

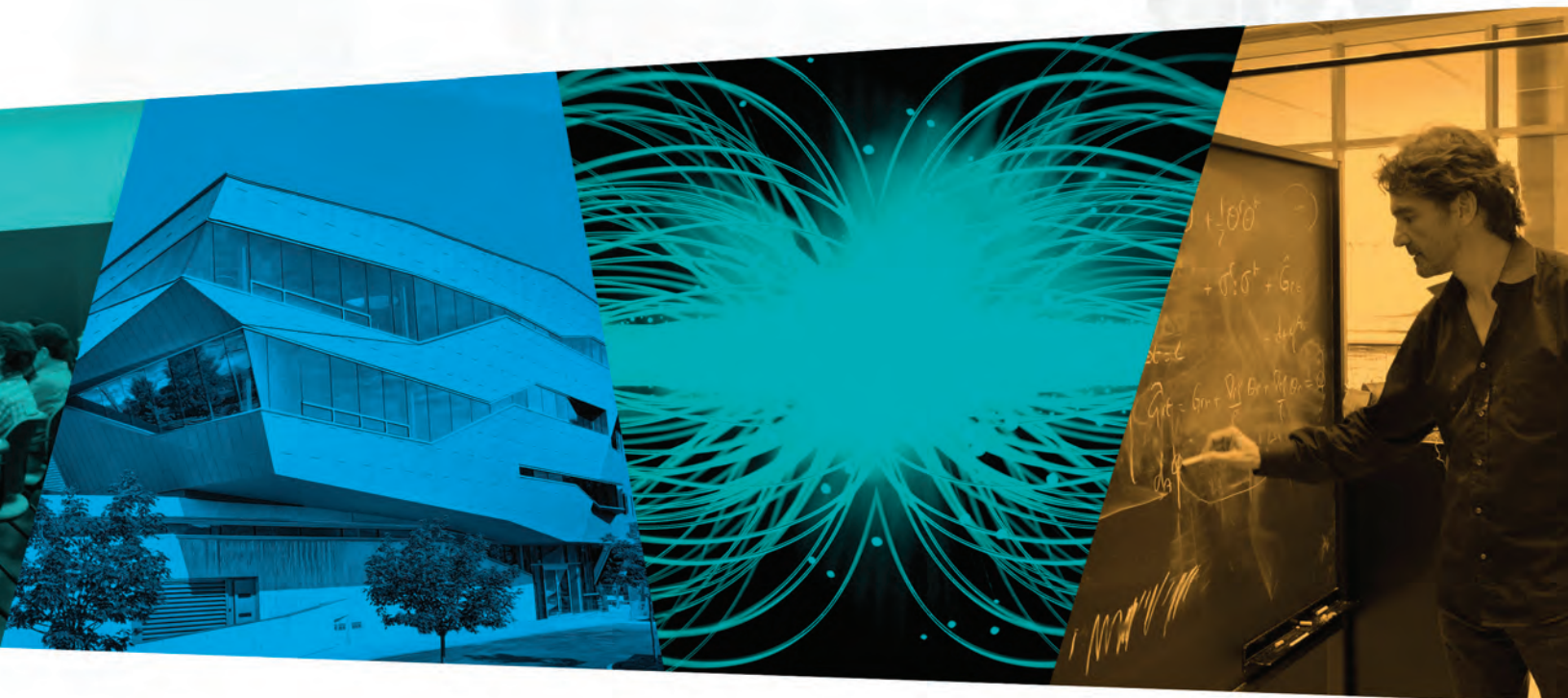
# 2011-12

# ACHIEVEMENT HIGHLIGHTS

August 1, 2011 to July 31, 2012

*“Perimeter Institute is now one of the world’s leading centres  
in theoretical physics, if not the leading centre.”*

– Stephen Hawking, September 2012



Why theoretical physics? Simply put, it's a great long-term investment.

History has proved this again and again. Wireless technologies and remote sensing are based on Maxwell's unification of electricity and magnetism. Semiconductors, lasers, and solar cells are founded on discoveries in quantum mechanics. GPS relies on Einstein's general relativity. It has been estimated that a quarter of all the wealth created in the 20<sup>th</sup> century flowed from basic physics.

Perimeter Institute's vision is to create the world's foremost centre for foundational theoretical physics, uniting public and private partners, and the world's best scientific minds, in a shared enterprise to achieve the next generation of breakthroughs that will transform our future.

## ACHIEVEMENT HIGHLIGHTS 2011-12

### ADVANCING FUNDAMENTAL RESEARCH

- Advanced fundamental research through 326 high calibre papers
- A recent study by Thomson Reuters showed that in 2010 Canada ranked first in physics citation impact among G8 countries; without Perimeter, Canada would have ranked fourth
- PI researchers won numerous awards and honours, including:
  - Faculty member Robert Myers won the Canadian Association of Physicists Vogt Medal
  - Faculty member Freddy Cachazo won the Canadian Association of Physicists Herzberg Medal
  - Distinguished Visiting Research Chair Nima Arkani-Hamed won the \$3 million Fundamental Physics Prize

A recent study by Thomson Reuters showed that in 2010 Canada ranked first in physics citation impact among G8 countries; without Perimeter, Canada would have ranked fourth.

### ATTRACTING THE WORLD'S BEST

- Welcomed Xiao-Gang Wen (recruited from MIT) as the BMO Financial Group Isaac Newton Chair and Davide Gaiotto (recruited from the Institute for Advanced Study) as the inaugural Galileo Chair
- Appointed Bianca Dittrich, Dmitry Abanin, and Kendrick Smith as junior faculty members
- Jointly recruited Avery Broderick and Roger Melko as associate faculty members with the University of Waterloo
- Jointly recruited Matthew Johnson as an associate faculty member with York University
- Hired 15 postdoctoral researchers in 2011-12 and recruited an additional 20 for 2012-13

### TRAINING THE SCIENTISTS OF THE FUTURE

- Trained 37 students from 20 countries, including 11 women, through the Perimeter Scholars International (PSI) master's program
- Trained 35 PhD students



## A GLOBAL HUB FOR SCIENTIFIC INTERACTION

- Concluded partnership agreements with the ICTP-South American Institute for Fundamental Research in Sao Paolo, Brazil, and the Institute of Mathematical Sciences in Chennai, India
- Provided extensive guidance to the African Institute for Mathematical Sciences-Next Einstein Initiative (AIMS-NEI)
- Held 17 conferences and workshops, attended by 1,013 scientists from around the world
- Presented 299 scientific talks (271 seminars, 28 colloquia)
- Hosted 401 visiting scientists
- Shared the Institute's scientific events virtually: 75,369 visitors from 166 countries accessed the Perimeter Institute Recorded Seminar Archive

## INSPIRING THROUGH OUTREACH

- Reached our one millionth student via PI educational resources
- Hosted the 10<sup>th</sup> annual International Summer School for Young Physicists for 39 Canadian and international students
- Delivered Perimeter content to 955 Aboriginal youth in 61 rural and remote communities in partnership with Actua
- Held six *GoPhysics!* camps and gave 14 *Physica Phantastica* presentations to over 2,100 students
- Delivered 85 workshops to more than 3,300 educators throughout Canada and abroad, impacting over 180,000 students
- Authored the modern physics unit of the grade 12 physics textbook tied to Ontario's curriculum
- Held festivities for the opening of the Stephen Hawking Centre, attended by over 10,000 on-site visitors and thousands more online and on television
- Presented 11 sold out Public Lectures, each attended by over 600 people

## CREATING AN OPTIMAL RESEARCH ENVIRONMENT

- Completed the Stephen Hawking Centre at PI on time and on budget, making Perimeter Institute the largest theoretical physics institute in the world
- Developed a three-tiered scientific computation environment, providing tailored, state-of-the-art computing resources to scientists
- Launched RECAST, a framework for applying high-energy physics analyses to new models, and Spaces, a tool to facilitate collaborative research



## GROWING THE PUBLIC-PRIVATE PARTNERSHIP

- Finalized federal funding agreement of \$50 million, beginning in 2012
- Finalized provincial funding agreement of \$50 million, beginning in 2011
- Secured \$7.8 million in commitments from the private sector including the Krembil Foundation, the John Templeton Foundation, BMO Financial Group, Sun Life Financial, Burgundy Asset Management, Canadian Tire, Scotiabank, CIBC Mellon, Christie Digital, and RBC Foundation, among many others

*"We need to commit not only to good science, but great science. Breakthrough science. Ultimately, that means supporting the best, from all over the planet, to go in the directions that their curiosity leads them, and to pursue their most ambitious ideas."*

## PERIMETER IN THE NEWS

- Branded Canada and Perimeter through major media coverage including *The Globe and Mail*, *National Post*, *Toronto Star*, *Macleans*, *CTV*, *CBC*, *NBC*, *Wall Street Journal*, *Australian Herald*, *Nature*, *Science*, *National Geographic News*, *Der Spiegel* and *The Economist*, among others.

*"It looks like a spaceship, feels like a playhouse and is designed to inspire researchers as they tackle some of the hardest problems in science ... a bold bet that a building can nurture genius, promote unconventional thinking and foster the kind of collaboration essential for success in many scientific fields."*

– "A playhouse designed to foster future Einsteins in Waterloo," *The Globe and Mail*, September 17, 2011

*"The Perimeter Institute has scored a coup in luring world-renowned theoretical physicist Xiao-Gang Wen away from the Massachusetts Institute of Technology."*

– "Perimeter Institute lures star theoretical physicist from MIT to Waterloo," *The Globe and Mail*, September 17, 2011

*"I believe that Waterloo could become the centre of 21<sup>st</sup> century quantum electronics," [Turok] says. "That fits with what the Institute for Quantum Computing is doing. It fits with what the technology community here is doing. If we do this right, I think we might not only develop the theory for the experiments, but also the spinoff into industry."*

– Director Neil Turok, quoted in "Perimeter Institute set to revolutionize the 21<sup>st</sup> century," *Waterloo Region Record*, September 17, 2012

*"The new wing, which has absorbed C\$29m, doubles PI's capacity, to over 200 researchers, making it the world's biggest institute for the study of theoretical physics. The humming brains it accommodates are working on a range of problems at the cutting edge of the subject: superstring theory, loop quantum gravity, condensed-matter physics, complex systems and quantum information—the last of which involves PI's single concession to experimental science, the sending of quantum-encrypted messages between it and the nearby Institute for Quantum Computing. A breakthrough in any of these areas would be the stuff of Nobel prizes."*

– "Stretching the perimeter," *The Economist*, September 29, 2011



For the entire 2011-12 Annual Report to Industry Canada, please see ...

[www.perimeterinstitute.ca](http://www.perimeterinstitute.ca)