

# Burnaby Now

## Math students help businesses; Top mathematicians descend on Burnaby's SFU campus to tackle industry problems

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Illustrations: Colour Photo: Carmine Marinelli, Burnaby Now / WHIZ KIDS: Top mathematics students descended on Burnaby's SFU campus to solve industry problems with numbers. Greg Hamill, left, Jessica Wu, David Lin, Cheng You, Iris Shau and mentor Philip Poon in the SFU math lab. ;

Armed with algorithms and aptitude, 30 of the finest number-crunching undergrads from around the world will spend four weeks in Industrial Math Summer School, a program that gives them a chance to develop mathematical-based solutions for real problems for actual companies in the business sector.

"The goal of the program is to help students see mathematical research from a business perspective," said J.F. Williams, assistant professor of mathematics at Simon Fraser University.

This will likely be the first time many of these students will have hands-on experience applying their math skills to real challenges that businesses are facing, said Williams.

"As a math major, I am often asked what I can possibly do with a math degree. These industry problems answer that question," said Natasha Richardson, a fourth-year mathematics major from SFU. "I look forward to learning how the pure mathematics which I am taught in my undergraduate coursework can be applied to real-world industry problems."

Richardson was one of 30 students from a pool of about 90 who were invited to attend the summer program.

They come from such universities as McGill, Harvard, the Technical University of Berlin, University of British Columbia, University of Toronto, University of California at Berkeley, Peking University, University of Ottawa, California Institute of Technology and the National Autonomous University of Mexico.

While many mathematicians and computer scientists enjoy working alone, Richardson said she is not one of them.

"I really thrive off communicating with the other people. On Friday morning my group sat down to hash out our problem - that back-and-forth of ideas flying is really cool," Richardson said.

The students were divided into teams of five and given their research challenges, which were presented by various B.C. businesses. One group received a challenge from the Vancouver-based company Sky Research to develop a model to help the company better understand the shock experienced by a projectile when it strikes the ground without exploding.

Up to 20 per cent of explosive devices deployed in conflict areas do not explode upon impact, which creates a public hazard that can persist for many years. Using algorithms the team will be able to verify methods to determine which buried metal objects are hazardous and which are not.

Another team is investigating ways to improve Kintama Research's underwater marine sensors for use in the Pacific Ocean Shelf Tracking Project, which tracks the movements and survival of marine animals along the West Coast.

"This workshop takes math out of the lab and into the real world," said Williams.

Training the next generation of mathematical researchers is important for the future of Canada as their problem-solving skills can be applied to virtually any economic or social challenge, said MITACS scientific director Arvind Gupta. The Industrial Math Summer School is funded by ACCELERATE B.C. and Industry Canada through the International Partnership Initiative and is part of MITACS, a Network of Centres of Excellence for mathematics.

From its research centre at SFU, MITACS works to develop mathematical solutions in five of the economy's fastest growing sectors: biomedical and health; environment and natural resources; information processing; risk and finance; and communication, networks and security.

"Businesses want to know what is possible. They want to know what can be developed. They want to know what, with leading-edge mathematical technology, is available. And proof of a concept is key," Gupta said.

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