

REPORT ON CANADA'S PARTICIPATION IN THE 8TH EUROPEAN PHYSICS OLYMPIAD IN KUTAISI, GEORGIA



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This year the Canadian Physics Team competed in the European Physics Olympiad (EuPhO), which took place July 15 to July 19, 2024 in Kutaisi, Georgia. This was a new experience for us, EuPhO having a different style and format from the International Physics Olympiad (IPhO) where we usually compete (this year's IPhO was held in Isfahan, Iran).

The Georgian organizers did a commendable job, especially with the challenge of having about double the usual number of participating countries. The EuPhO Academic Committee created excellent problems, which challenged the best high school physics students in the world, developed their interest in aspects of physics usually not taught in schools, and taught them some new skills.

The experimental problem explored the use of piezoelectric crystals to measure mechanical properties of other objects. The students determined the piezoelectric properties of a crystal and then used it to study the deformation of an elastic ball that was dropped on the crystal. The problem required students to make creative uses of the given experimental components, to design appropriate circuits to get precise measurements (for example to deal with the capacitance of the multimeter), and to handle the measured data. The combination tested the experimental skills of the students very well.

In the first theoretical problem students analyzed the impulse as a sliding puck collides with a concave semicircular fence and eventually rebounds from it (a phenomenon that may be familiar to Canadians). The second theoretical problem led students through calculating the relativistic Doppler effect for signals of subluminal speed. In the third problem the students analyzed the Fabry-Pérot interferometer. The problems were difficult, with a best overall score of 86%.

We would like to deeply thank our sponsors: UBC, the Trottier Family Foundation, former Team Canada member (1998, 1999) and medalist Sonny Chan, TRIUMF (Canada's particle accelerator), the University of Toronto Schools, and the UBC Physics and Astronomy Department. Their generosity allowed us to organize an 8-day National Olympiad finals and training camp in Vancouver for 17 top students and to send the team to Georgia: all the students' travel and accommodation expenses for the finals and the PhO were covered by the Canadian Physics Olympiad.

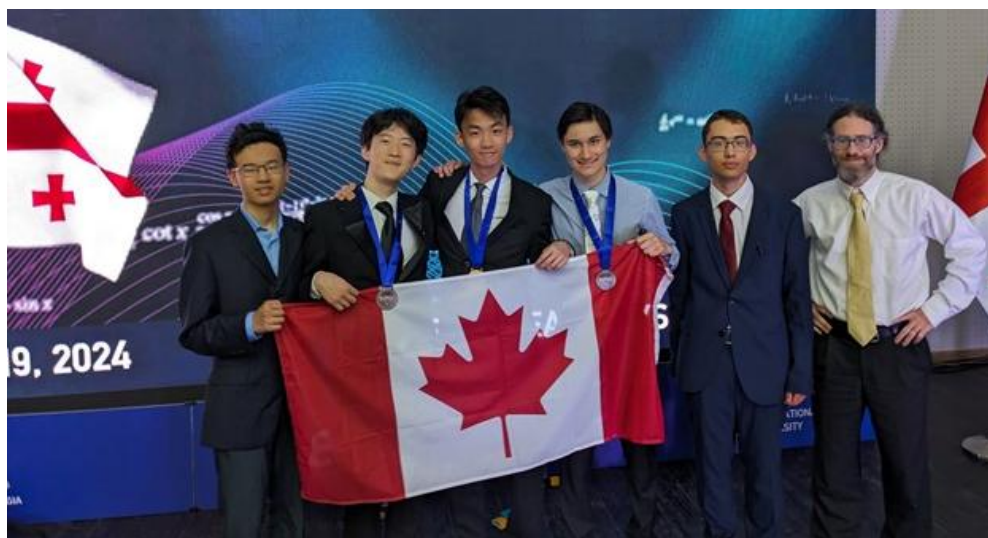


Figure 1. Our team with medals after the closing ceremony. From left: Zhou Long, Harry Gong, Zander Li, Tristan Yan-Klassen, Athanasios Mavrakanas, Lior Silberman.

Training camp participants were selected from the top 20 scores in the 2024 Canadian Association of Physicists High School/Cégep Prize Exam. Team Canada members, selected at the end of the camp, were:

- Zander Li from Laurel Heights Secondary School, ON, student of teacher David Vrolyk
- Harry Gong from St. George's School, BC, student of teacher Nathan Moens
- Zhou Long from Access Academy, AB, student of teacher Kevin Sunie
- Tristan Lee Yan-Klassen from Eric Hamber Secondary, BC, student of teacher Mark Lam
- Athanasios Mavrakanas from Marianopolis College, QB, student of teacher Baharak Fatholahzadeh

The team leader was Dr. Lior Silberman, professor of mathematics at UBC and past IPhO contestant (1994 Israeli team).

The competition was held at Kutaisi University, a university founded in 2020 in the city of Kutaisi, Georgia. The opening and closing ceremonies featured formal speeches by (among others) the Georgian Minister for Education and the EuPhO President, as well as artistic demonstrations of traditional Georgian culture including both dancing and singing. The compressed EuPhO schedule afforded less time for cultural exploration than an IPhO but there was time for some excursions to nearby historical monuments.

Fifty-four teams participated in this year's Olympiad. Our students did very well considering their short training (as compared to the countries with many gold medalists, which train their team for 1 to 2 years). Zander Li won a gold medal, finishing 21st of 186 competitors. Harry Gong and Tristan Yan-Klassen won bronze medals, and Zhou Long and Athanasios Mavrakanas won honourable mentions.