

W ENGINEERING DISCOVERY DAYS

2016 EVENT PROGRAM

EXHIBITS SORTED BY DEPARTMENT

○ - Letter in circle represents location on Map

AERONAUTICS & ASTRONAUTICS

- D Aircraft Icing** - Investigate fluid flow over a wing using 3D printed components and real time data acquisition systems. *Friday only.*
- D Autonomous Fish Robots** - This exhibit demonstrates the operation of autonomous underwater vehicles with design motivated by biological capabilities.
- E Continuous Rotating Detonation Engine** - Learn about the unique jet engine device that operates with a continuous explosive detonation wave that is being tested in the AER building.
- D Design, Build, Fly** - DBF at UW is a student-run organization participating in the 2016 Design, Build, Fly Competition. Our team is tasked with creating and flying the best RC aircraft for a specified mission. *Saturday only.*
- E Drones & Unmanned Aerial Systems** - Examine and interact with Unmanned Aerial Systems (drones), including simulation, hardware, and flight simulators. *Friday only.*
- J Engineered Materials & Structures** - Learn about the research activities at the Laboratory of Engineered Materials and Structures.
- E HIT-SI3 Plasma Physics Experiment** - Learn about a unique magnetic confinement experiment for fusion energy.
- E Ram Accelerator Space Launcher** - The fastest ramjet engines in the world are flown in the basement of AERB! The ram accelerator is a unique mass driver capable of launching payload into orbit. Tours every half-hour.
- J UW SARP Rocket** - UW SARP will be displaying our posters and video explaining our rocket. We will also have the rocket at the booth for viewing.
- J Water Bottle Rockets** - Learn the basics of rocketry as you design, build, and launch a rocket!
- E ZaP Flow Z-Pinch Experiment** - ZaP is a plasma physics experiment that uses flows to stabilize an otherwise unstable configuration. Tour includes a brief machine description, the instruments used, and plasmas in our everyday lives.

BIOENGINEERING

All exhibits will be on Rainier Vista **J** on Friday & Foegle Hall **D** on Saturday.

Bioengineering Academic Programs - Talk with advisors about our summer camp and our degree programs. *Saturday only.*

Build a Prosthetic - Build a model prosthetic device, and learn about the factors that bioengineers consider when designing prosthetics for humans and animals.

DNA Detectives - Put your detective skills to the test to solve the DNA mystery! Learn how to build a complete DNA strand and discover how drug-resistance arises when DNA sequences are altered.

Engineering & Simulating Biological Cells - Learn about how we can simulate biological cells on a computer and how we can engineer cells in the lab to understand how cells work.

Engineering Biological Systems - Come learn about synthetic biology and biological engineering through hands-on activities and demonstrations with UW's competitive research team!

Pumping the Heart - A hands-on demonstration of the circulatory system where students can pump the heart and watch as blood flows through either healthy or diseased blood vessels.

Regenerating the Heart! - Test your endurance against the heart and learn how researchers at UW are using stem cells to regenerate the heart.

Strawberry DNA Extraction - Learn to extract strawberry DNA!

Ultrasound - Learn about ultrasounds and test them out to see your own veins! *Saturday only.*

CHEMICAL ENGINEERING

All exhibits will be at Benson Hall **N**

Cooler than Ice - Explore physical properties at extremely low temperatures. Come see what happens to common objects at subzero temperatures.

Enginearrings - Learn how electrochemistry creates thin titanium dioxide films on titanium, why the transparent films look colorful, and walk away with a unique pair of titanium earrings.

Making Molecules from Bugs - Genetic engineering lets us manipulate DNA in harmless microorganisms to safely produce renewable materials. Learn how to do your own DNA experiment at home!

The Power of Polymers - Sodium polyacrylate is a super-absorbing polymer that can hold over 300 times its own weight in water. We will be showcasing this commonly-used polymer's capabilities.

Walk on Water - Come "walk on water" and explore the mysteries of non-Newtonian fluid behavior.

CIVIL & ENVIRONMENTAL ENGINEERING

- L Behind Red Light, Green Light** - Demonstration of how traffic signals work and other interactive transportation engineering demos. *Friday only.*
- K Computer Modeling of Tsunamis** - We will be discussing tsunami events in the northwest and showing computer models that we have been developing. *Friday only.*
- K Drinking Water Treatment** - Learn where your drinking water comes from, test for chlorine in tap water, and watch dirt and particles removed. *Friday only.*
- J Engineering Plants to Fight Pollution** - Learn about using genetically modified plants to degrade pollutants from military live fire training ranges, home air, and greenhouse gases.
- K Hydrologic Remote Sensing** - Demos showing how satellites measure surface water and how we can use the information they collect to solve difficult water management problems. *Saturday only.*
- K Lights, Camera, Chemistry!** - Use colored lights to activate special dyes that glow differently depending on chemical conditions, and learn about how this technology is used to understand climate change! *Friday only.*
- K Locks Exchange & Heat Maps of Water** - Learn about the interactions between fresh and salt water and observe what a thermal camera can show you about the water surface that your eye can't see. *Friday only.*
- J Maze Runners** - Learn about different transportation modes, why people choose them, and how different combinations of different modes increase efficiency in a city.
- K Pacific Northwest Transportation Consortium** - Learn about our transportation research, video-based pedestrian detection systems, and play "Traffic Hero." *Friday only.*
- K Shake Table Exhibit** - Build and test model structures to see if they can withstand a series of simulated earthquakes while learning about structural engineering.
- K Snow in the Mountains** - Come find out how we measure the water content and temperature of snow! *Friday only.*
- K Soil Liquefaction Demo** - A hands-on exhibit where participants will learn how soil can act like a liquid during an earthquake. *Friday only.*
- K Using Drones to Find Landslide Hazards** - We'll show you how UW researchers are using drones to find and characterize landslides along major roadways in Alaska. *Friday only.*
- K UW Concrete Canoe** - See a Concrete Canoe and test samples of floating concrete.
- K UW Steel Bridge** - Come and see a 20 foot long model steel bridge! *Saturday only.*
- K Watershed Dynamics** - See a demonstration of a physical watershed hydrology model and simulation results.

COMPUTER SCIENCE & ENGINEERING

All exhibits will be in the CSE Atrium **H**

AccessSTEM & AccessComputing - Learn how we promote science and engineering to people with disabilities and try our cool and accessible science equipment!

Center for Game Science - Our focus is on scientific discovery games, STEM, collective intelligence, and solving hard problems in a game based environment.

DawgBytes - Come play a tune on our Banana Piano or try some code at our Code.org activity station.

Taskar Center for Accessible Technology - We engage the public in collaborative large team projects that enhance access for everyone, including people with disabilities.

The Allen Center from the Ground Up (& Down!) - CSE student tour guides show you what makes this world-class facility for computing education unique. Tours run every 1/2 hour from 10am -1:30pm. *Saturday only.*

The UbiComp Lab - See how computer science can be used to solve problems in sustainability, health sensing, and interaction. We'll show you how a laptop, smartphone, and even light bulbs can become sensors. *Saturday only.*

Wireless Power & Personal Robotics - See how sensors give personal robots new capabilities, and also experience ways to power those sensors without wires or batteries.

ELECTRICAL ENGINEERING

- I Cloud Printing** - Turn your classic printer into a cloud printer. Learn about "the cloud" and see how you can make use of it to print your homework from anywhere! *Saturday only.*
- H Crowd Sensing** - Learn about a platform for estimating the air quality in an urban environment.
- G Dark Side of Consumer Electronics** - Every year, around the world, we throw away over 25 million tons of electronics. That's the equivalent of 26 million cars! What's in all that waste?
- G Discover Nanofabrication, Nanoscience, & Molecular Engineering** - Discover how microchips and sensors are made using nanofabrication techniques. Learn about practical applications of nanotechnology by exploring thin-films and plasma processes with hands-on demos.
- H Fashioning Electronic Waste into Jewelry** - Looking for a brand new look to wear to school? Looking for a Mother's Day gift? Here's a great opportunity for you to repurpose electronic waste into your own custom made earrings. *Tickets required & may be picked up at the Electrical Engineering Welcome Table in the CSE Building, room AE100.*
- H High Voltage! Historical Electrical Apparatus** - Several reproductions of classic high voltage generators will be demonstrated, including Tesla coils, Van de Graaff generators, repulsion coils, and a Jacob's Ladder.
- G Racing with Light** - Join us in learning how light plays an important role in our daily lives, from solar powered cars to the magic patch and the rainbow peephole. Light can be used to power our devices, to see very small objects, or to color the world around us. You'll never see light the same way again! *Friday only.*
- H The Glowing Pickle** - What happens to the ordinary pickle when you plug it in to an equally ordinary wall outlet? Don't try it at home... but we invite you to watch what happens when we try it! *Tickets required & may be picked up at the Electrical Engineering Welcome Table in the CSE Building, room AE100.*

HUMAN CENTERED DESIGN & ENGINEERING

- I Designing for People!** - Hands-on activities for collaborative learning and play. Use Osmo, a unique gaming accessory for the iPad, and express your creativity by designing smart home systems with LittleBits electronics.

INDUSTRIAL & SYSTEMS ENGINEERING

All exhibits will be on Rainier Vista ③ on Friday, April 22 only.

Accuracy vs. Precision - Learn the difference between accuracy and precision in scientific measurement by playing a dart game.

Getting Lean - Learn about efficient manufacturing in our model airplane and crane building activity.

How Sweet It Is - Learn about probability and statistics with M&Ms.

Learning Curve Maze Challenge - Explore the concepts of the learning curve by completing a human-sized maze at high speed that will demonstrate how your performance improves with experience.

MATERIALS SCIENCE & ENGINEERING

③ **Effects of Hot & Cold** - See the effects of extreme heat and cold on materials from space shuttle tiles to racquet balls to marshmallows.

① **Energized with Solar** - Try your hand at building a solar car and learn about circuits and renewable energy.

④ **Functional Materials** - Functional Materials are engineered to perform specific tasks such as converting mechanical energy to electrical. Come and learn more about this group of special materials.

④ **Materials for Energy** - Materials scientists have found a number of different kinds of materials that can be used for power. Come by and see how solar cells, batteries, and fuel cells work.

④ **Materials Miscellany** - What do magnets, Jell-O, lasers, and bubbles have in common? They're all materials! Stop by and see the wide range of applications a materials scientist engages in.

③ **Materials of Food** - Stop by and see how chocolate demonstrates an important concept of materials science - phase transitions.

③ **Materials of Music** - Musical instruments are made from a wide range of materials that include bio-materials, metal alloys, and polymers. Come and see the artistic side of engineering.

④ **Materials Science Welcome Table** - Welcome to Materials Science and Engineering. Here you will find more information about our department and receive a periodic table and a special gift from the students in MSE.

④ **Medical Nano-Materials** - Come see how nanoparticles are made and learn how they are used to treat diseases!

④ **Microscopy in Materials** - Microscopes are a common tool in biology, chemistry, physics, and most other sciences. Come and learn about how it works and the unique ways materials engineers use it.

③ **Organic Electronic & Photonic Materials** - Learn how organic materials are being made to use as optical and electronic devices! Go from silly putty to a laser!

④ **Scanning Electron Microscope** - The Scanning Electron Microscope is one of the most important tools for a materials scientist. This instrument will be demonstrated on Saturday once per hour. *Saturday only.*

④ **Slip-Casting** - Slip-Casting is a common technique for making ceramics in materials science and art. MSE will demonstrate the method and visitors are encouraged to participate.

MECHANICAL ENGINEERING

④ **Carbon Fiber & Composites Shop** - Check out some of the carbon fiber composite parts we make at UW.

① **Exploring Engineering** - Learn about some of the cool things mechanical engineering students get to do. Make your own Bristlebot, learn about 3D printing, and more!

④ **Fun in Vibrations** - See interesting phenomena of vibrations such as the resonance of tuning forks and mode shape patterns shown by sand on a vibrating plate.

④ **Fun with Granular Media!** - Granular media such as sand, rice, and corn starch are commonly found around us. Join for us for experiments on how grains flow and jam, and learn the physics of granular media!

① **Human Powered Submarine** - Student-run group designs, builds, & races a submersible propelled entirely by human power.

③ **Husky Robotics: Mars Rover** - A Mars rover designed to drive rugged terrain, collect & analyze soil samples, & assist astronauts in various tasks.

① **Husky Robotics: RoboMasters** - An international robotics competition that brings online gaming offline.

④ **Marine Renewable Energy** - Learn about marine renewable energy conversion and its environmental effects.

④ **Mechanical Test Lab** - Learn how engineers test materials and structures using big machines, little sensors, light waves, and more. Breaking stuff is fun!

④ **Smart Materials** - See a demo of multi-functional materials (thermoelectrics) allowing people to power a fan using body heat. *Friday only.*

④ **The Little Cell That Could Tug** - Come learn how strong cells are and how we measure their nanoscale forces with cantilevers. *Friday only.*

④ **The Ultimate Machine** - The human body is the ultimate machine. Come learn how the brain, muscles, bones, and joints work together to help us move.

③ **UW EcoCAR3** - Come see UW students as they engineer the hybrid sports car of the future, based on the all-new 2016 Chevrolet Camaro. *Saturday only.*

④ **UW Formula Motorsports** - See the cars and carbon/machined parts, and learn about what we do in the school year! *Saturday only.*

④ **Woof 3D** - Learn about how we build 3D printers and explore the possibilities of additive manufacturing.

STUDENT GROUPS

③ **Edible Engineering** - Learn how to make ice cream in 5 minutes and the science behind it.

③ **Engineers Without Borders** - Learn about what EWB does and our projects

③ **Grasping with Straws & Basically Acidic Ink** - Activities include making a robotic hand out of straws, tape, and string, and decoding messages using acids, bases, and cabbage juice.

① **UW Hyperloop** - Learn about the Hyperloop, a conceptual high-speed transportation system put forward by entrepreneur Elon Musk.

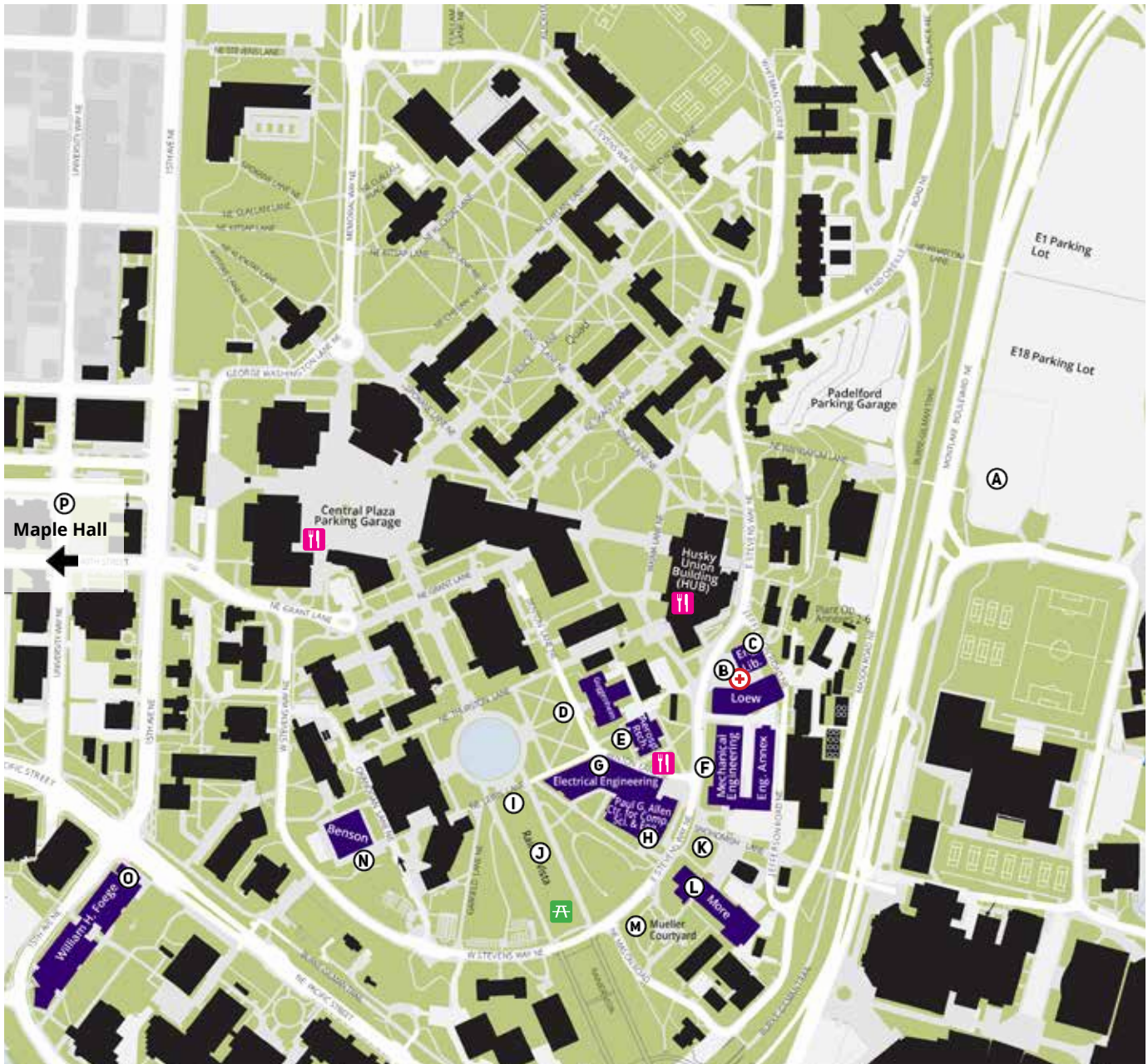
④ **Wide World of Sound** - Explore sound in several areas, including medical ultrasound, underwater sounds, and simulated sounds.

OTHER

④ **Area 01 Dabble Lab** - See the Area 01 Dabble Lab and a demonstration of 3D printers and a laser cutter. Tours every 30 minutes. *Saturday only.*

④ **Engineering is Awesome!** - Explore different types of engineering at the Engineering Library. You'll be guided by some of our favorite Lego™ engineers!

2016 ENGINEERING DISCOVERY DAYS



KEY:

- Engineering Building
- Non-emergency Medical
- Picnic Area
- Food Option

- A.** E18 Welcome Tent
- B.** Loew Hall Welcome Tent (Information, Lost Children)
- C.** Engineering Library
- D.** Guggenheim Hall and Lawn
- E.** Aerospace & Engineering Research
- F.** Mechanical Engineering Building
- G.** Electrical Engineering Building
- H.** Computer Science & Engineering Atrium

- I.** Drumheller Fountain Tent
- J.** Rainier Vista Tent
- K.** More Hall Tent
- L.** More Hall
- M.** Mueller Hall and Mueller Courtyard
- N.** Benson Hall and Patio
- O.** Foege Hall
- P.** Maple Hall

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