

PNACP 2026 Agenda

Organization: Pacific Northwest Association for College Physics

Local Organizer: James Butler, Pacific University

Dates: Friday and Saturday, April 17--18 2026

Last update: 2026-03-03

Wifi Network: Boxer Guest

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Friday, April 17th, 2026

Location: Murdock Hall 118, McGill Auditorium (unless otherwise stated below)

Time	Title	Speaker
9:30 – 12:00	Board Meeting: Berglund Hall 147 Zoom option: Will be sent to the board	
12:00 - 1:00	Lunch (on your own for non-Board members) / Registration Please click here for a list of nearby recommended restaurants.	
1:00– 1:15	Welcome	James Butler, Pacific University
1:15 – 2:15	<u>Invited Speaker</u> : Teaching Physics and Astronomy in a Climate-Changed World	Travis Rector, University of Alaska Anchorage
2:15 – 3:15	<u>James Gerhart Lecture</u> : Physics Education Research at the University of Washington	Facilitators: Suzanne White Brahmia and team from UW
3:15 – 3:30	Break	
3:30 – 3:50	Contributed Speaker: The Reed College Nuclear Reactor: A Regional Resource	Jerry Newhouse, Reed College, and James Butler, Pacific University
3:50 – 4:50	<u>Invited Speaker</u> : Direct Observation of Self-Assembled Water Chains and Coil-to-Bridge Transitions in a Nanoscopic Meniscus	Byung Kim, Boise State University

Social Hour and Banquet: 5:15-8pm

Location: Boxer Pause, University Center

Time	Title	Speaker
5:15 - 6:00	Social Hour	
6:00 – 8:00	Banquet: The Story of an Oregon Company With Physics Roots	David Vernier, Vernier Science Education

Saturday, April 18th, 2026

Location: Murdock Hall 118, McGill Auditorium

Time	Title	Speaker
8:30 - 9:00	PNACP Planning Discussion (Optional)	James Butler, Pacific University
9:00 - 9:10	Welcome	James Butler, Pacific University
9:10 - 10:10	<u>Invited Speaker</u> : A Retrospective: 45 years Presenting Physics	Stan Micklavzina, University of Oregon
10:10 - 10:30	Break	
10:30 - 11:30	<u>Invited Speaker</u> : Engineering and Science on the International Space Station: ELVIS observes microbial motility	Jay Nadeau, Portland State University
11:30 - 1:00	Lunch (on your own) Please click here for a list of nearby recommended restaurants.	
1:00 - 2:00	<u>Invited Speaker</u> : Novel Insights into the Flight Performance of Hummingbirds	Bret Tobalske, University of Montana
2:00 - 2:20	Contributed Speaker: Why Study Science? Articulating the Value of General Education Physics and Astronomy	Andrea Goering, University of Oregon
2:20 - 2:40	Break	
2:40-3:00	Contributed Speaker: The STEAM Hub as a Recruiting Tool for Physics Majors	David Terrell, Warner Pacific University
3:00-3:20	Contributed Speaker: The Physics of Sailing	Christine Berven, University of Idaho
3:20-4:20	<u>Invited Speaker</u> : Laboratory Astrophysics at UM and Synchrotron Light Sources - The Challenge of Doing Graduate Research with Undergrads	David Macaluso, University of Montana
4:20-4:30	Meeting Adjourn	James Butler, Pacific University

Abstracts on Following Pages

Abstracts

Banquet Talk:

The Story of an Oregon Company With Physics Roots

David Vernier, Founder and Co-President

Vernier Science Education

Vernier Science Education (formerly Vernier Software & Technology) was started 45 years ago by an Oregon high school physics teacher. Over the years, the company has produced software, sensors, lab manuals, and equipment for physics instructors. The company's original products were for Apple //, and over the years they have expanded to work with any computer that gained popularity in science classrooms, and even to TI calculators, Palm Pilots, Chromebooks, and cell phones. In this talk, Dave Vernier, the founder, will tell the story of the company's development and present some favorite physics demonstrations, using both old and new Vernier products.

James Gerhart Lecture:

Physics Education Research at the University of Washington

Panel Discussion: Suzanne White Brahmia, Associate Professor; Anne Alesandrini, Post Doc; Kristin Keller, Post Doc; Cameron Flynn, Grad Student; Al Snow, Grad Student

University of Washington

Founded by Lillian McDermott, the Physics Education Group at the University of Washington has spent decades bridging the gap between cognitive theory and classroom practice. Since its inception, the group has produced over 30 doctoral dissertations, reflecting a vast breadth of research spanning from introductory mechanics to advanced quantum topics. Current efforts focus on deep conceptual understanding and the mathematization of physical phenomena, investigating how students navigate formal reasoning and quantitative literacy. These diverse contributions advance both theoretical cognitive research and the practical implementation of research-validated instruction, maintaining the group's legacy of evidence-based educational reform.

Invited Talks:

Teaching Physics and Astronomy in a Climate-Changed World

Travis Rector, Professor

University of Alaska Anchorage

Climate change is one of the most important issues our students face, now and in the future. While most students are concerned about the problem, they are often anxious and confused about what can be done- often as a result of exposure to misinformation and disinformation. In this talk I'll discuss how the science they learn in our introductory physics and astronomy classes is well suited to understanding the problem, as well as the solutions. I'll also discuss how to incorporate science media literacy in your curriculum, to help our students differentiate fact from fiction.

Direct Observation of Self-Assembled Water Chains and Coil-to-Bridge Transitions in a Nanoscopic Meniscus

Byung Kim, Professor

Boise State University

Water confined between surfaces plays a central role in bio/nano science and water-based nanotechnology. Using cantilever-based optical interfacial force microscopy (COIFM), we directly observed self-assembled water chains and their coil-to-bridge transitions in a nanoscopic water meniscus in air. Force–distance measurements reveal large sawtooth-like oscillatory forces. Analysis of the rising segments with the freely jointed chain model indicates short chains (14–42 units), while the sigmoidal segments correspond to coil-to-bridge transitions of longer chains (197–383 units). These transitions provide insight into long condensation distances, nucleation timescales, high surface tension, and long-range biomolecular interactions in confined water systems.

A Retrospective: 45 Years Presenting Physics

Stan Micklavzina, Dr.h.c., Senior Instructor II Emeritus

University of Oregon

I am honored to be chosen as an invited speaker for the 60th meeting of the PNACP. I gave my first professional talk at a PNACP meeting 40 years ago, a Casio SK1 keyboard for demos and labs. Showing the Physics being studied has been a priority in my teaching, instructional support for faculty, and my public presentations for 45 years.

I will present some of my favorite Physics Demonstrations developed for lectures and science shows to promote discussions regarding the future of Physics demonstrations in the classroom. PPT slides used in my talk can be obtained at this link: [Stan's PNACP April 18th presentation.](#)

Engineering and Science on the International Space Station: ELVIS observes microbial motility

Jay Nadeau, Associate Professor

Portland State University

The International Space Station (ISS) is a platform for microgravity research as well as for development of technologies for space flight. Portland State University recently (May 2025) deployed a custom built digital holographic microscope, called ELVIS (Extant Life Volumetric Imaging System) to the ISS along with live cultures of an extremophile bacterium, *Colwellia psycherythraea*. The microscope was based off a previous field design but underwent complete re-engineering for space flight, reducing size and weight and adapting for concerns of safety and for interfacing with the Life Sciences Glovebox inside the ISS. We worked with an implementation partner, Teledyne Brown Engineering, in order to fulfill all of the testing and documentation requirements. These included in-house tests such as temperature cycling and leak testing, as well as tests at NASA Marshall Space Flight Center such as electromagnetic interference and ISS interface testing. The microscope was controlled from the ground during its time on the ISS from a secure communications center established at PSU. All engineering was performed by graduate and undergraduate students, and additional students were involved in carrying out ground-based control experiments using similar bacterial cultures. We were able to

directly image bacterial swimming in space for the first time, and are currently working on 'omics analysis of the returned cells. These experiments have yielded a flight-qualified instrument as well as a knowledge base for ISS operations that could serve other students and institutions nearby who are interested in ISS work.

Novel Insights into the Flight Performance of Hummingbirds

Bret Tobalske, Professor

University of Montana

Hummingbirds are the only birds that can sustain hovering in still air, and they exhibit astounding agility. Along with small body size, evolution appears to have minimized the moment of inertia of their wings. This wing design provides an opportunity to test for form-function tradeoffs: 1) minimizing energetic costs for wing oscillation versus maximizing agility and 2) optimizing aerodynamics for sustained hovering versus forward flight such as during migration. Mechanisms that help explain their extraordinary performance include elastic energy storage, inertial steering and inertial coupling, yet aspects of their wing design constrain aerodynamic function in forward flight compared with their nearest relatives, the swifts.

Laboratory Astrophysics at UM and Synchrotron Light Sources - The Challenge of Doing Graduate Research with Undergrads

David Macaluso, Professor

University of Montana

Liberal Arts universities typically emphasize excellence in undergraduate education, whereas R1 universities primarily focus on graduate research productivity. Somewhere in between lies the University of Montana, an R1 graduate research institution that emphasizes its rigorous liberal arts undergraduate degree programs. Stranger still is the UM Department of Physics & Astronomy, a research intensive department that is the only program in the UM College of Science that lacks a graduate program. In this talk the various graduate-level research projects within the department will be described, including how and why that research is accomplished with exclusively undergraduate research assistants. Particular emphasis will be placed on the experimental atomic and laboratory astrophysics work of professor and chair Dr. David Macaluso, whose undergraduate research program is currently building a next-generation merged-beams photoionization endstation to be used at synchrotron radiation facilities throughout North America and beyond.

Contributed talks:

The Reed College Nuclear Reactor: A Regional Resource

Jerry Newhouse, Reactor Director, Reed College

James Butler, Professor, Pacific University

A review of the capabilities of the Reed Research Reactor, highlighted by an example of recent collaboration with Pacific University.

Why Study Science? Articulating the Value of General Education Physics and Astronomy

Andrea Goering, Instructor

University of Oregon

Why do university students from every major need to take general education science classes? Depends on who you ask! I will first describe my own goals for gen ed science and how I am operationalizing ideas like “science literacy,” “critical thinking,” and “information literacy” in large enrollment (200+) 100-level astronomy and physics classes. I will then report on an in-progress, mixed methods PER project in which I combine quantitative measures of student motivation with qualitative surveys about what students value in these same classes. I hope to offer jumping-off points for us to engage in dialogue with students and with one another to clarify what value gen ed science courses offer in a changing world. This material is based upon work supported by the National Science Foundation under Grant No. 2526856. Link to presentation: <https://tinyurl.com/pnacp-s26-why-science>

The STEAM Hub as a Recruiting Tool for Physics Majors

David Terrell, Professor Emeritus

Warner Pacific University

Afterschool programs for high school students can be organized with the objective of alerting students about the possibilities in Physics. Physics is an effective gateway to any STEM career. By creating a safe environment where Creativity, Innovation, Sustainability and Stewardship (CISS) students will develop a pathway to a prosperous and meaningful life.

The Physics of Sailing

Christine Berven, Associate Professor Emerita

University of Idaho

How do sailboats move? They can be pushed but also pulled! In this talk I will discuss the forces that act on a sailboat that keep it on track and allow it to sail upwind with a focus of the physics of lift.