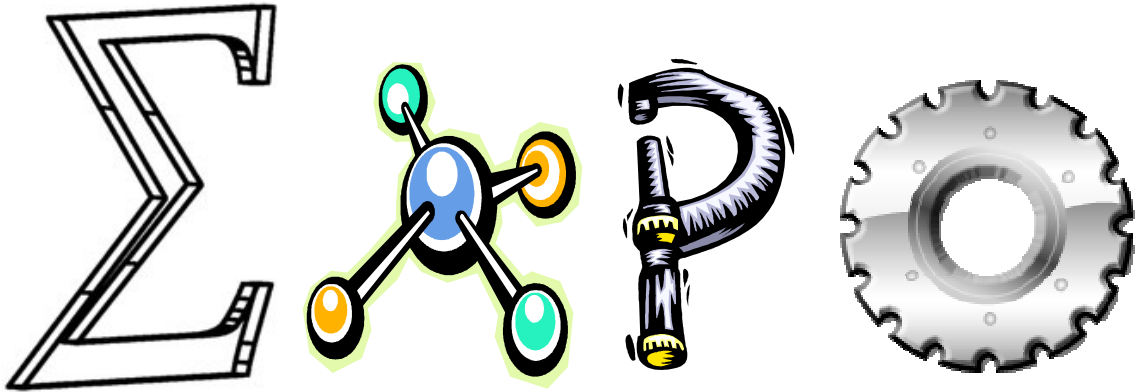


38th Annual
EMS *EXPO*



University of Wisconsin – Platteville
**College of Engineering,
Mathematics and Science**

April 2, 2009

Welcome Visitors!

Welcome students, teachers, alumni, and friends to the University of Wisconsin – Platteville.

EXPO 2009 has two purposes: to inform each of you what engineering, mathematics and science are all about, and to provide incentive for the challenge awaiting those of you who choose a career in one of these fields. You will have the opportunity to observe students and faculty “in action” and to see what people educated at UW-Platteville College of Engineering, Mathematics and Science can do.

We invite you to join the faculty and students of the College of Engineering, Mathematics and Science in this effort to display the advantages of an engineering, mathematics and science education. Many exhibits designed and developed by students are on display – exhibits which we hope will be helpful in giving you an insight into what engineering, mathematics and science are, the role of engineers and sciences in today’s society, and the many challenges they face in the future.

Enjoy your **EXPO** visit!

Richard Shultz, Dean
College of Engineering, Mathematics and Science

College of EMS EXPO Committee

Christina Curras, Civil and Environmental Engineering
Sam Eiring, Software Engineering
Hal Evensen, Engineering Physics
John Goomey, Electrical Engineering
Jeff Hoerning, Mechanical Engineering
Mike Ira, Mathematics
Justin Kile, Industrial Engineering
David Kraemer, Mechanical Engineering
June Li, Chemistry
Ali Olcay, General Engineering
Mike Rowe, Computer Science & Software Engineering
Kim Schmelz, UWP Alumni Office

Organizational Support

Joyce Clifton, Mechanical and Electrical Engineering
Rose Durni, Electrical Engineering
Diane Hardyman, Civil and Environmental Engineering
Carol Beals, Dean’s Office

COLLEGE OF EMS *EXPO 2009*

University of Wisconsin-Platteville

<http://www.uwplatt.edu/expo/>

e-mail: expo@uwplatt.edu

Phone: 608-342-1455

UWP Prospective Student Information Table – Ottensman Front Lobby East

Hospitality Room — Ottensman 115

Teachers, judges, and chaperones of visiting students are invited to rest their feet and enjoy complimentary refreshments provided by the College of Engineering, Mathematics and Science.

Alumni Room — Ottensman 115

Get acquainted with other alumni back to see exciting *EXPO* activities. Catch up on things that have changed since you graduated from UWP.

Food Concessions

| | |
|----------------------|---|
| <i>Alchemists:</i> | Bake sale – Front Lobby West |
| <i>ASCE:</i> | Nachos, popcorn & soda – Atrium East |
| <i>IIE:</i> | BBQ pork, chips, soda – Outside Front Entrance West |
| <i>Pi Tau Sigma:</i> | Brats – Outside Front Entrance East |

Laboratories

Several labs throughout the building will be open and have displays set up. Please allow time to visit them and ask questions of the students. This is your opportunity to learn more about the engineering and science disciplines.

Educational Tools

An educational tool, "The Scavenger Hunt," is available for use by teachers and parents. The scavenger hunt has both easy and hard questions for participants to use. They can be picked up at the 1st floor main entry (Ottensman 100) or located online at <http://www.uwplatt.edu/expo/>.

Answers will be posted online after Monday 6 April at noon.

Teachers' Choice

Teachers, please vote for your favorite project. *Teachers' Choice* ballots are located in the Hospitality Room, Ottensman 115.

Events Suitable for Elementary School Students

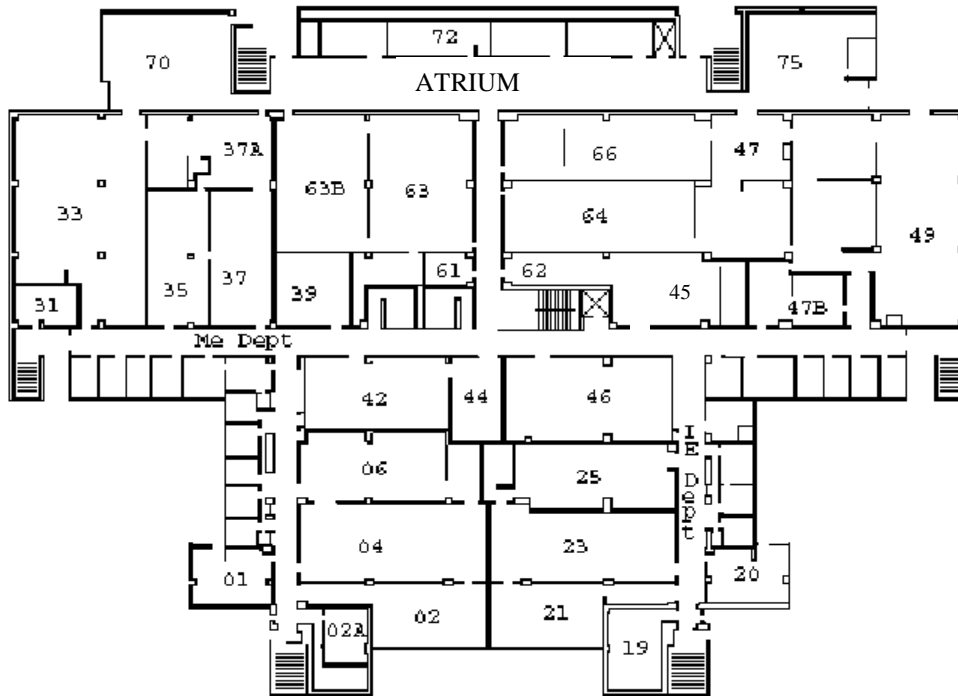
| | | |
|-------------|-----|--|
| Room | 25 | Nintendo has Ergonomics?! |
| | 33 | Penny Boat Contest (<i>Preschoolers must have supervision</i>) |
| | 33 | Village Washout |
| | 37 | How Fast Can You React? |
| | 37A | Timber Framed Covered Bridge |
| | 37A | Spaghetti Bridge Project |
| | 39 | The Incredible BoxyBot |
| | 63B | Big Bang |
| | 64 | Marvelous Machines and Mechanisms |
| | 66 | Candyland Sieve Analysis |
| | 66 | Quicksand! |
| Atrium | | ASCE's 2008 Concrete Canoe |
| Parking Lot | | Red Rider Football Launcher |
| | 101 | Muddy Water Filtration |
| | 103 | Marshmallow Towers |
| | 103 | Sweet N Sticky Earthquake Shake |
| | 106 | Sieve Analysis |
| | 108 | DSP Prototyping Workbench |
| | 122 | Slime Pit |
| | 123 | Alice in object-oriented-land |
| | 124 | Mind-Blowingly Trippy Music-Synchronized ESI Christmas Lights |
| | 140 | Pioneer 600 |
| | 144 | Remarkable Demonstrations of Chemistry |
| | 209 | Sonic Death Ray |

Special Thanks!

The EMS *EXPO* Committee would like to thank the Dean of EMS, Richard Shultz, the student exhibitors, and all of the judges and volunteers who have committed time and energy to making *EXPO* 2009 a success.

We hope you enjoy your day. See you for next year's Expo on March 25, 2010!

Parking Lot



Ottensman Hall
Ground Level

| Times | Event | Location |
|--|---|-----------------|
| 11:00, 11:20, & 11:40 | <i>Assemble a Sundae</i> | Room 20 |
| Work with a team to make the fastest sundae assembly line. | | |
| All Day | <i>Emergency Preparation: Learning and Planning the Unexpected</i> | Room 21 |
| Don't jeopardize your life in case of an emergency; come learn what to do with emergency jeopardy. | | |
| 10:00, 11:30, & 1:00 | <i>Fun with Sensors</i> | Room 21 |
| See demonstrations of infrared and optical sensors. Students can pedal a bicycle while the two sensors register their speed; come see how fast you can pedal! | | |
| 9:00, 9:20, & 9:40 | <i>Lego My House</i> | Room 23 |
| Learn what an assembly line is by building a Lego house in 5 steps with four other people. | | |
| 10:00, 10:30, & 11:00 | <i>How Fast Are You?</i> | Room 23 |
| Test your reaction time using special test equipment. Compete against your friends. | | |
| All Day | <i>Robots at Work</i> | Room 23 |
| See how robots are used in a manufacturing setting. | | |
| 12:00, 12:30, 1:00, & 1:30 | <i>Messy Card Mayhem</i> | Room 23 |
| Speed is key for messy card mayhem. Working with three other players, you will sort a shuffled deck of cards by suit and increasing order. See if you can beat 23 seconds! | | |

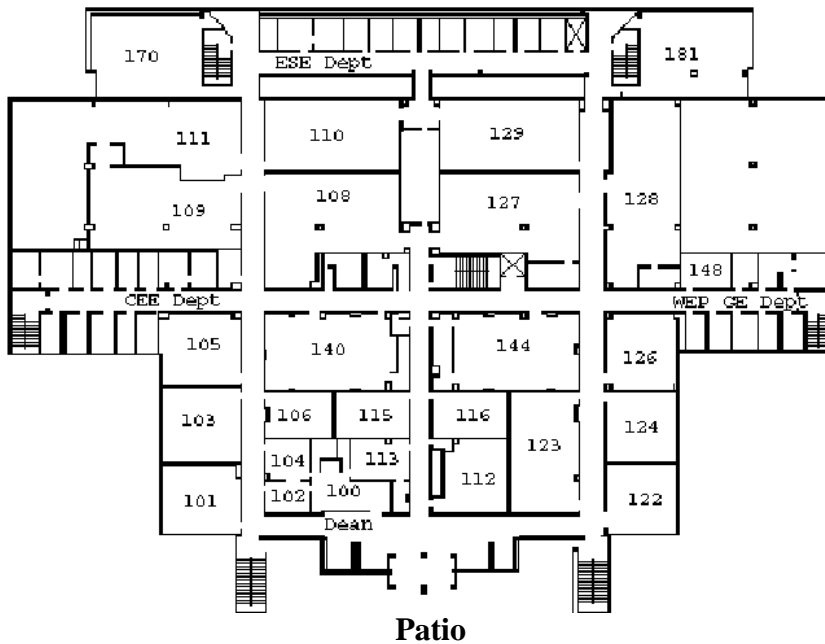
| | | |
|--|---|-----------------|
| All Day | <i>Nintendo has Ergonomics?!</i> | Room 25 |
| See how the ergonomics of game controllers have evolved over the past decade. | | |
| All Day | <i>Penny Boat Contest</i> | Room 33 |
| You are stranded on a deserted island. Can you build a raft strong enough to help you escape? Stop on by and see! (Preschoolers will need supervision.) | | |
| All Day | <i>Village Washout</i> | Room 33 |
| Nsmea is in danger of being washed away! Can you fix the problem in the short time you have? | | |
| All Day | <i>How Fast Can You React?</i> | Room 37 |
| Project will address determining reaction time and why it is important in transportation engineering. Students will be able to determine their own reaction time on the computer and see how they measure up to average times. | | |
| All Day | <i>Timber-Framed Covered Bridge</i> | Room 37A |
| How difficult would be to design and build a 30' long - 8' wide wood bridge to be placed in one of the city parks of Darlington, WI? Teams of design, construction and quality control would like to talk with you about their magnificent experience and the things they learned like "Measure Twice, Cut Once". | | |
| 10:00, 11:00, & 1:00 | <i>Spaghetti Bridge Project</i> | Room 37A |
| How would you design and build at least 30 in long bridge made from only spaghetti and glue? Freshman students built 25 spaghetti bridges and 16 of those bridges already carried 25 lbs which qualified them to compete at EXPO. Come and see which bridge will be the winner of 2 nd Annual Spaghetti Bridge Competition. | | |
| All Day | <i>The Incredible BoxyBot</i> | Room 39 |
| The Incredible BoxyBot is a high-powered remote-controlled and autonomous-capable vehicle! This robot has been rebuilt to utilize a custom long-range wireless control system, high-torque electric motors, and two car batteries. Its chassis is expandable for housing any number of sensors and future automation projects and it is a LOT of fun to drive! | | |
| All Day | <i>Shake It!</i> | Room 42 |
| Demonstration of how vibrations can be made or eliminated using a spring and a weight. Learn how to shake it, or make it stop! | | |
| 10:00, 12:00, & 1:00 | <i>Man vs. Machine: A Juggling Competition</i> | Room 42 |
| For months, a group of Mechanical Engineering students have been designing and building a juggling machine. Now, if you're ready, we could use your help testing it. | | |
| All Day | <i>Cold as Ice</i> | Room 45 |
| Come chill while you construct a device to keep an ice cube from melting. Compare your time to others! | | |

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| All Day | <i>The Leaning Arm of Spaghetti</i> | Room 45 |
| Come test your skills and imagination to make the longest arm of spaghetti without breaking or touching the floor. See if you can get on the leader board! | | |
| All Day | <i>Balsa Wood Bridge Contest</i> | Room 49A |
| Students across the Tri-State area have constructed wooden bridges. Come see them break apart as they are loaded to failure. | | |
| All Day | <i>The Big Bang</i> | Room 63B |
| An EXPO favorite. Sparks will fly, and so will cans, pennies, aluminum foil and steel wool as electrons course through metal objects. | | |
| All Day | <i>ASME Presents Marvelous Machines & Mechanisms</i> | Room 64 |
| Surround yourself in small assorted demonstrations of principles essential to mechanical engineering. See a showcase of our Human-Powered Vehicle team's work! Stop by and try hands-on displays! | | |
| All Day | <i>Candyland Sieve Analysis</i> | Room 66 |
| If you like candy, you will love how we use candy to demonstrate soil classifications. | | |
| All Day | <i>Quicksand!</i> | Room 66 |
| Experience quicksand – could you float or would you sink? | | |
| All Day | <i>ACSE's 2009 Concrete Canoe</i> | Atrium, East |
| The canoe demonstration culminates the hard work of the 2008-2009 concrete canoe team. Come and see last year's canoe and how concrete floats. Yes, that's right, concrete can float! | | |
| All Day Demo at 12:00 | <i>ASCE's 2009 Steel Bridge</i> | Atrium, East; Parking Lot |
| Come see all the hard work of the 2008-2009 steel bridge team in the Atrium. Marvel at the bridge's sleek design and the team's ingenuity. Go to the Parking Lot at noon to see the team assemble the bridge! | | |
| All Day | <i>Elementary Surveying Demonstrations</i> | Atrium, Center |
| Demonstration of elevation differences with electronic survey equipment. Also, demonstrating reflectorless electronic distance measurement and the history of surveying. | | |

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|--|--|--------------------------|
| All Day | <i>Innovations in Automotive Technology</i> | Atrium, West |
| Learn about the cutting-edge in off-road vehicle design, environmentally-friendly snowmobile technologies, and fast-paced race car engineering techniques with the Society of Automotive Engineers. Their Mini Baja car, Clean Snowmobile, and Formula One-style race car will all be on display. Engineering students will be on hand presenting techniques utilized to design and manufacture their innovative vehicles. | | |
| 9:00, 12:00, & 1:00 | <i>Tennis Balls with a Hoot</i> | Parking Lot, East |
| Come see a pneumatic, bolt action, electrically triggered tennis ball launcher (gun). | | |
| 10:00, 11:00, & 1:00 | <i>Red Rider Football Launcher</i> | Parking Lot, West |
| The "Red Rider Football Launcher" device can hurl a football up to 20 yards and 30 feet into the air. | | |
| 10:00 – 12:00 | <i>SurvA</i> | Parking Lot |
| Ever wonder what people with surveying equipment are doing? A demonstration will be held outside. | | |



Mark your calendars for next year's *EXPO*:
Thursday, March 25, 2010



Ottensman Hall First Floor

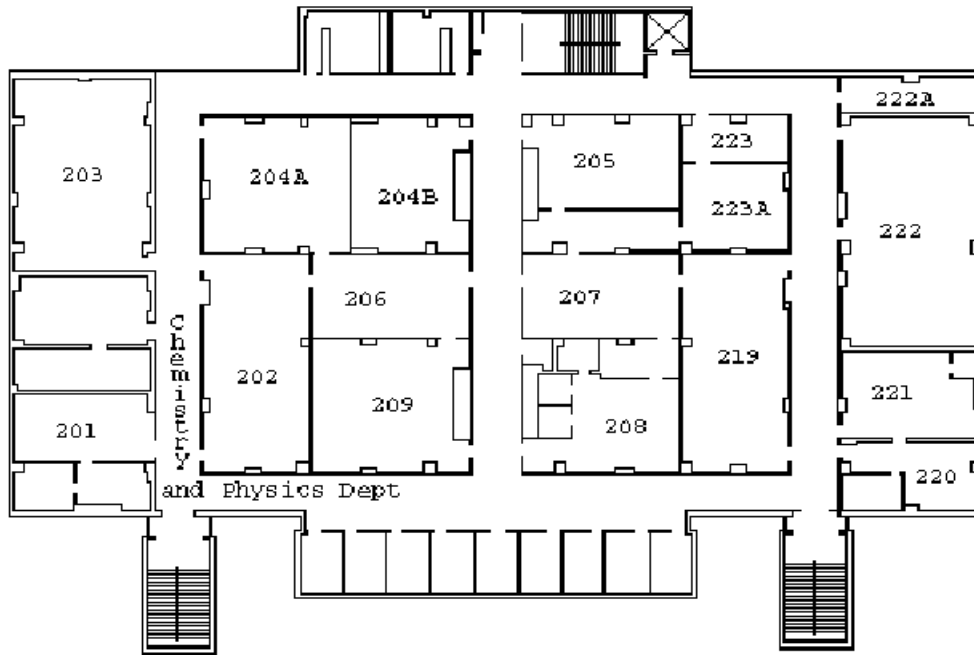
| Times | Event | Location |
|---|---|-----------------|
| All Day | <i>Toyota Off-Road Monster Truck</i> | Patio |
| Come see this world-class off-road truck built to go anywhere. Bent tubing, steel plate, and engineering come together to form a true beast. | | |
| 9:00, 10:00, & 11:00 | <i>Muddy Water Filtration</i> | Room 101 |
| Small groups will be given the top of a 2 liter bottle and several different materials, with the objective to filter dirty water. | | |
| 9:00, 9:45, & 10:30 | <i>Float Your Boat</i> | Room 101 |
| We will have a large tub of water in which students will float boats made of play-doh! We will also explain buoyancy to the older students. | | |
| 11:00, 12:00, & 1:00 | <i>Marshmallow Towers</i> | Room 103 |
| Take some marshmallows and small pieces of spaghetti and try to build the tallest and most structurally sound tower in the time allowed. Then the judges will put your tower to the test! | | |
| 10:00, 11:00, & 12:00 | <i>Sweet N Sticky Earthquake Shake</i> | Room 103 |
| Congratulations! You just won a chance to live on the world-renowned Themor Island. Now, all you have to do is pick between four different locations to build your new home. Beware, this tropical island may not be as ideal of a place to live as it seems! | | |
| All Day | <i>How Structures Work</i> | Room 105 |
| See displays illustrating important considerations for designing and constructing buildings, bridges, and other structures. | | |
| 10:00, 10:30, & 11:00 | <i>Sieve Analysis</i> | Room 106 |
| Eat "dirt"! High school, middle school, and elementary school students will do an assisted sieve analysis with candies of different sizes. Learn about the properties and importance of soil sizes, then eat your "soil" sample! | | |

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| 9:30, 12:00, & 1:30 | <i>Music Synthesizer</i> | Room 108 |
| Hear music created by this system which uses state-of-the-art technology. | | |
| 9:00, 10:00, 1:00 | <i>DSP Prototyping Workbench</i> | Room 108 |
| This is a computer system based around a custom 16-bit CPU that has been optimized for the purpose of controlling special tone generators. Using eight of these tone generators, this device is able to play back specially-made audio sequences, resulting in the production of music. | | |
| All Day | <i>Save the World! Be an Environmental Engineer!</i> | Room 109 |
| Come see stream models and ground water well models. Learn how environmental engineers clean the water we drink and use. | | |
| All Day | <i>Concrete Mixer</i> | Room 112 |
| Students will be able to mix up their own batch of concrete inside of a Dixie cup. There will be pre-made samples showing the formation of concrete over time. A poster will be on display for students to see the “formula” needed to make their own batch. | | |
| 10:30, 11:30, & 1 | <i>Tours of the New Engineering Building</i> | Meet in Room 116 |
| UWP has a new engineering building, which houses state-of-the-art classrooms and laboratories, plus space for student design projects such as race cars and mini-Baja vehicles. It has a dynamometer for full-size vehicles and will be home to a nanotechnology fabrication laboratory and a renewable energy resource center. | | |
| All Day | <i>Slime Pit</i> | Room 122 |
| People and kids will be making slime themselves; colorful slime, in red, yellow, green, blue, and purple. You pick the color. | | |
| 10:00 & 11:00 | <i>Alice in object-oriented-land</i> | Room 123 |
| Do you enjoy playing <i>The Sims</i> or <i>Zoo Tycoon</i> ? Have you ever wanted to change the world yourself and customize it to do what you want? Meet Alice. Alice is a program that allows you to create a virtual world, with pre-made objects like people, animals, backgrounds, sounds, and things like trees, grass, and other objects you can manipulate. It is much more than a virtual world. In the background, Alice creates object-oriented code that describes the objects and their placement, movement and actions in the world. | | |
| All Day | <i>Platteville Electronic Survey Tool (PEST)</i> | Room 123 |
| PEST: save time, save paper! Environmentally friendly electronic survey tool allows you to publish surveys, invite participants, and collect results. Please rate your interest: 1 2 3 4 5 | | |

| | | |
|---|---|-----------------|
| All Day | <i>Arcade Gaming Center</i> | Room 124 |
| Enjoy games created by UWP's ACM team as you fight aliens, fly ships, and play your friends on two-player modes! | | |
| All Day | <i>Insanely Tiny Web MP3 Jukebox – Eros Echos</i> | Room 124 |
| This web-enabled MP3 jukebox will blow your mind! Access it on the internet, upload and download music, queue up your favorite songs, and rock out at full volume...all on a tiny computer the size of a business card! | | |
| All Day | <i>Mind-Blowingly Trippy Music-Synchronized ESI Christmas Light Controller</i> | Room 124 |
| The Christmas Light Controller is back, and better than ever! Tons of Christmas lights pulse and flash to the beat of several different songs like A Mad Russian's Christmas and the Super Mario theme. The lights are now controlled wirelessly by a computer – from up to several hundred feet away – allowing multiple buildings to be included in the same presentation. Come and experience the future of holiday light shows! | | |
| All Day | <i>Pioneer 600</i> | Room 140 |
| Pioneer 600 Race: Students bring in the cars they built from kits and race them against each other. | | |
| All Day | <i>Remarkable Demonstrations of Chemistry</i> | Room 144 |
| Demos of fire, explosions, glowing substances and more will be given by chemistry students and professors. | | |



Mark your calendars for next year's *EXPO*:
Thursday, March 25, 2010



Ottensman Hall Second Floor

| Times | Event | Location |
|--|---|------------------|
| Contest starts at 11:00 | <i>Engineering Physics Altitude Challenge</i> | Room 202 |
| Watch the competitors race to raise a motor by any means necessary! Come see ingenuity and creativity pay off. | | |
| All Day | <i>The Nano Room</i> | Room 204B |
| Come explore the "Nano World!" With our scanning electron microscope and atomic force microscope, see things as you've never seen them before. <i>Done in conjunction with the nationwide "NanoDays" activities.</i> | | |
| 9:15, 10:15, 12:15, & 1:15 | <i>An Automated Ballast Control System</i> | Room 204A |
| Under the sea! Come see a basic diving control system and demonstrates the basic concepts of buoyancy. | | |
| 9:15, 10:15, 11:15, 12:15, & 1:15 | <i>Sonic Death Ray</i> | Room 204A |
| Wine glasses being destroyed by speakers on the other side of the room! Why do speakers have such terrible table manners? Come and see! | | |



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