 8th grade - Merino Jr/Sr High School - Merino - Mrs. Carlye Armstrong

1-12-002 *Mycorrhizal Symbiosis: Unlocking the Potential of Soil* - Devon Enke - 7th grade - La Veta Jr/Sr High School - La Veta - Mrs. Patricia Keeling

1-12-003 *To Fertilize or Not to Fertilize* - Josiah Higgins - 7th grade - Genoa-Hugo School - Hugo - Mr. Will Mallory

1-12-004 *Does Carbon Dioxide Effect Zea mays and Phaseolus vulgaris Growth?* - Beth Lenz - 8th grade - Buchanan Middle School - Wray - Mr. Eric Oestman

1-12-005 *HOT PLANTS: The Effects of Global Warming on Development of Plants, Blossoms, Seeds, and Seed Pods* - Haley Matteson - 7th grade - North Middle School - Colorado Springs - Mr. Charles Matteson

1-12-006 *Avocado Seed Immerse* - Reyna Ramirez - 6th grade - Pueblo School for the Arts and Sciences - Pueblo - Ms. Lori Leyh

1-12-007 *Local Plants as Insect Repellant* - Xavier Sabourin - 6th grade - Cortez Middle School - Cortez - Ms. Alison Eddy

1-12-008 *A Comparison of Moisture Content of Three Apples* - Ashley Snyder - 6th grade - Lincoln Elementary School - Lamar - Mrs. Julie Dorenkamp

1-12-009 *Fertilizers Affect on Plant Growth* - Christina Stratton - 7th grade - Arriba-Flagler School - Flagler - Mr. Allen Bell

1-12-010 *Let-Us Farm* - Luke Summar - 7th grade - West Jefferson Middle School - Comifer - Mrs. Mary Pond

1-12-011 *Effect of Magnesium Chloride and Sodium Chloride on Plant Life* - Shelby Teague - 7th grade - Wiggins Middle School - Wiggins - Mr. Jordan Sonnenberg

1-12-012 *Dog-Gone Yellow Spots* - Anna Tedstrom - 8th grade - Eagle County Charter Academy - Edwards - Mr. Daniel Sipes

1-12-013 *Under Pressure: Stress Gene Response in Pressure Bruised Tubers* - Brisha Wakasugi - 8th grade - Sierra Grande Jr/Sr High School - Blanca - Mrs. Judy Lopez

1-12-014 *Hydroponics vs. Conventional Gardening* - Kayla Hannel - 8th grade & Tiana Isley - 7th grade - Holly Jr/Sr High School - Holly - Ms. Abby Ambrose

1-12-015 *The Scent of Blood* - Ryan Johnston & Maeya Allsup - 8th grade - Dolores Middle School - Dolores - Mr. Dave Hopcia
CSEF Senior Division Finalists

Animal Sciences

2-01-001 The Onion Thrip Trick, Phase II - Lindsey Denison - 12th grade - Paonia Jr/Sr High School - Paonia - Ms. Mary Groome

2-01-002 Different Hunting Seasons and Their Effects on Deer and Elk Population - Michael Johnson - 10th grade - Canon City High School - Canon City - Ms. Carrie Trimble

2-01-003 Biological Control of Canada Thistle-Phase 3 - Testing Local Crops for Damage by Canada Thistle Insects - Nakayla Lestina - 9th grade - Dove Creek High School - Dove Creek - Mr. John Lestina

2-01-004 Moo...Gration - Abby Ney - 9th grade - Blevins Junior High School - Fort Collins - Mr. Rick Ney

2-01-301 Presenting the Champion or Maybe Not - Ben Smith, Kasey Miles & Kyle Tallent - 9th grade - Hotchkiss High School - Hotchkiss - Dr. Douglas Horton

2-01-302 Need a Compass? Find a Horse - Charlie Smith - 12th grade & Jennifer Vero - 11th grade - Nederland Middle/Senior High School - Nederland - Mrs. Laura Marts

2-01-303 Give That Dog His Bone: OSA Pedigree Analysis in Irish Wolfhounds & Inhibiting OSA via Statins and B - Kelsey Martin & Brandy Haller - 11th grade - Woodlin School - Woodrow - Mr. Blake Byall

Behavioral & Social Sciences

2-02-001 Brain Age: Conditioning the Human Brain in Minutes a Day! - Joshua Garcia - 10th grade - Monte Vista High School - Monte Vista - Mr. Gary Wilkinson


2-02-003 The Mind's Eye - Katy Schneider - 9th grade - Durango High School - Durango - Mrs. Brenda Downs

2-02-004 The Long-Term Effectiveness of the Desensitization of Ophidiophobia - Candice Pak - 11th grade - Cherry Creek High School - Greenwood Village - Mrs. Jessica Olsen

2-02-005 Teen Saving: Can You Bank On It? - Cassa Niedringhaus - 9th grade - Blevins Junior High School - Fort Collins - Mrs. Jacquelyn Niedringhaus

2-02-006 Sleep-Deprivation Won't Make You a Dope - Emily Owens - 10th grade - Merino Jr/Sr High School - Merino - Mrs. Carlye Armstrong

2-02-007 Stressed Out? The Effects of Extra Curricular Activities on the Cortisol Levels of Teens - Ralene Larson - 12th grade - Fleming High School - Fleming - Mrs. Linda Niccoli

2-02-008 The Effects of Equine Association on the Initial Beneficiary Benefactor - Katlin Hornig - 12th grade - Sargent Jr/Sr High School - Monte Vista - Mrs. Ronna Cochran

2-02-009 Metaphors and the Senses - Diane Schulze - 9th grade - Cherry Creek High School - Greenwood Village - Mr. Stephen Smith

2-02-010 Do You See What I See? - Alana Wilbee - 10th grade - Palmer High School - Colorado Springs - Mr. Warren Wilbee

Chemistry

2-03-001 An Alternative Application of the Sabatier Process for More Sustainable - Alan Bromwell - 12th grade - Cherry Creek High School - Greenwood Village - Dr. TJ Donahue

2-03-002 Synthesis of 4-Bromo-2,2'-Bipyridine - Benjamin Hoffman - 12th grade - Fairview High School - Boulder - Dr. Tarek Sammakia

2-03-003 Analysis & Extraction of Anthocyanins and Anthocyanidins in Vaccinium angustifolium - Christa Loyd - 12th grade - Wray High School - Wray - Mr. James DePue

2-03-004 Investigating the Effects of Tissue Decay on the Underlying Soil Chemistry - Ashlyne Miller - 10th grade - Lone Star School - Otis - Mrs. Dena Palser

2-03-005 Catching the Electric Current - Emily Schnoor - 11th grade - Sargent Jr/Sr High School - Monte Vista - Mrs. Ronna Cochran

2-03-006 Analysis of Fuel Composition by Gas Chromatography/Mass Spectrometry (GC/MS) - Travis Zuniga - 10th grade - South High School - Pueblo - Ms. Laurice Lopez-Cepero

2-03-007 The Effect of Magnetism on Ksp - Kyle Ayer & Jessica Vickers - 11th grade - Montrose High School – Montrose - Mrs. Margaret Hutt
CSEF Senior Division Finalists

**Earth Science**

2-04-001 Reconstructing Paleoccosystems: Community Structure Throughout the EECO - **Sean Buck** - 12th grade - Cherry Creek High School - Greenwood Village - Dr. TJ Donahue

2-04-002 Feeling The Heat? - **Jerrica Cherry** - 10th grade - Springfield Jr/Sr High School - Springfield - Ms. Lisa Cherry

2-04-003 Soil Biogeochemical Development of the Mendenhall Glacier Forelands - **Lisa Kant** - 12th grade - Boulder High School - Boulder - Dr. Diana Nemergut

2-04-004 Infested Forests and Evapotranspiration - **Johanna Phillips** - 9th grade - Monte Vista High School - Monte Vista - Mrs. Judy Lopez

2-04-005 Mitigation of Soil Liquefaction with Magnetic Fields - **Tanya Petach** - 10th grade - Fairview High School - Boulder - Dr. Jay Donaghy


**Energy & Transportation**

2-05-001 Electrifying the World, One Loop at a Time - **Christy Farnsworth** - 11th grade - Paonia Jr/Sr High School - Paonia - Mrs. Patricia Farnsworth

2-05-002 Plausibility of the United States As A Clean-Energy Only Country, Analyzed State By State - **Anthony Cisneros** - 11th grade - Union Colony Preparatory School - Greeley - Mrs. Catherine Hoyt

2-05-003 Stirling Energy: A Means of Collecting Solar Energy Stored in Asphalt - **Janet Duggan** - 12th grade - Fairview High School - Boulder - Mr. Mike Duggan


2-05-005 Sun-Sational Solar - **Abbi Helfer** - 9th grade - Palmer High School - Colorado Springs - Mr. Duane Helfer

2-05-006 Improved Efficiency of Microbial Fuel Cells - **Stacey Lyne** - 12th grade - Brush High School - Brush - Mr. David Miner

2-05-007 Water Used as a Fuel - **Darla Rosenbrock** - 11th grade - Brush High School - Brush - Mr. Brian Rosenbrock

2-05-008 H2O - Water or Fuel? - **Grant Slinger** - 12th grade - Stratton High School - Stratton - Mrs. Jennifer Askew

2-05-301 Putting Humans to "Work": Generating Usable Electricity from Wasted Energy - **Matthew Bull** - 12th grade & Forrest Pieper - 11th grade - Nederland Middle/Senior High School - Nederland - Mrs. Laura Marts

2-05-302 Hot Boxing Efficiency - **Tara Dillon & Sheridan Cooper** - 12th grade - Canon City High School - Canon City - Ms. Carrie Trimble

**Engineering**

2-06-001 Plasma Propulsion III - **Jesse Ellison** - 11th grade - Bayfield High School - Bayfield - Mr. Carl Ellison

2-06-002 Where It Wasn't - **John Parish IV** - 10th grade - Home Schooled - Colorado Springs - Mrs. Maureen Parish

2-06-003 Parabolic Solar Desalination for the Developing World - **Kelci Garcia** - 10th grade - Antonito Jr/Sr High School - Antonito - Mr. Diego Martinez

2-06-004 Design and Construction of a Silent Magnetohydrodynamic Propulsion - **Ethan Hahn** - 11th grade - The Classical Academy - Colorado Springs - Ms. Linda Cummings

2-06-005 Motion Sensored Controls: Advancement In A Higher Application - **Cole Kembel** - 12th grade - Brush High School - Brush - Mr. David Miner

2-06-006 Lockdown Bot Phase 2.0 - **Adam Schendel** - 11th grade - Merino Jr/Sr High School - Merino - Mrs. Carlye Armstrong

2-06-007 Spotsucker Cleaning System - **Kyle Myhra** - 11th grade - Broomfield High School - Broomfield - Ms. - Karen Hyde-Edgerly

2-06-008 It's A Breeze - **Mike Fulmer** - 9th grade - Arriba-Flagler School - Flagler - Mr. Brandon Borich

2-06-009 Valveless Pumping - **Joe Rosenbrock** - 10th grade - Brush High School - Brush - Mr. David Miner

2-06-010 Effects of Various Propeller Designs on the Efficiency of an Underwater - **Scott Martin** - 11th grade - Cherry Creek High School - Greenwood Village - Dr. TJ Donahue

2-06-011 Sick Stopper - **Trevor Skaar** - 9th grade - Blevins Junior High School - Fort Collins - Mrs. Rebecca Duran

2-06-012 Analyzing the Material "Fingerprint": The Relationship of Fundamental Frequency to Young's Modulus - **Ambrose Soehn** - 10th grade - Boulder High School - Boulder - Ms. Karlene Soehn

2-06-013 Casting Aluminum Helmet Hangers - **Sean Wright** - 9th grade - Blevin Junior High School - Fort Collins - Mrs. Anita Wright
CSEF Senior Division Finalists

Environmental Sciences

2-07-001  Char and Methanol Synthesis by the Destructive Distillation of Biomass – Environmental Implications - David Wu - 12th grade - Cherry Creek High School - Greenwood Village - Dr. TJ Donahue

2-07-002  Effect of Water Quality on Aquatic Invertebrates - Rennie Winkelman - 9th grade - Blevins Junior High School - Fort Collins - Dr. Dana Winkelman

2-07-003  Carbon Sinks to Carbon Sources: A Soil Analysis of the Colorado Mountain Pine Beetle Infestation - Alan Seltzer - 11th grade - Fairview High School - Boulder - Mr. Dan Fernandez

2-07-004  Pollution in Our Soil - Kayla Schwartz - 9th grade - Arriba-Flagler School - Flagler - Mr. Brandon Borich

2-07-005  Preventing Pollutants - Samantha Ensz - 10th grade - Hi-Plains Jr/Sr High School - Seibert - Ms. Ashley Pollard


2-07-008  Quantitative Assay of Environmental Cs-137 in Oncorhynchus clarki pleuriticus and Oncorhynchus mykiss Muscle Tissue and Soil From Fallout in a Mountain Environment - Jeffrey Hibbert - 10th grade - Lone Star School - Otis - Mrs. Dena Palser


2-07-010  The Impact of Temperature Inversions and Wind on Air Quality - Jana Elrick - 9th grade - Arriba-Flagler School - Flagler - Mr. Brandon Borich

2-07-011  The Pink Side of Water: An Investigation of Estrogen in Northeast Colorado Water Sources - Allie Martin - 10th grade - Woodlin School - Woodrow - Mr. Blake Byall

2-07-012  The Effect of Reservoir on the Biodiversity of Aquatic Invertebrates in Cold Water Fisheries - Erik Schnanderbeck - 10th grade - Sargent Jr/Sr High School - Monte Vista - Mrs. Ronna Cochran

2-07-301  The Removal of Copper Ions Through the Application of Natural and Synthetic Zeolites - Zach Miller & Matt O'Keefe - 11th grade - Cherry Creek High School - Greenwood Village - Mrs. Jessica Olsen

2-07-302  Phytoplankton and DMS: A Study of Environmental Alteration - William Leigh & Mark Sers - 11th grade - Cherry Creek High School - Greenwood Village - Dr. TJ Donahue


2-07-304  The Effectiveness of Carbon Water Filters on E. coli and Pharmaceuticals - Lorne Muir II & Nathan Weeks - 9th grade - The Classical Academy - Colorado Springs - Mrs. Candus Muir

2-07-305  Elaeagnus Angustifolia Friend or Foe? - Paul Campfield & Tim Kerbs - 12th grade - Wray High School - Wray - Mr. James DePue

2-07-306  A Biological and Chemical Approach to Effective Digiration of Kochia - Chelsea Larson & Josi Arnold-Krumwiede - 10th grade - Fleming High School - Fleming - Mrs. Linda Niccoli

Mathematics & Computer Sciences

2-08-001  The Golden Ratio: An Exploration of the Prevalence of Phi - Bethany Dilda - 11th grade - Branson School - Branson - Mrs. Dianne Brown

2-08-002  Speedy Networking - Ratna Malkan - 9th grade - Lamar High School - Lamar - Ms. Robin Staker

2-08-003  Finding Number One - Molly Wagner - 9th grade - Arickaree School - Anton - Mr. Don Myers

2-08-004  Dual Frequency GPS Accuracy with a Single Frequency Receiver - Dominic Fuller-Rowell - 12th grade - Boulder High School - Boulder - Mr. Tony Jiron

2-08-005  Variograms: Forewarning Disaster - Christopher Krause - 11th grade - The Classical Academy - Colorado Springs - Mrs. Candus Muir

2-08-006  Copy CATS (Completely Autonomous Transportation System) - Christopher Rice - 10th grade - Alamosa High School - Alamosa - Ms. Cammie Wilson

2-08-007  Voting Systems: An Outcome Analysis - Vikash Evans Hypio - 9th grade - Hotchkiss High School - Hotchkiss - Dr. Douglas Horton
CSEF Senior Division Finalists

Medicine & Health

2-09-001 The Effects of Bisphenol A From Polycarbonate Plastic on the Mutagenesis of Caenorhabditis elegans - Chace Carver - 12th grade - Merino Jr/Sr High School - Merino - Mrs. Carlye Armstrong

2-09-002 A Depressing Diet? A Study of Food Additives and Clinical Depression - Nathan Frantz - 9th grade - Fleming High School - Fleming - Mrs. Linda Niccoli

2-09-003 Effect of Cytotoxic Chemicals on Apoptosis in Caenorhabditis elegans - Sarah Guthrie - 12th grade - Boulder High School - Boulder - Mr. Brian Harry

2-09-004 Localizing "Moving" Sounds - Tae Kim - 9th grade - Cherry Creek High School - Greenwood Village - Mr. Stephen Smith


2-09-006 Restoration of microRNA-200c: Effect on HEY Cancer Cell Behavior - Connie Liu - 10th grade - Cherry Creek High School - Greenwood Village - Mrs. Jessica Olsen

2-09-007 Evaluation of Two-Year Study of M. charantia on Insulin-Signal Transduction and Glucose-Uptake In Vitro - Harraz MohdReza - 10th grade - Union Colony Preparatory School - Greeley - Mrs. Catherine Hoyt

2-09-008 The Meaning of Nonsense: The Role of 3'UTR's in the Nonsense-Mediated-Decay Pathway - Himgauri Nikrad - 12th grade - Fairview High School - Boulder - Dr. Jens Lykke-Andersen

2-09-009 Oh What a Pain . . . Ear Infections Cause Obesity - Amanda Patrick - 10th grade - Merino Jr/Sr High School - Merino - Mrs. Carlye Armstrong

2-09-010 Assaying Cellular Migration on A 2D Surface: A Comparative Approach to Cancer Metastasis - Radhika Rawat - 11th grade - Boulder High School - Boulder - Dr. Kristi Anseth

2-09-011 The Molecular Mechanism of Combination Cancer Therapy Using Chloroquine and Avastin - Susannah Rogers - 10th grade - Rampart High School - Colorado Springs - Mrs. Lisa Villalobos-Menuey

2-09-012 Proteomic Characterization of ECM to Identify Tumor Associated Biomolecules Part 2 - Aarthi Shankar - 11th grade - Rampart High School - Colorado Springs - Mrs. Regina Miller

2-09-013 Hepatotoxic Effects of Repeat Therapeutic Doses of Acetaminophen - Jesse Soule - 10th grade - Cherry Creek High School - Greenwood Village - Mr. Stephen Smith

2-09-014 Warning! Consume At Your Own Risk - Sage Thompson - 10th grade - Walsh Jr/Sr High School - Walsh - Mrs. Kristi Thompson

2-09-015 The Internal Battle With Melanoma: Triggering an Immune Response Using Toll Ligands - Tonya Pavlenko & Laura Gudvangen - 10th grade - Palmer High School - Colorado Springs - Mrs. Nancy Hampson

Microbiology

2-10-001 Deadringing Copper: Amplifying the Bactericidal Properties of Copper and Cuprous Oxide - Ryan Dewey - 10th grade - Palmer High School - Colorado Springs - Mrs. Nancy Hampson

2-10-002 Open Wide and See What's Inside? - Alyssa Dunlap - 9th grade - Springfield Jr/Sr High School - Springfield - Mrs. Debbie Dunlap

2-10-003 Larval Transfer Theory and Inter-Taxa Hybridization - Andrew Fleming - 11th grade - Cherry Creek High School - Greenwood Village - Dr. TJ Donahue

2-10-004 Irradiation Extermination - Kelli Lynch - 9th grade - Blevins Junior High School - Fort Collins - Mr. Peter Justice

2-10-005 Slime Out: A Correlation Between the Effects of Digestive Enzymes on Pseudomonas Fluorescens Biofilm - Jessie Haugen - 12th grade - Sargent Jr/Sr High School - Monte Vista - Mrs. Ronna Cochran

2-10-006 What Duration of Ultraviolet Light Kills Bacteria? - Jessica O’Clair - 10th grade - Brush High School - Brush - Mrs. Doree Thilmony

2-10-007 The Effect of Marigold Beta-Carotene on Pseudomonas fluorescens - Katelyn Yowell - 10th grade - Genoa-Hugo School - Hugo - Mrs. Marguerite Yowell

2-10-008 Resist the TEMPtation - Hanna Pelican & Forre Zook - 10th grade - Palmer High School - Colorado Springs - Mrs. Nancy Hampson
CSEF Senior Division Finalists

Physics


2-11-002 Sound Absorption of Various Building Materials at Different Frequencies - Cameron Brandenburg - 12th grade - Brush High School - Brush - Mr. David Miner

2-11-003 The Rotational Phenomenon of a Simple Wing - Isaac Brost - 12th grade - Brush High School - Brush - Mr. David Miner

2-11-004 Lightin' Up The Sound - Garrett Crownover - 10th grade - Plainview School - Sheridan Lake - Mrs. Brenda Fickenscher

2-11-005 Identifying the Properties of Constructive and Destructive Interference - Donald Dutro - 12th grade - Genoa-Hugo School - Hugo - Mrs. Marguerite Yowell

Pressure Induced Voltage Output in Piezoelectric Crystals - Samuel Meaux - 10th grade - Faith Christian Academy - Arvada - Mr. Christopher Powers

Wind Turbines And Bat Barotrauma - Layne Barrett - 9th grade - The Classical Academy - Colorado Springs - Mrs. Candus Muir

Accelerants’ Minor League Baseball - Christiaan van der Walt IV - 12th grade - Denver School of the Arts - Denver - Ms. Victoria Brown


Plant Sciences

2-12-001 Aspens in a State of SADness: A Statistical Analysis of the Decline of Populus tremula - Nikki Buhrdorf - 9th grade - Hotchkiss High School - Hotchkiss - Dr. Douglas Horton

2-12-002 Evaluating Forage Soybean as an Alternative Dryland Crop for the Central Great Plains - Tawney Bleak - 10th grade - Otis Jr/Sr High School - Otis - Mr. Karl Donnelson

2-12-003 Aquaponics vs. Hydroponics: A Comparison of Tilapia Effluent and Conventional Fertilizers as a Hydroponic Nutrient - Haydn Christensen - 12th grade - Sargent Jr/Sr High School - Monte Vista - Mrs. Ronna Cochran

2-12-004 Mendelian Study of Cosmos bipinnatus - Andrew Delany - 12th grade - Basalt High School - Basalt - Mr. Mark Duff

2-12-005 How Does Your Garden Grow? Part 2 - Alexa Gerber - 10th grade - Walsh Jr/Sr High School - Walsh - Mrs. Shannon Gerber

2-12-006 Does CO2 Affect Plant Efficiency? - Taylor Huebner - 10th grade - Canon City High School - Canon City - Ms. Carrie Trimble

Biodiesel from Sunflowers: Phase 2-An Analysis of Soil Moisture Content and Sunflower Oil Content - Jordan Lestina - 10th grade - Dove Creek High School - Dove Creek - Mr. John Lestina

Effect of Carbon on Tanacetum vulgare Allelochemicals - Tyler Willson - 12th grade - Basalt High School - Basalt - Mr. Mark Duff

The Stress Effects of Caffeine and Alcohol on Arabidopsis Wild-type and Mutant Strains - Lindsay Baum, Kylie Dickson & Kristin Watkins - 12th grade - Monarch High School - Louisville - Mrs. Kristin Donley

Can Carnations Smell like Dead People? Ask a Trained K9 - Krista Garchar & Stephanie Williams - 10th grade - Dolores High School - Dolores - Mr. Charles Melvin
2009 CSEF Finalist Statistics
312 Finalist Participants with 281 Exhibits from 13 Regional Science Fairs
142 Senior Division Finalists with 121 Exhibits
170 Junior Division Finalists with 160 Exhibits

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Schools/Teachers-
104 schools from throughout the state were represented, and 168 teachers and adults sponsored the students’ projects. There were 43 high schools represented.

Judges-
More than 100 professional scientists and engineers volunteered to judge the Finalists for the Grand Awards.

Special Awards-
At least 60 organizations offered Special Awards to the finalists, judged by more than 150 professionals from those organizations.

Sponsorship-
The 2009 Colorado Science and Engineering Fair had 25 sponsors. Sponsors include 9 Platinum Sponsors (providing over $2500 of support), 7 Gold Sponsors ($1000 or more of support each), 1 Silver Sponsor ($750 or more of support), and 8 Regular Sponsors ($500 or more of support each). In addition, there were 14 Financial Contributors (less than $500 each). Also, several individuals donated through the Denver Combined Federal Campaign.

Dates are subject to change.
Directions to Thompson Valley High School - Loveland, Colorado

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 Agilent Technologies and open fields off to the East. Turn West onto Carlisle until reaching Eagle Drive. This will be the fourth 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 one 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/ and enter Thompson Valley High School's address as 1669 Eagle Drive Loveland, CO.