FOR INFORMATION **PUBLIC** **OPEN SESSION**

TO: Academic Board

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DATE: April 24, 2014 for May 1, 2014

AGENDA ITEM: 5

ITEM IDENTIFICATION: 2013 Annual Report of the Vice-President, Research & Innovation: Inside the World's Great Questions – the Power of Research Networks

JURISDICTIONAL INFORMATION: The Academic Board is one of the three Boards of the Governing Council. It is responsible for matters affecting the teaching, learning and research functions of the University, the establishment of University objectives and priorities, the development of long-term and short-term plans and the effective use of resources in the course of these pursuits.

HIGHLIGHTS:

Big problems, issues and challenges demand that many minds and areas of expertise come together. No one person is going to solve climate change, for example. But the right combination of people, in the form of a network, just might. Research networks really do bring the expression "more than the sum of its parts" to life.

The University of Toronto has laid an excellent foundation of activity in the research network arena. Some involve a few groups within U of T. Others bring together researchers from many universities around the world, government agencies and the private sector.

Inside the World's Great Questions highlights 10 networks. Some are led here at U of T and in others we are a partner. Each illustrates one of the themes in ***Excellence, Innovation, Leadership: The University of Toronto Strategic Research Plan.***

As you will see, U of T's professors and students are making vital contributions to the global effort to address issues that affect people everywhere.

FINANCIAL AND/OR PLANNING IMPLICATIONS:
None

RECOMMENDATION:
For Information

DOCUMENTATION PROVIDED:

2013 Annual Report of the Vice-President, Research & Innovation: Inside the World's Great Questions – the Power of Research Networks

University of Toronto Research by the Numbers: The Power of Research Networks

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INSIDE THE WORLD'S GREAT QUESTIONS

THE POWER OF RESEARCH NETWORKS

UNIVERSITY OF TORONTO

THE UNIVERSITY OF TORONTO IS DISTINGUISHED BY ITS AMAZING BREADTH AND DEPTH OF EXCELLENCE.

OUR RESULTING STATURE AMONG THE GREATEST UNIVERSITIES IN THE WORLD ENABLES US TO MAKE A SIGNIFICANT DIFFERENCE IN ADDRESSING THE GLOBAL CHALLENGES OF OUR TIME.

Our researchers help to create new knowledge, to foster broader understanding, and to share and apply what we learn in every field—human rights, peace and conflict, politics, the economy, urban development, poverty, health, climate change, literature, music, art, technology and so much more, touching every aspect of our society and our daily lives.

Just as important, we know that we are not alone in our efforts. When we combine our curiosity and ingenuity with that of colleagues at other universities, colleges, and hospitals, and in government, private sector corporations and community organizations, the potential for discovery and innovation is that much greater. At the outset of my presidency I identified the strengthening of our partnerships as one of the University's highest strategic priorities. By continuing to build our relationships locally, nationally and internationally, U of T will be better able to contribute its vast expertise to advance the common good.

Partnership building is one of the many leadership talents Professor Paul Young has shown in his wonderfully productive seven years as U of T's Vice President, Research and Innovation.

Professor Young, who at the time of this writing was about to step down from that portfolio, achieved a great deal during his two terms: advocating for and securing increased research funding; advancing institutional research accountability; strengthening our innovation and entrepreneurship capacity; helping our faculty to receive the awards and honours they so richly deserve; and enhancing U of T's communications about its research excellence and the impact of its brilliant researchers.

Transcending all these achievements, Professor Young demonstrated an outstanding ability to bring people together, so they can make that impact. Through his work in partnership building—between people within the University and with various external organizations—he has helped fulfill the mission of the University of Toronto as Canada's leading institution of advanced research and research-intensive education.

On behalf of the University of Toronto community, I thank Professor Young for his passion, commitment and legacy of innovation as Vice President, Research and Innovation. I look forward to collaborating with our colleagues here and all of our partners in the continuing pursuit of new knowledge and new applications of knowledge, for the benefit of individuals and of our society.

Professor Meric S. Gertler, PhD, FRSC, AcSS, MCIP
PRESIDENT, University of Toronto

WO

WE OBSERVE AND WE INVESTIGATE. WE GET INSIDE THE PROBLEMS AND CHALLENGES.

How do we do that?

We work as individuals, to be sure. Some of the great advances in knowledge have come from researchers who pursue answers independently. In fact, some work can *only* be done by a solo scholar.

We also work in collaboration with others. ***Inside the World's Great Questions*** examines a kind of grand group work called "research networks."

Big problems, issues and challenges demand that many minds and areas of expertise come together. No one person is going to solve climate change, for example. But the right combination of people, in the form of a network, just might. Research networks really do bring the expression "more than the sum of its parts" to life.

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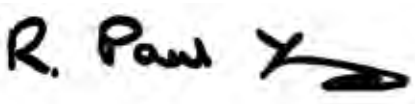
As you will see, U of T's professors and students are making vital contributions to the global effort to address issues that affect people everywhere.

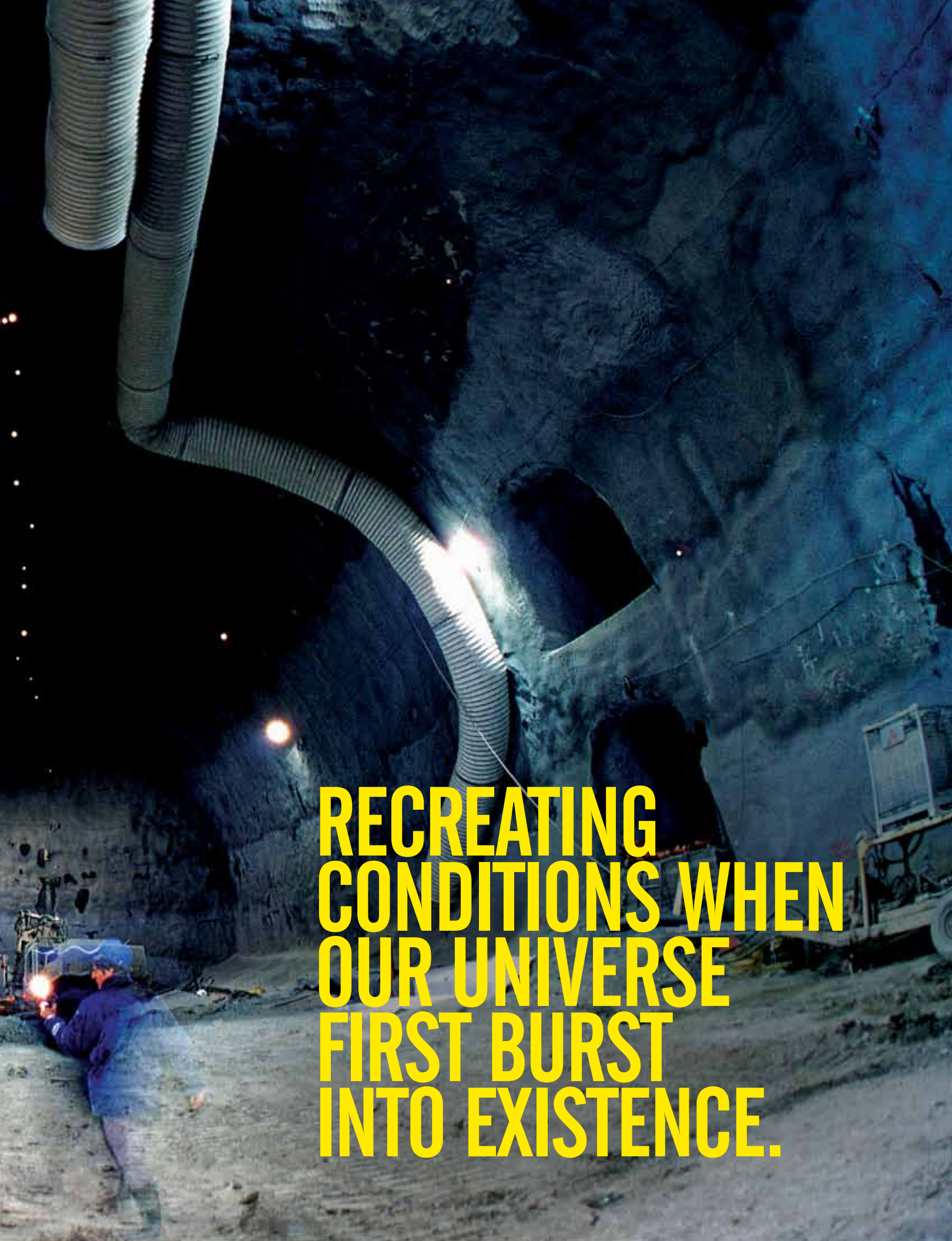
This marks my final year as Vice President, Research and Innovation. I am returning to my research as a professor in the Faculty of Applied Science and Engineering. I am deeply thankful for having the opportunity to serve the University of Toronto in this role for the past seven years. It has been a great journey with great people. I remain proud of this institution and confident we will continue to make a difference for people around the world.



Professor R. Paul Young, PhD, FRSC
VICE PRESIDENT, Research and Innovation

BACK TO THE BEGINNING OF TIME

THE LARGE HADRON COLLIDER AT CERN


RECREATING
CONDITIONS WHEN
OUR UNIVERSE
FIRST BURST
INTO EXISTENCE.

THE MOST AMBITIOUS SCIENCE EXPERIMENT OF A GENERATION

A 27-metre tunnel buried underground near Geneva, 20-plus years in the making. Beams of protons are smashed together at nearly the speed of light. Each one makes the 27-kilometre lap 11,000 times a second, and scientists record what happens when the protons collide and take on split-second incarnations as other particles we've never seen before.

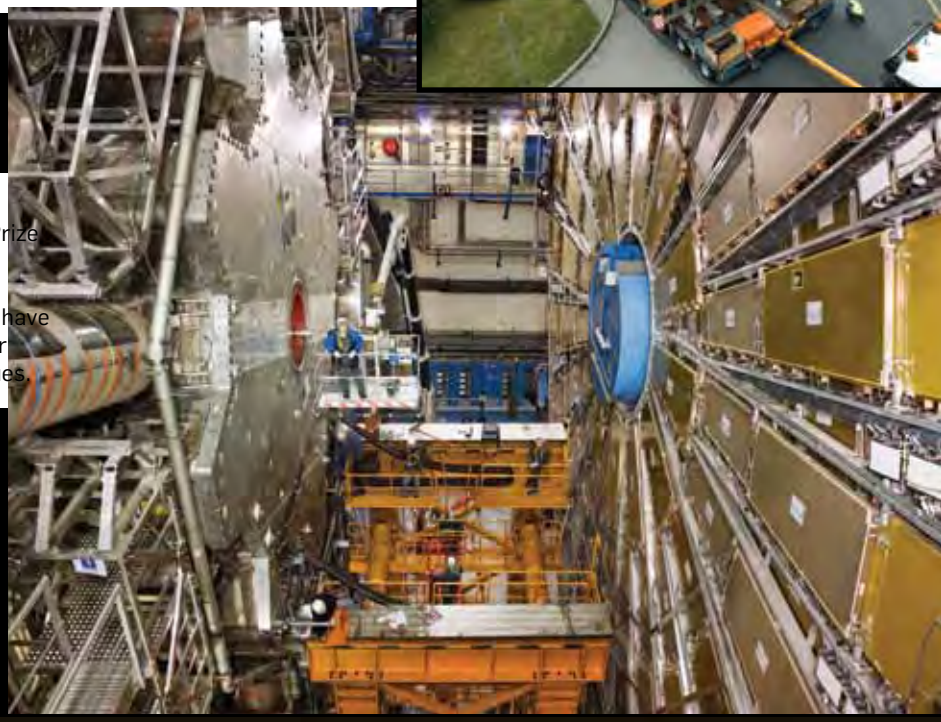
In essence, the Large Hadron Collider (LHC) recreates the conditions that existed one millionth of one millionth of a second after the Big Bang, when the universe first burst into existence.

WHY?

The Standard Model of Physics describes the fundamental structure of the universe: everything in existence is made up of a group of fundamental particles. But the model is not complete. For it to be right, scientists needed to find a missing particle—the **Higgs Boson**. Without it, the theory topples.

A NOBEL PRIZE-WINNING DISCOVERY

On July 4, 2012, the **6,000 researchers** at the LHC announced they had found the "missing" Higgs. A Nobel Prize was awarded to Peter Higgs (below, right) and François Englert (below, left), the particle's original theorists. But one answer leads to more questions. The Higgs does not have the mass it should have if the model is extended to higher energies, so something else is going on. The hunt continues.



BUT, REALLY, WHY?

Michael Faraday was asked the same thing 300 years ago about his discovery—electricity. There are already dozens of spin-off technologies from the LHC, including the World Wide Web, which was invented by CERN researchers to allow them to share data. But the real answer is: we don't know yet what research at CERN will tell us. We hunt for the Higgs—and beyond—**because we're human**.

"IF WE WEREN'T CURIOUS, WE'D STILL BE LIVING IN CAVES."

Pierre Savard, professor, U of T Department of Physics and CERN researcher

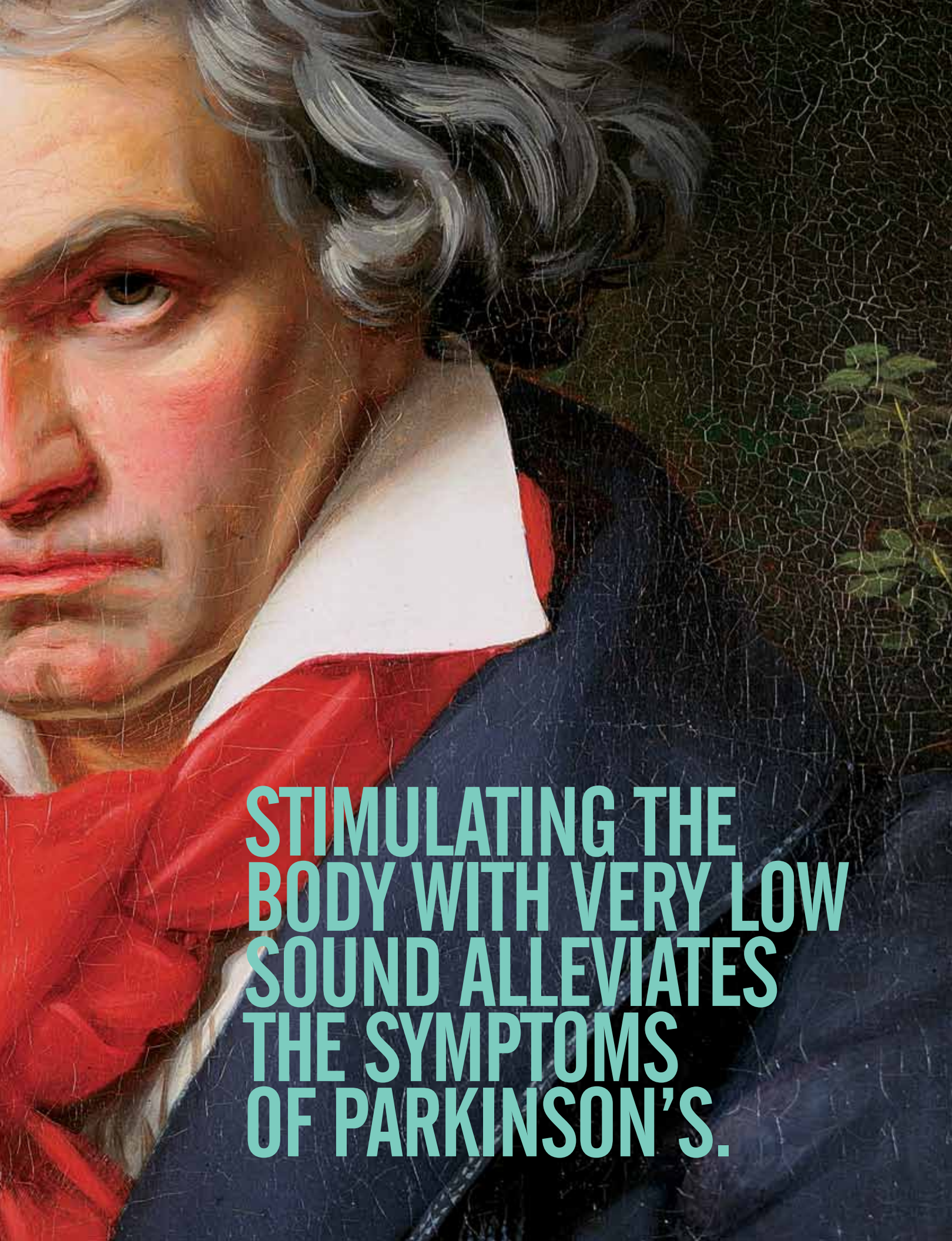
U of T physicists working at CERN, from left to right: Pekka Sinervo, Pierre Savard, Peter Krieger, Robert Orr, David Bailey, William Trischuk. Richard Teuscher is not pictured.

THE NETWORK

Six thousand researchers from over 40 countries, operating with **no hierarchy**, committed to collaboration, acting as co-authors on their findings and making those findings freely available to the public. U of T is also connected to CERN through TRIUMF, Canada's national nuclear particle physics lab.

M I

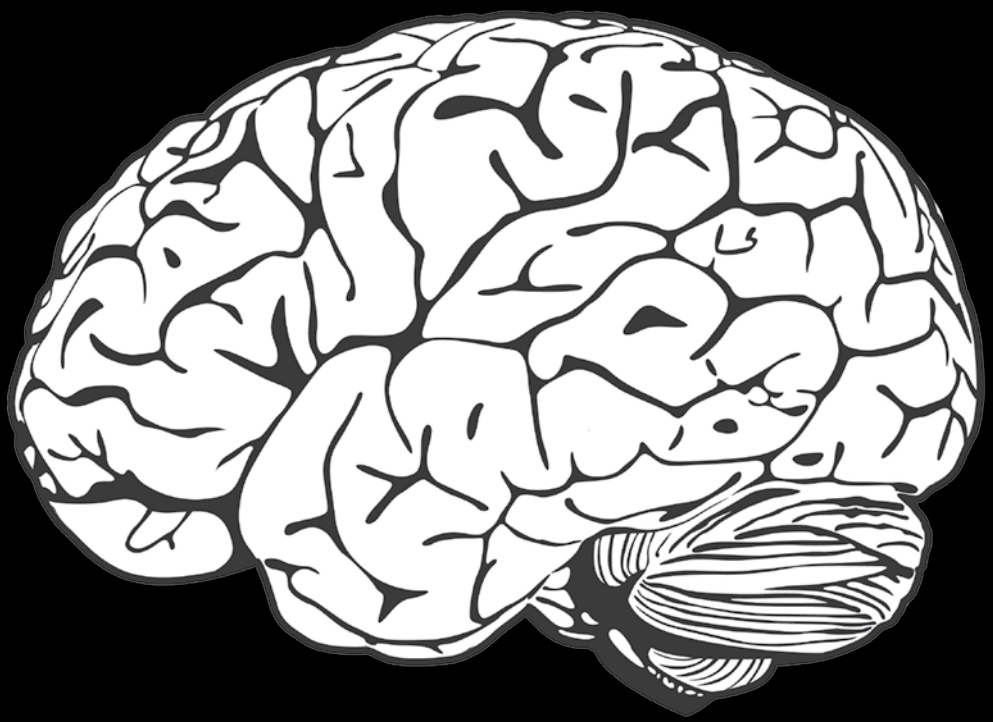
THE MUSIC AND HEALTH RESEARCH COLLABORATORY (MaHRC)



STIMULATING THE BODY WITH VERY LOW SOUND ALLEVIATES THE SYMPTOMS OF PARKINSON'S.

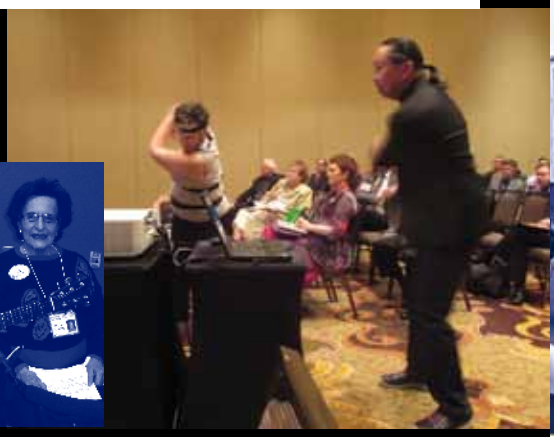
SOUND CAN CHANGE WHAT'S HAPPENING INSIDE YOUR BODY

Parkinson's. Dementia. Hearing loss. Stress. Traumatic brain injury. Learning ability in children with autism. Recovery from heart surgery. These are serious health conditions that demand sophisticated treatment approaches. And research has proven that **music can be part of that treatment**—not only because music can lift your spirits, but because the sounds that come from music have a direct physiological connection to your health. MaHRC is bringing together a variety of researchers in everything from pain management to brain surgery to social work to take the research deeper.



DRUMBEATS TO REHABILITATE STROKE, E NOTES FOR PAIN MANAGEMENT

Important progress has been made in proving the connection between music and health. People dealing with fibromyalgia, for example, have had their pain eased by sounds played for them in the key of E. Beating a drum can help patients recovering from stroke to re-gain use of damaged limbs. As the human body is made up of an interconnected series of functions, approaches to maintaining our health must also be interconnected. **That's why a network is needed:** psychologists, neurologists, sound engineers, rehab experts, hearing specialists, music therapists and so many others working hand-in-glove.



"THE MAGIC OF MaHRC IS THAT IT HAS BECOME A MAGNET TO PULL TOGETHER HEALTH AND MUSIC RESEARCHERS WHO NORMALLY WOULD NOT HAVE COLLABORATED. THERE HAS BEEN GOOD WORK DONE, BUT IT HAS BEEN DONE IN SILOS. NOW, WORKING AS A NETWORK, WE SEE MaHRC AS THE ROOT OF AN EXPLOSION OF NEW KNOWLEDGE THAT CAN BE APPLIED TO MANY OF THE MOST SERIOUS HEALTH CHALLENGES WE FACE."

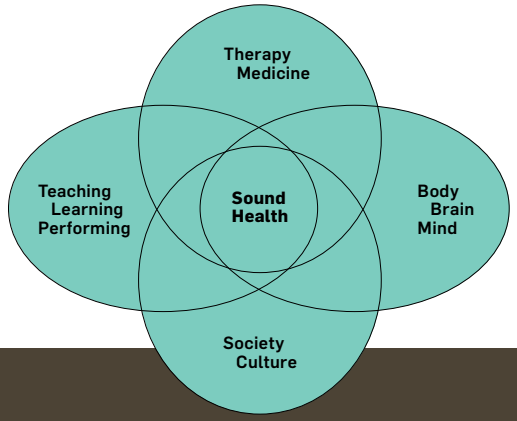
– Lee Bartel, professor, U of T Faculty of Music and MaRHC founder

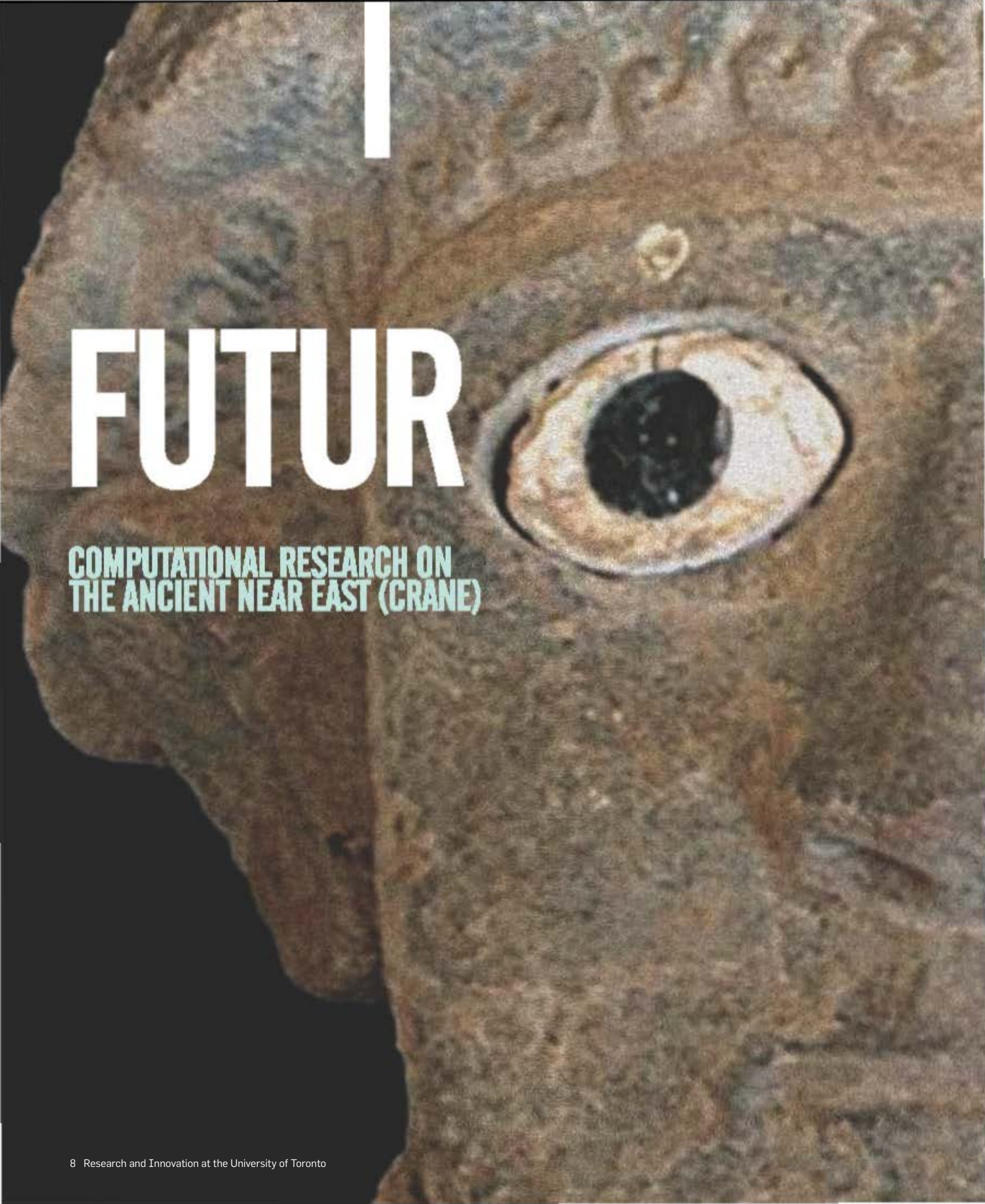
THE NETWORK

MaHRC has recruited 50 researchers from U of T, its nine partner hospitals, universities around the world and organizations like The Royal Conservatory, the International Association of Music Medicine and the Canadian Hearing Society.

They will be focussing their work on four spheres:

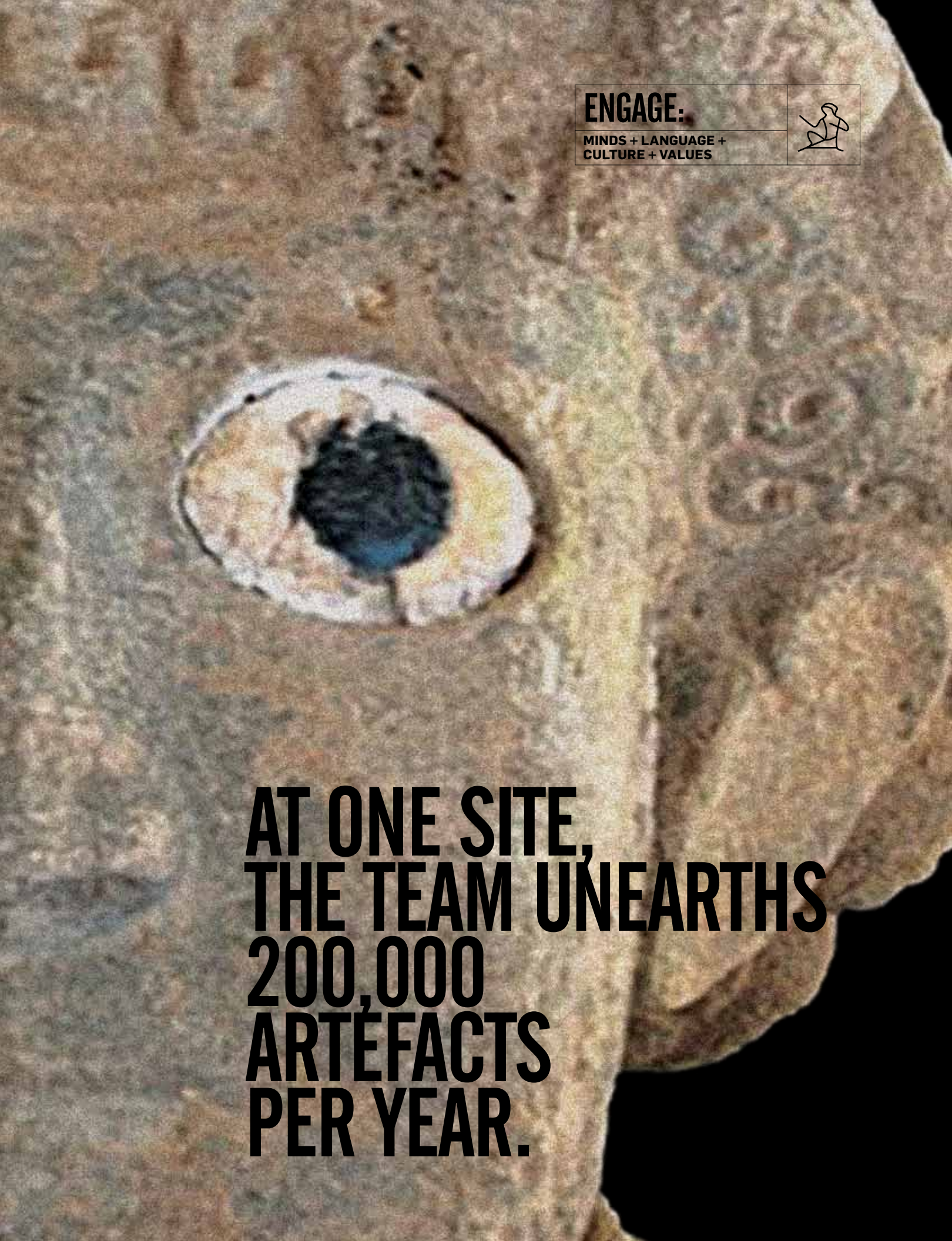
- **Music in Therapy and Medicine**
- **Music in Body, Brain and Mind**
- **Music in Health Issues in Culture and Society**
- **Music and Health in Teaching, Learning and Performing**





FUTUR

COMPUTATIONAL RESEARCH ON THE ANCIENT NEAR EAST (CRANE)



ENGAGE:

MINDS + LANGUAGE + CULTURE + VALUES

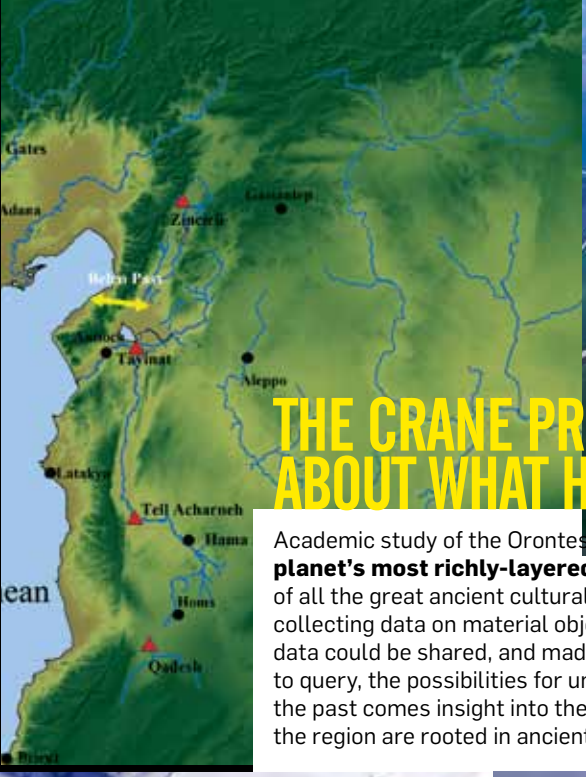
AT ONE SITE, THE TEAM UNEARTHS 200,000 ARTÉFACTS PER YEAR.

"IF I WANTED TO STUDY A FAMILY, I MIGHT BE ABLE TO EXCAVATE THEIR HOUSE, LEARN ABOUT THEIR DIET AND THEIR LIFE. BUT I CAN ONLY TAKE IT SO FAR. SOCIETIES AREN'T LIMITED TO ONE PERSON OR ONE PLACE. AN ARCHAEOLOGICAL SITE IS A BODY OF MATERIAL THAT PRESERVES THE RECORD OF A COMMUNITY OVER TIME, BUT IT'S STILL ONLY ONE PLACE. IF YOU CAN PULL TOGETHER A BUNCH OF THESE PROJECTS, YOU'LL GET A PERSPECTIVE THAT IS MUCH MORE REFLECTIVE OF THE COMPLEXITY OF A SOCIETY."

Timothy Harrison, professor, U of T Department of Near and Middle Eastern Civilizations and Director, CRANE

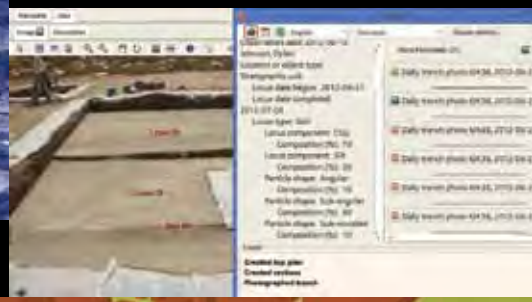
ARCHAEOLOGY IS ABOUT DISCOVERY

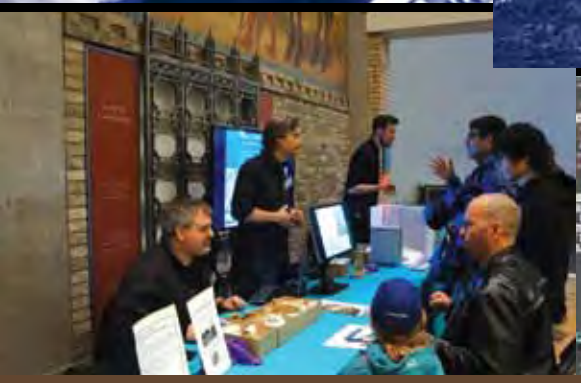
It's not every day you stumble onto a 3,000-year old king. **"I am Suppiluliuma,"** said the inscription on the giant 3,000-year-old statue unearthed at an archaeological dig in southeastern Turkey. The massive monument made headlines around the world when a U of T team excavated the head and shoulders, which themselves measured five feet high. Suppiluliuma provides a glimpse of creativity in the Iron Age. But it's just a glimpse. Every year at their field site, the U of T team headed by Timothy Harrison finds 200,000 artefacts.

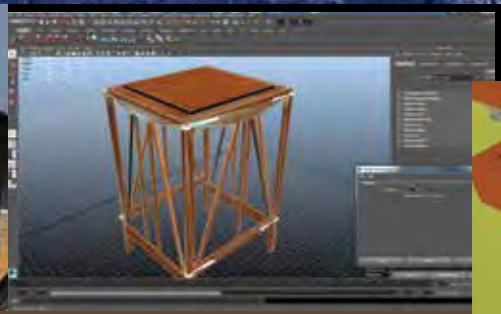


THE CRANE PROJECT IS ABOUT WHAT HAPPENS NEXT

Academic study of the Orontes region goes back 150 years. **It's one of the planet's most richly-layered pieces of real estate,** an intersection of all the great ancient cultural worlds. Most projects have proceeded in silos, collecting data on material objects, plants, animals and even climate. If the data could be shared, and made widely available for researchers everywhere to query, the possibilities for understanding the past explode. And with the past comes insight into the present—lots of contemporary conflicts in the region are rooted in ancient patterns.







WHO'S IN THE NETWORK

With funding from SSHRC, CRANE is starting small. But they plan to grow steadily, incorporating more and more data.

U of T researchers from Near and Middle Eastern Civilizations, Computer Science and Anthropology

+

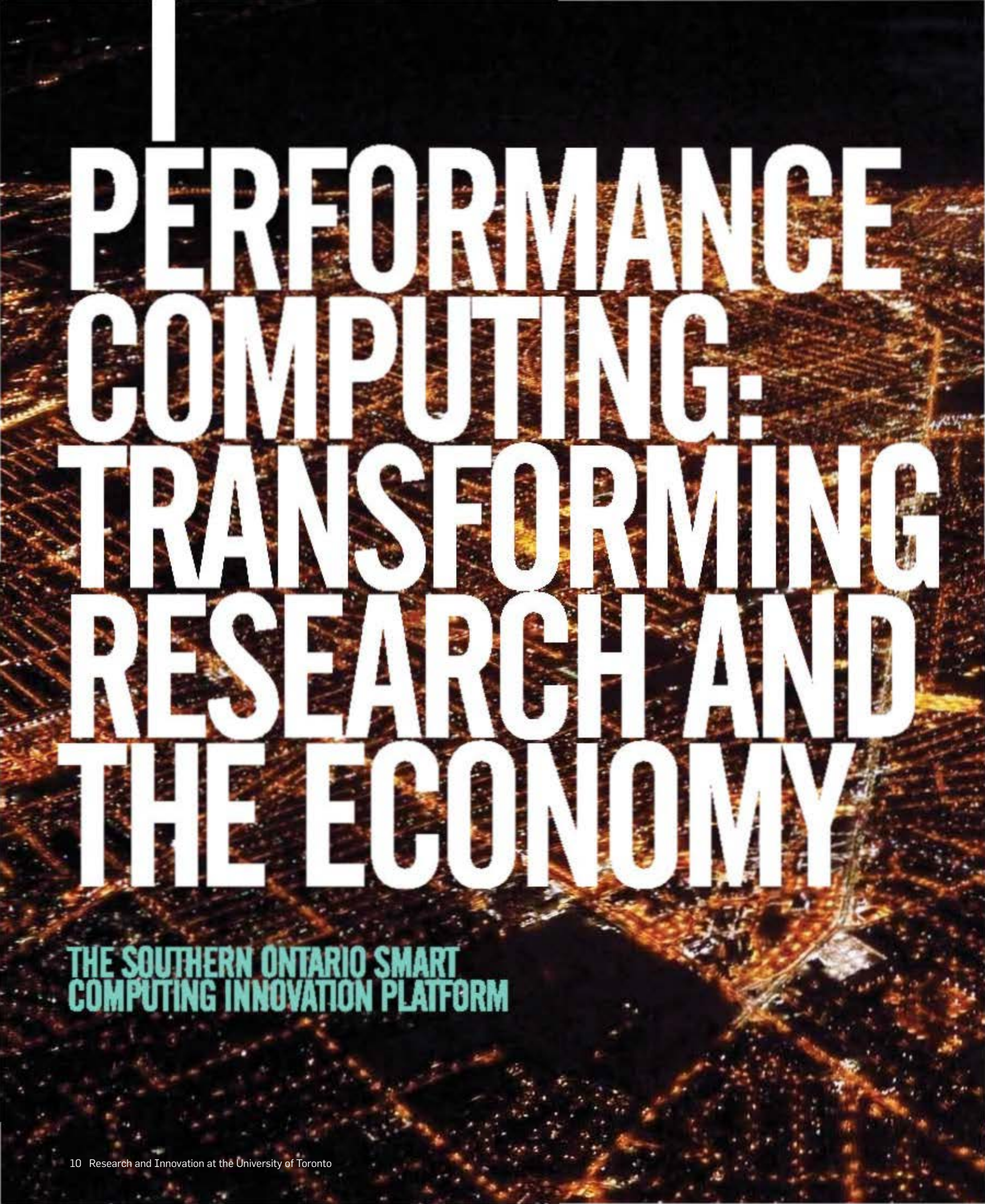
Researchers from the **University of Chicago, Durham University** and **Cornell**

+

The Royal Ontario Museum

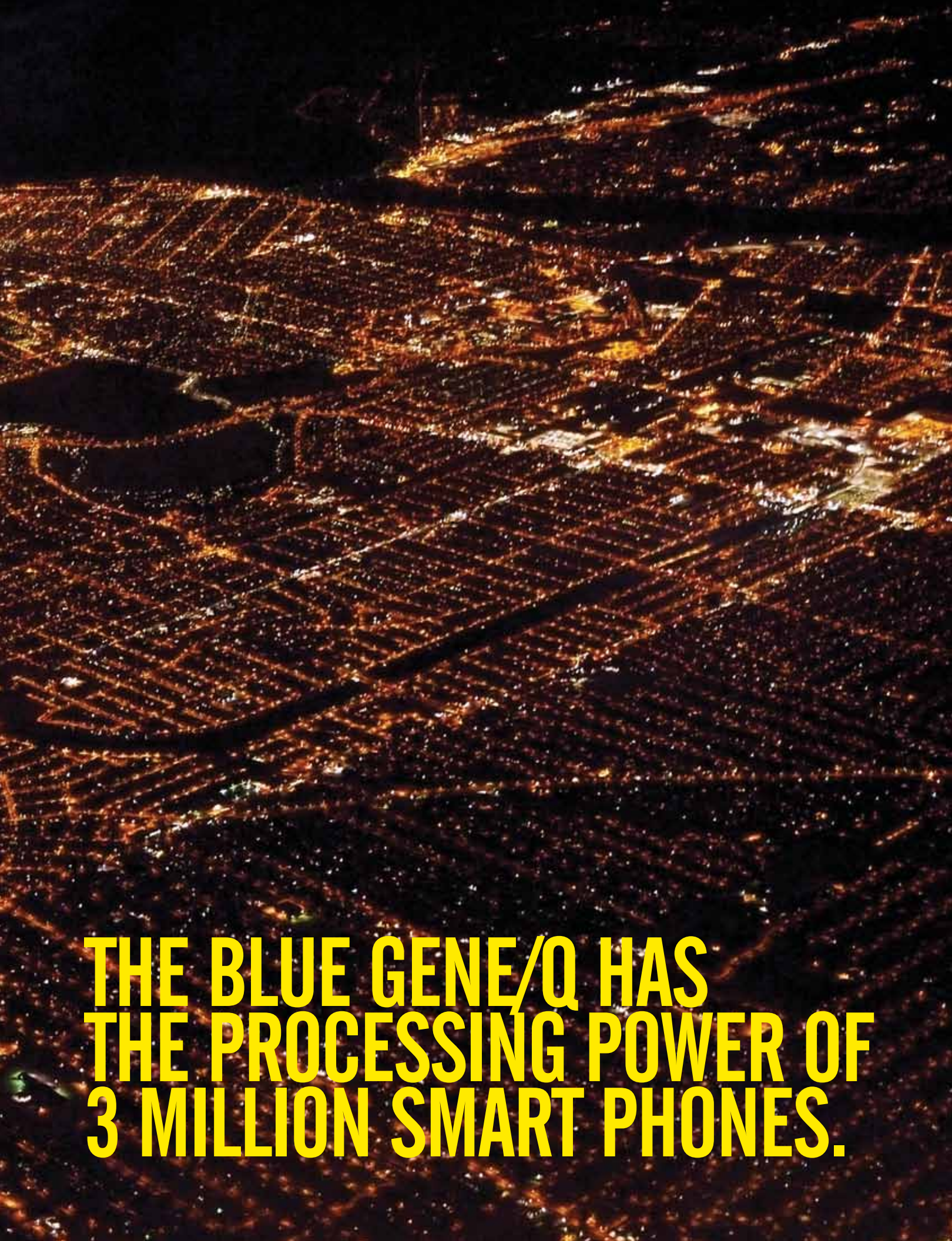
+

Argonne Labs



PERFORMANCE COMPUTING: TRANSFORMING RESEARCH AND THE ECONOMY

THE SOUTHERN ONTARIO SMART COMPUTING INNOVATION PLATFORM

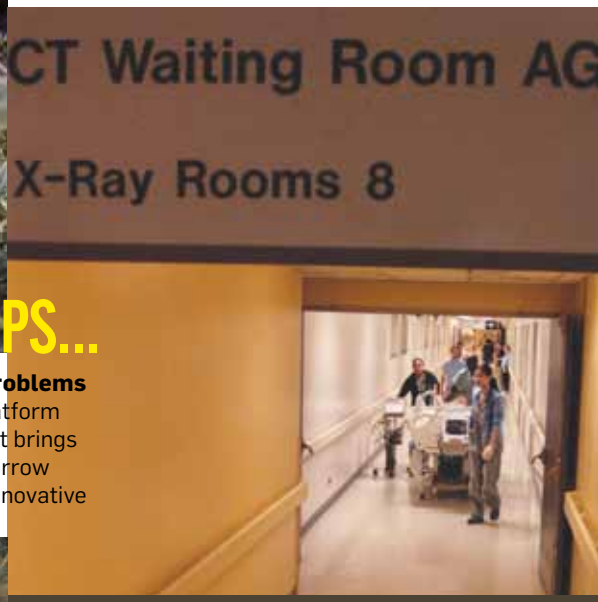

THE BLUE GENE/Q HAS
THE PROCESSING POWER OF
3 MILLION SMART PHONES.

TODAY'S BIG DATA CHALLENGES: CITIES, HEALTH, ENERGY, WATER

How can we use Big Data to make our **cities** work better? How can we monitor premature babies to improve their health outcomes and chances of survival? We all know we need alternatives to **oil and gas**—but how do we get new green technologies to be competitive? **Water** is the key to life—can data help us manage this precious resource? Can we find more efficient ways to make better cars that are also more affordable? How can we ensure that the security of our data and our privacy are protected?

THE RECIPE FOR PROGRESS: MIX SMART PEOPLE, SMART PARTNERSHIPS...

Traffic congestion, pollution, oil alternatives, premature babies, clean water. **These problems define Big Data complexity**. The Southern Ontario Smart Computing Innovation Platform (SOSCIP) is designed to deal with that complexity while boosting Ontario's economy: it brings together top academic researchers and cutting-edge businesses in collaboration to narrow the gap between research and innovation. And it provides these talented people and innovative organizations with some of the most powerful computing technologies ever devised.



...AND SMART TECHNOLOGIES

- The **IBM BlueGene/Q** supercomputer (the fastest in Canada and one of the fastest on the planet) located at U of T's SciNet high performance computing facility
- **Cloud and agile** computing platforms located at Western University

THE NETWORK

- **Seven founding universities**—U of T, Western, McMaster, Ottawa, UOIT, Queen's and Waterloo—plus new members Carleton, Laurier, Ryerson and York and more to come in the future.
- **IBM Canada**
- **Over 30 Ontario businesses and growing**
- **Ontario Centres of Excellence**
- **In partnership with the Government of Canada and the Province of Ontario**

SOSCIP'S GREATEST STRENGTH IS ITS FOCUS ON PEOPLE AND PARTNERSHIPS. OUR UNIQUE COLLABORATIVE MODEL FOR RESEARCH AND DEVELOPMENT BRINGS TOGETHER UNIVERSITY PROFESSORS, POST-DOCTORAL FELLOWS AND GRADUATE STUDENTS TO WORK ON ADVANCED COMPUTING PLATFORMS WITH RESEARCHERS FROM IBM AND SMALL TO MEDIUM-SIZED ENTERPRISES. LIKE ANY PARTNERSHIP, THE CRITICAL CATALYST IS THE MATCHMAKER. THIS IS ALSO TRUE OF SOSCIP. THE HIGH PERFORMANCE COMPUTING TEAM AT THE ONTARIO CENTRES OF EXCELLENCE MATCHES COMPANIES WITH UNIVERSITY RESEARCHERS TO WORK ON COLLABORATIVE PROJECTS.

– Prof. Paul Young, Vice President, Research & Innovation, University of Toronto, Co-Chair, SOSCIP Board of Directors

– Mr. Dan Sinai, Associate Vice President, Research, Western University, Co-Chair, SOSCIP Board of Directors

THE MELT IS ON

THE CANADIAN SEA ICE AND SNOW EVOLUTION NETWORK (CanSISE)

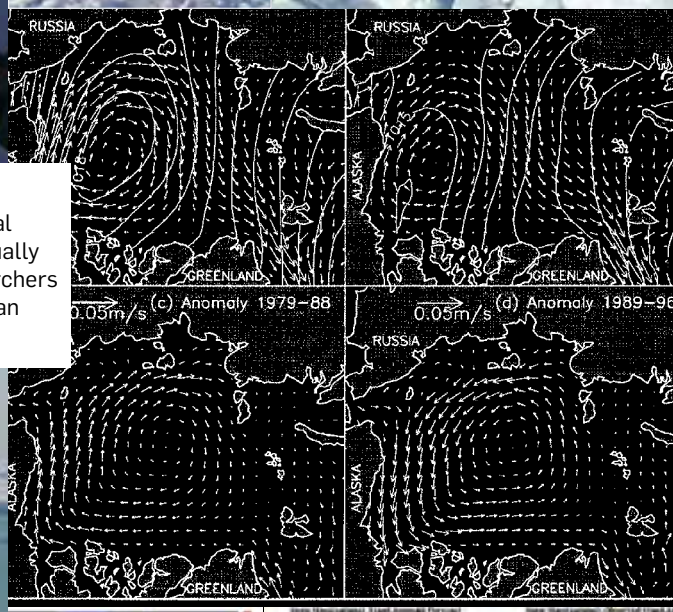
SUSTAIN:
HUMANITY AND THE ENVIRONMENT

THE PAST SEVEN SUMMERS HAVE SEEN THE SEVEN LOWEST ARCTIC SEA ICE MINIMUMS SINCE SATELLITE RECORDS BEGAN IN 1979.

MELTING ARCTIC ICE IS CHANGING LIFE ON EARTH. WANT TO KNOW WHY?

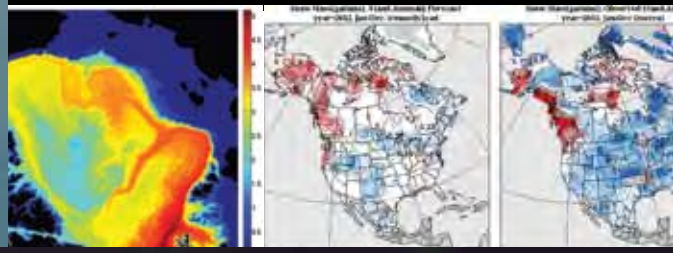
Records are being shattered, but it's not a good thing. In 2007 and 2012, there were record-breaking sea ice melts in the Arctic. 2013 saw the most rapid retreat of snow from the Arctic ever. With ice and snow at historic lows, CanSISE was formed to investigate these losses. The network will:

- Make seasonal and multi-decade predictions about snow and ice coverage
- Learn how much of the change is attributable to human influence and understand what the broader impact of snow and sea ice loss will be
- Improve our understanding of the relationship between snow and sea ice change and climate.



THE BIG VALUE IN SHARING DIFFERENT TYPES OF RESEARCH

CanSISE bridges university and government researchers to come up with new ways of sharing data and ideas. It also brings together experimental researchers with theoreticians who construct models—groups that don't usually work together. Under the CanSISE umbrella, measurements taken by researchers crossing the ice on snowmobiles, aerial observations and satellite imagery can be brought into simulations and models.



THE NETWORK

- **Eight Canadian universities:** Toronto, Victoria, UBC, York, Waterloo, Guelph, UNBC, McGill
- **Environment Canada**
- **The Pacific Climate Impacts Consortium**
- **Individual collaborators** from universities and governments in Canada, the U.S., France, South Korea and the U.K.
- **Funded by NSERC**

"IN 2013 WE HAD THE MOST RAPID RETREAT OF SNOW FROM THE ARCTIC FROM APRIL TO JUNE. IT'S BEEN DISAPPEARING. WE HAVE PEOPLE GOING UP TO MEASURE IT AND IT'S NOT THERE."

– Paul Kushner, professor, U of T Department of Physics and Principal Investigator, CanSISE

WHAT'S AT STAKE?

You've seen the photos of the polar bears stranded by the melting of their once icy habitat? **Sea ice and snow loss are threatening northern communities** that rely on local sources of food and endangering wildlife and ecosystems.

Snow is also a reservoir for water—it dictates the amount of water that's in the soil in the spring and summer. This, in turn, affects everything from agriculture to ecosystems, determines stream flow in the Rockies and influences summer climate.


RELIGION
STILL
MATTERS.
LET'S
DISCUSS IT.
RELIGION IN THE
PUBLIC SPHERE INITIATIVE (RPS)

IN 2010 MORE THAN 84% OF THE GLOBAL POPULATION WAS RELIGIOUSLY-AFFILIATED.

WHAT'S IT ABOUT?

Is there any force in human history that has inspired and provoked more people and transformed society more than religion? It has affected almost everything—from health care to war and peace, from capital punishment to what we wear at work, from what we eat to how we feel about marginalized peoples, from what our laws dictate to how our taxes are used for education, from when retail stores are open to what a Hollywood movie can show. Religion has been a mystery and influence since the earliest days of humanity. And it still is today—a force that gets us reacting and talking about how we live our lives.

RPS—WHERE DOES IT FIT IN?

Reli[illegible] plores the intersection of religion with[illegible] It examines how religion man[illegible] itutions and interactions, and cons[illegible] **possibilities of religious dive**[illegible] d the globe.

THE NETWORK

- **U of T** faculty members and students from disciplines like law, public health and the study of religion
- **Partner universities** like Utrecht, Columbia, and the London School of Economics
- **Organizations** like Citizenship and Immigration Canada and the Inspirit Foundation

WHAT DOES IT DO?

RPS has many activities, which often include bringing its research network together to help society take action for change. For example, when the Ontario Human Rights Commission wanted help defining the word "creed" in the human rights code, it turned to RPS. The result was a day-long community research workshop, bringing together students, government, researchers and citizens from across the GTA. With its members committed to informing policy debates and exposing students to ideas at work in the world, the network is, says Professor Simon Coleman of the Department for the Study of Religion, **"an experiment in putting people together who wouldn't normally be together—and seeing what happens."**

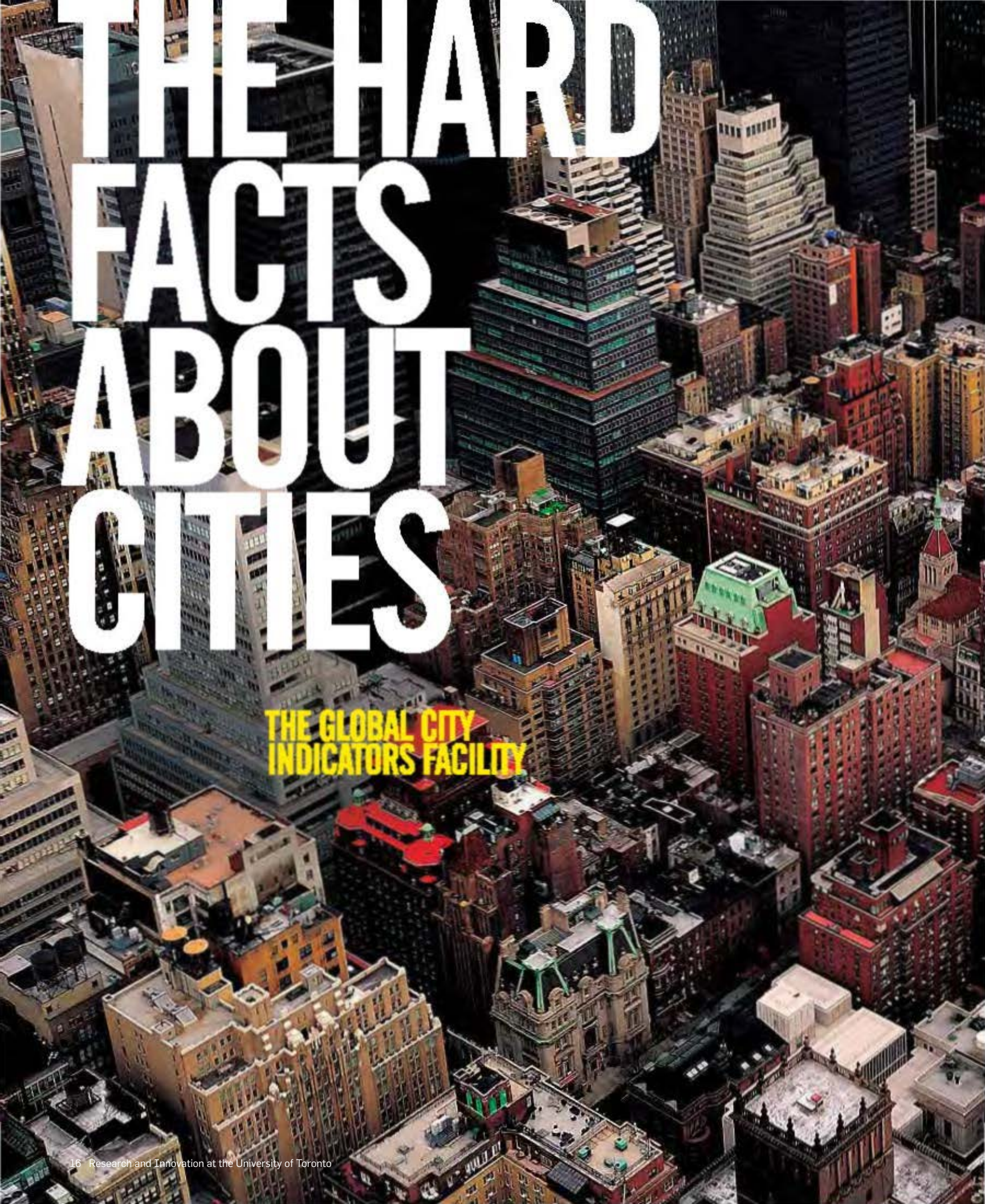
> "IT DOESN'T MATTER IF YOU'RE RELIGIOUS OR NOT. PEOPLE ARE OUT IN THE WORLD MAKING THINGS HAPPEN IN THE NAME OF RELIGION. WE NEED TO BE STUDYING THIS."

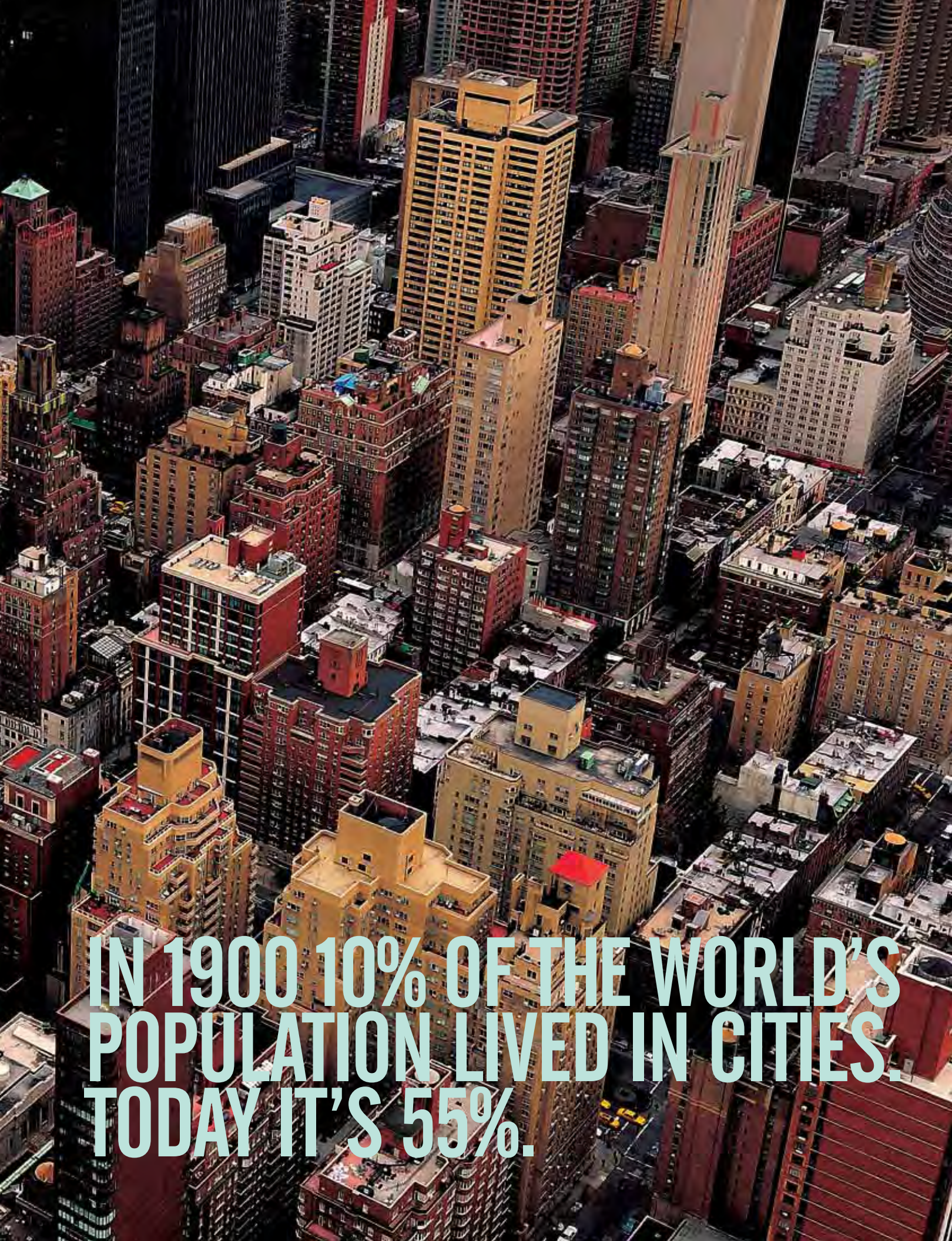
Pamela Klassen, professor, U of T Department for the Study of Religion and Director, RPS

RPS faculty (from left to right): Professors Simon Coleman, Amira Mittermaier, Ruth Marshall, Pamela Klassen and Kevin Lewis O'Neill

THE HARD FACTS ABOUT CITIES

THE GLOBAL CITY INDICATORS FACILITY




IN 1900 10% OF THE WORLD'S
POPULATION LIVED IN CITIES.
TODAY IT'S 55%.

THE URBAN REVOLUTION (PART I)

We are living on what has been called an urban planet. By 2050, 70 per cent of the world's population will live in cities. And cities are becoming powerful economic engines. Right now, 70 per cent of the world's gross domestic product (GDP) is generated by cities, which means the economic strength of cities ranks alongside the most powerful countries in the world. **In short, cities are important.**

THE URBAN REVOLUTION (PART II)

This growth creates opportunities—and challenges. To accommodate the growth and importance of cities, urban governments have to re-design their cities in various ways. How should, say, Winnipeg plan for transit? What should Bogota, Colombia, do to provide health services, like ambulances and hospitals? And what about safety in Toronto, or protection of the natural environment being usurped by the urban sprawl of New York City? And how do all cities prepare for climate change and natural disasters?

WHAT IS THE KEY TOOL FOR URBAN IMPROVEMENT?

Data. Hard information that makes the realities of cities tangible. Information that mayors can use when planning change. How, for example, is Richmond Hill, Ontario, dealing with hospital care compared to Surrey, B.C.? What are fire service response times in Madrid versus Montreal? How are downtown business improvement plans working in Phoenix and Liverpool?

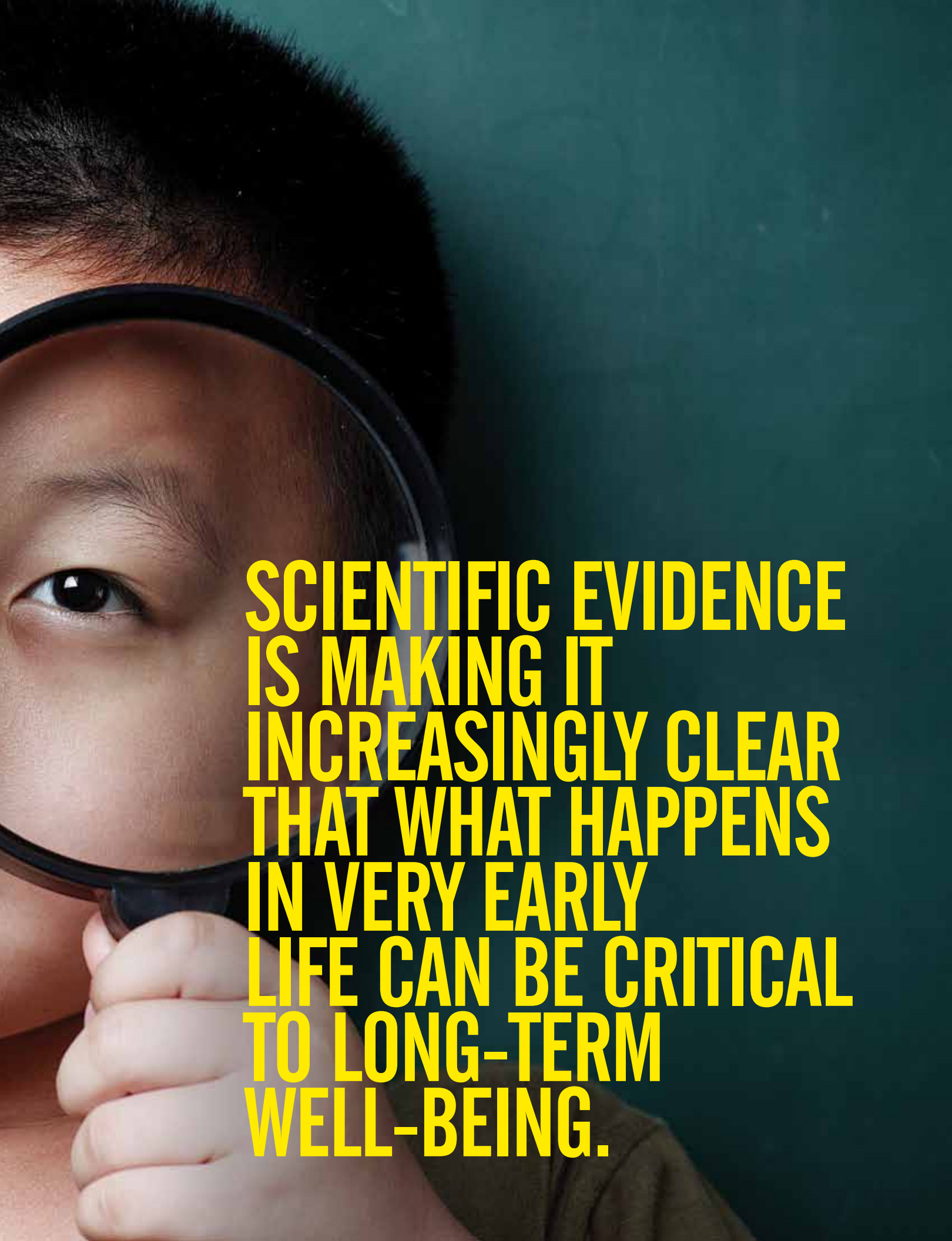
ENTER THE GCIF

The Global City Indicators Facility at U of T was founded in 2009 with funding from the World Bank and nine pilot cities. Today, the GCIF has **253 cities** from around the world in its network. Cities feed information about urban topics into the GCIF. That information is then made available to member cities. And it's information that is standardized, so comparison is effective and meaningful. In fact, the GCIF set of indicators has been approved as the first International Standards Organization standard on city metrics.

"CITIES HAVE BECOME TOO IMPORTANT TO NOT BE USING STANDARDIZED DATA TO PLAN THEIR NEXT MAJOR STEPS. WE'VE SEEN A TREMENDOUS INTEREST IN THE GCIF AND OUR GROWTH HAS BEEN MUCH FASTER THAN I THOUGHT IT WOULD BE. NOW WE HAVE AN INTERNATIONAL NETWORK OF CITIES USING THE INFORMATION GATHERED THROUGH THE GCIF. WE ARE IN A NEW AGE OF URBAN PLANNING AND RE-PLANNING. TO DO IT RIGHT, YOU NEED THE RIGHT INFORMATION."

– Patricia McCarney, professor, U of T Department of Political Science and Founding Director, GCIF


FIRST
2000
DAYS
THE FRASER MUSTARD INSTITUTE
OF HUMAN DEVELOPMENT



SCIENTIFIC EVIDENCE IS MAKING IT INCREASINGLY CLEAR THAT WHAT HAPPENS IN VERY EARLY LIFE CAN BE CRITICAL TO LONG-TERM WELL-BEING.

CHILDREN'S LIFE EXPERIENCES MATTER MORE THAN WE EVER IMAGINED

The early life experiences of kids have a profound [illegible] on their [illegible] way they develop. Examples: Growing up poor makes it harder to learn. Breastfed babies grow up to be less obese. The Fraser Mustard Institute for Human Development is documenting the impact of the earliest experiences of children on their lifelong health, learning and social abilities.

WE HAVE THE POWER TO INFLUENCE THOSE EARLY EXPERIENCES TO HELP KIDS

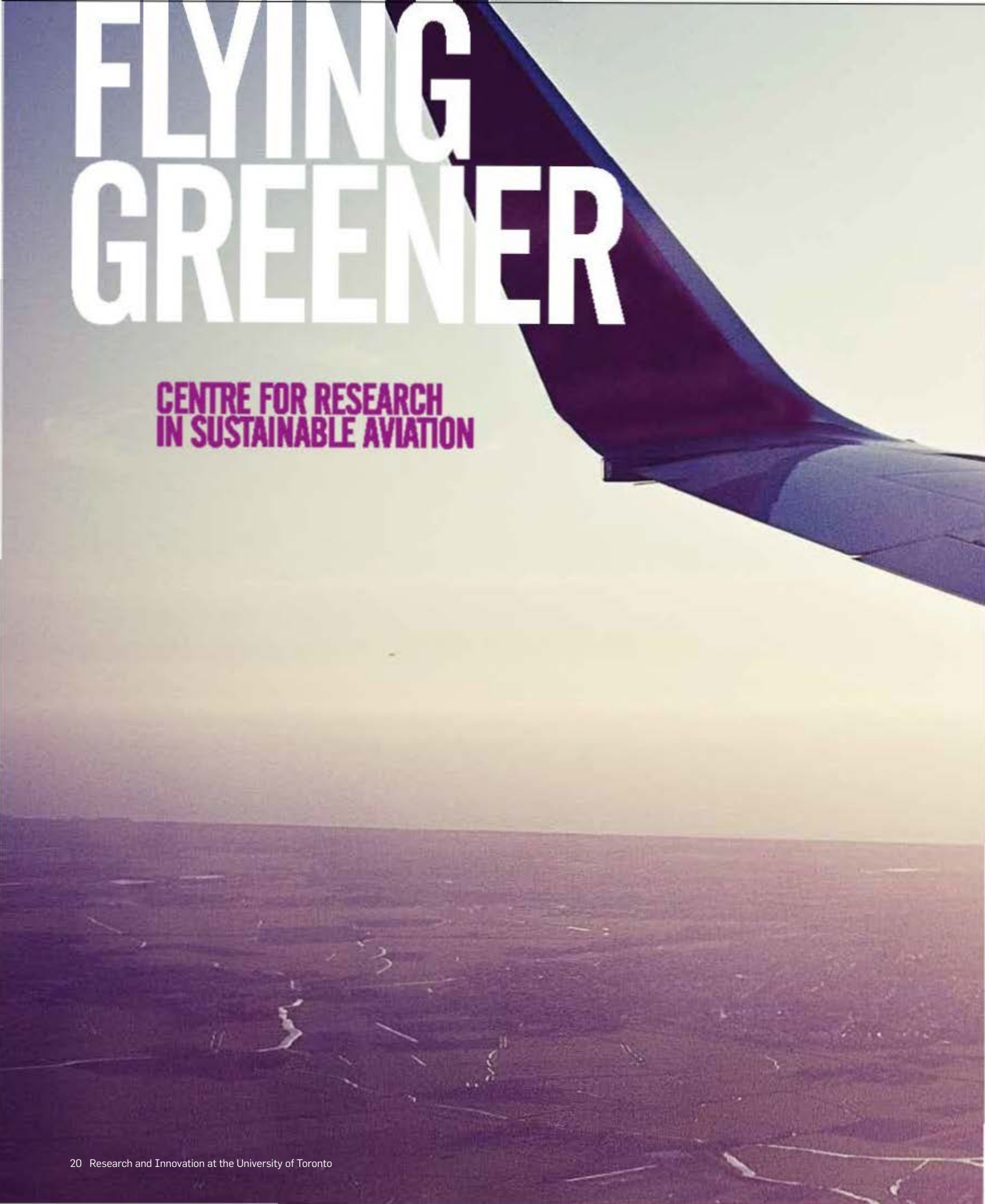
Experiences in the womb and in the first years of life create chemicals that interact with a child's DNA. This means we have a window of opportunity to create better outcomes for kids—**genetics isn't destiny.** And it goes beyond helping individual kids. Policy changes designed to help mothers and children lead to healthier societies and save money. Example: 40 per cent of babies could carry a copy of the gene that predisposes them to be overweight and obese during childhood and adulthood. But three to six months of breastfeeding could revert their risk and ensure normal development.

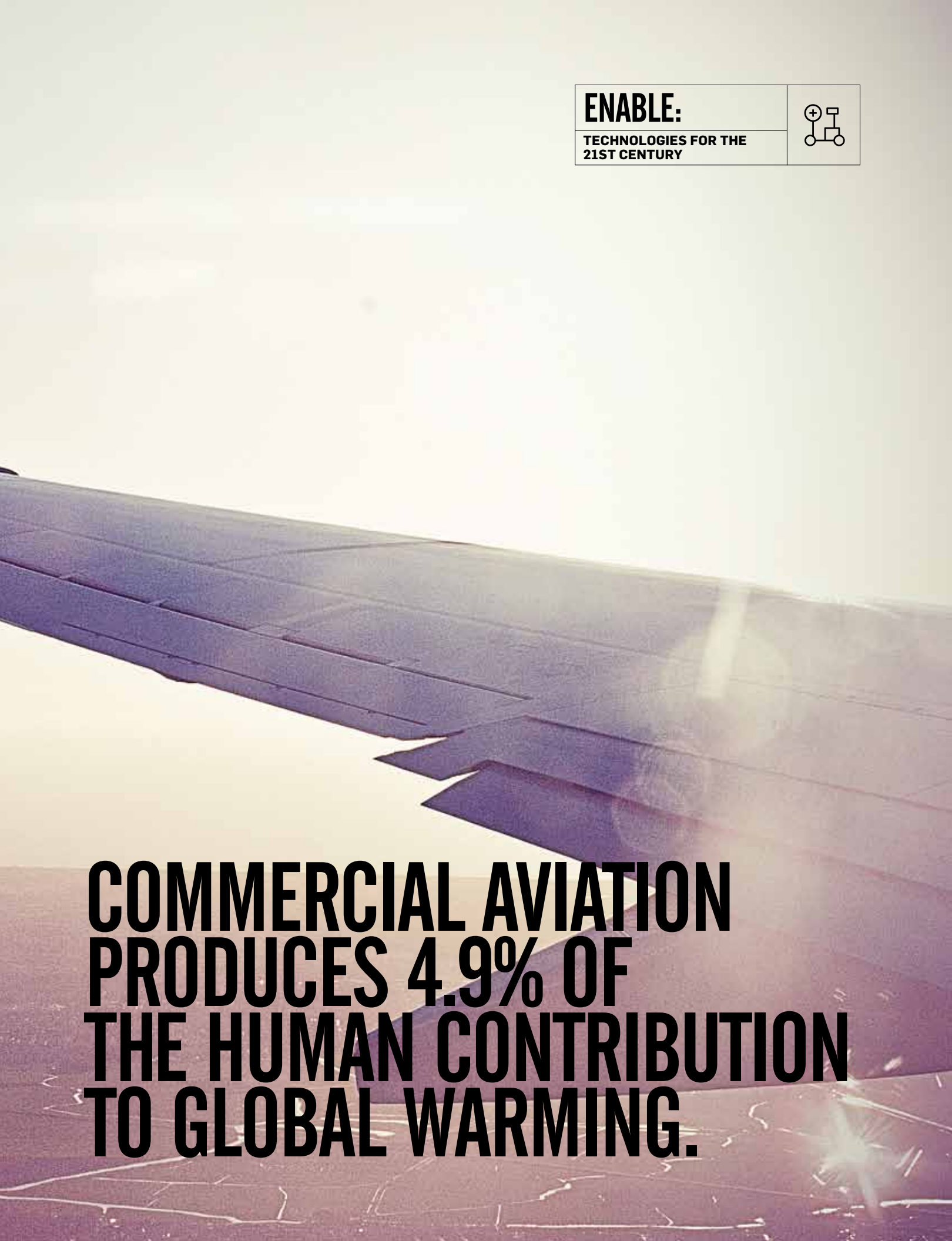
"OUR SOCIETY HAS DECONSTRUCTED THE CHILD. WE'VE GIVEN CHILD HEALTH TO DOCTORS TO WORRY ABOUT, LEARNING TO SCHOOLS AND BEHAVIOUR TO SOCIOLOGISTS. BUT KIDS' BRAINS AREN'T DIVIDED THAT WAY. OUR NETWORK IS WORKING TO BREAK DOWN THESE SILOS AND CREATE SPARKS OF INNOVATION TO IMPROVE THE WELL-BEING OF KIDS, AND THE SOCIETIES THEY LIVE IN."

Stephen Lye, professor, U of T Department of Obstetrics and Gynaecology; Associate Director, Research, Lunenfeld-Tanenbaum Research Institute, Mount Sinai Hospital; and Executive Director, Fraser Mustard Institute for Human Development

THE NETWORK

- Includes **researchers** from throughout U of T and its partner hospitals
- **Research themes:**
  - > Healthy Kids
  - > The Developing Brain and Human Potential
  - > Aboriginal Health and Wellbeing
  - > The World's Child
  - > Developmental Path and Interventions
- **Partnered with organizations** like the Karolinska Institutet and the Aga Khan Foundation
- **Advises government**
- **Funded by U of T's Connaught program**


FLYING
GREENER
CENTRE FOR RESEARCH
IN SUSTAINABLE AVIATION



ENABLE:

TECHNOLOGIES FOR THE 21ST CENTURY

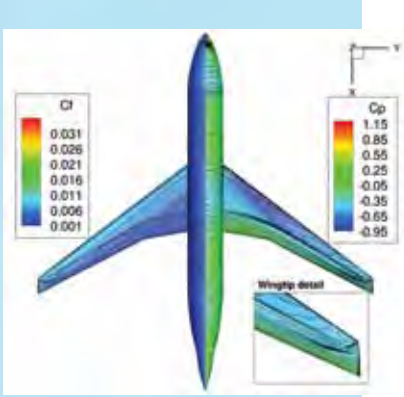
COMMERCIAL AVIATION PRODUCES 4.9% OF THE HUMAN CONTRIBUTION TO GLOBAL WARMING.

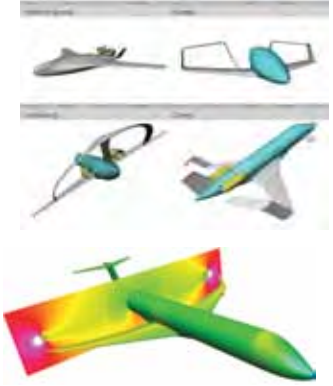
THE PLANET IS HEATING UP

We live on a warming planet. Commercial air travel is responsible for 4 per cent of the total human contribution to that warming—and demand for air travel is climbing.

AN AMBITIOUS TARGET TO REDUCE EMISSIONS

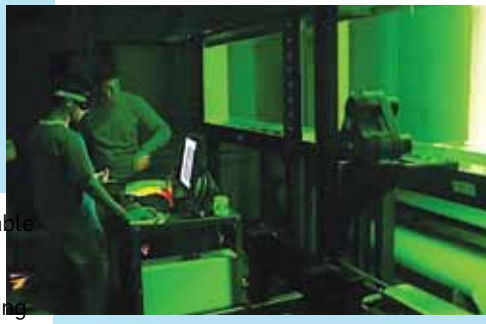
The International Air Transport Association has targeted a **50-per-cent drop in emissions** by 2050, relative to 2005 levels. And because planes travel for 30 years, change needs to happen now. At the same time, Canadian aerospace companies are always striving to remain globally competitive.





THE NETWORK

Under the umbrella of the Centre for Research in Sustainable Aviation, collaborators from U of T, partner universities like Michigan, Stanford, Sherbrooke and Cambridge, and companies like Bombardier and Pratt & Whitney are working together to figure out **how to make air travel greener**.



HOW DOES A NETWORK HELP?

Since many of the components of sustainable aviation are not traditional topics for aerospace engineering, the network has a broad reach and has invited contributions from fields as diverse as law and chemistry. It also includes a training component so **the next generation of engineers and scientists** will have the skills and knowledge to effect the change required to meet emissions targets.

HOW?

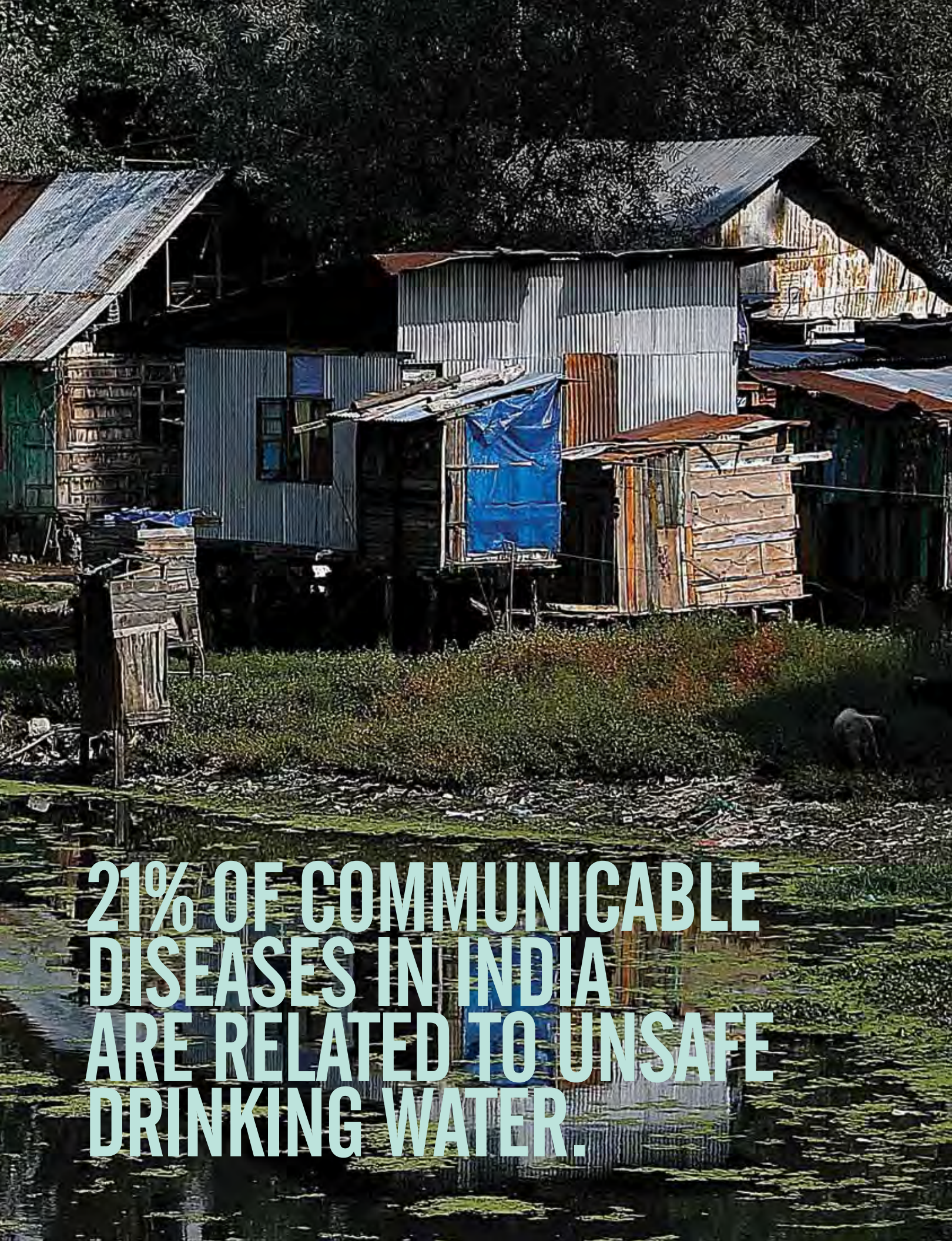
- **Making airplane parts out of lighter materials**
- **Redesigning planes to see if a configuration other than the standard "tube with wings" could be more energy efficient**
- **Using biofuels to make combustion less harmful**

"FIFTY YEARS AGO, THE MANTRA IN FLIGHT WAS: HIGHER, FASTER, FURTHER. WE'VE GONE AS HIGH AND FAST AND FAR AS WE CAN. NOW, CLIMATE CHANGE IS THE ISSUE OF OUR DAY. WE HAVE OTHER PROBLEMS, BUT IF WE DON'T SOLVE THE CLIMATE PROBLEM, NONE OF IT WILL MATTER."

– David Zingg, professor and Director, U of T Institute for Aerospace Studies

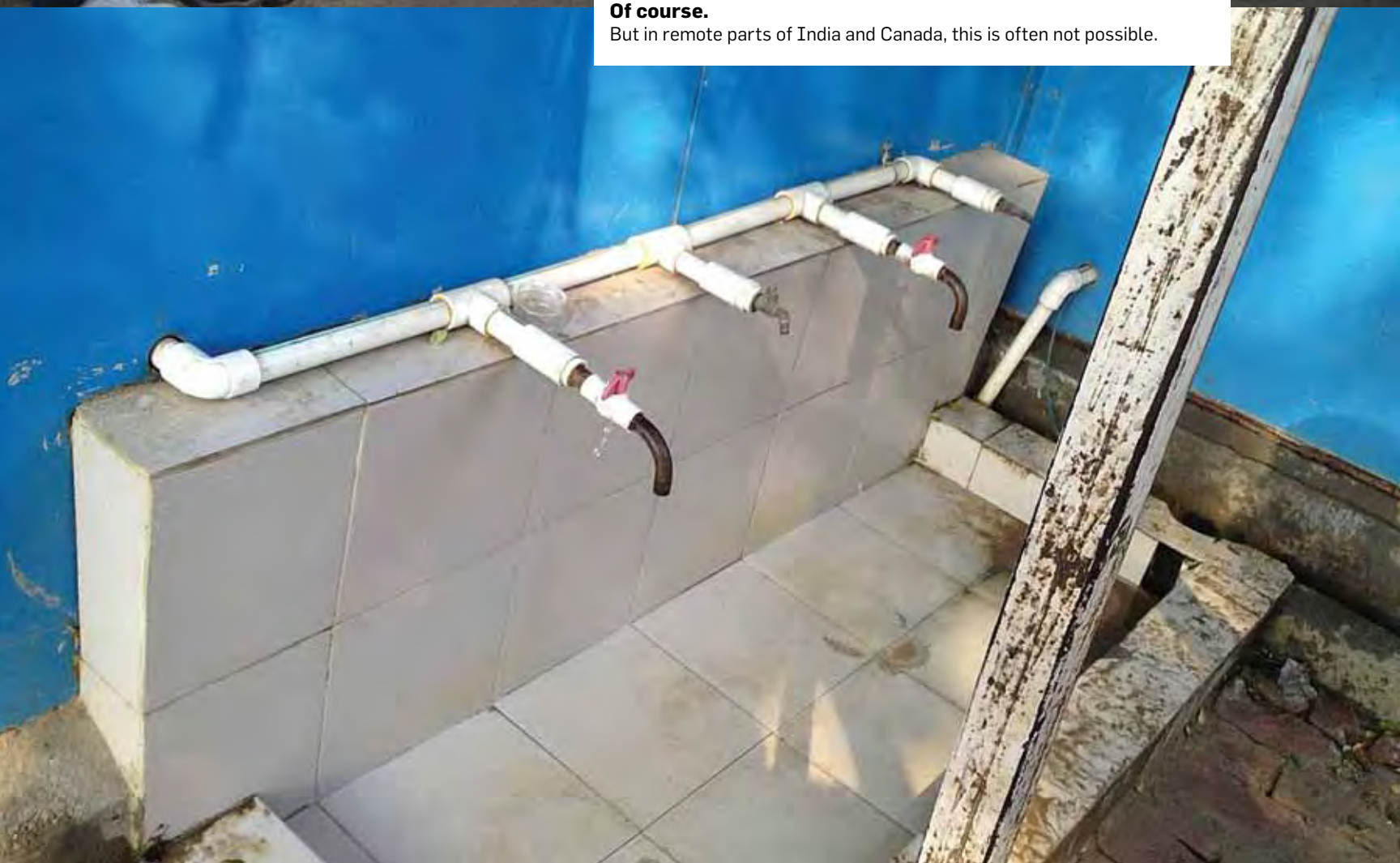
URGENT ACTION FOR REMOTE COMMUNITIES

IC-IMPACTS


21% OF COMMUNICABLE
DISEASES IN INDIA
ARE RELATED TO UNSAFE
DRINKING WATER.

IT'S HARD TO BELIEVE THIS IS TRUE

Should you be able to drink water in your home and be sure it's safe?
Should you have fast and easy access to a doctor?
Should the sewage system where you live work correctly?
Of course.
But in remote parts of India and Canada, this is often not possible.



WHAT IS IC-IMPACTS?

The official name is the **India-Canada Centre for Innovative Multidisciplinary Partnerships to Accelerate Community Transformation and Sustainability**. The initiative was launched in 2012 with investment from the Government of Canada's Networks of Centres of Excellence program.

THE NETWORK

IC-IMPACTS begins with a partnership between the University of British Columbia, the University of Alberta and the University of Toronto. From there, a large, international team comes together, made up of researchers, industry innovators, community leaders, government agencies and community organizations from India and Canada.

THE GOAL IS IMPACT

- **Integrated Water Management**—new technologies to monitor water quality and to treat drinking and waste water.
- **Sustainable and Safe Infrastructure**—new tools and technologies to ensure civil infrastructure (like sewers) and concrete structures (bridges, for example) can be assessed, repaired and rebuilt.
- **Public Health**—develop new point-of-care solutions for monitoring infectious diseases, mobile health applications for delivering educational messages and new training programs for field workers.

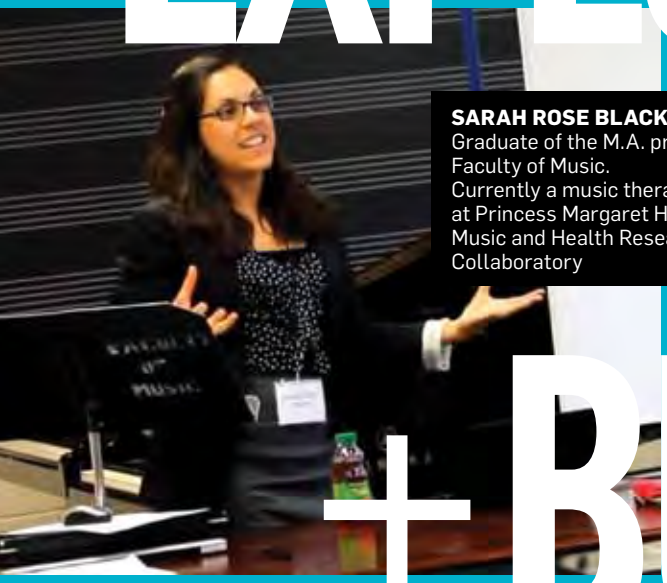
"THESE ARE COMPLEX PROBLEMS FACED BY COMMUNITIES IN BOTH INDIA AND CANADA. THAT'S WHY WE NEED A SOPHISTICATED NETWORK OF EXPERTS TO FIND SOLUTIONS. WE'LL HAVE ENGINEERS WORKING WITH EXPERTS IN MANUFACTURING, PUBLIC HEALTH AND NURSING. WE'RE BIG ON BREAKING OUT OF THE BOX. WE WANT NEW WAYS TO CREATE A POSITIVE IMPACT."

– Stewart Aitchison, professor, U of T Edward S. Rogers Sr. Department of Electrical and Computer Engineering and Associate Scientific Director, IC-IMPACTS

Research networks don't just conduct research—they train students. Students are also critical to the success of all the networks featured here. And today's students will go on to become tomorrow's researchers, policy makers and leaders.

DERRICK CHOV
MASc Student,
U of T Institute
Aerospace Studi
Centre for Resea
Sustainable Avia

U OF T STUDENT EXPLORING + SU ENGAGIN + BUILDING + PROMOTING.



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Currently a music therapist at Princess Margaret Hospital, Music and Health Research Collaboratory

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Master s student,
Department of Civil Engineering,
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S
USTAINING +
G + ADVANCING
ENABLING +

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For more information on these research networks:
http://home.web.cern.ch
http://www.music.utoronto.ca/about/MaHRChome.htm
https://www.crane.utoronto.ca
http://soscip.org
http://www.cansise.ca
http://rps.chass.utoronto.ca
http://www.cityindicators.org
http://www.oise.utoronto.ca/humandevelopment
http://www.utias.utoronto.ca/sustainable aviation
http://ic impacts.com

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U OF T RESEARCH BY THE NUMBERS

THE POWER OF RESEARCH NETWORKS

For more information on data sources in this booklet, please visit **researchnetworks.utoronto.ca**

AN ACADEMIC ECOSYSTEM

U of T's three campuses and nine partner hospitals form a robust ecosystem. Our commitment to maintaining a depth, breadth and standard of excellence in research and scholarship is unrivalled in Canada and rare in the world. Collectively, this ecosystem reflects and upholds U of T's reputation as one of the world's top universities.

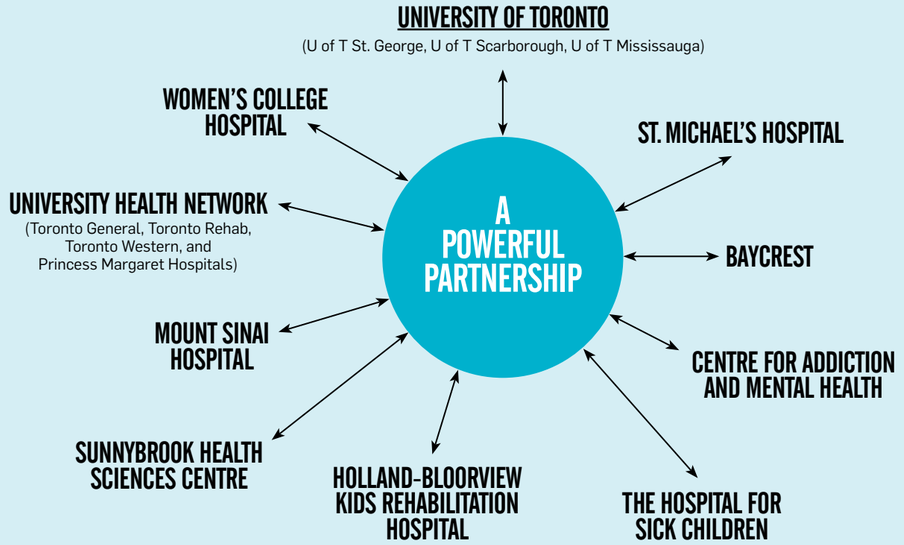
7,000
full-time faculty members

2,700
postdoctoral fellows and research associates

15,000
graduate students

$1.2B
annual research funding

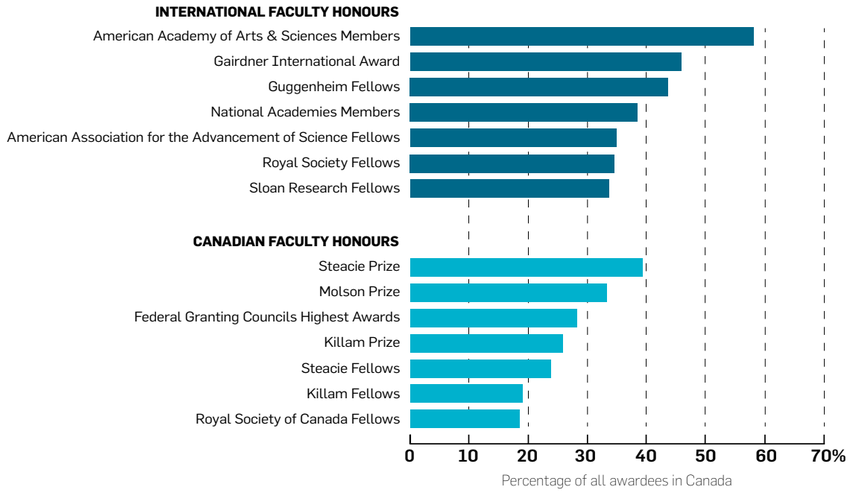
10,000
annual publications



FACULTY EXCELLENCE

U of T's excellence is the product of its people. Our researchers consistently win more prestigious awards and prizes than their peers at any other Canadian university. As a research community, this brilliant team helps make Canada a global leader in knowledge and innovation. (See the end of this book for a detailed list of awards and honours received by our faculty between February 2012 and February 2014.)

Faculty Honours (1980-2013)

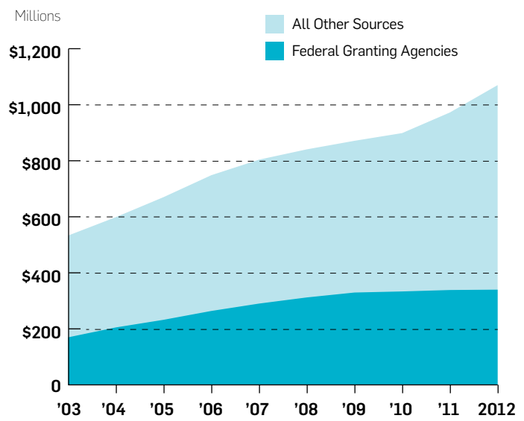


RESEARCH FUNDING

Great ideas attract great investment from a variety of sources. Despite a challenging fiscal environment, the University of Toronto's ability to attract more than $1.2 billion per year in research funding is a direct result of the excellent ideas, powerful innovations and strong commitment to partnership of more than 7,000 faculty members and 1,000 sponsors. U of T is grateful for ongoing investment from its many partners.

Research Funds Awarded – Ten-Year Trend in Current Dollars

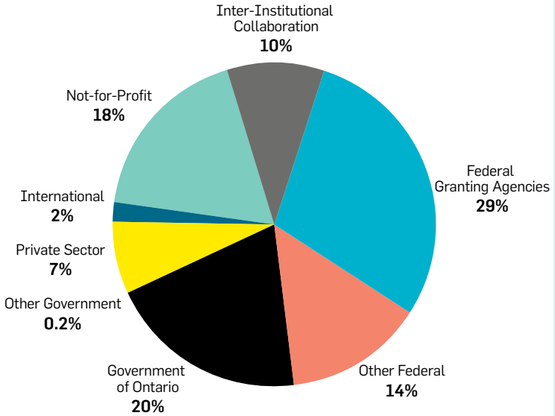
U of T and Partner Hospitals



Research Funds Awarded by Sector (2011-12)

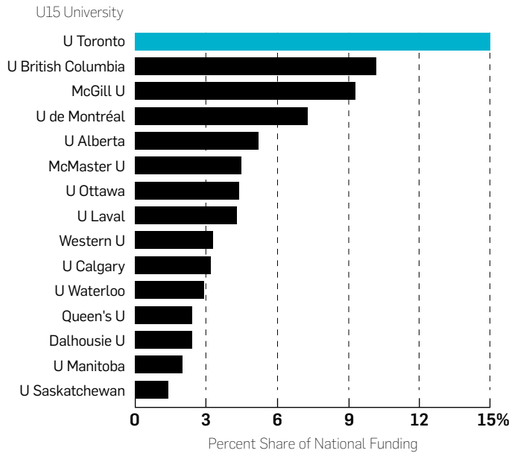
U of T and Partner Hospitals

Total: $1.2B



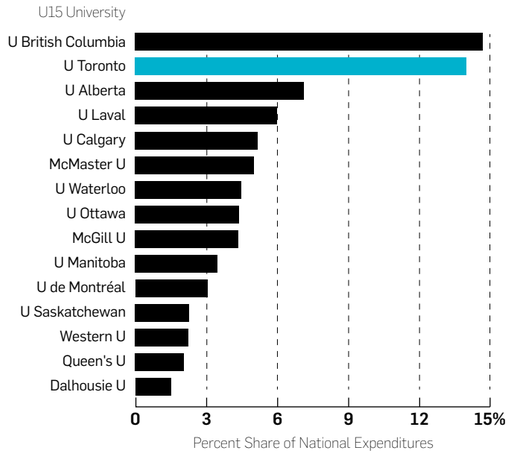
FEDERAL FUNDING

Share of Tri-Agency Funding (2012-13) U15 Universities



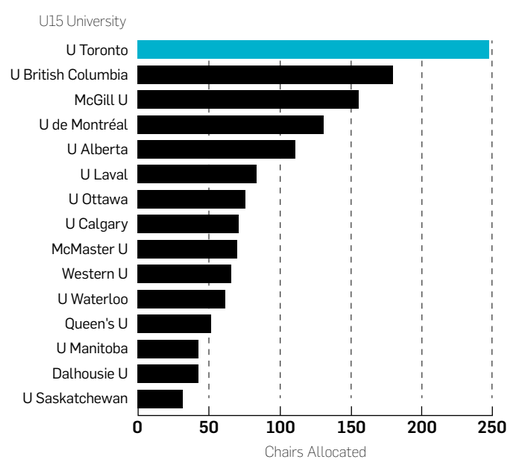
Investment from the tri-agencies is the lifeblood of U of T research.

Networks of Centres of Excellence Expenditure (2009-10 to 2011-12) U15 Universities



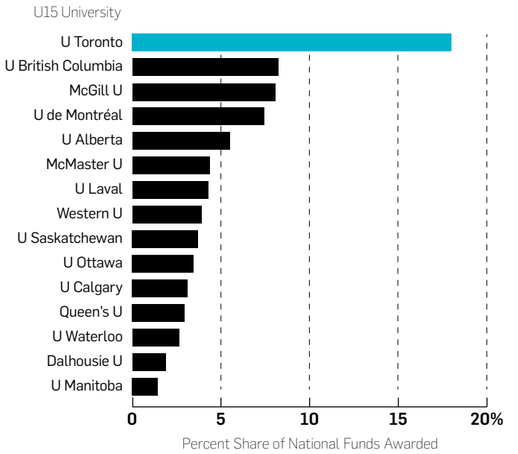
U of T is a participant in 12 of 13 active Networks of Centres of Excellence. We are committed to increasing our networked research activity.

Canada Research Chairs Regular Chairs Allocation (2013-14) U15 Universities



As a result of our strong showing in tri-agency and Networks of Centres of Excellence competitions, we have been able to use our high CRC allocation to attract and retain the world's best research talent. This marquee program helps place Canada on the international research stage.

Canada Foundation for Innovation (CFI) Funding Since Inception (1998-2013) U15 Universities



U of T and partner hospitals have earned over $800 million in research infrastructure funding, keeping Canadian research on the global map. As a leader in CFI funding, U of T is able to keep top research talent in Canada.

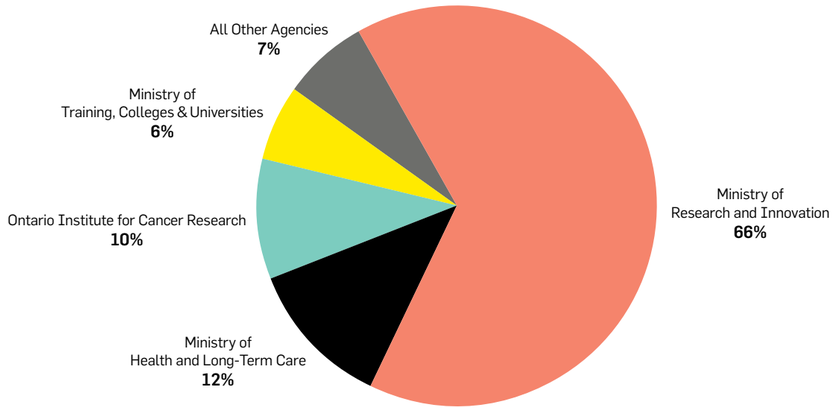
ONTARIO GOVERNMENT FUNDING

U of T is the grateful recipient of 54 per cent of Ontario's provincial research funding, which keeps our province globally competitive.

Provincial Funding (2011-12)

U of T and Partner Hospitals

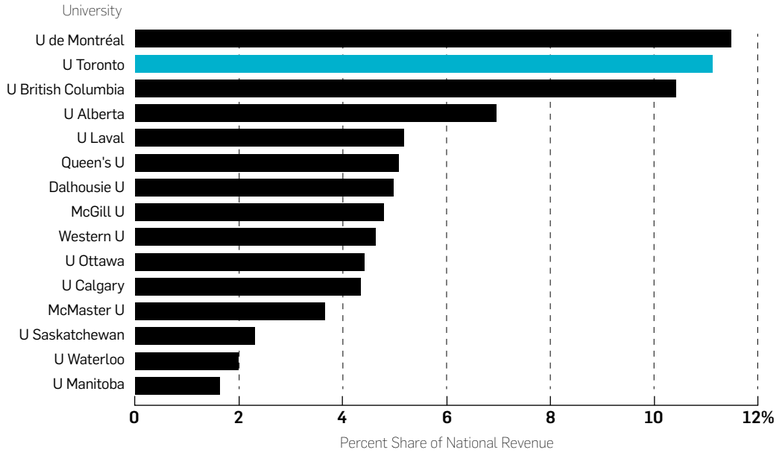
Total: $240M



PRIVATE SECTOR PARTNERSHIPS

U of T is a leader in working with the private sector to innovate in a multitude of areas that have an impact on global society.

Research Revenue from Industry (2011-12)
U15 Universities

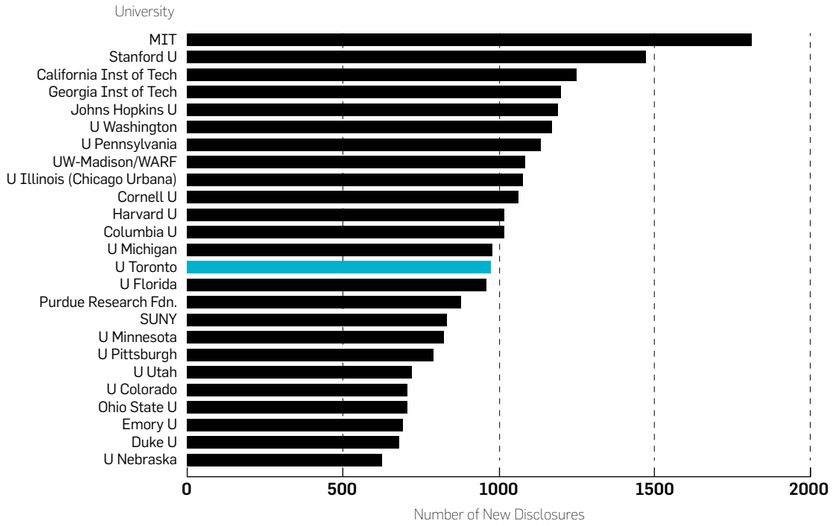


INNOVATION

U of T is a Canadian and North American leader in generating new ideas and inventions.

Over **70%** of the invention disclosures at U of T include a student as a co-inventor.

New Invention Disclosures (2009-10 to 2011-12)
U.S. & Canadian Universities



Note: Universities which report as systems are excluded.

INNOVATION

U of T has created a vibrant entrepreneurial ecosystem and has emerged as a leading university in North America in the creation of new start-up companies. This ecosystem provides faculty members, research associates, post-doctoral fellows and students with opportunities to turn their ideas and inventions into new companies and jobs.

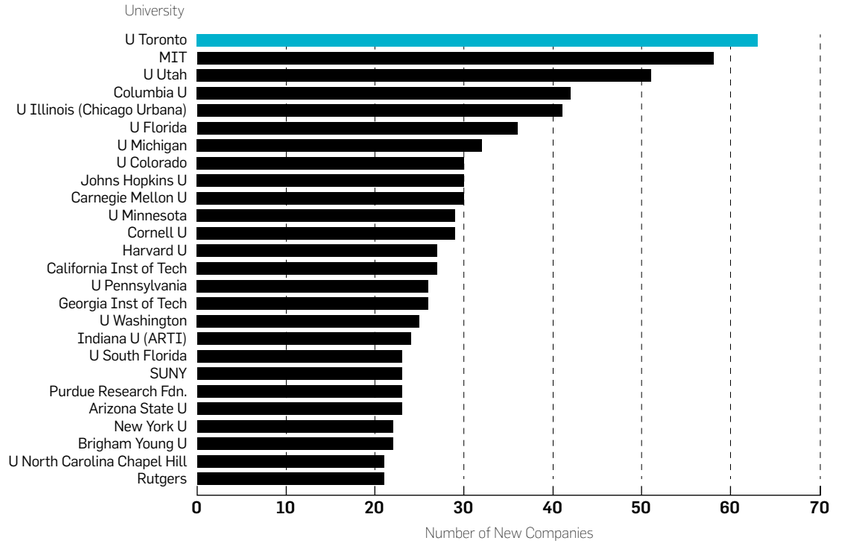
In 2011-12 U of T and partner hospitals

secured **32** US patents

filed **91** new US patent applications

and executed **95** licenses and options to help protect Canadian ideas and innovations and bring our technologies into the global marketplace.

New Start-Up Companies (2009-10 to 2011-12)
U.S. & Canadian Universities



Note: Universities which report as systems are excluded.

IMPACT

Across all disciplines, U of T is among leading institutions in publishing new knowledge that drives policy, invention and a clearer understanding of all aspects of our world. The influence of U of T's research, measured by how often it is cited, puts us at or near the top in many fields of research.

Rankings on Numbers of Publications and Citations (2008 to 2012)

	Canadian Peers U15		North American Public Peers (N=51)		North American Private & Public Peers (N=76)	
	Publications	Citations	Publications	Citations	Publications	Citations
ALL FIELDS	①	①	①	①	②	②
HEALTH & LIFE SCIENCES	**1**	**1**	**1**	**1**	**2**	**2**
Clinical Medicine	1	1	1	1	2	2
Pediatrics	1	1	1	1	2	4
Rehabilitation	1	1	1	1	1	1
ENGINEERING & MATERIALS SCIENCES	**2**	**1**	**9**	**7**	**10**	**10**
Cell & Tissue Engineering	1	1	2	1	3	3
Biomedical Engineering	1	1	1	2	2	4
Environmental Engineering	2	1	5	3	5	5
PHYSICAL SCIENCES						
Biophysics	1	1	1	4	2	8
Chemistry, Organic	1	1	1	1	2	3
Mathematics	1	1	4	6	6	10
SOCIAL SCIENCES	**1**	**1**	**1**	**3**	**2**	**5**
Anthropology	1	1	1	6	2	9
Behavioral Sciences	1	1	1	1	2	2
Economics	1	1	3	3	14	13
HUMANITIES						
Language & Linguistics	1	1	1	1	1	2
Literature	1	2	2	7	3	11
Philosophy	1	1	1	1	1	1

CONNAUGHT FUND

Recognizing Excellence, Creating Impact

Founded in 1972, the Connaught Fund was created from the sale of Connaught Medical Research Laboratories, which first mass-produced insulin, the Nobel award-winning discovery of U of T Professors Frederick Banting, Charles Best, J.J.R. Macleod and Bertram Collip. The University has stewarded the fund in the years since, awarding more than $150 million to U of T researchers. Today, the fund invests $3 to 4 million annually in emerging and established scholars. In 2010 the Office of the Vice-President, Research and Innovation launched a series of new programs under the Connaught banner to target unmet societal needs and cultivate collaborations with transformative impact.

Connaught Fund Annual Program Allocations[1]

Program	Number of Awards	Maximum Allocation
Global Challenge Award	1 full award 3 proposal development awards	$1,030,000
New Researcher Award	60 awards in $10K category 8 awards in $50K category	$1,000,000
Innovation Award	approx. 10 awards	$500,000
Summer Institute Award	up to 3 awards	$150,000
McLean Award	1 award matched by McLean Endowment	$50,000
International Doctoral Scholarship	numerous awards	$1,000,000
Faculty Recruitment Support	numerous awards	$50,000
	Total:	**$3,780,000**

[1] Actual spending varies year-by-year depending on demand, quality of submissions and funds availability. The 2012-13 total expenditure level was $2.3M

2012 MCLEAN AWARD WINNERS

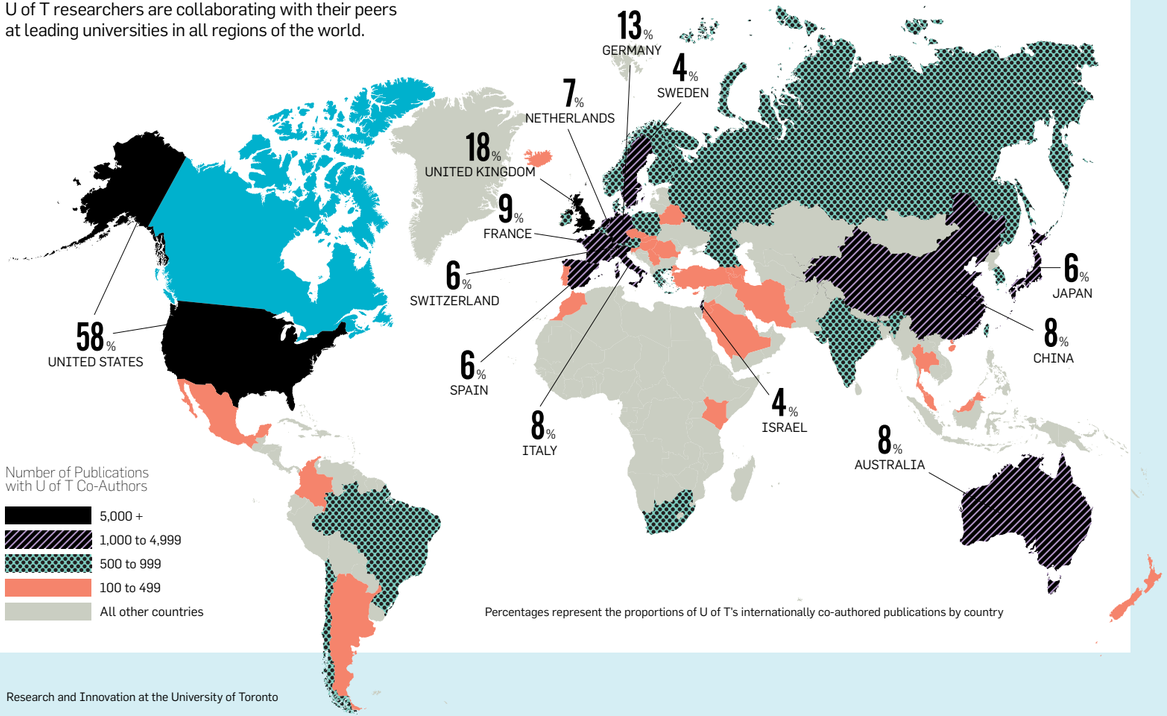
Professors Milica Radisic and Craig A. Simmons are the winners of the prestigious 2012 McLean Award, an award honouring emerging leaders in basic research in the engineering sciences, physics, chemistry, computer science, mathematics and theory and methods of statistics. Radisic is a tissue engineer working on using stem cells to grow new organs, and Simmons is tackling heart valve disease and musculoskeletal degeneration. Their work has the potential to lead to health breakthroughs.

For more information visit http://connaught.research.utoronto.ca.

GLOBAL REACH

U of T's International Co-Authorship (2009 to 2013)

U of T researchers are collaborating with their peers at leading universities in all regions of the world.



Percentages represent the proportions of U of T's internationally co-authored publications by country

2013 World University Rankings

	U of T WORLD RANK
National Taiwan University	8
QS World University Rankings	17
Times Higher Education	20
Shanghai Jiao Tong	28

U of T is the highest-ranked university in Canada and among the top-ranked in the world.

AWARDS AND HONOURS

Selected Awards and Honours (February 2012 to February 2014)

Alexander von Humboldt Foundation – Humboldt Research Award
Eugenia Kumacheva, Department of Chemistry
Andreas Mandelis, Department of Mechanical & Industrial Engineering

Alfred P. Sloan Foundation – Sloan Research Fellowship
Florian Herzig, Department of Mathematics
Joel Kamnitzer, Department of Mathematics
Martin Krkosek, Department of Ecology & Evolutionary Biology
Ruslan Salakhutdinov, Department of Computer Science
Bianca Schroeder, Department of Computer & Mathematical Sciences – UTSC
Dwight Seferos, Department of Chemistry
Mark Taylor, Department of Chemistry
Vinod Vaikuntanathan, Department of Computer Science
Robert Young, Department of Computer & Mathematical Sciences – UTSC

American Association for the Advancement of Science – Fellow
Alberto Leon-Garcia, Department of Electrical & Computer Engineering
Andreas Mandelis, Department of Mechanical & Industrial Engineering
Doug Perovic, Department of Materials Science & Engineering
Locke Rowe, Department of Ecology & Evolutionary Biology
Pekka Sinervo, Department of Physics

American Cancer Society – Luther L. Terry Award
Prabhat Jha, Dalla Lana School of Public Health

American Historical Association – Adams Book Prize
Natalie Rothman, Department of Historical & Cultural Studies – UTSC

American Historical Association – Marraro Book Prize
Natalie Rothman, Department of Historical & Cultural Studies – UTSC

Berlin-Brandenburg Academy of Sciences and Humanities – Helmholtz Medal
John Polanyi, Department of Chemistry

BIAL Foundation – BIAL Merit Award in Medical Sciences
Peter St George-Hyslop, Department of Medicine

AWARDS AND HONOURS

Canada Council for the Arts – Killam Prize
Geoffrey Hinton, Department of Computer Science
Richard Peltier, Department of Physics

Canada Council for the Arts – Killam Research Fellowship
Ran Hirschl, Department of Political Science
Mark Lautens, Department of Chemistry
Jeremy Quastel, Department of Mathematics
Sali Tagliamonte, Department of Linguistics

Canada Council for the Arts – Molson Prize
Keren Rice, Department of Linguistics

Canadian Academy of Engineering – Fellow
Grant Allen, Department of Chemical Engineering & Applied Chemistry
Michael Carter, Department of Mechanical & Industrial Engineering
Yu-Ling Cheng, Department of Chemical Engineering & Applied Chemistry
Omer Gulder, University of Toronto Institute for Aerospace Studies
Doug Hooton, Department of Civil Engineering
Andrew Jardine, Department of Mechanical & Industrial Engineering
David Johns, Department of Electrical & Computer Engineering
Mark Kortschot, Department of Chemical Engineering & Applied Chemistry
Alberto Leon-Garcia, Department of Electrical & Computer Engineering
Andreas Mandelis, Department of Mechanical & Industrial Engineering
Jeffrey Packer, Department of Civil Engineering
Shamim Sheikh, Department of Civil Engineering
Molly Shoichet, Department of Chemical Engineering & Applied Chemistry

Canadian Academy of Health Sciences – Fellow
Benjamin Alman, Department of Surgery
Ross Baker, Institute of Health Policy, Management & Evaluation
Philip Berger, Department of Family & Community Medicine
Dina Brooks, Department of Physical Therapy
Denis Daneman, Department of Paediatrics
Raisa Deber, Institute of Health Policy, Management & Evaluation
Eleftherios Diamandis, Department of Laboratory Medicine & Pathobiology
Paul Dorian, Department of Medicine
George Fantus, Department of Medicine
Herbert Gaisano, Department of Medicine
Prabhat Jha, Dalla Lana School of Public Health
Rita Kandel, Department of Laboratory Medicine & Pathobiology
Brian Kavanagh, Department of Anaesthesia
Gary Lewis, Department of Medicine
Andres Lozano, Department of Surgery
Stephen Lye, Department of Obstetrics & Gynaecology
Muhammad Mamdani, Leslie Dan Faculty of Pharmacy
Phillip Marsden, Department of Medicine
John Marshall, Department of Surgery
Robin McLeod, Department of Surgery
Steven Narod, Dalla Lana School of Public Health
Avery Nathens, Department of Surgery
Patricia O'Campo, Dalla Lana School of Public Health
Beverley Orser, Department of Anaesthesia
Thomas Parker, Department of Medicine
Linda Rabeneck, Dalla Lana School of Public Health
Reinhart Reithmeier, Department of Biochemistry
Paula Rochon, Department of Medicine
Sean Rourke, Department of Psychiatry
Paul Santerre, Faculty of Dentistry
Molly Shoichet, Department of Chemical Engineering & Applied Chemistry
Sharon Straus, Department of Medicine
James Wright, Department of Surgery
Bernard Zinman, Department of Medicine

Canadian Academy of Recording Arts and Sciences – Juno Award for Traditional Jazz Album of the Year
David Braid, Faculty of Music

Canadian Medical Hall of Fame – Inductee
John Dirks, Department of Medicine
David MacLennan, Department of Biochemistry

Canadian Science and Engineering Hall of Fame – Inductee
Ursula Franklin, Department of Materials Science & Engineering

CIHR – Canadian Medical Association Journal – Top Achievements Award in Health Research Award
Daniel Drucker, Department of Medicine

CRM-Fields Institute-PIMS – CRM-Fields-PIMS Prize
Stevo Todorcevic, Department of Mathematics

E.W.R. Steacie Memorial Fund – Steacie Prize for Natural Sciences
Edward (Ted) Sargent, Department of Electrical & Computer Engineering

Eni – Eni Environmental Protection Prize
Barbara Sherwood Lollar, Department of Earth Sciences

Genetics Society of America – Edward Novitski Prize
Charles Boone, Donnelly Centre for Cellular & Biomolecular Research

Governor General of Canada – Governor General's History Award for Popular Media: The Pierre Berton Award
John English, Department of History

Governor General of Canada – Queen Elizabeth II Diamond Jubilee Medal
Izzeldin Abuelaish, Dalla Lana School of Public Health
Andrew Baker, Department of Anaesthesia
Sandra Black, Department of Medicine
Robert Boyko, Department of Family & Community Medicine
Dina Brooks, Department of Physical Therapy
James Carson, Department of Family & Community Medicine
Tom Chau, Institute of Biomaterial & Biomedical Engineering
George Elliott Clarke, Department of English
Stephen Cook, Department of Computer Science
Michelle Craig, Department of Computer Science
Levente Diosady, Department of Chemical Engineering & Applied Chemistry
Lee Errett, Department of Surgery
Guy Faulkner, Faculty of Kinesiology & Physical Education
Michael Fehlings, Department of Surgery
Geoff Fernie, Institute of Biomaterial & Biomedical Engineering
Neil Fleshner, Department of Surgery
Herbert Gaisano, Department of Medicine
Monique Gignac, Dalla Lana School of Public Health
David Goldbloom, Department of Psychiatry
C.C. (Kelly) Gotlieb, Department of Computer Science
Allan Gross, Department of Surgery
Gillian Hawker, Department of Medicine
Patterson Hume, Department of Computer Science
Robert Inman, Department of Medicine
Michael Jewett, Department of Surgery
Harold Kalant, Department of Pharmacology & Toxicology
Eli Kassner, Faculty of Music
Shaf Keshavjee, Department of Surgery
Laurence Klotz, Department of Surgery
Guylaine Lefebvre, Department of Obstetrics & Gynaecology
Stephen Lewis, Department of Surgery
Ren-Ke Li, Department of Surgery
Mingyao Liu, Department of Surgery
Daune MacGregor, Department of Paediatrics
Minelle Mahtani, Department of Human Geography – UTSC
Peter Martin, Department of Astronomy & Astrophysics
Alexander McLean, Department of Materials Science & Engineering
Don McLean, Faculty of Music
Gillian Monica Thomas, Department of Radiation Oncoloy
Steven Narod, Dalla Lana School of Public Health
Milica Radisic, Institute of Biomaterial & Biomedical Engineering
Vivian Rambihar, Department of Medicine
Gail Robinson, Department of Psychiatry
Betty Roots, Department of Cell & Systems Biology
Ori Rotstein, Department of Surgery
Deep Saini, Department of Cell & Systems Biology – UTM
Hugh Scully, Department of Surgery
Chandrakant Shah, Dalla Lana School of Public Health
Molly Shoichet, Department of Chemical Engineering & Applied Chemistry
Rachel Shupak, Department of Medicine
Gary Sibbald, Dalla Lana School of Public Health
Marla Sokolowski, Department of Ecology & Evolutionary Biology
Catriona Steele, Department of Speech-Language Pathology
J. Carter Thorne, Department of Medicine
Marvin Tile, Department of Surgery
John Trachtenberg, Department of Surgery
Graham Trope, Department of Ophthalmology
Murray Urowitz, Department of Medicine
Franco Vaccarino, Department of Psychiatry – UTSC
Mladen Vranic, Department of Physiology
John Wedge, Department of Surgery
Carin Wittnich, Department of Surgery
Paul Young, Department of Civil Engineering
Lorne Zinman, Department of Medicine

James S. McDonnell Foundation – McDonnell Scholar Award
Morgan Barense, Department of Psychology

John Simon Guggenheim Memorial Foundation – Guggenheim Fellowship
Paul Stevens, Department of English
Marten van Kerkwijk, Department of Astronomy & Astrophysics

Karolinska Institute – Herbert Olivecrona Award
Andres Lozano, Department of Surgery

AWARDS AND HONOURS

Korean Academy of Science and Technology – Member
Chul Park, Department of Mechanical & Industrial Engineering

Microsoft Research – Microsoft Research Faculty Fellowship
Ruslan Salakhutdinov, Department of Computer Science

Ministry of Foreign Affairs and Ministry of Cultural Heritage (Italy) – Flaiano Prize in Italian Studies
Konrad Eisenbichler, Department of Italian Studies

MIT Technology Review – World's Top 35 Innovators Under the Age of 35
Joyce Poon, Department of Electrical & Computer Engineering

National Endowment for the Humanities – National Humanities Medal
Natalie Zemon Davis, Department of History

NSERC – E.W.R. Steacie Memorial Fellowship
Aneil Agrawal, Department of Ecology & Evolutionary Biology
Warren Chan, Institute of Biomaterial & Biomedical Engineering
Milica Radisic, Institute of Biomaterial & Biomedical Engineering
Yu Sun, Department of Mechanical & Industrial Engineering

NSERC – Gerhard Herzberg Gold Medal for Science and Engineering
Stephen Cook, Department of Computer Science
Richard Peltier, Department of Physics

NSERC – John C. Polanyi Award
Greg Scholes, Department of Chemistry

NSERC – Synergy Award for Innovation
Eugene Fiume, Department of Computer Science
Paul Santerre, Faculty of Dentistry

Ontario Ministry of the Attorney General – David W. Mundell Medal
Kent Roach, Faculty of Law

Order of Canada – Companion
Natalie Zemon Davis, Department of History

Order of Canada – Member
David R. Beatty, Rotman School of Management
Rebecca Cook, Faculty of Law
Mary Ferguson-Paré, Lawrence S. Bloomberg Faculty of Nursing
Harold Kalant, Department of Pharmacology & Toxicology
Marian Packham, Department of Biochemistry
Bernard Zinman, Department of Medicine

Order of Canada – Officer
J. Edward Chamberlin, Department of English
Donald Fraser, Department of Statistical Sciences
Michael Fullan, Department of Leadership, Higher & Adult Education
Thomas J. Hudson, Department of Molecular Genetics
David Jenkins, Department of Nutritional Sciences
Prabhat Jha, Dalla Lana School of Public Health
Joseph Macerollo, Faculty of Music
Arnold Noyek, Department of Otolaryngology – Head & Neck Surgery
Eliot Phillipson, Department of Medicine
Keren Rice, Department of Linguistics
Ian Tannock, Department of Medicine

Order of Ontario – Appointee
Izzeldin Abuelaish, Dalla Lana School of Public Health
Anna Banerji, Department of Paediatrics
Sandra Black, Department of Medicine
Stephen Cook, Department of Computer Science
Ronald Deibert, Department of Political Science
Rory Fisher, Department of Medicine
Shaf Keshavjee, Department of Surgery
Gail Robinson, Department of Psychiatry
James Rutka, Department of Surgery
Louis Siminovitch, Department of Molecular Genetics

Pierre Elliott Trudeau Foundation – Trudeau Foundation Fellowship
Joseph Heath, Department of Philosophy
Kent Roach, Faculty of Law

Radio-Canada – Scientist of the Year
Pierre Savard, Department of Physics

Republic of Austria – Austrian Decoration for Science and Art
Ian Hacking, Department of Philosophy

Royal Society (London) – Fellow
Douglas Stephan, Department of Chemistry

Royal Society of Canada – Fellow
Jonathan Abbatt, Department of Chemistry
Emanuel Adler, Department of Political Science
Sandra Black, Department of Medicine
Jutta Brunnée, Faculty of Law
Brenda Cossman, Faculty of Law
James Dennis, Department of Molecular Genetics
Daniel Drucker, Department of Laboratory Medicine & Pathobiology
Elizabeth Edwards, Department of Chemical Engineering & Applied Chemistry
Grant Ferris, Department of Earth Sciences
Joseph Heath, Department of Philosophy
Alison Keith, Department of Classics
James Kennedy, Department of Psychiatry
Frank Kschischang, Department of Electrical & Computer Engineering
Mohan Matthen, Department of Philosophy – UTM
Steven Narod, Dalla Lana School of Public Health
Andrew Orchard, Centre for Medieval Studies
Donna Orwin, Department of Slavic Languages & Literatures
Ato Quayson, Department of English
Keren Rice, Department of Linguistics
Jonathan Scott Rose, Department of Electrical & Computer Engineering
Jeffrey Rosenthal, Department of Statistical Sciences
Katherine Siminovitch, Department of Medicine
Paul Stevens, Department of English
Sali Tagliamonte, Department of Linguistics
Evan Thompson, Department of Philosophy
Andrei Yudin, Department of Chemistry

Royal Society of Canada – Henry Marshall Tory Medal
Douglas Stephan, Department of Chemistry

Royal Society of Canada – Konrad Adenauer Research Award
Stephen Clarkson, Department of Political Science

Royal Society of Canada – McNeil Medal for the Public Awareness of Science
Nicholas Eyles, Department of Physical & Environmental Sciences – UTSC

Royal Society of Canada – Rutherford Memorial Medal in Physics
Ray Jayawardhana, Department of Astronomy & Astrophysics

Royal Society of Chemistry – Bourke Award
Greg Scholes, Department of Chemistry

Royal Society of Chemistry – Fellow
Mohini Sain, Faculty of Forestry
Andrei Yudin, Department of Chemistry

Royal Society of Chemistry – Joseph Black Award
Aaron Wheeler, Department of Chemistry

Royal Society of Chemistry – Khorana Prize
Lewis Kay, Department of Molecular Genetics

Royal Society of Chemistry – Ludwig Mond Award
Douglas Stephan, Department of Chemistry

Royal Society of Edinburgh – Fellow
Stewart Aitchison, Department of Electrical & Computer Engineering

Spanish Ministry of Foreign Affairs – Caballero de la Orden del Merito Civil Award
Luis Seco, Department of Mathematics

Statistical Society of Canada – Gold Medal
Jeffrey Rosenthal, Department of Statistical Sciences

Thinkers50 – Thinkers50 Global Ranking of Management Thinkers
Richard Florida, Rotman School of Management
Roger Martin, Rotman School of Management

University of Toronto – Connaught Global Challenge Award
Edward (Ted) Sargent, Department of Electrical & Computer Engineering

University of Toronto – Connaught McLean Award
Milica Radisic, Institute of Biomaterial & Biomedical Engineering
Craig Simmons, Department of Mechanical & Industrial Engineering
David Sinton, Department of Mechanical & Industrial Engineering

University of Toronto – University Professor
Thomas Hurka, Department of Philosophy
Lewis Kay, Department of Molecular Genetics
Eugenia Kumacheva, Department of Chemistry
Mark Lautens, Department of Chemistry

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