2025 Canadian Association of Physicists (CAP) Congress High School Teacher Workshop

Monday, June 9, 2025, 8:30 am – 5:30 pm
University of Saskatchewan
Arts Building, 9 Campus Dr., Saskatoon.

The CAP High School Teachers Workshop will be held on Monday, June 9, 2025, at the University of Saskatchewan as part of the CAP's 2025 Congress. This exciting and informative workshop will offer high school teachers an opportunity to meet colleagues from across Canada, as well as access to innovative learning techniques and educational resources. The day will feature world experts in physics through workshop activities and speakers, including tours of the Canadian Light Source, USask Observatory, and Physics and Engineering Physics Labs.

Registration details (registration to open mid-April, early-bird until May 16, 2025):

$25 CAP Members

You can access the registration system at https://crm.cap.ca. After you log in, please go to "Your Events" and then go to "Register for the 2025 CAP Congress"

$50 non-members, includes a High School Teacher membership in the CAP to Dec. 31, 2025.

To see more information about the High School Teacher membership, please follow https://cap.ca/membership/hscc-membership/. The 2025 CAP High School Teacher Membership Fee is $30.

On the registration form, please make sure to select at least Monday for the "Attending on (Days)" option. Please note that teachers who pre-register can choose to attend only the High School Teachers Workshop Day (Monday) or select to attend other individual or all days of the CAP Congress at *no extra fee*.

Teachers are invited join the Congress Welcome BBQ, and free Herzberg Public Lecture.

Schedule

Time	Session	
8:30 - 9:00	Registration	
9:00 - 9:15	Welcome	
9:15 - 9:45	Tracy Walker – Canadian Light Source **Using Big Science Research to Deliver Education Outcomes**	*9:00 – 9:45* *Plenary Parallel Session: Kathryne Daniel | University of Arizona* ***"Two-Eyed Seeing": Dynamical evolution across galactic scales and the future of big science***
9:45 - 10:15	Break	
10:15 - 11:00	Patrick Kossmann – Perimeter Institute for Theoretical Physics **Tools for Teaching Science**	Institute for Quantum Computing **The Quantum Explorations Student Toolbox (QuEST)**
11:00 - 12:00	Joe Muise – St. Thomas More Collegiate **Fantastic Physics Pro-D**	
12:00 - 13:00	Lunch	
13:00 - 14:00	**Panel: Supporting student success in physics**	
14:00 - 15:45	**Physics Teaching and Learning Topic Tables**	
15:45 - 16:15	Break	
16:00 - 17:30	Tours (sign up at workshop)	
17:00 - 18:30	Welcome BBQ	
18:30	Transport to Western Development Museum	
19:15	*Herzberg Memorial Public Lecture* *Shohini Ghose – Wilfrid Laurier University* ***Quantum 2.0***	

Workshop Sessions

Tracy Walker – Canadian Light Source

Using Big Science Research to Deliver Education Outcomes

On the north end of the University of Saskatchewan Campus sits Canada's only synchrotron research facility, the Canadian Light Source (CLs). Since the grand opening in 2005 more than 5,700 scientists from 200 Canadian institutions and 45 countries have published close to 8,000 publications with 1,100 international collaborations using data collected at our facility. That's a lot of people engaged in discovering a lot of new scientific knowledge – and a fabulous resource and centre of learning for more than 1,000 educators and 2,800 students that the education team has worked with. STEM education and science literacy challenges require thoughtful and innovative approaches that help learners connect with real-world research while fostering curiosity, inclusion, and respect for diverse perspectives. The CLS Education Team contributes to these efforts by supporting educators, and sometimes their students, in engaging with research through inquiry-based learning and hands-on experiences where possible**.** A key focus of these efforts is weaving perspectives of First Nation, Métis, and Inuit peoples into science education, recognizing the importance of respect for Traditional Knowledge and cultural expressions in broadening participation of Indigenous peoples in STEM. This presentation will outline how you can engage with the CLS to provide context for the various curricular content, outcomes, and concepts in your courses.

Plenary Parallel Session: Kathryne Daniel – University of Arizona (regular conference program)

"Two-Eyed Seeing": Dynamical evolution across galactic scales and the future of big science

"Two-eyed seeing" was coined by Albert Marshall, a Mi'kmaq elder, to describe the depth of perspective gained when perceiving the world through both an Indigenous and Western lens. Using this framework, I will describe my approach to science, which focuses on emergent behavior in disk galaxies as a driver of evolution. Dynamical resonances are essential to the evolution of disk galaxies. These resonances arise in the presence of massive structures, like a bar, spiral arms and satellites, and they reshape a galaxy as they diffuse, shepherd and rearrange orbits and stellar populations. This talk will highlight a collection of methods that together enable us to connect orbital dynamics to morphological evolution. The end of this talk will touch on the status of the next generation

gravitational wave observatory in the US, Cosmic Explorer. In particular, how our approach to site selection embodies two-eyed seeing and why our approach is critically important to the future of big science.

Patrick Kossmann – Perimeter Institute for Theoretical Physics

Tools for Teaching Science

Tools for Teaching Science is a reference resource from the Perimeter Institute for Theoretical Physics for science teachers striving to improve student learning. It is suitable for teachers at any point in their career and for teachers in different science disciplines. The resource showcases a variety of tools you can use in your classroom that will help you plan not only the content for a lesson but also the learning students will be doing along the way. 48 tools are explored in the resource with strengths, alerts, and tips for differentiation. A selection of these tools will be explored during the workshop time

Fiona Thompson and Taylor Pacholko – Institute for Quantum Computing

The Quantum Explorations Student Toolbox (QuEST)

The Quantum Explorations Student Toolbox (QuEST) contains a series of hands-on activities tailored to introduce K-12 students to quantum mechanics. Designed to be affordable, open-source, and easy to replicate, these activities cover the historic development of quantum mechanics and deepen understanding of fundamental principles, while showcasing modern and future technologies.

This highly interactive workshop will guide teachers through some of the activities that are part of QuEST. By rotating through stations relevant to different high school grade levels, teachers will discover ways to celebrate the International Year of Quantum Science and Technology in their classes.

Joe Muise – St. Thomas More Collegiate

Fantastic Physics Pro-D

Physics teachers are fortunate to have access to some of the best professional development opportunities. Major research labs around the world have great outreach programs and embrace inspiring teachers, to help them inspire their students. This has been important in my development as a teacher, and for helping me build a network of like-minded educators.

Panel: Supporting student success in physics

Current affairs and success stories in teaching and learning Physics. The panel will include students and educators in Physics and Engineering Physics at the University of Saskatchewan.

Physics Teaching and Learning Topic Tables

A unique activity with several topic stations (tables) chosen in advance by survey. Participants will be welcome to choose tables with the most popular themes and may move to different tables during the activity. The participant driven discussion will be collected by notetakers who will record themes and trends in the discussion before presenting summaries to the larger group. The Topic Tables offer a novel and engaging way to share, connect and inspire teaching in Physics.

Tours

- Canadian Light Source
- Physics and Engineering Physics Department Tour
- University of Saskatchewan Observatory

Herzberg Memorial Public Lecture

This event is free to the public, presented at the Western Development Museum.

Shohini Ghose | Wilfrid Laurier University

Quantum 2.0

Abstract to come.