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.

<table>
<thead>
<tr>
<th>Event</th>
<th>High Schools</th>
<th>Middle Schools/ Junior High Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physics Bowl</td>
<td>24 Teams, 72 Students</td>
<td>---</td>
</tr>
<tr>
<td>G-forces Contest</td>
<td>28 teams, 57 Students</td>
<td>29 teams, 84 Students</td>
</tr>
<tr>
<td>Demonstration Design Contest</td>
<td>31 Entries, 68 Students</td>
<td>27 Entries, 72 Students</td>
</tr>
<tr>
<td>Ride Design Contest</td>
<td>37 Entries, 90 Students</td>
<td>34 Entries, 74 Students</td>
</tr>
<tr>
<td>Logo Design Contest</td>
<td>119 Entries, 134 Students</td>
<td>195 Entries, 204 Students</td>
</tr>
<tr>
<td>Student Workbooks</td>
<td>9 Schools, 211 Students</td>
<td>13 Schools, 450 Students</td>
</tr>
<tr>
<td>Total Contest Participation</td>
<td>532 (~38%) Participants</td>
<td>884 (~55%) Participants</td>
</tr>
</tbody>
</table>

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 Desseret News, and the Davis County Clipper also had nice stories to cover the event.

http://deseretnews.com/dn/print/1,1442,505033725,00.html
**Summary of Prizes awarded:**

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

* Estimated value.
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
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
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…
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

**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

**Third Place:**

Twin Falls High School
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

**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
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
Montserret Avilla
Leslie McBride
(Same as above)

Second Place:
Box Elder High School
Ron Cefalo, Advisor
Brigham City, UT 84302
Jacob Hurdtsman
(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, 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)
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
LOGO DESIGN CONTEST
HIGH SCHOOL DIVISION

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

“Water Ride”
Jacinda Nelson
(Same as above)

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

“Spider Ride”

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

“Einstein w/Red Collar”
Crystal Loya
(Same as above)

LOGO DESIGN CONTEST
MIDDLE/JUNIOR HIGH SCHOOL DIVISION

First Place:
Wahlquist Junior High School
Bonnie Meaders, Advisor
Ogden, UT 84404

“Roller Coaster w/Text of Acting Forces”
Jennifer Weston
(Same as above)

Second Place:
Kaysville Junior High School
Mark Tolman, Advisor
Kaysville, UT 84037

“Albert Einstein w/Chalkboard”
Lauren Pineda
(Same as above)

Third Place:
North Layton Junior High School
Russell Tucker, Advisor

“Rocket – USS Lagoon”
Patrick Milligan
(Same as above)
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”
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

Third Place: (TIE)
Box Elder High School
Ron Cefalo, Advisor

COLOSSUS’ COLOSSAL G-FORCES CONTEST

MIDDLE/JUNIOR HIGH SCHOOL DIVISION

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

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)

Third Place:
Churchill Junior High School

Nina Bennet
Jessica Ku
Stephanie Sakellariou
Bridgette Keys
(no addresses)
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
**utahstate in the news**

*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 demonstrate 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

**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
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; www.lagoonpark.com. Additional information about Physics Day activities is available at 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 or Dennison at 435-797-2936, jr.dennison@usu.edu.

####
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.