

# EXPANDING YOUR HORIZONS WORKSHOP CHOICES

OCTOBER 19, 2019



## ARCHITECTURE & INTERIOR DESIGN

- **TRACKING THE SUN.** In Architecture and Interior Design knowing how the sun will affect our spaces and designs is crucial for our work. The first step is to understand the sun's path. We will create a sundial specifically for Carbondale and test our work after we are complete. Learning about the sun is crucial for creating passive environmental strategies to save energy in our buildings.  
*Shannon Sanders McDonald, Architecture & Interior Design, SIUC*

## BIOLOGICAL SCIENCES

- **MICROBES: THE GOOD, THE BAD AND THE UGLY.** Microorganisms, including bacteria; are essential to life on earth. Bacteria are composed of a single cell, yet they are very complex. In our bodies, bacteria outnumber our own cells and help us by making vitamins, and by protecting us from other "bad" disease-causing microbes. Many bacteria can cause diseases in humans and animals; therefore, getting to know the bacteria is important for not only appreciating the good things they do for us, but also for developing therapies against bacteria that cause disease. In the Microbiology workshop, we will learn how to "feed" and grow bacteria. We will also microscopically examine bacteria that are genetically engineered to "glow in the dark".  
*Vjollca Konjufca, Microbiology, SIUC*
- **GAMIFICATION OF SCIENCE.** How do plants compete for light, water and nutrients? Leaves require light for photosynthesis while roots absorb water and nutrients. We are using the strategic board game Photosynthesis™ so attendees can practice shade avoidance using photosynthate (photosynthetic products) points to grow or place seeds. Depending on location and the availability of the Sun, some seeds germinate and seedlings grow and accumulate photosynthate while the others do not, due to shading of bigger tree(s).  
*Matt Geisler, Plant Biology, SIUC*

- **THE ART, SCIENCE AND TECHNOLOGY OF DENTAL HYGIENE.**

In this session, participants will experience the following:

1. Placing sealants on extracted teeth----Participants will discover the types of materials used in this procedure. Sealants are like 'raincoats' for the chewing surfaces of the teeth to protect teeth and prevent caries or "cavities".
2. Show how dental hygienists use ultrasonic machines to remove calculus (hard buildup) from teeth. We will be utilizing "fake" calculus on extracted teeth and with guidance from SIUC Dental Hygiene students, participants can try it as well.
3. Explain how dental hygienists interpret and evaluate x-rays (radiographs) of teeth and jaw structures using the Dexis digital system. There will be different conditions and restorative materials (fillings, crowns, braces) that will be discovered.

*Jennifer Sherry, School of Allied Health, SIUC*

## CHEMISTRY

- **SIMPLE, HIGH-TECH DEVICES THROUGH LOW COST.** We will demonstrate synthesis of devices using simple, readily available, and low-cost materials. We will also have colorful chemistry demonstrations that utilize common ingredients available in the kitchen. These experiments will provide knowledge on many natural phenomena occurring in nature around you.  
*Punit Kohli, Department of Chemistry, SIUC*

- **FORENSIC FUN.** The science of fingerprints is pretty cool.... each and every fingerprint is unique! No two people share the same fingerprints and even identical twins have different prints. This is why fingerprints are so useful in crime scene identification. The ridges, whorls and swirls that make up your fingerprints form when you are still in the womb. Their pattern is partly dependent on genetics and partly dependent on environmental factors. Learning about fingerprints and fingerprint forensics is super fun.

*Stefanie Ellis, STEM Education Research*

*Dr. Senetta Bancroft, Department of Chemistry & Biochemistry, Curriculum & Instruction, SIUC*

## **ENGINEERING AND TECHNOLOGY**

- **LASERS AND PHOTONICS.** Lasers, polarization of light, and fiber optic cables will be explained and shown in the laboratory. Participants will also view a small laser show.

*Mohammad R. Sayeh, Department of Electrical and Computer Engineering, SIUC*

- **ANDROID PROGRAMMING WITH APP INVENTOR.** Students will be introduced to concepts for developing applications that run on the Android platform. Students will gain hands-on experience creating mobile applications with App Inventor, an open source visual development tool.

*Belle Woodward, Department of Electrical and Computer Engineering, SIUC*

- **THE SCIENCE OF HOMEMADE ICE CREAM.** Have you ever made homemade ice cream? A lot of interesting science is needed to make ice cream. For example, think about how you start out with room-temperature ingredients and then need to cool them down to turn them into ice cream. How do the ingredients change during this process? In this lab you'll make your own ice cream and explore the best way to chill the ingredients to make them become a delicious reward!

*Allison McMinn, President, Society of Women Engineers, SIUC*

## **GEOLOGY**

- **MARS EXPLORATION: IS THERE LIFE ON MARS?** During the next two decades, NASA will conduct several missions to address whether life ever arose on Mars. It's possible that life on another planet might be very different. The challenge is to be able to differentiate life from non-life no matter where one finds it, no matter what its varying chemistry, structure, and other characteristics might be. In this workshop we will learn about the ingredients necessary for life, if they have been found on Mars, and what type of life one may find on Mars in the future.

*Liliana Lefticariu, Department of Geology, SIUC*

- **LEARNING ABOUT GEOLOGY AND MAPS WITH A VIRTUAL SANDBOX.** Come and see a new way to learn and interact with geologic maps! We are able to create and display various geological features such as rivers, lakes, volcanoes and mountains all from a virtual augmented sandbox that will show contour lines as seen on topographic maps!

*Zachariah Seaman, STEM Education Research Center, SIUC*

- **HOW DO RIVERS CHANGE?** Rivers can be great and powerful dynamic geologic features that can be helpful for society or harmful. We will be able to watch how a river changes over time and what are ways to keep rivers from changing and how humans might avoid flooding hazards from rivers!

*Kailey Seaman, Department of Geology, SIUC*

## MATHEMATICS

- **REIMAGING THE PAPER CRANE GAME!** Learn how getting crafty with paper can touch someone's heart or even land you among the stars! See how origami can be used to make compact collapsible solar panels and heart stints while getting a chance to get hands on and try to fold paper all the way to the moon! Experience how mathematics and geometry come together to bring the second dimension into the third by folding your own flowers, animals, and 3D geometric shapes.

*William Holt, Math Club; Manisha Varahagiri, Deviani Basu, AMS Grad Student Chapter, SIUC*

## MEDICINE

- **UNCOVERING MICROSCOPIC MYSTERIES.** Ever wonder how tissues are prepared for microscopic analysis? What is needed to change a biological specimen from an animal or human into a microscope slide that can reveal clues to chemical exposure, trauma, disease or death? Learn how tissue specimens are processed, sectioned and stained to unlock the secrets of cellular structure.

*Maureen Doran, BA, MS, HTL(ASCP), Saffron Scientific Histology Services, LLC*

## PHYSICAL FITNESS

- **YOGA FOR SELF LOVE.** Why is being a woman so powerful? Learn how to shine in your own power you possess. Learn how to create and channel your feminine energy into your career, school, art, etc.

*Kennedy Rawlings, Recreational Sports and Services, SIUC*

## PHYSICS

- **CARS, COLLISIONS, AND KINEMATICS.** Why do you lean to the side in a car? Why do you have to wear seat belts? Do airbags really help? What would happen if my car crashed into someone else? If you've found yourself riding in a car and wondering about any of these things, this workshop is right for you. We will explore how cars move, what we've done to make them safe, and what happens during a car crash by looking at the fundamentals of kinematics – the physics of motion.

*Sarah Hagen, Society of Physics Students, SIUC*

## PSYCHOLOGY

- **THE SCIENCE OF PREJUDICE.** Prejudice permeates all facets of our culture and society. This reality is not surprising, given that humans possess an evolutionary predisposition to favor people who are like them over others. Further, our minds process information in ways that create and reinforce stereotypes, and preferences for our groups over others are cognitively and motivationally intertwined with our identity and self-esteem. These biases often operate undetected and outside of awareness to reinforce systematic disparities. Join us to explore the psychology of prejudice and unearth the hidden biases that exist in all people.

*Kathleen Schmidt, PhD; Psychology, SIUC*

- **KIDS ARE CUTE! BUT HOW DO WE MEASURE THEIR BEHAVIORS?** How do our genes affect our behaviors? What is the difference between MZ and DZ twins? How do we decipher children's behaviors? Discover more about different types of twins, and learn how to code infants' and preschoolers' behaviors during testing and interactions.

*Lisabeth DiLalla, Ph.D., Matt Jamnik, Emily Pali, Riley Marshall  
Departments of Family & Community Medicine and Psychology, SIUC*

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