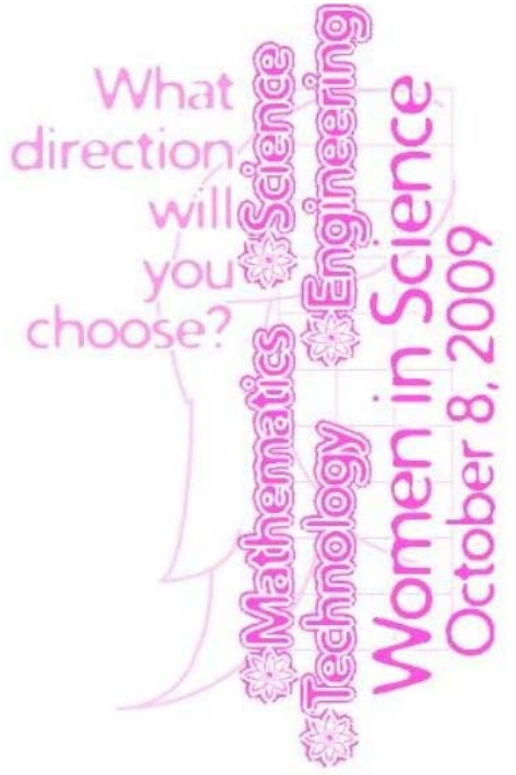
# Women in Science Day, 2009

## October 8 – Washburn University

***An opportunity for young women to experience a day of career possibilities in the sciences***




### Schedule of Events

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| 8:15-8:30 | Registration |
| 8:35 | Opening remarks |
| 9:00 | Keynote speaker |
| 10:00 | Morning labs |
| 11:00 | Lunch with lab instructors and time to network with other girls! |
| 12:00 | Afternoon labs |
| 1:05 | A special event you won't want to miss! *Sponsored by Sunflower AWIS* |
| 1:30 | Closing remarks |

### • Keynote Speaker •

**Julie Adolphson** is the Meteorologist in Charge of the National Weather Service Office in Pleasant Hill/Kansas City, Missouri, the Federal Government office who issues all of the severe weather warnings 24 hours a day to over 2 million people in 44 counties in northern Missouri and eastern Kansas. Before arriving in Kansas City in 2006, she did the same job in Glasgow, Montana. Before Montana, Julie lived in Indiana, not far from where she grew up in southern Michigan. She spent 4 years prior to that in Colorado, teaching at the National Center for Atmospheric Research - a good place to learn the latest on tornadoes! She chased an F-5 tornado with the team that the movie "Twister" was portraying. Before her exciting return into the weather world, she was a Space Physicist in the US Air Force, where she was the last investigator for the Roswell, NM claim of alien landing! She was the chief of space physics programs, so she spent a lot of time with NASA scientists and engineers, including a fascinating trip to England to help in the design of a space tracking radar. Before that job, she lived in Italy for 3 years, and was the Commander of a solar observatory, where they watched the sun because explosions send high energy to the earth and disrupt many important systems. She's excited to share fun stories and spark your interest in science and math!

# Lab Descriptions

**Lab 1: Flowers of the Field**

Flowers are more than just pretty decorations – they contain everything needed for a flowering plant to reproduce. In this lab, each student will cut apart different flowers in order to learn about reproduction, the parts of the flower, and the amazing diversity of flowering plants.

**Who:** Hayley Kilroy

**Where:** Stoffer 122

**Lab 2: Electricity and Magnets**

You are familiar with common magnets, such as those that you put on your refrigerator, but did you know that magnetism and electricity are related? In this lab, you will learn about the relationship between electricity and magnetism. You will then have the opportunity to create a magnet using electricity, and to explore the behavior of an electric current in the vicinity of different types of magnets.

**Who:** Karen Camarda

**Where:** Stoffer 105

"How Electromagnets Work"
http://science.howstuffworks.com/electromagnet.htm

"An introduction to how magnets work..."
http://www.explainthatstuff.com/magnetism.html

**Lab 3: Freddie the Fish and Urban Stew**

Learn about watersheds, how stream hydrology and geomorphology changes in response to urbanization, non-point source pollution and how urbanization affects the aquatic ecosystem as we take a journey with Freddie the Fish through an urban watershed. Topics covered will include; urban and non-urban pollutants, what can be done to keep pollutants out of the water, aquatic insects in healthy and not so healthy streams, and stormwater best management practices that help 'clean-up' water in urban watersheds.

**Who:** Heather Ross Schmidt

**Where:** Stoffer 130

**Lab 4: What's in that Dirty Mouth?**

You probably know that the mouths of cats and dogs have lots of bacteria living inside of them. What you may or may not know is that human mouths also contain a wide variety of microorganisms. Are you curious about what kinds of bacteria you can find in your mouth? Come join us as we search saliva samples for bacteria that live inside the human mouth and discuss some of the positive and negative impacts these microbes have on your lifestyle.

**Who:** Susan Bjerke

**Where:** Stoffer 124

http://commtechlab.msu.edu/sites/dlc-me/zoo/zahmain.html

**Lab 5: What Lies Beneath?**

Everyone enjoys spending time at the lake. Have you ever looked out over the water and wondered what goes on beneath the lake surface? There are a lot of things going on down there! The unique physical properties of water allow lakes to separate into distinct layers during warm summer months. This process is called thermal stratification. During this laboratory you will construct a model lake, create thermally distinct layers, explore how storms affect these layers, and discuss the influence these layers have on water quality and aquatic organisms.

**Who:** Jennifer Graham

**Where:** Stoffer 110

http://faculty.gvsu.edu/videticp/stratification.htm

http://waterontheweb.org/under/lakeecology/05_stratification.html

**Lab 6: Game Show Math** morning session ONLY

Deal or no deal? Which door is hiding a car, and which a goat? Where should you drop the Plinko disk for the best chance to win a good prize? Come to this workshop to explore the math behind game shows. Who knows? It might just help you win the grand prize one day!

**Who:** Sarah Cook, Jennifer Wagner and Hwa Chi Liang

**Where:** Morgan 176/179

**Lab 7: Mussel power!**

Did you know that oysters and clams have relatives in the Midwest? Learn all about freshwater mussels from the inside out – from anatomy and life history to amazing facts about their diversity and ecology – and then take a mussel shell home with you!

**Who:** Liz Smith and Diana Chamberlain
**Where:** Stoffer 128

**Lab 8: Would You Drink That Water?**

The chemical properties of water tell a story about where it came from. Learning about what's in water and its watershed can be a great adventure! During this lab, students will test water from several sources. The test results will give clues about where the water came from and whether or not students would want to drink it. Students will have the opportunity to use leading edge technology to test for chemical properties such as dissolved oxygen, nutrients, and pH.

**Who:** Mandy Stone
**Where:** Stoffer 134

Information about water chemistry:

http://ga.water.usgs.gov/edu/waterquality.html
http://www.dnr.mo.gov/env/wpp/vmqmp/vwqm-intro07.pdf

Hydrology and what hydrologists do:
http://ga.water.usgs.gov/edu/hydrology.html

**Lab 9: Get Heart Smart!** afternoon session ONLY

Learn how the heart works, and then listen to normal and abnormal heart sounds, and learn to take blood pressures. Students will also have a chance to calculate heart rates during various activities.

**Who:** Iris Gonzalez
**Where:** Petro 226

**Lab 10: Everyday Super Powers!**

We all know that if you touch something hot, you will pull back quickly, or If an insect flies towards your eye, you blink. Have you ever thought about how that happens? Come investigate the amazing "World of Reflexes". See how reflexes protect you by utilizing different parts of the nervous system, then test the speed and strength of some of your reflexes.

**Who:** Paul and Tracy Wagner

**Where:** Stoffer 016

**Lab 11: Up, Up, and Away! Winds at the Surface and Above**

Have you ever wondered: If you were to send up a balloon with your name and address, would it be returned by someone? How far and high could it fly? What makes a balloon rise in the first place? What happens to that balloon once it climbs so high that it's out of sight? Let's find out! You never know, you may get a reply from somewhere you never expected! In this lab, we'll simulate an official weather balloon launch and build wind speed measuring equipment using common household materials.

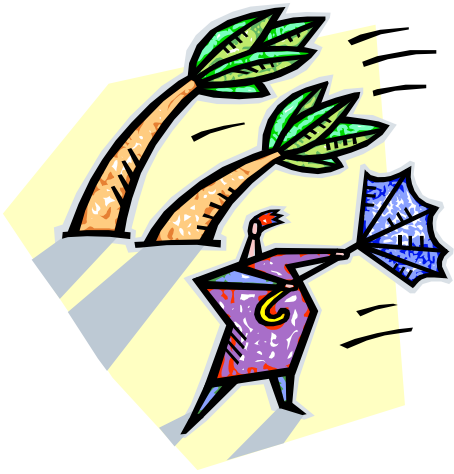
**Who:** Meteorologists from the National Weather Service in Topeka

**Where:** Stoffer 022

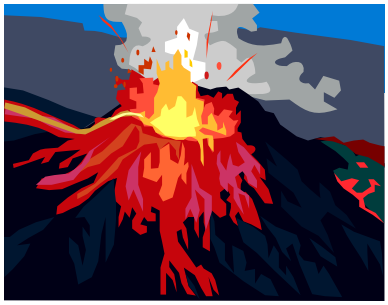
Careers in the National Weather Service:
http://www.srh.noaa.gov/jetstream/nws/careers.htm

NOAA Student Opportunities and Scholarships:
http://www.oesd.noaa.gov/noaa_student_opps.html

JetStream Online School for Weather:
http://www.srh.noaa.gov/jetstream/index.htm



**Lab 12: Volcanoes!**



This lab will delve into all aspects of volcanoes - some of the most feared and awe-inspiring structures in the natural world. The lab will be divided into four stations that will cover everything from how volcanoes are formed to the history and dangers of volcanic eruptions. You will be able to build your own volcanoes and watch them explode, play with edible magmas and lavas, and model the formation of magma deep within the Earth's crust.

**Who:** KU Chapter of the Association for Women Geoscientists
**Where:** Stoffer 118

http://en.wikipedia.org/wiki/Volcanology

http://volcanoes.usgs.gov/ (general info on volcanoes monitored by the USGS, also has tabs to more info about volcanoes/volcanology)

http://volcanoes.usgs.gov/about/faq/index.php (this link includes answers to questions like "how do i become a volcanologist?" and "what kind of schooling do i need to be a volcanologist" that might be useful for the girls)

http://volcano.oregonstate.edu/kids/index.html (OSU's website on volcanoes for kids; also has links to active volcanoes, FAQs, etc.)

http://www.volcano.si.edu/faq/ (smithsonian global volcanism program website)

http://www.kidsgeo.com/ (geology/geography site w/ info and games for kids, the lesson particularly relevant for volcanology/plate tectonics is: http://www.kidsgeo.com/geology-for-kids/0037-the-earth-earth-inside-out.php )

**Lab 13: Who Dunnit?**

Who Dunnit? That is the question our budding forensic chemists will answer using and viewing analytical techniques used in actual crime laboratories. The hands-on laboratory will allow our future forensic scientists to run two types of chromatography. The demonstrations will include identification of a white powder by Infrared Spectroscopy (IR), differentiating various clear liquids by color change using Atomic Absorption Spectrophotometry (AAS), and – the ultimate crime solving tool – DNA analysis.

**Who:** Sue Salem and Sam Leung
**Where:** Stoffer 108/109

IR spectroscopy:
http://video.google.com/videoplay?docid=-4094804743877083008 #

chromatography:
http://www.chemguide.co.uk/analysis/chromatography/paper.html#top

emissions: http://en.wikipedia.org/wiki/Emission_spectrum

DNA: http://www.youtube.com/watch?v=DZzuNpEwkvg

**Lab 14: Tickling Crickets**

Crickets are known for singing to communicate with one another, but they are also very sensitive to touch. In this lab we'll tickle crickets and discuss how crickets sing and interact with each other and their environment.

**Who:** Ginger Miller
**Where:** Carnegie 203

**Lab 15: Pavlov's Dogs and Skinner's Rats (Morning Only)**

This lab will explore two forms of learning—known as classical conditioning and operant conditioning. But, instead of working with dogs and rats, train a classmate instead!

**Who:** Lee Boyd
**Where:** Stoffer 007

http://www.clickertrain.com/whatis.html
http://www.wagntrain.com/OC/

## Fields of Study at Washburn University

**Astronomy**
Astronomy is the study of the contents of the universe, those contents' distinguishing features, composition, motion, radiation, past and future.

**Biology**
Biology is the study of living things: their origin, evolution, diversity in structure and functions as well as interactions with each other and the environment.

**Chemistry**
Chemistry scientifi cally studies matter--both animate and inanimate, its structure, reactions, and associated energy changes. Synthesis of matter, molecular modeling, and prediction of chemical properties derive from observational based theory.

**Computer Information Sciences**
The study of the interrelationships of procedures, hardware, software, data, and people--which allow the computer to be used as a tool. The discipline emphasizes the development of the analytical skills needed to apply technological solutions to complex problems.

**Engineering**
Engineering is a broad applied fi eld which is concerned with ways to utilize mathematics and natural science for the benefit of mankind.

**Geography**
Geography is the science that describes the interactions between human life, the planet surface, natural features and resources, and non-human living systems.

**Health**
Health involves a sense of physical, emotional, mental, social and spiritual well-being by living in harmony with yourself, with other people and with the environment. Within the Department of HPEES, courses are taught that promote these qualities.

**Mathematics and Statistics**
The study of numbers, their form, arrangement, and associated relationships using rigorously defined literal, numerical and operational symbols. Statistics deals with the collection, analysis, and interpretation of data.

**Physics**
Physics treats the principles governing the inanimate world of matter and energy, force and motion, heat, electricity, light, atomic and nuclear structure.


**We would like to acknowledge the following people and organizations who volunteered time and resources for this event.**

- Washburn University
- USGS Water Science Center, Lawrence
- The Zonta Club of Topeka
- National Weather Service Topeka
- Sunflower AWIS
- Capitol Federal Foundation
- Texas Instruments
- Kansas Department of Health and Environment
- Association for Women Geoscientists
- Washburn University Biology Club
- University of Kansas Geology Club


WASHBURN UNIVERSITY

USGS science for a changing world

NATIONAL WEATHER SERVICE

ZONTA INTERNATIONAL

AWIS Association for Women in Science

# For Notes and Autographs