

EXPANDING YOUR HORIZONS WORKSHOP CHOICES

NOVEMBER 19, 2016



AVIATION

- **AVIATION CAREERS.** Learn about careers in the aviation industry including pilot, weather observer, and aviation maintenance technician. See the university flight training aircraft and get some hands-on experience in a Frasca flight training device.
Lorelei Ruiz, Aviation Management and Flight, SIUC

BIOLOGICAL SCIENCES

- **DNA ANALYSIS.** What is DNA? What information does it encode? How is DNA used in understanding disease and solving crimes? Learn the answers to these questions. In the workshop we will also extract DNA from cells and analyze it.
Judy Davie, School of Medicine, SIUC

- **THE ART, SCIENCE AND TECHNOLOGY OF DENTAL HYGIENE.** In this session, participants will experience the following techniques:
 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 cavities.
 2. Show participants 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 SIU 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.
 4. There will be a tour of the SIU Dental Hygiene Clinic as well as Q and A time at the end of the session.
Jennifer Sherry, Dental Hygiene, 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
- **THE CHEMISTRY OF FIREWORKS! THE SCIENCE OF EMISSION AND ABSORPTION SPECTROSCOPY.** In this workshop, students will be able to use diffraction lenses and spectroscopes to examine the unique absorption and emission properties of many metal salts used in fireworks. The various wavelengths of color emitted can be seen with the human eye, while all of the colors we do not see are trapped inside the compound!
Chelsea Bridgmohan, Chemistry Club, Department of Chemistry, SIUC

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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
- **DIRIGIBLES, ZEPPELINS AND BLIMPS.** Explore why dirigibles, zeppelins, and blimps can be used for transportation. Design, build, and test a small scale “sky glider” using materials supplied by the College of Engineering. Learn about buoyancy, the design process, and flight.
Lizette Chevalier and Tan Chai, College of Engineering, SIUC; Co-sponsored by the student chapter of the Society of Women Engineers

GEOLOGY

- **EARTH: A CONTINUOUSLY CHANGING PLANET.** Earth is a complex system of interactions between rock (geosphere), water (hydrosphere), air (atmosphere) and life (biosphere). Components of Earth’s systems such as magnetic fields, global climate, landscapes, ecosystems, and the extent of glaciers may appear stable, change slowly over long periods of time, or change greatly and abruptly with significant consequences for living organisms. In the decades and century to come, we will experience extraordinary changes on our planet, with consequences that may dramatically change the way we live our lives. Reducing uncertainty, whether in predicting future climate, severe weather, or changes in ecosystems, requires scientific research to continuously improve our understanding of the Earth as an interdependent system of ocean, air, land, and living world.
Liliana Lefticariu, Department of Geology, SIUC

GEOGRAPHY

- **UNDERSTANDING AGRICULTURAL LAND USE CHANGE IN THE UNITED STATES USING GEOGRAPHICAL INFORMATION SYSTEMS AND SOCIOECONOMIC DATA.** US agriculture in our region has been undergoing several changes in the last decade. Because of the ethanol mandate, reduced funding for land conservation, and growing demand for agricultural products in countries such as China and India, the Corn Belt has seen increases in agricultural production and losses of grasslands. We will explore these land use changes using satellite imagery produced by the US Department of Agriculture (USDA), and researching conservation datasets. We will also use USDA statistics to investigate causes for these changes, such as increases in crop prices, and environmental impacts of these land use changes, such as increased use of fertilizers.
Silvia Secchi, Department of Geography and Environmental Resources, SIUC

MATHEMATICS

- **COUNTING HIGHER: AN INTRO TO COMBINATORICS.** How many ways can three friends stand in for a picture? How many email passwords can a person make given certain conditions? Why do probability and combinatorics matter in my life? This will be a fun hands-on workshop in which you will discover the many different ways objects are counted.
Rebecca Durig, Department of Mathematics, SIUC

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MICROBIOLOGY

- **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, Department of Microbiology, SIUC

LINGUISTICS

- **LANGUAGING!** Did you know that human are the only species with language? Do you know how languages are created? Do you have a particular code that you talk to your friends? In this workshop, you will be learning how to create your own language by using different techniques we use in Linguistics, so that you can start languaging with your friends.

Itxaso Rodriguez- Ordóñez, Department of Linguistics and Spanish, SIUC

MEDICINE

- **A GOOD HORSE IS NEVER A BAD COLOR.** We know horses can be colors like gray, brown, white and black. And many of us know horses can be spotted, golden or red. But can you get blue, rose, champagne, spotted and striped horses? And what color is a Knabstrupper? A Grulla? A Rabicano? We'll talk about the different colors of horses and some of the genetics behind the unusual colors.

Sandy Shea, Family and Community Medicine , SIUC

PHYSICS

- **PHYSICS WORKSHOPS COMING.**

PHYSICAL FITNESS

- **PHYSICAL FITNESS WORKSHOPS COMING.**

PLANT BIOLOGY

- **SEEING PLANT COMPETITION THROUGH GENES.** How do plants compete for light, water and nutrients in a garden? Leaves require light for photosynthesis while roots absorb water and nutrients. How will leaves and roots of plants work together or will they compete with each other? Discover the genetic basis for plant recognition and interaction.

Matt Geisler, Jane Geisler-Lee, Department of Plant Biology, SIUC

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PSYCHOLOGY

- **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., Emma Diaz, Matt Jamnick

Departments of Family & Community Medicine and Psychology, SIUC.

ZOOLOGY

- **AQUATIC ECOLOGY: A DAY IN THE LIFE OF A FISH.** Water is an important resource for, not only humans, but also every other plant and animal on earth, and the lakes and rivers surrounding us here in Southern Illinois are buzzing with activity. In this workshop, we'll discover the creatures who make water their home, from microscopic organisms to insects to fish and learn about how water quality affects all of these animals. We'll use microscopes and other laboratory equipment to observe these creatures and to determine some characteristics of the water they live in.

Elizabeth Patricia Tristano, Zoology, SIUC