



**SCIENCE DAY 2016  
FRIDAY, OCTOBER 7**

**Science Day 2016 is designed to provide science experiences for high school students, teachers, and parents. This is the first time the event will be held in Augustana's new Froiland Science Complex. We are excited to welcome you to our new facility and introduce you to the exciting world of science at AU.**

- 9:00 – 9:50 a.m.      **Welcome to Science Day 2016**  
Mikkelsen Auditorium/Room 113, Froiland Science Complex  
This opening session will include chemistry demonstrations presented by Dr. Barrett Eichler, students selected for the Trustees Fellowship in Chemistry, and student members of the Augustana Chapter of Student Affiliates of the American Chemical Society.
- 10:00 – 10:50 a.m.      **Break Out Session 1**
- 11:00 – 11:50 a.m.      **Break Out Session 2**
- 10:00 a.m. –  
12:00 p.m.      **Teacher's Hospitality Room**  
Room 345, Froiland Science Complex (3<sup>rd</sup> Floor Faculty Lounge)
- 12:00 – 1:00 p.m.      **Mysteries of the Universe Revealed**  
Mikkelsen Auditorium/Room 113, Froiland Science Complex  
The closing session will be presented by Dr. Drew Alton, Dr. Amy Engebretson, Dr. Nathan Grau and Dr. Eric Wells, Augustana University Professors of Physics, and Augustana students. This will be an exciting show of lights, bangs, explosions, and fun.
- 1:00 – 2:00 p.m.      **Lunch**  
Ordal Dining Room, Morrison Commons
- 2:00 – 2:15 p.m.      **Informational Session: Y.T. Johnson Science Day Scholarship**  
Room 363, Froiland Science Complex
- 2:15 p.m.      **Campus Tour (Optional)**  
Departs from the Froiland Science Complex, North Entrance  
Please indicate during the 8:30 a.m. registration if you are interested in a tour.

## Break Out Sessions Science Day 2016

**If a session does not appear in the breakdown session selection area on the registration form, that session is no longer available as it has been filled.**

### **A Career in Sports Medicine**

Dr. James Day, Athletic Training

**Location:** Room 241, Elmen Center

**Time:** 10:00 a.m.

**Limit:** 40 students

*This athletic training presentation is intended to give those interested in sports medicine an understanding of the career field, employment options, salary ranges, and educational courses which need to be taken. Time will be allowed for student questions.*

### **Alchemy at Work: Copper Converted to Silver and Gold**

Dr. Duane Weisshaar, Chemistry

**Location:** Room 313, Froiland Science Complex

**Time:** 10:00 and 11:00 a.m.

**Limit:** 20 students per session

*Join us for an exploration of some physical and chemical changes of copper. Be prepared to work and think; this is not a show and tell. You will run the reactions on the pennies (provided), you will make the observations, and you and your group will work together to figure out what's happening. Come and enjoy.*

### **Analyzing Blood Cell Function via Platelet Aggregation**

Dr. Mark Larson, Biology

**Location:** Room 212, Froiland Science Complex

**Time:** 10:00 a.m.

**Limit:** 12 students

*Our blood is composed of three primary cell types: red blood cells (erythrocytes), white blood cells (leukocytes), and platelets (thrombocytes). The platelets are the primary players in the formation of blood clots. Once the blood vessel is damaged, platelets move from a resting state to an active state that allows platelets to bind together, or aggregate. Platelet aggregation is essential for normal wound healing, but is also a major factor in the development of heart attacks and strokes. This hands-on demonstration will give you a sense of how we can isolate platelets from the blood and how we can measure their ability to aggregate.*

### **Bioinformatics in Science and Medicine**

Dr. Carrie Olson-Manning, Biology

**Location:** Room 376, Froiland Science Complex

**Time:** 10:00 and 11:00 a.m.

**Limit:** 40 students per session

*Big data is changing the way we approach the fields of biology and medicine. Join us for an introduction to how scientists and doctors use large datasets to understand humans and other organisms. You will learn how bioinformatics combines biology with computer science, statistics, mathematics, and engineering to understand biological systems.*

### **Careers in Computer Science**

Dr. Stephen Shum, Computer Science

**Location:** Room 372, Froiland Science Complex

**Time:** 10:00 and 11:00 a.m.

**Limit:** 20 students per session

*We will discuss what Computer Science is and what career opportunities exist. We will also discuss local opportunities for Computer Science majors during college and following graduation.*

### **Careers in Genetics**

Dr. Season Vitiello, Biology, and Quinn Stein, Genetic Counseling

**Location:** Room 253, Froiland Science Complex      **Time:** 10:00 and 11:00 a.m.      **Limit:** 20 students per session  
*When your teacher covered genetics in Biology class, did you find it fascinating? Are you interested in a career in genetics, but you are unsure what kind of jobs to consider? Come explore careers in the growing field of genetics with Season Vitiello, instructor of the Augustana genetics course, and Quinn Stein, Director of the Augustana Genetic Counseling Program.*

### **Careers in the Health Professions**

Dr. Paul Eglund, Biology

**Location:** Room 114, Froiland Science Complex      **Time:** 11:00 a.m.      **Limit:** 40 students  
*Join Professor Eglund, Chief Health Professions Advisor, and a group of Augustana University seniors to talk about preparation for careers in Medicine, Dentistry, Physical Therapy, Physician Assistant, Optometry, Pharmacy, and other health professions.*

### **Code Blue Team in Nursing**

Beth Karel, Nursing

**Location:** Room 270, Froiland Science Complex      **Time:** 10:00 and 11:00 a.m.      **Limit:** 20 students per session  
*Ambulance Report: "45 year old man arriving by ambulance with a possible heart attack. He has no pulse, CPR is in progress, and the Code Blue Team has been activated. All nurses report STAT." Learn the science behind the life-saving skills required during a cardiac arrest while working as a team to save this patient's life!*

### **Conway's Rational Tangles**

Dr. Martha Gregg and Dr. Curtis Olson, Mathematics

**Location:** Room 373, Froiland Science Complex      **Time:** 10:00 and 11:00 a.m.      **Limit:** 40 students per session  
*Can you do math with ropes? Using only two 'moves,' called 'Twist' and 'Rotate,' what knots can be created or untangled? We'll tangle – and untangle – a pair of ropes and mathematically analyze the "tangles" we create. In the process we'll have glimpses of knot theory, group theory, continued fractions, and topology, among other mathematical fields.*

### **Do you have what it takes to be an Augustana Student Athlete?**

Faculty from Exercise and Sport Sciences

**Location:** Room 273, Froiland Science Complex      **Time:** 10:00 and 11:00 a.m.      **Limit:** 20 students per session  
*Have your fitness and sport performance potential tested in Augie's Human Performance Lab. You will be assessed by high-tech equipment used by professionals to measure muscular power, muscular strength, body composition, flexibility, and cardiorespiratory fitness. Compare your scores to your classmates and Augustana student athletes.*

### **Evolution: Separating Fact from Fiction**

Dr. Steven Matzner, Biology

**Location:** Room 214, Froiland Science Complex      **Time:** 10:00 and 11:00 a.m.      **Limit:** 15 students per session  
*Perhaps nowhere does science and religion come into greater conflict than in the subject of evolution. Do science and religion have to be in conflict or can science and religion be integrated? This session will survey your current views and discuss ways to view the relationship between science and religion. In addition, we will look at examples of hominid skulls and homologous bones.*

### **Fire, Glass, and Fun**

Dr. Jetty Duffy-Matzner, Chemistry

**Location:** Room 317, Froiland Science Complex   **Time:** 10:00 and 11:00 a.m.   **Limit:** 10 students per session  
*Different techniques of glass sculpting and blowing will be demonstrated and practiced. Students will be able to take their creations home!*

### **Heartbeat: Taking an Electrocardiogram**

Dr. Jennifer Gubbels and Dr. Ann Vogelmann, Biology

**Location:** Room 216, Froiland Science Complex   **Time:** 10:00 and 11:00 a.m.   **Limit:** 12 students per session  
*The heart begins beating 18 days after conception and does not stop until death. Find out more about this amazing organ and learn how to take an electrocardiogram (EKG) at rest and after exercise. Also learn how to interpret the EKG trace and how the electrical impulses conduct through the heart. Examine and dissect a pig heart, which is close in size and anatomy to a human heart.*

### **Not your everyday fish bait: Catch these worms with neon DNA**

Dr. Cecelia Miles and Dr. Lisa Baye, Biology

**Location:** Room 251, Froiland Science Complex   **Time:** 10:00 and 11:00 a.m.   **Limit:** 12 students per session  
*If you Google “glow in the dark” you can find glowing running shoes, t-shirts, glasses, and even toilet paper! Today you are going to use a special microscope to look at worms with DNA that glows when you shine a certain wavelength of light on them. Yes, they are alive! These worms are hermaphrodites that self-fertilize and have very young offspring still growing inside of them. We can see the DNA inside each cell of the developing offspring, we can watch cell division happening in real time. If you ever wondered what it really looks like when a mother cell divides its DNA up between two daughters, this is your chance!*

### **Pediatric Anaphylaxis**

Mary Nelson, Nursing

**Location:** Room 268, Froiland Science Complex   **Time:** 10:00 and 11:00 a.m.   **Limit:** 20 students per session  
*An 8 year old child is coming into the emergency department with an anaphylactic reaction. Learn how to “think like a nurse” as you provide care to this patient who is experiencing a serious life threatening event.*

### **Physics at an Abandoned Gold Mine**

Dr. Drew Alton, Physics

**Location:** Room 370, Froiland Science Complex   **Time:** 10:00 and 11:00 a.m.   **Limit:** 50 students per session  
*As you may have heard in the news, the state of South Dakota has taken ownership of the Homestake Gold Mine in Lead with the plan that the Department of Energy will construct a Science Underground Research Facility (SURF) there. First experiments are underway. We will discuss the best model of the universe, dark matter, and neutrinos, if time permits.*

### **Problem Solving and the mathematics of the Rubik’s Cube**

Dr. Carl Olimb, Mathematics

**Location:** Room 362, Froiland Science Complex   **Time:** 10:00 and 11:00 a.m.   **Limit:** 15 students per session  
*There are 43,252,003,274,489,856,000 possible configurations with only one solution. Solving the cube becomes almost trivial once a certain core set of algorithms are learned. Using basic group theory, the reason these solutions are not incredibly difficult to find will become clear.*

### **Radioactive Isotopes and Marbles**

Dr. Andrew Klose, Chemistry

**Location:** Room 374, Froiland Science Complex    **Time:** 10:00 and 11:00 a.m.    **Limit:** 15 students per session

*You are made of atoms. Atoms are tiny building blocks that come in many different types (elements) and make up all of the objects you know. Atoms consists of a "nucleus" of protons and neutrons surrounded by a cloud of "electrons". Help us produce and identify radioactive isotopes of various elements using marble models and a particle accelerator!*

### **Swarming: A Mathematical Approach**

Dr. Timothy Sorenson, Mathematics

**Location:** Room 118, Froiland Science Complex    **Time:** 10:00 and 11:00 a.m.    **Limit:** 20 students per session

*This session with provide an introduction of how a general mathematical swarming model can assist in determining physiological facts.*

### **The Who, What, Where and When of Nursing: How much do you know?**

Dr. Michelle Gierach, Nursing

**Location:** Room 272, Froiland Science Complex    **Time:** 10:00 and 11:00 a.m.    **Limit:** 25 students per session

*Compassionate, helpful and kind- nurses are pretty phenomenal! What's more, they are smart, capable and brilliant. Test your nursing knowledge and learn more about the profession of nursing.*

### **Your Life, an Open (Face)Book**

Sharon Gray, Computer Science

**Location:** Lab 002, Madsen Center    **Time:** 10:00 and 11:00 a.m.    **Limit:** 24 students per session

*Privacy's elusive. Nearly everything about us is being digitally recorded. Find out what people can learn about you, whether you want them to or not! We'll explore searching the "deep web" and learn how to protect what little privacy we still have.*