

# INAUGURAL WOMEN IN PHYSICS CANADA CONFERENCE

BY COLIN HUNTER



The physics conference begins as most such conferences do — attendees sip wine and nibble hors d'oeuvres while mingling at the reception, subtly glancing at one another's name badges and striking up conversations about physics, the universe and everything. Over by the bar, a pair of high-energy physicists from opposite sides of the continent chat about mutual acquaintances in the field. In the catering line, a cosmologist and a quantum information theorist discuss shared interests, scientific and otherwise.

The reception would be indistinguishable from those held at countless physics conferences around the world, apart from one detail: every physicist in the room is a woman. "Usually I walk into a conference and I'm the only woman there," says Miriam Diamond, a research intern at the University of Waterloo's Institute for Quantum Computing (IQC). "As a woman, you always know you're going to be in a minority, so this conference is refreshing."

Approximately 60 female physicists from around the world ("That's all of them!" joked one attendee) convened in Waterloo, Ontario in mid-July for the inaugural Women in Physics Canada conference. The meeting was dedicated to celebrating the achievements of young female physicists throughout the country, networking toward new national collaborations, gaining skills for successful careers and aiding the formation of working groups to advance women in physics.

Co-hosted by the IQC and the Perimeter Institute for Theoretical Physics (PI), the three-day conference was created by and for female physicists, but was only partly *about* female physicists.

## SUMMARY

**Approximately 60 female physicists from around the world convened in Waterloo, Ontario in mid-July for the inaugural Women in Physics Canada conference.**



Monika Deivat of the University of Calgary delivers a talk at the Institute for Quantum Computing (IQC) during the inaugural Women in Physics Canada conference. Photo Credit: Peter Kovacs.



Participants in the Women in Physics Canada conference tour the nuclear magnetic resonance quantum computing laboratory at the Institute for Quantum Computing (IQC), University of Waterloo. Photo credit: Peter Kovacs.

"It's a scientific conference, first and foremost," said conference co-creator Anne Broadbent, a postdoctoral fellow at the IQC. "We have a great line-up of speakers, and students will be giving scientific talks. But there are so few women in the field, and we're so far apart, we don't have many opportunities to meet and share ideas with one another like this."

The talks, held at both IQC and PI, ranged in scope from dark matter to quantum computation to magnetic fields in supergiants. While some talks were subtly modified to suit the unique audience (the standard "Alice and Bob" nicknames used when discussing quantum communication became "Alice and Barb"), the focus remained on science.

But it was during a panel discussion that attendees pondered and tackled one of the most vexing meta-questions in physics — why women are so vastly outnumbered in the field.

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“This question has been asked by women around the world: why are the numbers of women so low in the physical sciences,” said panel moderator Marianne Fedunkiw, a communications consultant whose clients include QuantumWorks, Canada’s quantum information network.

The disproportionate gender ratio in science — particularly in the physical sciences — has been widely noted for decades, though closing the gap has proven easier said than done.



The Women in Physics conference allowed women to build friendships and support networks during social events, including the opening wine and cheese reception at Waterloo’s Perimeter Institute for Theoretical Physics. Photo Credit: Peter Kovacs.

In 1995, the Committee to Encourage Women in Physics, an initiative of the Canadian Association of Physicists, sponsored a survey of physics departments at colleges and universities across the country. The findings, based on data from the preceding two years, bore out a trend that most in the field implicitly knew: barely more than a tenth of PhDs in physics were granted to women, and a mere five per cent of faculty — and two per cent of tenured faculty — were women.

By 2001, the balance had shifted slightly, with 15 per cent of physics PhDs going to women, and eight per cent of faculty positions (five per cent tenured) held by women.

The disparity appears to have some roots in the gender roles instilled in young children, reinforced throughout adolescence and adulthood. The odds of a female first-grader in 1985 growing up to earn a PhD in physics are 1 in 286, according to a long-term study released in 2010 by the Natural Sciences and Engineering Research Council of Canada (NSERC). The odds of a boy in the same Grade 1 class eventually earning a physics PhD are markedly better — about 1 in 167, according to the study.

“As a woman, you know that you’re going to be in the minority,” said Diamond. “I think it has absolutely nothing to do with the innate ability of females. I think it has more to do with what’s considered cool, especially in high school. There are these predefined rules for what’s considered cool for girls to study. We just have to get the word out there that there’s nothing uncool about being a woman in physics.”

But encouraging women to pursue a career in physics is only part of the answer; getting them to *stay* in the field raises new challenges. Physics seems to be particularly susceptible to a phenomenon known as the “leaky pipeline” — over time, more

and more women step away from careers in physics, frequently to raise families.

“I encountered gender discrimination when I got pregnant,” said panelist Adriana Predoi-Cross, a professor of physics and astronomy at the University of Lethbridge. “I was told (by a colleague) I had basically destroyed my career by getting pregnant, but I proved him wrong.”

In the intervening years since Predoi-Cross had her first child, highly improved policies for maternity leave and support have been put into place at universities and research facilities. Nowadays, the leaky pipeline phenomenon is more likely a result of the shifting priorities of women than overtly discriminatory work environments.

Of the five panelists at the Women in Physics conference, four were mothers who spoke about the struggles of balancing academic and family life.

What tends to be missing for many women in physics, the panelists agreed, is a support network of peers and role models.

One of the conclusions of the panel discussions was that women, men, institutions, and governments need to work together to encourage, educate, recruit, retain, and promote more women in physics and other science and technology professions.

The Women in Physics conference was created in part to encourage this process, said conference co-creator Sarah Croke, a postdoctoral fellow working on quantum information theory at Perimeter Institute.

“The simple fact is that being a woman in a competitive and demanding career such as academic physics can be isolating at times,” said Croke, who began organizing the conference while on her own maternity leave.

“Events such as this one create a network of peers for young women, and allow them to learn from more senior women the challenges of the job — both scientific, and those challenges that apply more specifically to women. These are important components in building a successful and, more importantly, fulfilling career in physics.”

To watch a video about the Women in Physics Canada conference, visit the QuantumIQC YouTube channel ([www.youtube.com/QuantumIQC](http://www.youtube.com/QuantumIQC)), or watch full sessions from the conference at [pirsa.org](http://pirsa.org). For more information about the conference, including speakers and talks, visit: [http://www.perimeterinstitute.ca/en/Events/Women\\_in\\_Physics\\_Canada/Women\\_in\\_Physics\\_Canada/](http://www.perimeterinstitute.ca/en/Events/Women_in_Physics_Canada/Women_in_Physics_Canada/).