

## Physics Day at Lagoon 2003

The fourteenth annual Utah State University Physics Day at Lagoon was held on May 16. This year Idaho National Engineering and Energy Lab (INEEL) and the USU Physics Department teamed to coordinate and run the event. There were approximately 4069 students and 320 teachers from 100 schools in four states [Utah, Idaho, Nevada and Wyoming] who attended. A newly revamped web site [ <http://physics.usu.edu/> ] included on-line registration and substantially enhanced information and curriculum materials for teachers.

Event	High Schools	Middle Schools/ Junior High Schools
Physics Bowl	24 Teams, 72 Students	---
G-forces Contest	28 teams, 57 Students	29 teams, 84 Students
Demonstration Design Contest	31 Entries, 68 Students	27 Entries, 72 Students
Ride Design Contest	37 Entries, 90 Students	34 Entries, 74 Students
Logo Design Contest	119 Entries, 134 Students	195 Entries, 204 Students
Student Workbooks	9 Schools, 211 Students	13 Schools, 450 Students
Total Contest Participation	532 (~38%) Participants	884(~55%) Participants
Totals Registered (Numbers in the table reflect actual registration. We estimate that ~20% of those attending did not complete registration on Physics Day.)	38 Schools 93 Teachers ~1394 Students	41 Schools 123 Teachers ~1614 Students

About seventy faculty, staff, and students from the USU Physics Department, about a twenty-five INEEL staff, and about sixty additional helpers other sponsoring agencies were on hand to assist with registration, organization and contest judging. The number of sponsor displays continues to grow in both number and ability to impress the students. There were an estimated **\$55,000 in prizes awarded this year**, more than 40% more than last year. Three **four year scholarships to USU** were awarded by the USU Office of Recruitment and Enrollments Services. Sponsors included Boeing, Clark Planetarium, Dupont Holographics, Idaho NASA Space Grant Consortium, Lagoon, Rocky Mountain NASA Space Grant Consortium, Thiokol, US Navy, USU College of Science, and USU Office of Recruitment and Enrollments Services. Three new sponsors joined our ranks this year, Moog Aircraft, S&S Power, and Visionary Products.

Television coverage from Ch. 4 in Salt Lake City provided a very nice spot on the evening news of the event. The Ogden Standard Examiner, the Deseret News, and the Davis County Clipper also had nice stories to cover the event.

[http://www.standard.net/standard/news/print\\_story.html?sid=00030516222017771058](http://www.standard.net/standard/news/print_story.html?sid=00030516222017771058)  
<http://deseretnews.com/dn/print/1,1442,505033725,00.html>

**Summary of Prizes awarded:**

Sponsor	Items	Quantity Awarded	Unit Price	Total Dollar Value
Lagoon	Season Passes	20	\$81.95	\$1,639.00
Lagoon	Day Passes	200	\$30.95	\$6,190.00
Clark Planetarium	Posters	200	\$3.00	\$600.00*
S&S Power	T-shirts	15	\$10.00	\$150.00*
Thiokol	Highlighters	200	\$2.00	\$400.00*
Visionary Products	Computer Cameras	2	\$50	\$100.00*
INEEL	T-shirts, etc.	50	\$10.00	\$500.00*
US Navy	Waterbottles, etc.	200	\$0.50	\$100.00*
USU High School Relations	Four Year Scholarship	3	\$14,224.68	\$42,673.86
USU College of Science, RMNSGC, Thiokol, Boeing, INSGC, INEEL	T-shirts	445		\$1,370.60
USU College of Science, RMNSGC, Thiokol, Boeing, INSGC, INEEL	Purchased Prizes		\$2,178.60	\$2,178.60
<b>Total Prizes</b>				<b>\$55,831.06</b>

\* Estimated value.

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# **PHYSICS DAY AT LAGOON 2003**

## **MIDDLE SCHOOL PRIZES**

### FIRST PLACE

#### Teachers

Set of 6 Grating Spectrometers  
1 Spectra Card  
Lagoon Day Pass  
2003 Physics Day T-Shirt

#### Students

Newtonian Collision Demonstration  
Night Spectra Quest  
Flip Over Buggy  
Lagoon Day Pass  
2003 Physics Day T-Shirt

### SECOND PLACE

#### Teachers

Planetica  
Lagoon Day Pass  
2003 Physics Day T-Shirt

#### Students

Laser Pointer  
Hobermann Microsphere  
Metrologic *"More Than 101 Ways to Use a Laser"*  
Flip Over Buggy  
Lagoon Day Pass  
2003 Physics Day T-Shirt

### THIRD PLACE

#### Teachers

Boomwacker Set  
Lagoon Day Pass  
2003 Physics Day T-Shirt

#### Students

Magic Pendulum  
Flip Over Buggy  
Lagoon Day Pass  
2003 Physics Day T-Shirt

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# **PHYSICS DAY AT LAGOON 2003**

## **HIGH SCHOOL PRIZES**

### FIRST PLACE

#### Teachers

Two Kick Disk Power Pucks  
Lagoon Day Pass  
2003 Physics Day T-Shirt

#### Students

Science Book  
Magic Pendulum  
Flip Over Buggy  
Lagoon Day Pass  
2003 Physics Day T-Shirt

*In Addition Each Member of the Winning Physics Bowl Team will Receive a **Four Year Scholarship** To Utah State University*

### SECOND PLACE

#### Teachers

Night Star Flashlight  
Lagoon Day Pass  
2003 Physics Day T-Shirt

#### Students

Laser Pointer  
Metrologic "*More Than 101 Ways to Use a Laser*"  
Cartesian Diver  
Flip Over Buggy  
Lagoon Day Pass  
2003 Physics Day T-Shirt

### THIRD PLACE

#### Teachers

Zero Blaster  
Lagoon Day Pass  
2003 Physics Day T-Shirt

#### Students

Magic Pendulum  
Flip Over Buggy  
Lagoon Day Pass  
2003 Physics Day T-Shirt

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# ***PHYSICS DAY AT LAGOON 2003***

## ***PRIZES FOR STUDENT WORKBOOKS***

***STUDENTS SUBMITTING STUDENT  
WORKBOOKS WILL RECEIVE AN  
OPPORTUNITY TO PARTICIPATE IN A  
RANDOM DRAWING***

***HUNDREDS OF PRIZES INCLUDE***

***10 SEASON PASSES TO LAGOON***

***25 DAY PASSES TO LAGOON***

***100 SPACE POSTERS***

*and much more...*

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UTAH STATE UNIVERSITY

PHYSICS DAY at LAGOON

CONTEST WINNERS (2003)

PHYSICS BOWL

First Place:

Layton High School Twin Falls High School  
James Lindsay, Advisor  
Layton, UT 84041

Pete Bracken  
Layton, UT 84040

Ben Steggell  
Layton, UT 84040

Collin Johnson  
Layton, UT 84041

Third Place:

Tom Schmidt, Advisor  
Twin Falls, ID 83301

Eric Edmunds  
Twin Falls, ID 83301

Jacob Smith  
Twin Falls, ID 83301

Jordan Rayborn  
Twin Falls, ID 83301

Second Place:

Twin Falls High School  
Tom Schmidt, Advisor  
Twin Falls, ID 83301

Becky Atkins  
Twin Falls, ID 83301

Jed Butler  
Twin Falls, ID 83301

Brooke Jardine  
Twin Falls, ID 83301

Fourth Place:

Hillcrest High School  
Randy Waite  
Ammon, ID 83406

Nina Smith  
Idaho Falls, ID 83406

Nathan Manwaring  
Idaho Falls, ID 83404

Kyle Hill  
Ammon, ID 83406

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**PHYSICS DEMONSTRATION DESIGN CONTEST**  
**HIGH SCHOOL DIVISION**

**First Place:**

Cyprus High School  
Anne Beus, Advisor  
Magna, UT 84094

“The Gauss Cannon”

Pablo Alvarez  
Carlos Villalhos  
Cindy Spangler  
Montserrat Avilla  
Leslie McBride

(Same as above)

**Second Place:**

Box Elder High School  
Ron Cefalo, Advisor  
Brigham City, UT 84302

Jacob Hurdsman  
(Same as above)

**Third Place:**

Box Elder High School  
Ron Cefalo, Advisor  
Brigham City, UT 84302

Jake Frischknecht  
(Same as above)

**PHYSICS DEMONSTRATION DESIGN CONTEST**  
**MIDDLE/JUNIOR HIGH SCHOOL DIVISION**

**First Place:**

Rocky Mountain Junior High School  
Alison Price, Advisor  
Ogden, UT 84403

Jordan Dickamore  
Ogden, UT 84401

**Second Place:**

Kaysville Junior High  
Mark Tolman, Advisor

Kaysville, UT 84037

Sara Olsen  
Andrea Barlow  
(Same as above)

**Third Place:**

Kaysville Junior High  
Mark Tolman, Advisor  
Kaysville, UT 84037

Steven Walker  
(Same as above)

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**RIDE DESIGN CONTEST**  
**HIGH SCHOOL DIVISION**

**First Place:**

Box Elder High School  
Ron Cefalo, Advisor  
Brigham City, UT 84302

“Cannon Ball”

Sarahn Durfee  
(Same as above)

**Second Place:**

Hillcrest High School  
Randy Waite, Advisor  
Idaho Falls, ID 83406

“Hydro-Hurl”

Gable Roth  
Nathan Manwaring  
Nina Smith  
Kyle Hill  
(Same as above)

**Third Place:**

Cyprus High School  
Anne Beus, Advisor  
Magna, UT 84044

“Twilight Zone”

Leslie McBride  
Julie Gunwell  
Cindy Spangler  
(Same as above)

**RIDE DESIGN CONTEST**  
**MIDDLE/JUNIOR HIGH SCHOOL DIVISION**

**First Place:**

Kaysville Junior High School  
Mark Tolman, Advisor  
Kaysville, UT 843037

“Cata-Loop”

Niall White  
Gardner Stevenett  
(Same as above)

**Second Place:**

Kaysville Junior High School  
Mark Tolman, Advisor  
Kaysville, UT 843037

“Water Maze of Doom”

Mari Lindstrom  
Brooke Bell  
(Same as above)

**Third Place:**

North Layton Junior High School  
Steve Young, Advisor  
Layton, UT 84040

“Loop ‘N’ Land”

Wade Robins  
Layton, UT 84040



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**LOGO DESIGN CONTEST**  
**HIGH SCHOOL DIVISION**

**First Place:**

Box Elder High School  
Mr. Cefalo, Advisor  
Brigham City, UT 84302

Seth Berbert  
(Same as above)

“Water Ride”

Jacinda Nelson  
(Same as above)

**Third Place:**

Box Elder High School  
Katie Geldmacher, Advisor  
Brigham City, UT 84302

**Second Place:**

Box Elder High School  
Mr. Cefalo, Advisor  
Brigham City, UT 84302

“Einstein w/Red Collar”

Crystal Loya  
(Same as above)

“Spider Ride”

**LOGO DESIGN CONTEST**  
**MIDDLE/JUNIOR HIGH SCHOOL DIVISION**

**First Place:**

Wahlquist Junior High School  
Bonnie Meaders, Advisor  
Ogden, UT 84404

“Albert Einstein w/Chalkboard”

Lauren Pineda  
(Same as above)

“Roller Coaster w/Text of Acting Forces”

Jennifer Weston  
(Same as above)

**Third Place:**

North Layton Junior High School  
Russell Tucker, Advisor

**Second Place:**

Kaysville Junior High School  
Mark Tolman, Advisor  
Kaysville, UT 84037

“Rocket – USS Lagoon”

Patrick Milligan  
(Same as above)

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**CURRICULUM DEVELOPMENT CONTEST**

**Two Entries Tied for First Place:**

Bonnie Meaders  
Wahlquist Junior High School  
Ogden, UT 84404

“The Catapult”

Ron Cefalo  
Box Elder High School  
Brigham City, UT 84302

“The Spider”

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**COLOSSUS' COLOSSAL G-FORCES CONTEST**  
**HIGH SCHOOL DIVISION**

**First Place:**

Box Elder High School  
Ron Cefalo, Advisor  
Brigham City, UT 84302

Kelsey Larsen  
Jocelyn Sexton  
(Same as above)

**Second Place:**

Box Elder High School  
Ron Cefalo, Advisor

380 S. 600 W.  
Brigham City, UT 84302

Trent Strombly  
(Same as above)

**Third Place: (TIE)**

Box Elder High School  
Ron Cefalo, Advisor  
Brigham City, UT 84302

Natalie Smith and Amber Lee  
(Same as above)

**COLOSSUS' COLOSSAL G-FORCES CONTEST**  
**MIDDLE/JUNIOR HIGH SCHOOL DIVISION**

**First Place:**

Churchill Junior High School  
Brian Lestarge, Advisor  
Salt Lake City, UT 84104

Kane Hallgren  
Karli Nielson  
Shally Clark  
(Same as above)

**Second Place:**

Churchill Junior High School  
Brian Lestarge, Advisor  
(Same as above)

Pat Law  
Scott Glen  
James Dickson  
Alan Canfield  
(Same as above)

Brian Lestarge, Advisor  
(same as above)

Collin Babcock  
Brad Rossiter  
Malcolm Benton  
Dustin Mack  
(Same as above)

Churchill Junior High School  
Brian Lestarge, Advisor  
(same as above)

Nina Bennet  
Jessica Ku  
Stephanie Sakellariou  
Bridgette Keys

(no addresses)

**Third Place:**

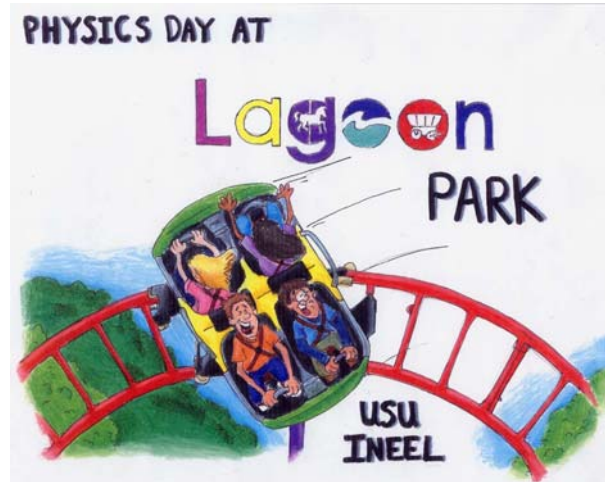
Churchill Junior High School

# 2003 Logo Contest Winners

## High School Winners



First Place  
Jacinda Nelson  
Box Elder High School  
Ron Cefalo, Advisor

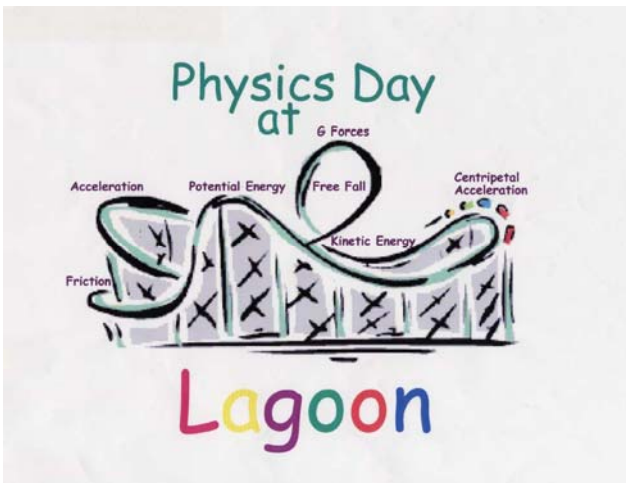


Second Place  
Seth Berbert  
Box Elder High School  
Ron Cefalo, Advisor

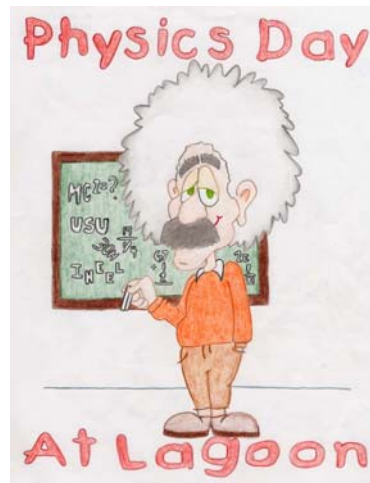


Third Place  
Crystal Loya  
Box Elder High School  
Ron Cefalo, Advisor

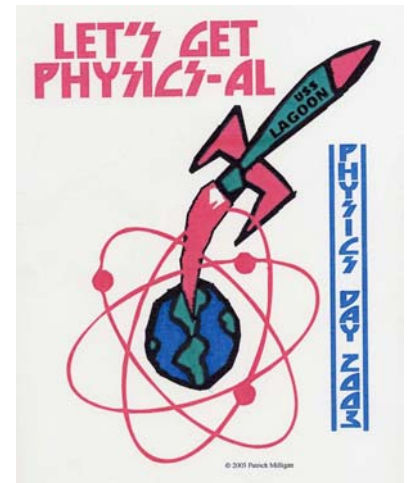
## Middle School Winners



First Place  
Jennifer Weston  
Wahlquist Junior High School  
Ms. Meaders, Advisor



Second Place  
Lauren Pineda  
Kaysville Junior High School  
Mark Tolman, Advisor



Third Place  
Patrick Milligan  
North Layton Junior High  
Mr. Tucker, Advisor



Tuesday, May 20, 2003

### KTVX NEWSCAST: PHYSICS DAY AT LAGOON

Amusing Science — Lagoon's Colossus Roller Coaster is teaching Utah kids about science. Today teens from the mountain west took physics lessons out of the classroom and turned them upside down. Students made homemade "G" force detectors and rode the coaster as part of Physics Day. The 13th annual Science Day was organized by USU. (KTVX newscast, 5:30 p.m., 10 p.m. 05/16/03)

### GRAVITY + ACCELERATION = THRILLS AT LAGOON: PHYSICS STUDENTS LEARN ABOUT FREE FALL AND VELOCITY

The 6-foot, brightly colored "Screamin' Serpent," grabbed the attention of hundreds of teenagers who flocked into the pavilion dedicated to physics at Lagoon on Friday. Its creator, Aliza Adams, did not hesitate to demon-strate how it worked or to explain terms like "velocity," "free fall" or "acceleration." The Kaysville eighth-grader spent 16 hours with her father and brother creating the miniature ride as a science project. "Free fall is when the rider experiences the sensation of being lifted out of their seats," Adams read from the card attached to her model. She was among hundreds of other junior high and high school students from Utah, Idaho and Wyoming participating in Physics Day at Lagoon. This is the 14th year it has been held, said J.R. Dennison, a physics professor from Utah State University. (Standard Examiner, 05/17/03) click on:

[http://www.standard.net/standard/news/print\\_story.html?sid=00030516222017771058](http://www.standard.net/standard/news/print_story.html?sid=00030516222017771058)

### THE THRILL OF PHYSICS: SCHOOL DAY AT LAGOON PUTS NEW SPIN ON TOUGH SUBJECT

Zach Widhalm, Sam Dahl and Kenny Seneff had to ride the Colossus roller coaster at Lagoon several times before they had recorded each G-force point on the ride. The Colossus measurements, taken on Seneff's homemade accelerometer containing a spring and bolt in a plastic tube, range from minus 1 to about 3 G's — or from feeling weightless to just the opposite. "So basically you weigh three times as much at 3 G's," Widhalm said. The high schoolers had traveled from Idaho Falls to Farmington for Friday's Physics Day, where high school and junior high physics students from Utah and surrounding states explored elements of physics found throughout the amusement park. "I guess roller coasters are fun. I guess I should say physics is fun," said event chairman J.R. Dennison, a professor of physics at Utah State University. (Deseret News, 05/17/03) click on:

<http://deseretnews.com/dn/print/1,1442,505033725,00.html>

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USU PRESS RELEASE

May 9, 2003

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Maren Cartwright (435) 797-1355

**PHYSICS ENTHUSIASTS HEAD FOR LAGOON MAY 16**

**MEDIA ALERT - Media representatives should check in with Lagoon's marketing office upon arrival for press passes. For information about Lagoon and safety issues regarding cameras on rides, contact Lagoon marketing director Dick Andrew, (801) 451-8062; [dandrew@lagoonpark.com](mailto:dandrew@lagoonpark.com); [www.lagoonpark.com](http://www.lagoonpark.com). Additional information about Physics Day activities is available at [www.physics.usu.edu](http://www.physics.usu.edu).**

LOGAN — It's time again for Physics Day when budding scientists descend on Utah's Lagoon amusement park for hands-on learning experiences, academic competition and fun. **Friday, May 16**, physics students from middle and high schools throughout the Intermountain West will explore such basic physics concepts as gravity and centrifugal force while enjoying the thrills of northern Utah's überplayground.

Event chair J.R. Dennison, professor of physics at Utah State University, said area students are building accelerometers and learning physics principles in preparation for a day of measuring g-forces, calculating maximum acceleration, counting rotations and hopefully not losing their lunches. Last year's event drew more than 4,500 participants from about 90 schools in Utah, Idaho, Nevada and Wyoming.

"The purpose of Physics Day is to motivate students' interest in science and to relate abstract concepts to familiar examples in a fun way," said Dennison. "What better laboratory to entice young people than an amusement park?"

The day's activities include a Physics Bowl competition for high school teams, featuring scholarship awards to Utah State and other prizes from the event sponsors, including season passes to Lagoon for winning competitors. Students also compete in logo and ride design contests and the Colossus' Colossal g-Force event.

Participation has grown steadily since the event was initiated by Utah State's Physics Department in 1990. The department sponsors the event, along with Boeing, Clark Planetarium, Dupont Holographics, Idaho NASA Space Grant Consortium, Lagoon, Moog Aircraft, Rocky Mountain NASA Space Grant Consortium, S&S Power, Thiokol, US Navy, USU College of Science, USU Office of Recruitment and Enrollments Services, and Visionary Products.

**The day's activities begin at 10:30 a.m. and conclude at 3:30 p.m.** For more information about Physics Day, contact Ali Siahpush, program manager, INEEL, 208-526-8708, [sia@inel.gov](mailto:sia@inel.gov) or Dennison at 435-797-2936, [jr.dennison@usu.edu](mailto:jr.dennison@usu.edu).

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## Physics Day at Lagoon

by J.R. Dennison

USU Physics Day at Lagoon is now a teenager. This past May 17 marked the thirteenth time high school and middle students from across the Intermountain Region converged on Lagoon Amusement Park for our annual education outreach activity. Approximately 4600 students and 200 teachers from 90 schools attended this year. Since its inception, we estimate the event has attracted over 50,000 participants from Utah, Idaho, Nevada, Wyoming, Colorado, and New Mexico. This year organizers from the Inland Northwest Research Alliance (INRA) and Idaho National Engineering and Energy Lab (INEEL) joined us in coordinating and running the event.

"The purpose of Physics Day is to motivate students' interest in science and to relate abstract concepts to familiar examples in a *fun* way," said USU lead organizer JR Dennison. "What better laboratory to entice young people than an amusement park?" Many variations of such Amusement Park Physics activities have been conducted across the country over the last three decades. USU Physics Day at Lagoon is the first such activity in the Intermountain Region. Physics Day at Lagoon provides a valuable educational experience for the high school and middle school students; at the same time it is a lot of fun and provides incentive for students to develop an interest in science.

Amusement parks provide nearly unlimited, illustrative and simple examples of many key physics concepts for experiments, measurements, and problem solving. The activities at Physics Day provide excellent motivation for classroom discussions, lessons, problems and experiments on topics such as rotational mechanics, centrifugal force, conservation of energy, design of measurement devices, and data collection and error analysis techniques, to name just a few. It is not surprise that it is much easier to get students excited to think about the physics of roller coasters than about carts on an inclined plane. Physics Day provides a chance for students to apply classroom concepts to real world situations and, like most field trips and "hands-on" learning experiences; its benefits stick with students longer than traditional lessons.

About sixty-five faculty, staff, and students from the USU Physics Department, about a twenty INEEL staff, and about twenty-five additional helpers other sponsoring agencies were on hand to assist with registration, organization and contest judging. There was an estimated \$39,000 in prizes awarded this year. Sponsors included Boeing, Clark Planetarium, Dupont Holographics, Idaho NASA Space Grant Consortium, Lagoon, Moog Aircraft, Rocky Mountain NASA Space Grant Consortium, S&S Power, Thiokol, US Navy, USU College of Science, USU Office of Recruitment and Enrollments Services, and Visionary Products. Our newly revamped web site [<http://physics.usu.edu/>] includes on-line registration and substantially enhanced information and curriculum materials



**Budding physicists scream while collecting data on Colossus.**