



## A QUARTER OF A CENTURY OF “Putting the ‘SIC’ in phySICs” 30<sup>th</sup> Year of USU Physics Day at Lagoon!!!

January 20, 2019

Dear Administrators:

Why should you support your physics and physical science teachers and students field trip to Lagoon? This Amusement Park Physics experience is an exciting (and inspirational) STEM event, that helps put hard earned book knowledge in the context of fun real-world adventures. Each year, teachers spend countless hours in and out of the classroom to help their students master physical concepts that drive the world around us. While this is very important, story problems on a piece of paper can only go so far to expand a student’s understanding. To truly gain understanding and appreciation of the principles and concepts taught in the classroom, students need to experience a hands-on, real-life jump into physics like the *USU Physics Day at Lagoon on Friday, May 17, 2019*. The event at Lagoon Amusement Park in Farmington, Utah is organized by the Utah State University Physics Department and School of Teacher Education and Leadership, the Idaho National Laboratory (INL), and an outstanding group of STEM sponsors listed below. Please encourage your teachers and students to join more than 8000 students and teachers this year and become part of ~150,000 students and teachers that have helped “Put the ‘SIC’ in phySICs” at Lagoon over the last twenty-eight years.

Each year the educational activities and opportunities continue to expand. The attached information describes more than a dozen physics oriented contests for students on Physics Day. As always, we will have new activities for teachers to choose from to create their own custom workbooks for their students. Lagoon’s new ride, Cannibal, is featured in this year’s workbook. Many other activities, for use at Physics Day and in the classroom before and after the event are described in the [curriculum materials](#) and [teacher development opportunities](#) detailed on our web site.

Information on registration, scheduling, activities, available educational materials and who to contact is provided below. Our web site provides useful information on Physics Day and on-line registration at <http://physicsday.usu.edu/>. You can also refer to our [Frequently Asked Questions](#) for further details. Please feel free to contact us with any questions or suggestions. **See you at Lagoon!**

Sincerely,

JR Dennison

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*A special thanks to the sponsors of USU Physics Day at Lagoon including Aerostructures, Albany, Apogee Instruments, ArduSat, Autonomous Solutions, Boeing, Campbell Scientific, Embry Riddle, Hill Air Force Base STEM Outreach Program, IM Flash Technologies, Lagoon, Micron, Ophir Spiricon, Orbital ATK, Parker-Hannifin Aerospace, Portage Environment, US Navy, USU College of Science, USU Emma Eccles Jones College of Education & Human Resources, USU Research Foundation, USU Space Dynamics Laboratory, USU Admissions, Utah NASA Space Grant Consortium, Utah and Idaho Virtual Academies, and WiTricity*

# USU Physics Day

at



Friday, May 17, 2019

## SCHEDULING AND COSTS

The 30<sup>th</sup> annual *USU Physics Day at Lagoon* is set for **Friday, May 17, 2019**. Physics Day is open to all high school and middle school physics and physical science students. The rides will be open from 9:30 to 5:00 and Physics Day events are scheduled from 10:00 to 4:00. Lagoon offers an exclusive discounted rate for schools participating in USU Physics Day and Lagoon's School Day Program. The cost of tickets for students and chaperones will be \$32.76 + tax, or \$35, tax included. Schools will have access to Lagoon's attractions and USU Physics experiments, Lagoon A Beach and Kiddieland will NOT be open on this date.

**Schools MUST register with Lagoon by visiting [Lagoon School Days site](#). The deadline for registration with Lagoon is May 10, 2018.** Please note that *Lagoon does not accept checks from school groups at the Main Gate on the day of the event.*

## REGISTRATION

Each school must complete a USU *School Registration Form* on line or via mail by May 13. **Teachers must also check in** at the USU Registration Desk at the Main Gate on Physics Day. To submit the **On-Line School Registration Form**, complete the information and select the "Submit" button. You will receive a confirmation email of your registration. We will have a completed pre-registration form waiting at the registration desk outside the Main Gate of Lagoon on Physics Day. Teachers stopping by the registration desk at the Main Gate to verify their pre-registration form will receive a complimentary Ride Passport for the day of the event, a free lunch pass and a coupon redeemable for a **FREE PHYSICS DAY T-SHIRT** at the prize desk in Davis Pavilion.

Each student must also register for each contest they participate in. Students may register in the Davis Pavilion on the day of the event. Registration for the Sky Ride contest is done at the bull's-eye at the event site and *Physics Bowl* registration is done at the Bighorn Pavilion. Contest registration forms are available **On-Line**. Downloading the *On-line contest registration and completing it before arriving at Lagoon will eliminate most of the time standing in lines at Physics Day and allow more student ride time.* Please refer to the appropriate web page for specific details about each contest.

## ACTIVITIES

As always, there are a wide variety of exciting and educational activities for students and teachers. The **Arduino Clean Air Solutions** and **Mouse Trap Car** are Physics Day competitions this year for middle and high school teams for MESA programs. Student teams from the **LEGO Mindstorm** robotics program will once again compete at Physics Day.

A primary activity at Physics Day is the **Student Laboratory Workbook** which is designed to encourage participation from all the students attending. USU has developed this year's Student Laboratory Workbook with a mixture of very simple and more challenging questions on a number of the rides at Lagoon. Separate workbooks for high school and middle school students are available on the Web. Alternately, teachers can custom design their own student workbooks by selecting from dozens of activities, allowing teachers to tailor their students' activities to their own curriculum needs. Teachers are responsible for providing copies of the Workbook to their students. USU will collect the Workbooks and return them to the teachers (with solutions) at the end of Physics Day. Prizes will be awarded on a random basis to students who turn in their workbooks. No student registration is required for the Student Workbooks.



Look close and you can see the accelerometers!

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We have planned several competitions for Physics Day. Complete [contest rules](#) are available on-line. Each student must register at Davis Pavilion to participate in these contests. There is a *Physics Demonstration Design Competition* which stresses innovative design and the explanation of the physics principles and a *Ride Design Contest* in which students design and model futuristic rides based on key physics principles. Students can measure the accelerations they experience at Lagoon in the *G-Forces Contest*. We are also sponsoring a *Physics Day Logo Design Contest*. The *Sky Drop Contest* is back for another year. Finally, there is an old favorite, the *Physics Bowl*. The *Physics Bowl* contest is limited to high school students. Separate middle school and high school categories are planned for the other contests. All students are encouraged to participate in as many contests as possible; however, none of the contests are mandatory.

The prizes for last year's contest winners were worth an estimated **\$50,000**; this year promises to be even better. For instance, each member of the winning and runner-up teams in the Physics Bowl competition will be offered a tuition scholarship to USU! All members of the top three teams in all contests will receive free day passes to Lagoon and a T-shirt with last year's Logo Design Contest winner on it. There will be other substantial prizes for individuals and their schools. Sponsors include Aerostructures, Albany, Apogee Instruments, ArduSat, Autonomous Solutions, Boeing, Campbell Scientific, Embry Riddle, Hill Air Force Base STEM Outreach Program, IM Flash Technologies, Lagoon, Micron, Ophir Spiricon, Orbital ATK, Parker-Hannifin Aerospace, Portage Environment, US Navy, USU College of Science, USU Emma Eccles Jones College of Education & Human Resources, USU Research Foundation, USU Space Dynamics Laboratory, USU Admissions, Utah NASA Space Grant Consortium, Utah and Idaho Virtual Academies, and WiTricity.

## CURRICULUM MATERIALS

An extensive set of curriculum materials has been developed for you to use in your classroom during the school year in conjunction with Physics Day activities. You are encouraged to use the activities at Lagoon as the basis of classroom discussions and lessons on various aspects of physics. The contests provide an excellent motivation for lessons in rotational mechanics and centripetal force, in conservation of energy, in design of measurement devices, and in data collection and error analysis techniques, just to name a few. An on-line edition of our [Amusement Park Physics Curriculum Manual](#) is available. The manual includes: (1) activities to relate classroom activities to Physics Day, (2) exercises to do at Physics Day, and (3) a set of more detailed workbook activities to follow up on lessons learned at Physics Day. The USU Physics Department also has a limited number of DVDs containing several short films on related topics that are available to circulate to your classroom; most of these are also available for download from the web site.

We are again sponsoring a [Curriculum Development Contest](#) open to all high school and middle school teachers at Physics Day, with cash prizes. Refer to the [Curriculum Manual](#) for some excellent examples of previous winners.

## See you at Lagoon!!!



2018 High School Logo Contest  
Sabrina Lin and Suzie Jo  
Herriman High School  
Advisor: Tony. Romanello