

# math & science workshop

PACIFIC UNION COLLEGE

**FEBRUARY 23,  
2020**

# WELCOME

Dear Students and Teachers,

Welcome to the annual Math & Science Workshop! We are excited you are here and look forward to working with and giving you a glimpse of what we do here at PUC. We hope the experiences you have here enrich your understanding of math and science.

The PUC math and science faculty work hard to make this program intellectually stimulating, interesting, and fun. We also want to show the importance and value of studying math and science on a campus where the faculty looks to God as the Creator and the source of all true knowledge. "The heavens are yours, and yours also the earth; you founded the world and all that is in it." Psalms 89:11 NIV

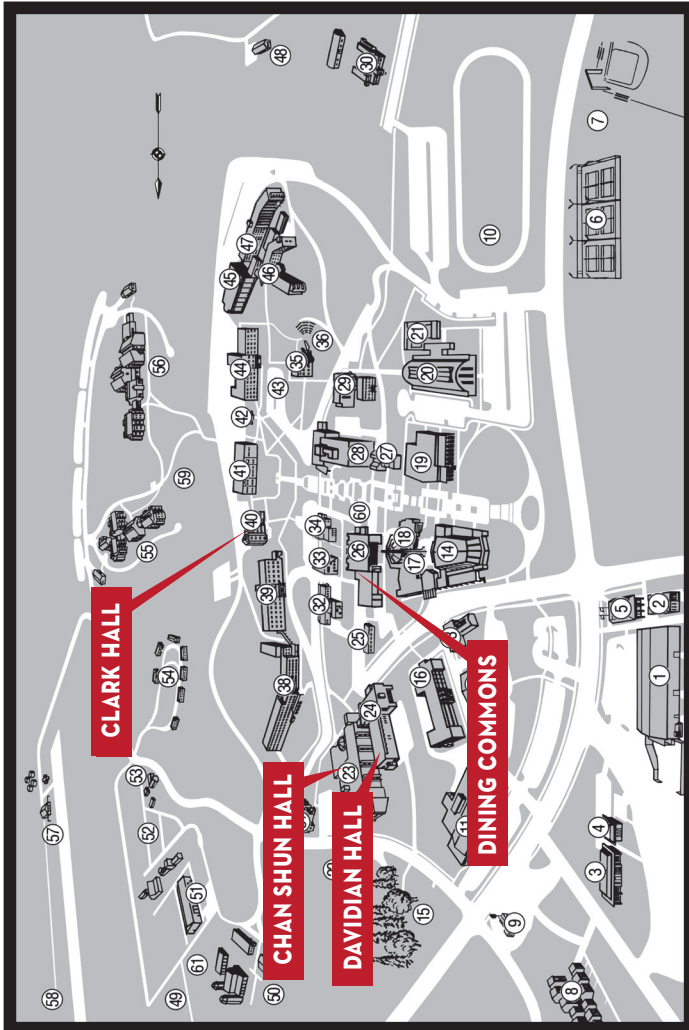
Kind regards,

*Aimee C. Wyrick (L.A.)* — *James F. Robertson*

**Aimee Wyrick**  
Department Chair  
Biology

**Kent Davis**  
Department Chair  
Chemistry

**James Robertson**  
Department Chair  
Math and Physics



# SCHEDULE OF EVENTS

## SUNDAY, FEBRUARY 23

- 10-10:50 A.M. WHAT EVERY STEM STUDENT SHOULD KNOW**  
 DAVIDIAN HALL 205  
 Together we will cover the basics of what you can do to promote your own math-science achievements in college.
- 11-11:50 A.M. LAB ACTIVITIES**  
 VARIOUS  
 Today you will learn about science and math and have fun while you're at it. This morning's 50-minute learning experiences will cover one of the following topics: biology, chemistry, math, or physics & engineering.
- 12-12:50 P.M. LUNCH**  
 DINING COMMONS SIDE ROOM  
 Fuel up with a healthy buffet lunch served in the side rooms of the Dining Commons.
- 1-3:50 P.M. LAB ACTIVITIES**  
 VARIOUS  
 This afternoon's three 50-minute learning experiences will include additional math and science classes you did not attend earlier today (biology, chemistry, math, and/or physics & engineering).
- 4-4:50 P.M. LIFE AS A MATH-SCIENCE MAJOR**  
 DINING COMMONS SIDE ROOM  
 Academy students will meet with current PUC students who are in the midst of their college experience. Find out what it's like to be a college student and learn from them what works and what doesn't.

# SCHEDULE OF EVENTS

- 4-4:50 P.M. TEACHER CONVERSATION**  
 CHAN SHUN HALL 109  
 Academy and PUC math-science teachers will gather to chat about life in the classroom. This session will allow participants to network, discuss best practices, and learn from each other.
- 5-5:50 P.M. DINNER**  
 DINING COMMONS SIDE ROOM  
 Enjoy a delicious meal with your friends, the science faculties at your school, and the professors from PUC.
- 6-7:30 P.M. DEMONSTRATIONS**  
 DAVIDIAN HALL 206  
 Science isn't always showy but tonight you'll see some things that will startle and amaze you!

# GROUP EXPERIENCES

SCHEDULE	A	B	C	D
11-11:50 A.M.	BIOLOGY	CHEMISTRY	MATH	PHYSICS & ENGINEERING
1-1:50 P.M.	PHYSICS & ENGINEERING	BIOLOGY	CHEMISTRY	MATH
2-2:50 P.M.	MATH	PHYSICS & ENGINEERING	BIOLOGY	CHEMISTRY
3-3:50 P.M.	CHEMISTRY	MATH	PHYSICS & ENGINEERING	BIOLOGY

## GROUP EXPERIENCES



### BIOLOGY

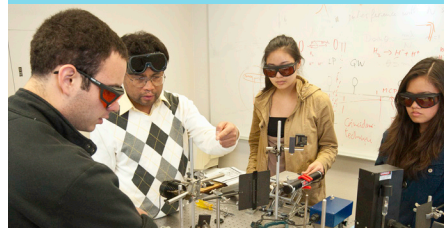
Our theme is equilibrium. You will study the effect of impaired vision on your ability to score in the game of darts as compared to normal vision. The brain receives input from a variety of sensory organs (e.g., eyes) and has to coordinate a response that is balanced and reasonable. When perception of your surroundings is damaged, it is likely the brain's reaction will be slowed and/or inappropriate. We will link your experience in this activity with the negative effects of alcohol on the human brain and body.



### MATHEMATICS

The notion of self-similarity is ever-present in the structure of nature's most complex and beautiful phenomena. The mathematical notion of the fractal is often utilized to model these most delicate designs. We will explore how simple iterative processes can give rise to complex patterns and see organization rise out of chaos much in the way it does in nature. To further our investigation, we will utilize our algebra and probability skills to simulate a simple process (often referred to as the "chaos game") with a computer code and generate a surprising visual design.

## GROUP EXPERIENCES



### PHYSICS & ENGINEERING

This group activity will be based on a biophysics hands-on demonstration. Using various lenses, we will illustrate the optical mechanism of the human eye. First, we will introduce the notion of refraction and use lab equipment to create a model of the human eye. Then, the students will be invited to assemble an experimental apparatus according to the model presented. Thereafter, the students will have the opportunity to simulate human eye diseases such as myopia and hyperopia using a more sophisticated model from PASCO. The remaining time will be allocated to a guided discussion.



### CHEMISTRY

Precision measurement is essential in chemistry. We will apply precise measurement techniques to determine the mass of a copper sample. Instead of using a balance, we will see how we can react the copper to form a colored solution which we can analyze with light using a technique called spectroscopy. We will compare our result using this method to the result obtained using a balance.

# EVENT OVERVIEW

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DAVIDIAN HALL 206



Pacific  
Union  
College

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PUC.EDU  
One Angwin Avenue  
Angwin, CA 94508