

# expanding your horizons

motivating young women in science + mathematics

## 1. The Wonders of Electricity: Build a Burglar Alarm!

Learn how electricity works by building and taking home your own burglar alarm.

*Dr. Angela Des Jardins, Deputy Director, Montana Space Grant Consortium, Bozeman; Dr. Aki Takeda, Research Scientist, MSU Physics Department*

**Location: EPS 258**

**Schedule: 1-4 (all workshops)**

## 2. That's Hot! Investigating the Edge of Life

What are the limits to life? Can organisms live in boiling water or boiling battery acid? Yellowstone National Park has thousands of hot springs, geysers, mud pots, and fumaroles thriving with life. Investigate these amazing organisms with hands-on experiments!

*Monica Brelsford, Hot Science Coordinator, MSU Thermal Biology Institute; Dana Skorupa, PhD student, Montana State University*

**Location: Leon Johnson 609**

**Schedule: 1-4 (all workshops)**

## 3. Survival Science

Awareness + Preparedness + Improvisation = Survival! Learn the basic skills of wilderness survival while becoming a competent and confident person in the outdoors. Explore the basics of navigating safely using a map and compass, building your own shelter, and starting a fire with a bow drill.

*Ciara Wolfe, Program Director, Montana Outdoor Science School, Bozeman*

**Location: EPS -- second floor balcony**

**Schedule: 1-4 (all workshops)**

## 4. Video U

Learn to make a short video with titles, transitions, music and credits. First capture, yourself as a digital video clip. These clips will be added to the time line where titles and transitions will be added. Music will then be added to finish off the project.

*Rebecca Wiegand, Owner, Déjà vu Video, Helena*

**Location: Reid 425**

**Schedule: 1-4 (all workshops)**

## 5. Sports Medicine: Girls on the Go!

Whether you're an aspiring athlete or someone who wants to be a doctor that takes care of athletes, this class will open your eyes to the exciting world of sports and medicine.

*Dr. Milica Livesay, Doctor of Physical Therapy, Clearwater Therapeutics*

**Location: EPS 108**

**Schedule: 1-4 (all workshops)**

## 2009 Workshop Schedule

Workshop I: 9:55-10:35

Workshop II: 10:45-11:25

Workshop II: 12:30-1:10

Workshop IV: 1:20-2:00

## 6. Risky Business

Do you want to be a detective? Interested in investigating a secret place on campus where few have ventured? Join an occupational safety and health specialist for a journey on assessing what constitutes risky business.

*Laurie Bachar, Occupational Health Officer, MSU Safety & Risk Management*

**Location: EPS 128, then campus tour**

**Schedule: 1-4 (all workshops)**

## 7. I Dig Trees!

Can you imagine a world without trees? Learn what professional arborists do and how they preserve our urban forest.

*Amy Hansen and Jennifer Robbins, ISA Certified Arborists, City of Bozeman Forestry Division*

**Location: Meet at Cobleigh Hall west entrance by Pepsi machine--upstairs or outside (weather-dependent)**

**Schedule: 1-4 (all workshops)**

## 8. Mobile Robots on the Loose!

Here is a chance to work with a small, mobile robot! Create your own computer program to tell the robot how to find its way through an obstacle course. Join us for some hands-on learning about computers and electronics. No experience required!

*Dr. Rob Maher, Department Head; Allison Banfield, System Administrator; MSU Dept. of Electrical and Computer Engineering*

**Location: Cobleigh 602**

**Schedule: 1-4 (all workshops)**

## 9. Design a Virtual Bridge...Learn about Engineering!

Have you heard about the bridge that collapsed in Minneapolis, Minnesota in 2007? Why did that bridge collapse while others withstand the test of time? Learn about the design process that engineers use to make bridges safe. Design your own virtual bridge, test the strength of your bridge, and optimize your design!

*Danielle Scharf, Associate/Senior Engineer, Sanderson Stewart, Bozeman*

**Location: Cobleigh 210**

**Schedule: 1-4 (all workshops)**

## 10. Sink Your Teeth In: Exploring Careers in Dentistry

Explore different careers within the exciting, innovative and artistic world of dentistry. You will also learn the basic

science behind oral health and oral disease and gain a better understanding of why dentistry is such a rewarding career for women!

*Dr. Lani McLane, DMD, Dental Dir., Community Health Partners, Boz.*

**Location: EPS 127**

**Schedule: 1-4 (all workshops)**

### 11. Listening to the Universe

Astronomers have historically used their eyes and ever improving telescopes to learn about the Universe. Today, new gravitational wave detectors catch ripples from distant stars and galaxies and allow us to listen to the Universe. You will be able to listen and try your ears at identifying different types of gravitational waves.

*Kathryn Williamson, Graduate Student, MSU Physics Department*

**Location: EPS 235**

**Schedule: 1-4 (all workshops)**

### 12. Biomimicry: Biology to Design

What do biologists and architects have in common? Biomimicry! Biomimicry is studying a termite mound to design a building that doesn't need air conditioning or researching a fish to invent a better car. Explore gecko feet, seashells and butterfly wings. Try biomimicry with Velcro races and solve a challenge.

*Jamie Dwyer, Biologist and Intern Architect, Biomimicry Institute, Bozeman*

**Location: EPS 126**

**Schedule: 1-4 (all workshops)**

### 13. Mapping the Way of Wonderful Water

We all need water, but where does our water come from, and how do we know if there is enough clean water to go around? Join an engineer to map a watershed and calculate the movement of water. Learn about fun careers working with natural resources.

*Karen Hoffman, Agricultural Engineer, USDA Natural Resources Conservation*

*Service; Ivy Allen, Public Information Specialist, USDA, NRCS, Bozeman*

**Location: Cobleigh 632**

**Schedule: 1-4 (all workshops)**

### 14. Now You See It: Adventures in Microscopy

Use stereo microscopes to discover surprising details in every-day items. Learn how cells are the building blocks of all organisms and see real cells in frog embryos. Find out what can and can't be seen with different types of microscopes.

*Dr. Christa Merzdorf, Asst. Prof., MSU Dept. of Cell Biology & Neuroscience*

**Location: Leon Johnson 106**

**Schedule: 3-4 (afternoon only)**

### 15. Slime

**Location: Cobleigh 201**

**Schedule: 3-4 (afternoon only)**

### 16. Colorful Coatings

Participants will coat silverware with red, yellow, blue or purple coatings using a small fluidized bed, which are used by engineers to coat many things we see in our daily lives – even M&M's!

*Dr. Abbie Richards, Asst. Professor, MSU Dept. of Chemical Engineering*

**Location: EPS 137**

**Schedule: 1-2 (morning only)**

### 17. The World Aquatic: Careers in Fisheries & Water

Does spending your days on streams, lakes, and rivers appeal to you? Careers in fisheries and water quality provide opportunities to combine a love of the outdoors with skills in math and science.

*Carol Endicott, Fisheries Biologist, MT Dept. of Fish, Wildlife & Parks; Tammy Crone, Water Quality Specialist, Gallatin Local Water Quality Dist.*

**Location: Cobleigh 201**

**Schedule: 1-2 (morning only)**

### 18. The Mystery of the Glowing Flask

Engineers don't just build things; they also use microbiology, chemistry, and critical thinking to solve problems. Use laboratory techniques to solve the mystery of the glowing flask.

*Dr. Darla Goeres, Research Engineer, MSU Center for Biofilm Engineering; Dr. Anne Camper, Associate Dean, MSU College of Engineering; Liz Sandvik, Natasha Mallette, & Laura Jennings, MSU students*

**Location: EPS 347**

**Schedule: 1-2 (morning only)**

### 19. DNA: Oodles and Gobs of Information

Learn to perform the first step in genetic engineering – the isolation of DNA! You will learn about the structure of DNA and the basic techniques used to isolate DNA from plant cells. Also included will be a discussion of how DNA carries the unique information for every living thing in a secret code!

*Dr. Paula Lutz, Dean, MSU College of Letters and Science; Dr. Anneke Metz, Assistant Professor, MSU Dept. of Cell Biology and Neuroscience*

**Location: Leon Johnson 106**

**Schedule: 1-2 (morning only)**

### 20. Magnet Magic & Magnetic Resonance Imaging (MRI)

Doctors depend on MRI images all the time to diagnose patients. Engineers use MRI images to understand unusual fluid behavior. How does it work? We'll use our MRI machine to image our "fruit, vegetable, and candy" patients! The technique is based on magnetic fields, and we'll explore the magic of magnets.

*Dr. Sarah Codd, Assistant Professor, MSU Dept. of Mechanical & Industrial Engineering*

**Location: Cobleigh 324**

**Schedule: 3-4 (afternoon only)**

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