

SEIZING THE MOMENT

PERIMETER INSTITUTE
5 YEAR PLAN - 2013-2018
Summary

May 2013





VISION

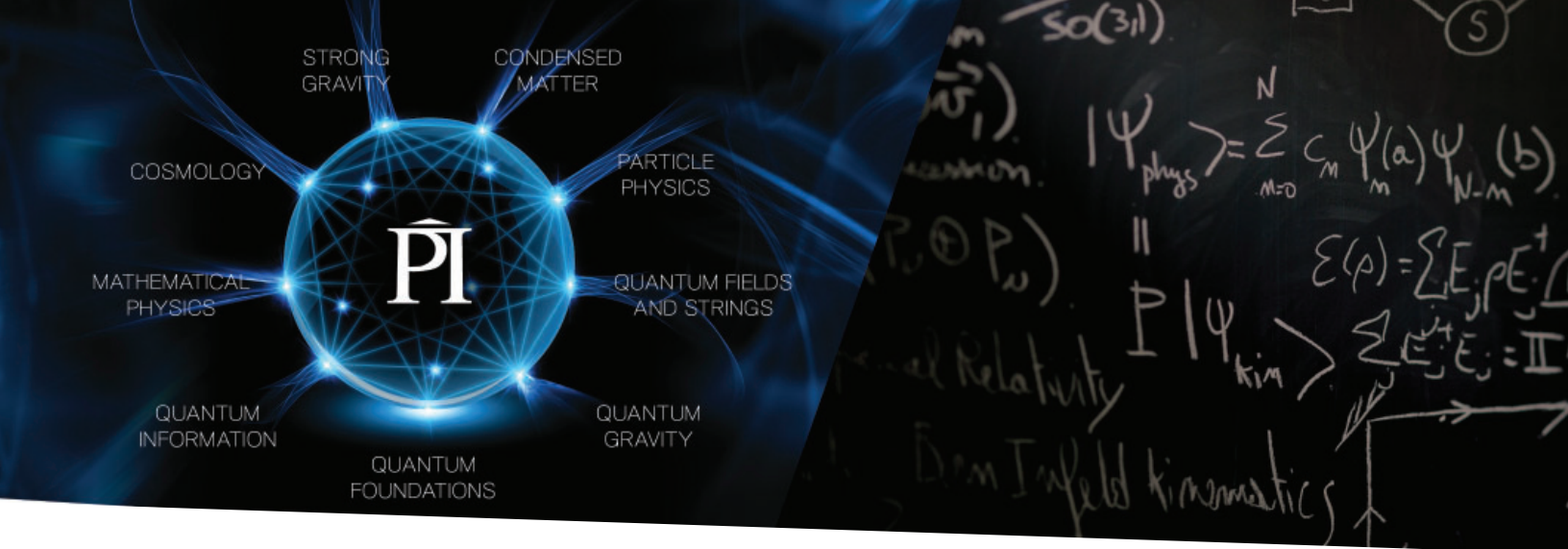
To create the world's foremost centre for foundational theoretical physics, uniting public and private partners, and the world's best scientific minds, in a shared enterprise to achieve breakthroughs that will transform our future.

CONVICTION AND PURPOSE

We believe breakthroughs are realized through a collision of intellect, imagination, and inspiration. We exist to enable the most ambitious research in theoretical physics and share its transformative powers with the world.

GUIDING PRINCIPLES

- Constantly raise the level of Perimeter's research, training, and outreach
- Prioritize: do fewer but more impactful things
- Focus, perfect, build on strengths acquired to date
- Look for opportunities and act quickly to pursue them
- Take risks but only smart ones
- Nurture a culture of modesty, respect, and responsibility
- Ensure cost-effectiveness, with a goal of zero waste



EXECUTIVE SUMMARY

Perimeter Institute aims to become the world's leading centre for foundational theoretical physics, setting a global example in its research, training, and outreach excellence and promoting major scientific breakthroughs.

Over the next 5 years, Perimeter Institute plans to raise the level of its activities in each of the following areas:

RESEARCH

Achieve Research Breakthroughs

- Raise the level and ambition of research conducted at Perimeter
- Strengthen Perimeter's strategically chosen combination of research areas
- Encourage collisions between different approaches and areas of expertise in order to stimulate progress on the most challenging problems
- Operate as a single interdisciplinary research community combining complementary insights to promote novel approaches
- Create a collaborative atmosphere which maximizes cross-fertilization
- Retain Perimeter's core focus on quantum theory and spacetime and their unification, while building capacity in three priority areas where the institute has an opportunity to become world-leading over the coming decade:
 - Black Holes and Strong Gravity
 - Quantum Matter and Quantum Materials
 - Quantum Field Theory and Particle Physics
- Build active collaborations with experimental and observational centres including the Institute for Quantum Computing, SNOLAB and TRIUMF in Canada, the Large Hadron Collider, the Planck satellite, LIGO and LISA, HSC, LSST, SKA, and others in order to pursue new experimental and observational tests of fundamental theory



Recruit a Critical Mass of Outstanding Scientists

- Continue to recruit faculty members of the highest international calibre:
 - Recruit new faculty and associate faculty members to move to a steady state of 50, recruiting a strategic mix of the most promising early career and outstanding senior researchers
 - Create the world's most prestigious set of 8 Chairs in theoretical physics research, of which 3 have already been recruited (Newton, Galileo, and Bohr). These Chairs will be named after legendary scientists whose insights helped define modern physics.
 - Make recruitment of women faculty a priority

Provide a Second Research Home for Outstanding Theorists

- Offer approximately 40 Distinguished Visiting Research Chair positions to world-leading scientists who spend 1 to 2 months annually at Perimeter
- Offer between 5 and 10 Visiting Researcher positions annually to top Canadian and international researchers who are seeking an opportunity to spend extended periods of time (3 to 12 months) at Perimeter
- Offer between 5 and 10 Visiting Fellow positions to eminent scientists who visit Perimeter for up to 6 months a year
- Continue to host top scientists for short-term collaborative visits of 2 to 6 weeks, with between 250 and 400 such visitors expected annually
- Host international scientists through collaboration agreements encouraging scientific exchange visits and joint activities between researchers at Perimeter and leading scientific centres throughout the world



Host Timely, Focused Conferences, Workshops, Seminars, and Courses

- Organize 10 to 15 workshops and conferences annually with strategically chosen topics, identifying new areas of exceptional promise where there is a likelihood of a significant outcome
- Host around 250 seminars annually
- Continue to supplement our Perimeter Scholars International (PSI) master's program and our PhD program, held in partnership with surrounding universities, with a small number of in-depth courses for credit and mini-courses on specialized topics

Increase Perimeter Institute's Role as Canada's Focal Point for Foundational Physics Research

- Expand the number of universities that Perimeter collaborates with on joint faculty recruitment
- Continue to offer approximately 100 Affiliate positions to faculty members across Canada
- Increase collaboration with local universities on supervision of PSI projects and PhD student recruitment





TRAINING

Generate a Flow-through of the Most Promising Talent

- Continue to recruit the world's most promising postdoctoral researchers, building the best environment globally, encouraging ambitious, independent-minded, young theoretical physicists to pursue unorthodox, ambitious, novel research:
 - Employ up to 50 postdocs each year, of whom 10 to 15 are anticipated to be funded through researcher grants
 - Continue to offer 3- and 5-year positions
- Attract outstanding graduate students in collaboration with university partners and prepare them for cutting-edge research:
 - Recruit and graduate 30 to 40 PSI master's students each year
 - Build the PhD student complement toward a steady state goal of around 60
 - Continue a top-up funding program for select PhD students to remain competitive in recruitment while placing the main responsibility for student funding on faculty through winning grants
 - Offer 6 to 10 Visiting Graduate Fellow positions per year
 - Offer 5 to 10 undergraduate student summer positions per year



OUTREACH

Engage in *Smart Aid*

- Continue to accelerate the emergence of innovative centres of excellence in math and physics around the world by exporting Perimeter's expertise in building impactful research and training institutes:
 - Serve as the lead North American partner for the African Institute for Mathematical Sciences-Next Einstein Initiative (AIMS-NEI), a network of training centres providing talented students with the high-level scientific and technical skills they need to propel Africa's future economic, scientific, technical, and educational self-sufficiency
 - Provide advice and expertise for similar initiatives in other parts of the developing world

Engage in High Impact Educational Outreach

- Continue to communicate the importance of basic research and the power of theoretical physics to general audiences and stakeholders through:
 - Public Lectures live in Waterloo, on TV throughout Canada, available internationally via the web and third party distribution
 - Public Lectures on the road
 - Major presentations at Canadian and international gatherings
 - One major international festival every two years
- Develop brilliant young Canadians for the field by:
 - Supporting a network of educators across the country and providing them with professional development opportunities
 - Generating high quality educational resources and programs to stimulate large numbers of youth
 - Identifying and guiding the very best scientifically-minded students toward a career in theoretical physics
- Become the international brand for physics outreach expertise, products, and programs by:
 - Providing on-line resources that are widely accessible
 - Making selective presentations to major international educational gatherings
 - Distributing and selling physics outreach products internationally



SUPPORT

Nurture a Unique Culture of Mutual Respect and Inclusion

- Strengthen research, training, and outreach efforts by maximizing mutual synergies
- Focus on the entire family in attraction and retention efforts including prioritizing opportunities for spouses
- Create a culture that is highly supportive of women
- Gain organizational wide buy-in on a code of conduct emphasizing tolerance, trust, and respect
- Enforce a zero tolerance policy to any form of harassment or abuse
- Foster a culture of mutual respect and common cause between scientists and the administration

Engage in High Impact Science Communication

- Invest in high quality materials that tell the Perimeter story including newsletters, reports, and videos
- Create the world's premier theoretical physics website, communicating the latest developments in research, training, and outreach in innovative and compelling ways
- Strengthen Perimeter's national and international brand by:
 - Leveraging high-profile speaking engagements
 - Fostering relations and engagement with major media to secure positive news coverage

Provide the Ultimate Environment and Infrastructure for Theoretical Physics Research, Training, and Outreach

- Maximize the use of the Stephen Hawking Centre by constantly reviewing and upgrading the facility
- Ensure the highest quality visitor accommodation
- Provide leading-edge information technology tools and expertise to researchers, including High Performance Computing, visualization, long distance collaboration, digital talk capturing and archiving tools
- Provide excellent information technology tools and expertise to administrative staff, including upgrades to systems for finance, scientific reporting, fundraising, library, and personnel and alumni tracking



Continue to Build on Perimeter's Innovative and Highly Successful Public-private Funding Model

- Continue to broaden Perimeter's base of support, gaining an ever increasing number of supporters who appreciate the value of investing in theoretical physics and particularly in the quality of Perimeter's world leading research, training, and outreach programs
 - Continue to build a comprehensive program of private sector fundraising, expanding the donor base and targeting both supporters of annual operations and of Perimeter's endowment fund
 - Continue to nurture and build the relationship with Perimeter's federal and provincial funders, providing excellent return on investment and value for money
- Leverage the quality and reputation of outreach products as a source of earned revenue