For Immediate Release

Canada's Brightest Minds Meet to Unveil How Mathematics Is Helping to Control the Spread of Infectious Disease

CAIMS-MITACS Annual Conference, June 16-20 in Toronto, will showcase the impact our country's mathematicians are having on Canadians, business

Canadian Space Agency astronaut Chris Hadfield to speak on role math plays in space exploration

Toronto, Ontario – June 8, 2006 – With the potential of a pandemic looming on the horizon, top academics from Canada's mathematical sciences community will demonstrate how mathematical modelling has become one of the most important tools for pandemic flu planning at the upcoming **CAIMS-MITACS Joint Annual Conference**, to be held in **Toronto, June 16-20**.

"The threat of a pandemic is a very real concern for the global community and yet there are many unknowns surrounding it," said Dr. Arvind Gupta, Scientific Director of MITACS, a national research network that brings together industry and academia in a collaborative effort to solve large-scale problems. "MITACS researchers are helping to address this problem by using information from past pandemics to model those in the future, giving Canada's public health leaders the critical information they need to plan and prepare ahead of time."

WHAT:	**CAIMS-MITACS 2006 Joint Annual Conference** (Canadian Applied and Industrial Mathematics Society-Mathematics of Information Technology and Complex Systems)
WHEN:	June 16 – 20, 2006
WHERE:	York University, Toronto –Technology Enhanced Learning (TEL) Building

At the event, the MITACS team, led by Dr. Jianhong Wu of York University, will announce recent findings from their research into infectious diseases – including West Nile Virus, Avian Flu, Pandemic Influenza and SARS – and will illustrate how mathematical modelling is providing a scientific framework to support the control and management of such diseases if, and when, they occur. In particular, because a vaccine for protection from a pandemic strain of influenza cannot be produced until the new strain has emerged and been identified, mathematicians are developing a model to show the most effective way to use the available vaccines and other anti-viral drugs in the meantime.

"Given the unavailability of vaccination at the beginning of a pandemic, as well as a possible limited supply of anti-viral drugs (flu shots), it is critical to find the optimal use of limited resources," explains

Wu, noting that one area under examination is whether to target transmitters of disease or those who are most vulnerable to disease. “Through mathematics and, more precisely, modelling-based optimization, we are creating a sort of ‘digital library’ of possible scenarios that can then be used by public health decision-makers to make informed choices,” adds Wu, whose team is working in collaboration with the Public Health Agency of Canada, the National Research Council of Canada’s Institute of Biodiagnostics, and the University Health Network in Canada.

The team will also be presenting a first-of-its-kind Summer School on Mathematical Modelling of Infectious Disease, which will take place from June 10 - 20 at York University, alongside the conference. To be attended by about 50 epidemiology, public health, math and science graduate students, and medical residents, the summer school was launched to provide training for collaborative research in infectious diseases based on mathematical modelling and qualitative analysis.

A highlight of the conference will be a public lecture by Canadian astronaut Chris Hadfield on Sunday, June 18, 2:00 p.m., in the Computer Science & Engineering Building, Lecture Hall A. Hadfield is Chief of Robotics for the NASA Astronaut Office at the Johnson Space Center in Houston and was the first Canadian astronaut to walk in space. In his lecture – organized by the MITACS Student Advisory Committee – he will ask: *How do you dock a spaceship*? *How does the Shuttle know where the runway is*? *How can we deflect an asteroid*? *What is space flight like*? With these questions, he will focus on the role of mathematics in space exploration from an astronaut's point of view.

In addition, there will be four plenary speakers from Oxford, McGill and Cornell Universities, and the Centers for Disease Control and Prevention, as well as an exhibition featuring posters and demonstrations by university students, research associates and faculty.

Other highlights of the conference include a showcase of how some of the world’s most innovative uses of math are being applied in the following areas:

- **Aerodynamics:** MITACS researchers and their associates have launched a new project aimed at developing computer software that uses mathematical algorithms to optimize the aerodynamic design of aircraft. The goal is to replace the current “cut and try” approach to airplane design that relies on the design team experimenting with a variety of different options to find the most effective one, which is a costly and time-consuming process.

- **Clinical Diagnosis:** Presenters will explore the potential of bioinformatics – a rapidly developing discipline that is at the forefront of molecular biology – to provide quantitative, accurate, and biologically relevant predictions of the behaviour of molecules. This research is helping to gain important insights into diseases such as Alzheimer's and diabetes.

- **Communications:** As more and more wireless systems – including satellites, radio-linked sensors, vehicle-mounted devices and unmanned emergency reconnaissance platforms – penetrate our critical communication network, mathematicians are finding ways to keep electronic transmissions stable, efficient and secure.

- **General Industry:** This session will illustrate how mathematicians are partnering with industry to address mathematical problems that arise when modelling is applied to help solve industry problems. One example is the modelling of electricity prices as power consumption continues to be a top of mind problem across all industry sectors.

- **Banking and Finance:** This session will showcase a variety of speakers who are conducting interesting work in the area of financial mathematics, a rapidly evolving discipline that is helping to characterize and manage risk in well-developed financial markets.

Sponsored by **Bell Canada, Bombardier, Centre de Recherches Mathématiques, Fields Institute for Research in Mathematical Sciences, Pacific Institute for Mathematical Sciences, Simon Fraser University** and **York University**, the five-day event is being held simultaneously with the **17th Canadian Symposium on Fluid Dynamics** and the **2006 Summer School on Mathematical Modelling of Infectious Diseases. For more information, please visit www.mitacs.ca.**

About MITACS

MITACS (www.mitacs.ca) is a Network of Centres of Excellence (NCE) for the mathematical sciences hosted by Simon Fraser University in Burnaby, BC. The only Canadian organization of its kind, it focuses on developing 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. Each MITACS research project partners academic scientists and their graduate students from universities across the country with Canadian organizations.

About CAIMS

The Canadian Applied and Industrial Mathematics Society CAIMS*SCMAI represents the community of applied mathematicians in academia, industry and government in Canada. It organizes national and international events and its annual meetings provide an important forum for research and networking in

Canada. The Doctoral Dissertation Award, Research Prize and Distinguished Service Award recognize outstanding contributions to Canadian applied mathematics. See www.caims.ca.

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Media are invited to attend the CAIMS-MITACS 2006 Joint Conference at York University, Toronto. Interview and photo opportunities will be available.

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