

2019 EVENT PROGRAM

Exhibits sorted by program

○ - Letter in circle represents location on Map

Aeronautics & Astronautics

- J AIAA Water Bottle Rocket** - Join UW's rocket scientists to launch your very own water bottle rocket.
- J Aircraft Icing** - Investigate fluid flow over a wing using 3D printed components and real time data acquisition systems.
- E Computational Plasma Physics Group** - See live demos of developing a model, implementing a computational framework, and learn about our research, plasma physics and fusion science. *AERB 228*
- J Drones & Unmanned Aerial Systems** - Examine and interact with unmanned aerial systems (drones), including simulation, hardware and flight simulators.
- E Electric Propulsion** - See how plasma can push spacecraft to further corners of the solar system. *AERB 013*
- E FuZE Plasma Experiment** - Can we harness the energy of the stars to power our planet and send astronauts deep into space? Tour the FuZE and ZaP experiments and learn about plasma through interactive demonstrations. *AERB 036*
- J Indoor GPS for Robots and Drones** - See how an ultrasonic beacon system can help robots and drones know their location without GPS. We will demonstrate a working indoor GPS system, and display other robotics technology.
- J Remote Controlled Aircraft** - Members of the Design Build Fly club will be showing the remote-controlled aircraft that was built to compete at this year's national competition.
- J Society for Advanced Rocket Propulsion** - Check out rocket parts that have actually flown and learn about how we build and fly our rockets.
- E The HIT-SI3 Plasma Physics Experiment** - Learn about a unique magnetic confinement experiment for fusion energy. *AERB 401*

Bioengineering

All exhibits will be on Rainier Vista **J**

Bioengineers Without Borders - Learn about our low-cost, sustainable medical technologies for the developing world.

Body in A Bag: Implants - Sometimes our bodies need a little bit of outside help to function. Learn about the different kinds of implants and try to identify their uses.

Build a Prosthetic - What do engineers need to consider when they are making prosthetics? Using the engineering design process, you'll learn to design and make your own prosthetic.

Enzymes De-Livered - Liver enzymes help our bodies break down bad chemicals. See liver enzymes at work and take a guess about which will work better - the liver smoothie or liver popsicle. *Thursday only.*

Fun with Computer Models - Computer models are growing in importance in predicting diseases such as epidemics and the growth of tumors. Play with some of our computer models.

Lego DNA - To understand molecular biology, we will conduct an activity with Legos and jelly beans to represent nucleotides, DNA, amino acids and peptides.

Nanoparticle Drug Delivery - Learn one way that scientists control how and where medicine is delivered in the body: nanoparticles.

Strawberry DNA Extraction - Learn to extract DNA from strawberries using household products.

Ultrasound: Seeing with Sound - With so many parts of the human body hidden under the skin, how do doctors and other medical workers see what's wrong? Ultrasound imaging uses sound waves to look inside the human body.

Chemical Engineering

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

Brain Engineering - It's hard to get medicine to your brain. Nanoparticles are an engineering solution for better drug delivery. Watch nanoparticles move and learn more about the brain.

Cooler than Ice - In nature, ice is often the coldest thing we encounter. What is even cooler than ice? Come and find out.

ECS Enginearrings - With electrochemistry, we turn grey titanium earrings into beautiful, colorful jewelry.

Instant Snow - Super-absorbent polymers can retain extremely large amounts of liquid relative to their own mass. In this hands-on exhibit, visitors will exploit these materials to create synthetic snow.

Painting with CRISPR-Engineered Bacteria - CRISPR is changing the way that we engineer biology. See art made with CRISPR-engineered bacteria and learn more about how scientists are using CRISPR to solve big problems.

Shape Memory Alloys - Nickel titanium is a common metal alloy used for shape-memory applications such as dental wires. Even after being subjected to stress, the alloy can be returned to its original shape by heating.

Splitting Water - Using electricity, we split water into hydrogen and oxygen to show how water can be used as an energy storage medium.

The Power of Polymers - Learn the science behind polymers and make Worm Goo. A fun, hands-on, squishy experiment.

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

Civil & Environmental Engineering

- L Beyond Red Light Green Light** - Ever wonder how traffic lights work or how vehicles are detected? Learn about these and other modern solutions to traffic problems like congestion and crashes. *More 101*
- K Build a Bridge with ASCE** - ASCE is a club for civil engineers, who build dams, bridges, roads, buildings and more. Learn more about civil engineering and build a bridge of your own.
- K Concrete Canoe** - Can concrete float? See how with a hands-on activity and if you're lucky, maybe even a concrete fish.
- G Earthquake Damage Scavenger Hunt** - After an earthquake, engineers evaluate the damage by tagging structures safe or unsafe. Join us in a scavenger hunt and, just like an engineer, determine if a building gets a green or red tag.
- K Engineering Plants to Fight Pollution** - Genetically modified plants help to degrade pollutants from military training ranges, home air and greenhouse gases.

- D Engineers Without Borders** - Learn about our work with communities in Nicaragua and Guatemala.
- D Exploring Earthquakes, Microbes, and Quicksand** - Geotechnical engineers study soil as an engineering material. We will discuss the effects of earthquakes on geosystems, show how bacteria can prevent damage, and explain quicksand.
- K Fantastic Modes and Where to Find Them** - Games and puzzles allow students to consider the tradeoffs of time, money and emissions that occur when deciding how best to transport people and goods through a city.
- L Industrial X-ray Scanner** - Engineers and scientists use x-rays to inspect the insides of objects. Learn the science behind x-ray vision. Bring in your interesting objects - we may use them as demos. *More 031*
- K Lock-Exchange Experiment** - Investigate the interactions between fresh and salt water using a small tank, salt and food coloring.
- K Magic Granules: How Microbes Thrive Together** - Learn how we employ natural and man-made microbial granules to clean up sewage.
- D Make It and Shake It: Your Buildings, Our Earthquakes** - Design and construct a building, then test its earthquake resistance on our shake table. Can your building survive Seattle's Big One?
- D Measuring Snow in the Mountains** - Where does your water come from? Come make snow and learn how we measure two important snow properties: temperature and snow water equivalent. *Thursday only.*
- D Pacific Northwest Transportation Consortium** - Experience "Rush Hour," a transportation mobility challenge.
- D PoopGames** - Play LoosePoops on a tablet or phone. Slice TinyPoops, squish PoopFlies, and learn about toilet design and wastewater treatment as you face pooppy challenges.
- D Structural Engineering Using K'Nex** - Learn about structural engineering experiments, interactive models and computer simulations by playing with K'Nex.
- K Water Treatment and Disinfection** - Water goes through many treatment steps before reaching your sink at home. Learn how to remove dirt and kill microorganisms in natural water.

Computer Science & Engineering

All exhibits will be in the CSE Atrium **H** unless otherwise noted

Allen School Ambassadors - Tour the Paul G. Allen School of Computer Science & Engineering, and learn about our K-12 outreach program (camps, workshops, class visits and more).

Center for Game Science - We develop educational and scientific discovery video games for all ages to help solve world-sized problems.

DawgBytes - Learn how to make almost anything into a computer key, and how to program a robot.

- O Food Manipulation for Assisted Feeding** - See our wheelchair-mounted robot that autonomously detects, acquires and delivers food to people with upper-body mobility limitations. *Amazon Auditorium*
- Lab in the Wild** - Curious how peoples' likes and dislikes are different around the world? Discover how culture and computers interact, and where you fit in.
- Programming Organisms with DNA Puzzles** - Every organism runs its own DNA program, and just like code can be shared between programs, DNA can be shared between organisms. Learn how to program organisms by solving DNA puzzles.

Robot vs. Human - Solving the Rubik's Cube - See a robot solving a Rubik's Cube utilizing AI, computer vision and novel sensing technology. Challenge the robot to see who can solve a Rubik's Cube faster.

Robotic Hands - Join CSE RSOs and make your own customized robotic hand using ordinary objects like straws and string.

Ubiquitous Computing Lab - Computers aren't just in desktops and laptops. See how computing affects our lives in all sorts of different ways, like checking our health and measuring how much energy we use in our home. *CSE 507*

Electrical & Computer Engineering

- D Advanced Robotics at UW** - Drive robots and learn about the intricacies of designing and building your own robot.
- H Fashioning Jewelry from Electronic Waste** - In this workshop, we'll repurpose electronic waste into custom designed, homemade earrings. *Tickets required - pick up at the ECE Welcome Table in the CSE building, room AE100.*
- D Light in Action** - What does Jell-O have to do with the Internet and how do 3D movies work? Learn the important role light plays in our daily lives, from powering our devices to coloring the world.

- P NanoFab Cleanroom Tour** - What do cell phones, game consoles, drones and electronics have in common? Tour our lab to see inside the windows of a cleanroom. Tour hours are 10am-12pm. *Fluke 1st floor*
- H The Glowing Pickle** - What happens to an ordinary pickle when it is plugged into an ordinary wall outlet? Don't try it at home, but we invite you to watch what happens when we try it. *Tickets required - pick up at the ECE Welcome Table in the CSE building, room AE100.*
- H Walking Robots** - Is walking simply falling with style? See a robot walk without motors.
- I Washington Superbike** - We are the first team from the USA to compete in the electric motorcycle racing and engineering MotoStudent competition held in Aragon, Spain. We design, build and test our very own superbike.
- H Wireless Power, Battery-Free Sensing, and Robotics** - See demonstrations of wireless power transfer, battery-free sensing and robotics, including a completely battery-free and wireless camera as well as a robot that can solve Rubik's Cubes.

Human Centered Design & Engineering

All exhibits will be on Rainier Vista **J**

Interactive Prototyping - Make your own app. Invent a new way to play music. Join us and use your creativity to solve real world problems.

Project EMAR: A Social Robot for Teens - Our goal is to design and build a social robot to help reduce teen stress.

Industrial & Systems Engineering

All exhibits will be on Rainier Vista ①

Accuracy vs. Precision - Learn about scientific measurements with a dart game.

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

Learning Curve - Learn about data collection by racing against your friends and yourself.

Word Color - Say the color of the listed words and see how different designs affect human performance.

Materials Science & Engineering

① **Captain Materials** - Learn about materials that will one day make us all superheroes.

② **Composites** - Compare the strength of composites with other materials.

③ **Functional Materials** - Functional materials are engineered to perform specific tasks such as converting mechanical energy to electrical energy. Learn more about this group of special materials.

④ **Hot and Cold** - See the effects of very hot and cold temperatures on materials like space shuttle tiles, racquetballs and marshmallows.

⑤ **Materials of Food** - Chocolate demonstrates up to 10 different materials fundamentals. That's right, chocolate is a material.

⑥ **Materials of Music** - Learn about the advanced composite, metallic, natural and synthetic materials used in modern musical instruments including the piano, violin, cello, acoustic guitar and electric guitar.

⑦ **Microscopy of Materials Science** - Microscopes are a common tool in biology, chemistry, physics and other sciences. Learn how they work and the ways materials engineers use them.

⑧ **Nanomaterials for Medicine** - See how nanoparticles are made and learn how they are used to treat diseases.

⑨ **Welcome Table** - Find more information about our department and receive a periodic table and a special gift from the students in MSE.

Mechanical Engineering

① **3D Printing with WOOF** - See 3D printers in action and learn about the different types. Learn how to write your name in G-code and practice with our pen printers. *MEB G045*

② **ASME@UW** - Explore 3D printing and build mini trebuchets, bristlebots and plastic ping pong ball launchers.

③ **Chaotic Water Wheel** - Cups spin around a wheel as water flows in the top and out the bottom, demonstrating chaos theory. Learn about other systems that behave this way and try to predict which way the wheel will turn.

④ **Fun of Vibrations** - Learn fun facts about vibrations by doing experiments using vibrating strings, tuning forks and vibrating plates. *MEB 114*

⑤ **Husky Robotics** - Husky Robotics competes in the University Rover Challenge, building Mars rovers. See our rover, with its arm and soil collection modules.

⑥ **Hyperloop** - The UW's Hyperloop team designs and builds a Hyperloop pod prototype as part of the SpaceX-sponsored Hyperloop Competition.

⑦ **Insect Scale Robotics** - Flying robots the size of bumblebees are an interesting challenge. Find out how robotics design is different when you shrink to insect scale. Magnifying glass not required.

⑧ **The Human Body: The Ultimate Machine** - Engineers use many tools to understand the complex machinery in the body. Try out devices that we use to listen to your muscles and learn how we use these devices to look into the brain. *MEB 127*

⑨ **The Little Cell That Could Tug** - Cells are the basic units of life and one of their jobs is to crawl, pull or tug. Learn how cells generate force and how we measure their strength with cantilevers. *MEB 127*

⑩ **UW EcoCAR** - Check out the UW EcoCAR hybridized Chevrolet Camaro and see what makes a hybrid electric car work.

⑪ **UW Human Powered Submarine** - Learn how our team designs, builds and tests a submarine operated by a scuba diver.

⑫ **UWashington Formula SAE Racecar** - See our SAE team's student built electric car. Learn about the cool engineering projects we work on and get a chance to sit in the car.

⑬ **Virtual Reality for Robots** - See how Boeing and the UW are using virtual reality to make it easier to create robotic systems. *MEB G046*

⑭ **Wearable Nanosensors** - We will demonstrate wearable sensors made of carbon nanotubes. *AERB 318*

Student Groups

① **Accessible Computing** - Learn about computing that is accessible to people with disabilities and make your name in Braille.

② **Arduino Demonstrations with Triangle** - Learn about programming and electrical engineering by interacting with some pre-built projects, or try programming micro-controllers and sensors.

③ **HuskyADAPT (Accessible Design and Play Technology)** - We adapt toys for children with disabilities and design solutions to accessibility problems. *MEB 127*

④ **Ice Cream in a Bag** - Learn the science behind making ice cream in a bag.

⑤ **Engineering with SWE** - Join us to learn about real-world applications of engineering, build prototypes of accessible engineering products, and how you can make an impact.

⑥ **Ghost Bubbles with Theta Tau** - Hang out with us and create some spooky bubbles with dry ice. See what happens when you make them pop.

⑦ **Underwater Robotics and ROVs** - A team focused on building and competing with underwater remotely operated vehicles.

Other

① **Brainworks!** - Explore activities that showcase the mysteries of your brain.

② **Candy Nanomaterials** - Join the Bioresource Science and Engineering department and see what products can be made sustainably from trees. Learn to make your own paper and candy carbon nanostructures.

③ **Learning from an Engineering Disaster** - Learn how engineers work through disasters like the Tacoma Narrows Bridge Collapse and solve problems.

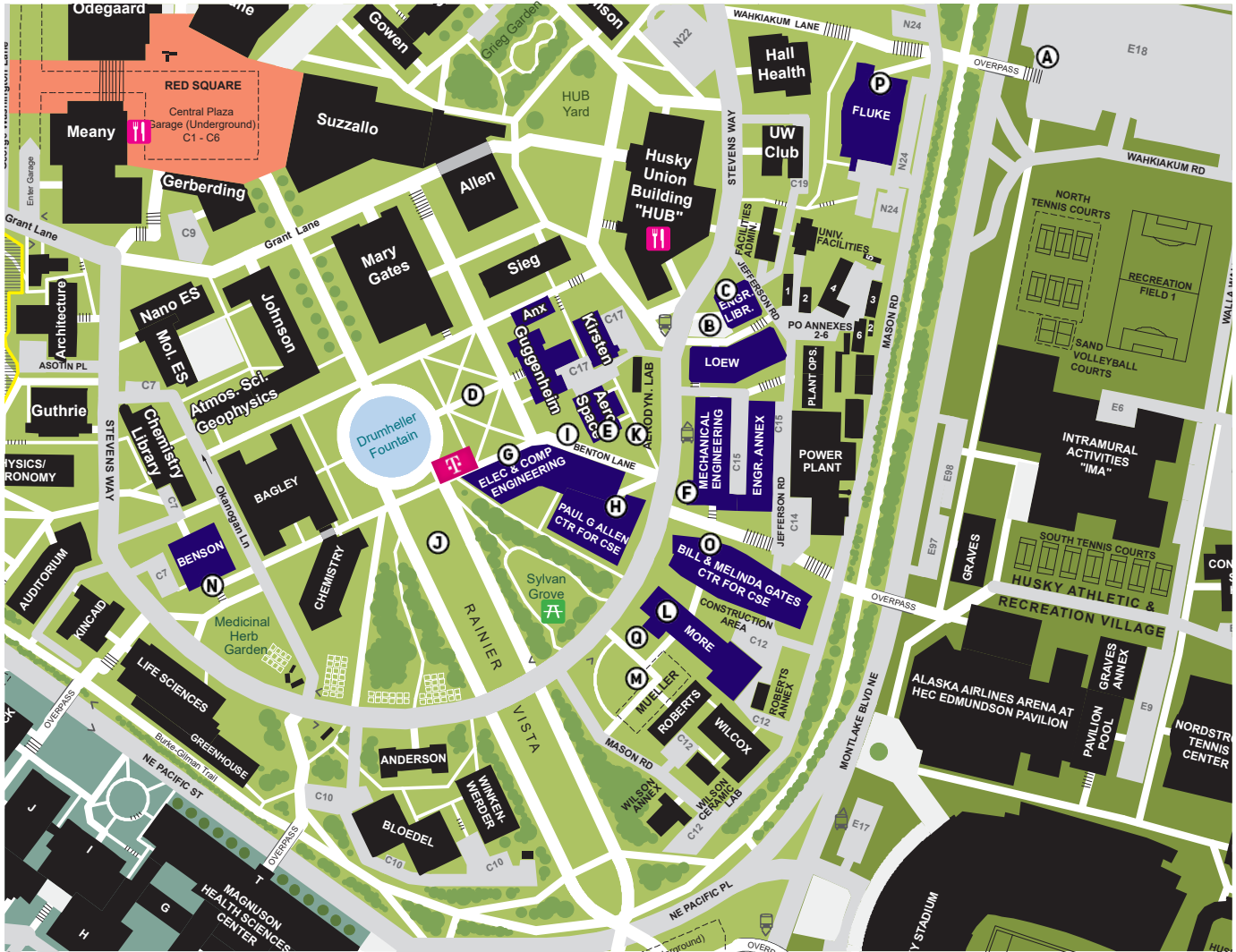
④ **Molecular Rainbows** - Discover how materials change at the nanoscale. Make a rainbow bookmark and look inside our dark box.

⑤ **Racing with the Sun** - Try building the fastest solar car with our car chassis and solar cells. Learn about solar research.





⑥ **Smashing Protons** - Want to learn more about the big bang machine (LHC)? Join us for exciting hands-on table games and computer simulations. We also have a LEGO model.

⑦ **WNF NanoEngineered Systems Institute** - See the nanotechnology and fabrication that go into nanoelectronics in your phones and computers. Create a thin film bookmark and see what plasma does to a nickel.

2019 ENGINEERING DISCOVERY DAYS MAP



Key:

-  Engineering Building
-  Picnic Area
-  Food Option
-  T-Mobile Tech Experience

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

- I. Benton Lane
- J. Rainier Vista Tents
- K. AERB Lawn Tents
- L. More Hall
- M. Mueller Hall and Courtyard
- N. Benson Hall and Patio
- O. Bill & Melinda Gates Center
- P. Fluke Hall
- Q. Roberts Lawn

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