2020/21 Annual Report Supplement

Covering the objectives, activities, and finances
for the period of August 1, 2020, to July 31, 2021

Submitted by: Robert C. Myers, Director
To: The Honourable Jill Dunlop
Minister of Colleges and Universities

Contents

Supplement to the Public Annual Report
covering the objectives of the 2020/21 Corporate Plan
for the period of August 1, 2020, to July 31, 2021.

Objective 1: Achieve breakthroughs in our understanding of the universe

Summary of achievements

- Advanced fundamental research through 502 high-calibre papers.[1]
- Since inception, Perimeter researchers have produced 6,784 papers appearing in more than 250 journals and on the arXiv, which have earned 351,264 citations, attesting to the importance and long-term impact of Perimeter research.[2]
- Recognized with eight national and international honours; for a list of honours, awards, and major grants received by Perimeter researchers, refer to **page 21** of the Annual Report.
- Underwent an assessment by the Audit and Evaluation Branch of Innovation, Science and Economic Development Canada, a major external review of all scientific, operational, and financial activities of Perimeter from 2016 to 2020. Further information and conclusions of the assessment can be found on **page 4** of the Annual Report.
- For descriptions of several research highlights, including achievements from the first four years of the Centre for the Universe, the first year of operations of the Clay Riddell Centre for Quantum Matter, and other cutting-edge research, refer to **pages 8-21** of the Annual Report.

Supplementary information (beyond the Annual Report contents)

Grants

In 2020/21, some Perimeter faculty members and researchers received Discovery Grant extensions from the Natural Sciences and Engineering Research Council of Canada (NSERC) to support graduate students.

Other grants and awards to Perimeter faculty, associate faculty, and initiatives included:
(Figures in Canadian dollars unless otherwise specified)

- Faculty member Bianca Dittrich, computational resources valued at approximately $38,700 from Compute Canada, and $13,000 from FQXi in support of “Computing quantum space times”
- Faculty member William East, $48,000 from the Arthur B. McDonald Institute HQP Pooled Resources competition
- Faculty member Laurent Freidel, a European Commission Grant of €255,768 over three years to support a joint postdoctoral position
- Faculty member Yin-Chen He, computational resources valued at approximately $30,700 from Compute Canada

[1] This reflects the one-year period from August 1, 2020, to July 31, 2021. Each publication has been counted only once, regardless of how many Perimeter researchers collaborated on it.
[2] These data come from Google Scholar, Research Gate, INSPIRES, ads (Harvard astrophysics data system), APS, and others, and reflect the period from inception to July 31, 2021.

- Associate Faculty member Niayesh Afshordi, $40,000 from the Arthur B. McDonald Institute HQP Pooled Resources competition
- Associate Faculty member Theo Johnson-Freyd, appointed as a member of the Simons Collaboration on Global Categorical Symmetries, which received a grant of $8 million USD over four years
- Associate Faculty member Michele Mosca, in partnership with the University of Bristol, $200,000 Quantum Technologies Canada-UK grant from NSERC and Innovate UK
- Associate Faculty member Ue-Li Pen, $348,000 over three years from the National Natural Science Foundation of China, and a $120,000 grant from Mitacs
- Associate Faculty member Daniel Siegel, computational resources valued at approximately $251,300 from Compute Canada, and a $760,000 grant from the Canada Foundation for Innovation/John R. Evans Leaders Fund and the Government of Ontario

Objective 2: Create the world's strongest community of theoretical physics researchers

Summary of achievements

- Official launch of the $25 million Clay Riddell Centre for Quantum Matter, supported by a $10 million commitment from the Riddell Family Charitable Foundation. Information about achievements during the Centre's first year of operations can be found on **pages 8-11** of the Annual Report.
- Director Robert Myers and Faculty Chair Laurent Freidel led a complement of 25 faculty and 21 associate faculty, including eight Perimeter Research Chairs. For a list of Research Chairs (including two additional Research Chairs, Visiting, for a total of 10), refer to **page 25** of the Annual Report. For complete faculty and associate faculty bios, see **pages 53-60** of the Annual Report.
- Welcomed Anton Burkov as an associate faculty member, cross-appointed with the University of Waterloo, and welcomed Theo Johnson-Freyd as an associate faculty member, cross-appointed with Dalhousie University. Refer to **page 25** of the Annual Report for more information about their research specialties.
- Recruited two exceptional young scientists to the Perimeter faculty: Sabrina Gonzalez Pasterski, currently at Harvard University, and Dominic Else, currently at Princeton University and recent winner of the New Horizons in Physics Prize. Both will begin their appointments at Perimeter in 2022. For more information, see **page 24** of the Annual Report.
- Launched and continued multiple initiatives aimed at increasing inclusion, diversity, equity, and accessibility (IDEA), including more than 40 initiatives and events led by members of the Inclusive PI Platform and an assessment by ShiftHealth. Highlights of Perimeter's IDEA successes can be found on **pages 22-23** of and – because IDEA initiatives are integrated in all Perimeter activities – throughout the Annual Report.

Supplementary information (beyond the Annual Report contents)

Perimeter Institute has an ongoing comprehensive attraction and retention strategy, including the following:

- Comprehensive ongoing support for researchers' families, including career support to partners; assistance accessing housing, local services, health care, and childcare; and social gatherings (in person or online) to help them build a support network and become established in the local community
- Numerous ongoing wellness and social activities for resident researchers and staff, contributing to a positive work environment
- Additional supports during the work-from-home period, including mental health support, virtual fitness classes, financial support for required home office equipment and supplies, a childcare

assistance program, and ongoing communication to all Perimeter residents about available supports

New attraction and retention initiatives in 2020/21:

- Retained the services of two in-house mental health professionals to provide individual counselling
- Worked with the Inclusive PI Platform to develop an Allyship Program offering person-to-person support to prospective and current residents via friendly, confidential dialogue with representatives from Inclusive PI Platform working groups
- Developed a hybrid workplace pilot program

Objective 3: Engage the worldwide research community

Summary of achievements

Though there were no in-person scientific visits in 2020/21 due to ongoing pandemic travel restrictions and public health guidelines, Perimeter continued a robust suite of programs and connections to researchers from the international community and appointed new researchers to its rosters of visiting scientists with official connections to Perimeter. We look forward to a return to in-person collaboration when possible.

- Appointed two new leading scientists as Distinguished Visiting Research Chairs (DVRCs), bringing the total to 44. For details of the DVRC program, including testimonials from Ganapathy Baskaran and Sandu Popescu, see **page 26** of the Annual Report. For a full list of DVRCs, see **page 62** of the Annual Report.
- Appointed seven new accomplished researchers as Visiting Fellows for a total of 52. For more information, see **page 27** of the Annual Report; a full list of Visiting Fellows is on **pages 20-21** of this supplement.
- Appointed nine new scientific researchers from universities across Canada as Affiliate members, bringing the total to 114 from 31 universities.
- Appointed four early-career researchers as Simons Emmy Noether Fellows. For details on the Simons Emmy Noether Fellows program, including its place in Perimeter's broader Emmy Noether Initiatives, refer to **page 23** of the Annual Report.
- Held seven conferences and workshops, attended by 1,058 scientists from around the world. For information about Perimeter's conference program, including the "Women at the Intersection of Mathematics and Theoretical Physics" conference, see **page 28** of the Annual Report. A full list of 2020/21 conferences is on **page 64** of the Annual Report.
- Presented 296 scientific talks, seminars, and colloquia. For more information, including details of Perimeter's new SciTalks platform and the ongoing Quantum Matter Frontier Seminars, refer to **page 29** of the Annual Report.

Objective 4: Serve as Canada's premier hub for foundational physics research

Summary of achievements

- Close ties between Perimeter researchers and those at other Canadian institutions are essential to building the capacity of physics research across Canada. Through its associate faculty, Perimeter has enabled eight Canadian universities to attract and hire outstanding scientists who those institutions could not have hired on their own. In 2020/21, Perimeter jointly appointed one new associate faculty member with the University of Waterloo and one with Dalhousie University (see Objective 2).
- Partnered with the University of Waterloo to hold the Perimeter Scholars International (PSI) master's program and involved faculty from Canadian universities as lecturers (see Objective 6).
- Continued to strengthen ties to universities and research organizations across the country through Affiliate members, who have an open invitation to visit Perimeter. In 2020/21, nine Affiliates were appointed, bringing the total to 114 from 31 universities.
- Sponsored seven off-site academic workshops and conferences across Canada; see the list on **page 64** of the Annual Report.

Supplementary information (beyond the Annual Report contents)

Catalyzing the quantum ecosystem

A significant portion of Perimeter's research is relevant to the rapidly developing field of quantum technology. Perimeter continues to work with key partners in Waterloo Region's Quantum Valley, ensuring Canada remains a leader in the global effort to create and support quantum industries. These industries are already seeing major increases in investment and job creation.

Local partners include those in the academic community (e.g., the Institute for Quantum Computing [IQC]), the region's vibrant incubators (e.g., Communitech), technology pioneers (e.g., 1QBit and ISARA), and venture capitalists (e.g., Quantum Valley Investments).

Perimeter's closest experimental partner continues to be IQC. Perimeter's ties to IQC include jointly appointed Associate Faculty members Raymond Laflamme, Debbie Leung, Michele Mosca, and Christine Muschik, as well as joint postdoctoral researchers Anurag Anshu, Justin Hilburn, Felix Leditzky, Fereshteh Rajabi, and Michael Vasmer.

Perimeter is also an integral part of the Toronto-Waterloo Region tech corridor. For instance, in 2020/21, Perimeter postdoctoral researcher Estelle Inack, who is also a postgraduate affiliate at the Vector Institute, founded her own start-up with the support of Creative Destruction Lab (see **page 11** of the Annual Report). Perimeter Associate Faculty member Roger Melko is a scientific lead at Creative Destruction Lab and a faculty affiliate at the Vector Institute.

Newly appointed Board Chair Mike Serbinis is a global technology leader and entrepreneur who has built transformative technology and platforms across several industries. As founder of the digital health tech company League, he also dedicates his time to organizations that are putting Canada on the map globally, including the Vector Institute, C100, and Creative Destruction Lab. Serbinis has been a champion and supporter of Perimeter for several years and joined the Institute's Board of Directors in 2014.

Partnerships and collaborative efforts

Perimeter continues to strengthen Canadian networks in physics research through collaborative efforts at the regional, provincial, and national levels.

- The Perimeter Institute Quantum Intelligence Lab (PIQuIL) is a research centre and training hub where physicists gather to advance the use of artificial intelligence algorithms in quantum physics. PIQuIL researchers come from academia, government, and industry to foster cross-disciplinary collaboration. Quantum computing start-up 1QBit has research staff at PIQuIL to take advantage of research synergies. Located in the Communitech Data Hub, PIQuIL works in collaboration with artificial intelligence centres and experts in Montreal, Ottawa, Sherbrooke, Toronto, Edmonton, and Vancouver. A partnership with the National Research Council of Canada (NRC) supports postdoctoral fellow Sebastian Wetzel.
- Other national partnerships include those with the Fields Institute for Research in Mathematical Sciences and the Dunlap Institute at the University of Toronto; the Arthur B. McDonald Canadian Astroparticle Physics Research Institute, a national research network of 13 Canadian partners dedicated to understanding dark matter and neutrino science; and the Canadian Institute for Theoretical Astrophysics.

Experiment and observation are the tests of all theoretical physics. Perimeter scientists are encouraged to forge strong partnerships with **observational and experimental** centres and initiatives across Canada.

- The Institute has formal partnership agreements with SNOLAB, an underground science laboratory specializing in neutrino and dark matter physics, and TRIUMF, Canada's particle accelerator centre.
- Daniel Family James Peebles Chair Kendrick Smith, Associate Faculty member Ue-Li Pen, and Computational Scientist Dustin Lang are deeply involved with fast radio burst research with the Canadian Hydrogen Intensity Mapping Experiment (CHIME) and Dominion Radio Astronomy Observatory, and its successor project, CHORD. A partnership with the NRC supports postdoctoral researcher Simon Foreman.

Objective 5: Raise Canada's profile as a global leader in fundamental physics research

Summary of achievements

- Associate Faculty member Theo Johnson-Freyd (refer to **page 25** of the Annual Report) has been named an inaugural member of the newly established Simons Collaboration on Global Categorical Summaries, which includes members from the University of California, Berkeley; Johns Hopkins University; Harvard University; the University of Zurich; the University of Edinburgh; and several other universities.
- Several researchers connected to Perimeter's Centre for the Universe play significant roles in experimental and observational work around the world (see feature stories on **pages 16-21** of the Annual Report). Here are a few of those global connections:
    - Associate Faculty member Will Percival is a senior member of the Extended Baryon Oscillation Spectroscopic Survey (eBOSS), the Dark Energy Spectroscopic Instrument (DESI), and the Euclid experiment of the European Space Agency.
    - Delaney Family John Archibald Wheeler Chair Avery Broderick is a leader in the international Event Horizon Telescope collaboration – an array of linked radio dishes around the world, plus 65 affiliated institutions.
    - Perimeter is a collaborating institution in the Simons Observatory, with Faculty member Kendrick Smith, Associate Faculty member Matthew Johnson, and several postdoctoral researchers and students involved.
    - Stavros Niarchos Foundation Aristarchus Chair Asimina Arvanitaki is part of the ARIADNE (Axion Resonant InterAction Detection Experiment) collaboration, which is looking for axion-mediated interactions in matter.

Supplementary information (beyond the Annual Report contents)

South American Institute for Fundamental Research

Perimeter has partnered with the South American Institute for Fundamental Research (SAIFR), located at São Paulo State University in Brazil, since 2015. The two institutes have a great deal in common, including several research fields, and active visitor and outreach programs.

In 2020/21, Perimeter continued to assist with SAIFR's growth.

- Faculty member Pedro Vieira spends a portion of each year in Brazil, helping to develop SAIFR, while Faculty member Luis Lehner serves on SAIFR's Scientific Council.
- Perimeter's Outreach team continues to assist SAIFR in developing its own outreach efforts, including helping to deliver 79 online teacher training workshops to 2,719 educators in Brazil in 2020/21.

- Through the Portuguese Resource Centre, three of Perimeter's educational resources were translated in 2020/21, for a total of 17 translated educational resources now available in Portuguese, allowing for a vastly greater impact in Brazil.

African Institute for Mathematical Sciences

The African Institute for Mathematical Sciences (AIMS) was founded in Cape Town, South Africa, in 2003 by Perimeter Director Emeritus Neil Turok and is now a globally recognized centre of excellence for postgraduate education and research. There are five AIMS campuses across Africa: one each in Cameroon, Ghana, Rwanda, Senegal, and South Africa. Seth Kurankyi Asante, a Perimeter researcher focusing on quantum gravity, currently hold the Fields-AIMS-Perimeter Postdoctoral Fellowship, which supports the careers of young researchers who are committed to advancing science in Africa. Read more about Asante and his work with Faculty member Bianca Dittrich on **pages 14-15** of the Annual Report.

Engagement with international experimental and observational centres

Perimeter researchers are known and respected for their work with experimental and observational centres around the world. Perimeter's global connections include the Large Hadron Collider at CERN, the Laser Interferometer Gravitational-Wave Observatory, the Simons Observatory, the Kavli Institute for Theoretical Physics, the Harvard Quantum Initiative, the Flatiron Institute, Scuola Internazionale Superiore di Studi Avanzati, the Asia Pacific Center for Theoretical Physics, the International Centre for Theoretical Physics, the Institute for Quantum Studies at Chapman University, the Institute for Quantum Optics and Quantum Information, and various other experiments including HIRAX, eBOSS, Euclid, DESI, ARIADNE, GNOME, and BaBAR.

Perimeter researchers also have collaborations and partnerships with international private sector industry labs such as Google's X (The Moonshot Factory) and IBM.

Objective 6: Attract and develop the next generation of brilliant minds

Summary of achievements

- Welcomed 12 new postdoctoral researchers from a pool of 772 applicants, while 22 completed their research terms and moved on to careers in research and industry. For details of the postdoctoral program, including profiles of Fereshteh Rajabi and Philip W. Anderson Fellow Han Ma, see **page 32** of the Annual Report. For a profile of Chien-Shiung Wu Fellow Cristina Mondino, see **page 15** of the Annual Report. For insight into the research of Francis Kofi Allotey Fellow Estelle Inack, including the start-up she founded, see **page 11** of the Annual Report. For a complete list of all postdocs at Perimeter in 2020/21, see **page 61** of the Annual Report.
- Provided ongoing training for 70 PhD students in residence and 39 associate PhDs. For details of the PhD program, including a profile of Lei Gioia Yang, see **page 33** of the Annual Report. For a list of PhD students at Perimeter in 2020/21, see **page 63** of the Annual Report.
- Perimeter students include two NSERC Vanier Canada Graduate Scholars; see **page 33** of the Annual Report for details on these and other academic scholarships and awards.
- Successfully ran the PSI master's program for 21 exceptional students, including nine women; in 12 years, 357 students have completed the PSI program. The program continues to be very competitive, with more than 900 applications for the 2020/21 cohort. For details of the PSI program, see **page 34** of the Annual Report. For a full list of PSI academic staff, see **page 62** of the Annual Report, and for a list of students, see **page 63** of the Annual Report.
- Continued Career Trajectories initiatives for young scientists at all levels, including industry talks and networking opportunities, academic career talks and networking opportunities, one-on-one academic and career counselling, interview preparation, and résumé building. For more information, including alumni successes, refer to **page 35** of the Annual Report.

Objective 7: Share the transformative power of theoretical physics

Summary of achievements

- Facilitated 8 million student interactions through educational programs and resources, bringing the total to more than 67 million to date. For more information, refer to **page 38** of the Annual Report.
- Delivered 152 workshops to 4,700 educators across Canada and around the world. Perimeter's Teacher Network has reached 41,000 educators since 2006. For details of EinsteinPlus and teacher workshops, plus professional development regarding Indigenous education, see **page 38** of the Annual Report.
- Hosted the 19th International Summer School for Young Physicists online for 39 students. For more information, refer to **page 39** of the Annual Report.
- Hosted the "Inspiring Future Women in Science" conference, giving 285 students a chance to hear from and ask questions of four women in various STEM fields and at different career stages. For more information, see **page 40** of the Annual Report.
- Attracted more than 225,000 unique visitors to Inside the Perimeter, the Institute's online home for accessible and shareable content, with everything from full-length features that make complex physics topics clear for general audiences, to fun quizzes for all ages.
- Presented seven engaging public lectures with more than 130,000 views. Over the past five years, Perimeter's public lectures have amassed more than 2 million views. For details, see **page 41** of the Annual Report.
- Expanded the Institute's science communication efforts with more than 6 million YouTube video views in 2020/21 alone – a 211 percent increase over the prior year – and continued growth across all social media channels. For more information, refer to **pages 40-41** of the Annual Report.
- Engaged global audiences through media coverage of Perimeter science by major news outlets including the *Globe and Mail* and the *National Post*. For a list of Top 10 media stories, see **page 41** of the Annual Report.

Objective 8: Continue to strengthen Perimeter's partnerships with the public and private sectors

Summary of achievements

- Continued five-year, $50 million funding agreements with the Government of Ontario and the Government of Canada.
- For details about government support and Perimeter's public-private partnerships, refer to **pages 42-43** of the Annual Report. This includes a list of donors who have made cumulative gifts of more than $100,000 since 2014, the membership list of the Perimeter Institute Leadership Council, and details about the Ptarmigan Foundation's support of postdoctoral researcher Ana-Maria Raclariu.
- Continued private sector support of the prestigious Perimeter Research Chairs from a variety of corporations and foundations (see **page 25** of the Annual Report) and the Distinguished Visiting Research Chair program, supported in part by Cenovus Energy (see **page 26** of the Annual Report).
- Continued support of Emmy Noether Initiatives, which support women and girls in physics, through the Emmy Noether Council, the Emmy Noether Circle, and the Simons Foundation. For a list of Emmy Noether Council members and details about the Institute's Emmy Noether Initiatives, see **pages 22-23** of the Annual Report. For a list of Emmy Noether Circle donors, see **page 45** of the Annual Report.
- In addition, the Simons Foundation has provided financial support for SciTalks, Perimeter's new international library of science videos (refer to **page 29** of the Annual Report) and special bridge fellowships for the pandemic period to three postdoctoral researchers (see **page 33** of the Annual Report).
- Continued private sector support of training and outreach programs, ensuring that economic factors are not a barrier to entry. These supporters include the Savvas Chamberlain Family Foundation, the Hellenic Heritage Foundation, Linamar Corporation, Brad and Kathy Marsland, Margaret and Larry Marsland, RBC Foundation, and Michael Serbinis and Laura Adams.
- For a full list of public and private supporters, refer to **pages 44-45** of the Annual Report.

Governance and financials

For Perimeter's governance structure, including all members of the Board of Directors, the Scientific Advisory Committee, and the senior leadership team, refer to **pages 46-47** of the Annual Report.

For details on the transition of Perimeter's Board of Directors, see **pages 46-47** of the Annual Report.

For more information about Perimeter's new Managing Director and Chief Operating Officer, Paul Smith, see **page 47** of the Annual Report.

Biographies of Board members and information about the Scientific Advisory Committee members can be found at ***perimeterinstitute.ca/people***.

Performance evaluation strategy

Perimeter Institute uses an array of performance monitoring and evaluation policies, systems, and processes (both internal and external) that are re-evaluated and updated on a regular basis. These mechanisms to measure outcomes, results, and impact include:

Performance monitoring – internal

- Annual reports on research activity submitted to the Institute's Director by all faculty and associate faculty members for evaluation
- Annual performance reviews of all staff
- Ongoing monitoring of publication and citation records
- Post-conference reports and evaluations
- Visitor research activity reports and ongoing tracking of all output
- Regular updates and monitoring of progress of all scientific programs
- Mid-term performance reviews for junior faculty and junior associate faculty
- Postdoctoral researcher mentorship program
- Monitoring of postdoctoral researchers' post-Perimeter placement success
- Monitoring of researchers' international presence and impact through collaborations and invitations to lecture
- Internal review and evaluation of PSI and PhD students and of all outreach programs and products

Performance monitoring – external

- Regular reporting to the international Scientific Advisory Committee, with subsequent performance assessment and recommendations
- Review of tenured faculty hires and promotions by the Scientific Advisory Committee
- Peer review of publications
- Annual audit of financial statements by an independent auditor
- Other performance audits and reviews in accordance with grant agreements
- External review and evaluation of all outreach programs and products

Public and private partnership

Perimeter Institute's continued achievements rely on a cooperative and highly successful funding model that provides for ongoing operations while remaining responsive and ready to act quickly when the potential for impact in new research arises.

Public partners contribute to research, training, and outreach activities and, in keeping with individual grant requirements, receive ongoing updates, reports, and yearly audited financial statements as required, to ensure value for money while remaining aware of the Institute's research productivity, outreach impact, and contributions to economic prosperity in Ontario and Canada.

In 2020/21, the Audit and Evaluation Branch of Innovation, Science and Economic Development Canada completed a thorough review of all Perimeter's operations and activities over a four-year period. More information and an overview of the results can be found on **page 4** of the Annual Report.

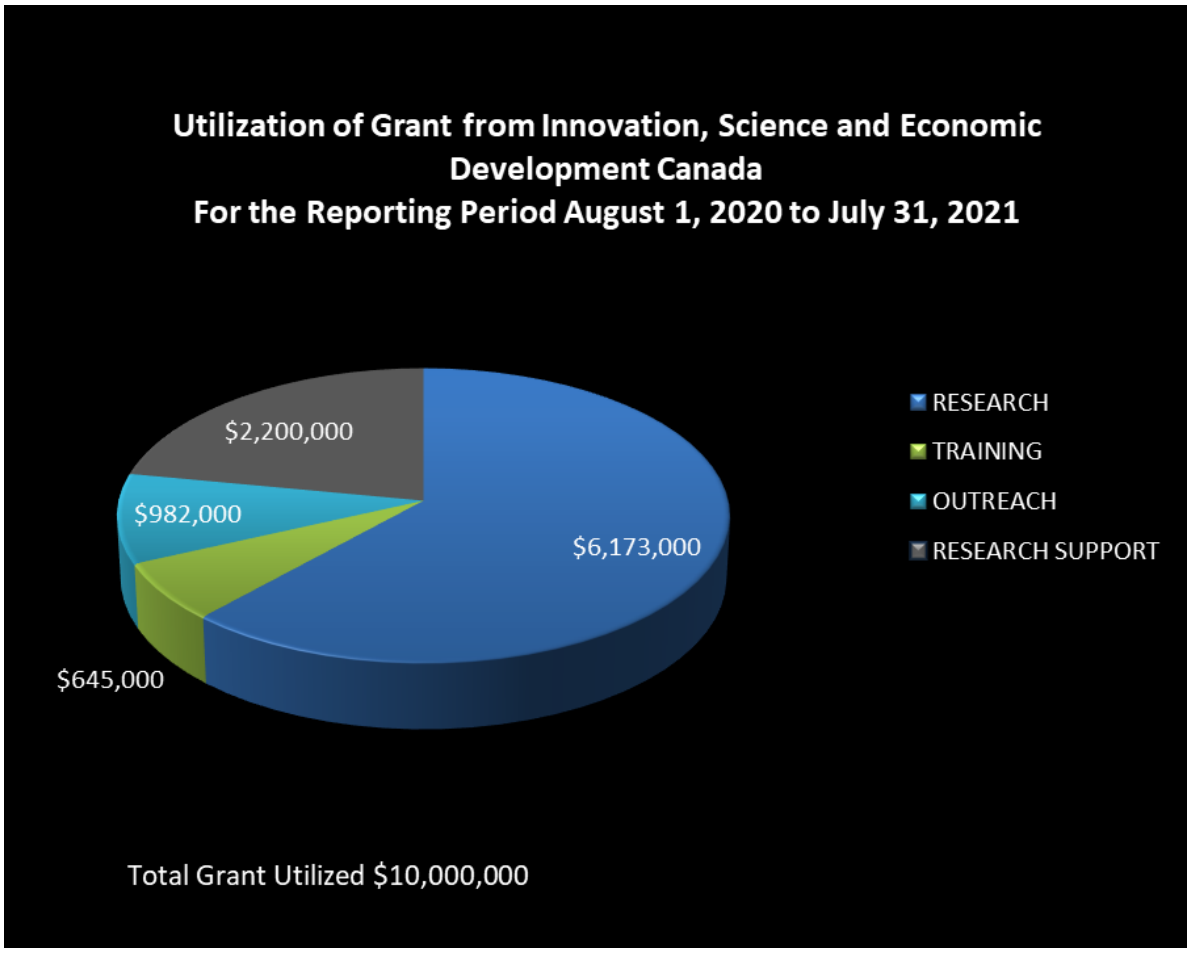
Private funds from a growing donor base of corporations, charitable foundations, and individuals are used to fund research, training, and outreach activities. Private funders are assured of the strong long-term financial health of the Institute by the protected endowment and the safeguards and stewardship related to government funding agreements.

Perimeter Institute continues to be an innovative example of how government and philanthropists can unite in a common quest to secure the transformative potential of scientific research in Ontario and across Canada.

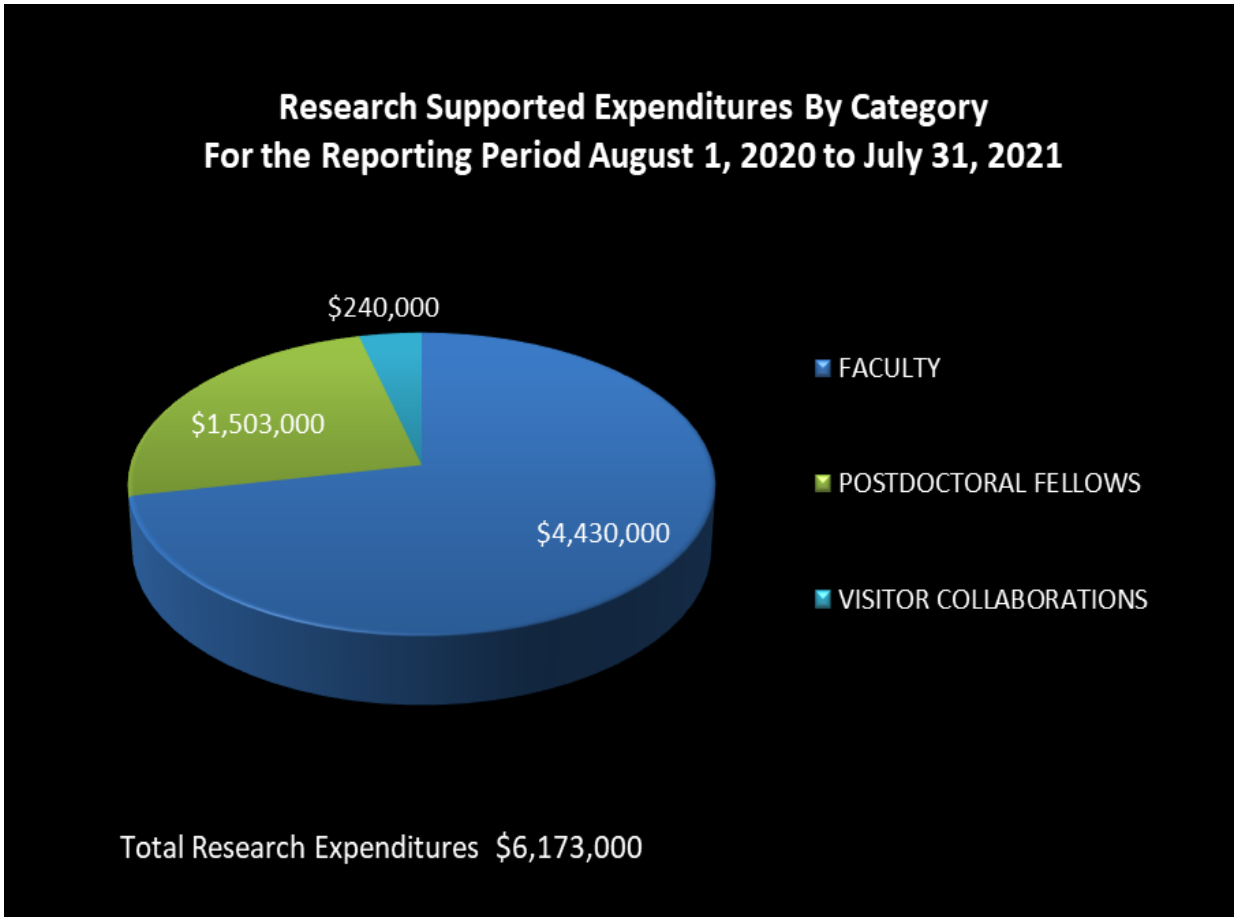
Overview of financial statements, expenditures, and investment strategy

For a summary of Perimeter's operating costs and details about its income, financial position, and long-term plan, refer to **pages 48-49** of the Annual Report. For the Institute's audited financial statements and the report of the auditor on the audited financial statements, refer to **pages 50-52** of the Annual Report.

Expenditure of Innovation, Science and Economic Development Canada grant



Research supported expenditures by category



A look ahead: Statement of objectives for 2021/22

Perimeter Institute is on track to achieve its foremost long-term goals: to create and sustain the world's leading centre for foundational theoretical physics research, to make discoveries that will change the world, to train the next generation of scientific innovators, and to provide trusted science outreach to students, teachers, and the public. Perimeter has established a set of strategic objectives to guide its continued development and to create an optimal and inclusive research, training, and working environment. The Institute's core mission will continue to inform every facet of its research, training, and outreach efforts, supported by a sustainable funding model.

The 2021/22 corporate plan sets out the Institute's objectives and provides overarching guidance for the coming year of Perimeter's government funding agreements. The ongoing pandemic may affect implementation of some aspects, and mitigation strategies are noted throughout this report.

Objective 1: **Achieve breakthroughs in our understanding of the universe**, drawing insights from and contributing to the whole spectrum of theoretical physics, focusing strategically on research areas that offer the greatest opportunities for major discoveries.

Objective 2: **Create the world's strongest community of theoretical physics researchers** by continuing to attract and retain top international talent and providing them with unparalleled infrastructure and support to help maximize productivity. Continue to support and develop integrated programs, practices, and procedures aimed at ensuring an optimally inclusive, diverse, equitable, and accessible environment.

Objective 3: **Engage the worldwide research community** by holding timely, focused conferences, workshops, and seminars on cutting-edge topics and facilitating scientific interactions among eminent and emerging researchers.

Objective 4: **Serve as Canada's premier hub for foundational physics research**, strengthening connections with institutions across the country and enabling frontier research, high-quality training, and public engagement.

Objective 5: **Raise Canada's profile as a global leader in fundamental physics research** by establishing and maintaining strategic international partnerships, providing access to excellence for vast new pools of scientific talent, and attracting top talent from around the world.

Objective 6: **Attract and develop the next generation of brilliant minds** by providing exceptional training to graduate students and postdoctoral researchers, developing their potential as innovators with powerful, widely applicable skills that will fuel successful individual careers and the knowledge economy more broadly.

Objective 7: **Share the transformative power of theoretical physics** across Canada and around the world, inspiring a new generation of scientific explorers through high-impact educational outreach, while engaging the general public with the wonder and excitement of basic physics research.

Objective 8: **Continue to strengthen Perimeter's partnerships with the public and private sectors** by demonstrating excellent return on investment, securing sustained funding from government partners, and expanding the Institute's private sector support base.

Appendix

Visiting Fellows, 2020/21

Haipeng An, Tsinghua University
Jonathan Barrett, University of Oxford
Joseph Ben Geloun, Laboratoire d'Informatique de Paris Nord
Celine Boehm, The University of Sydney
Joseph Bramante, Queen's University
Simon Caron-Huot, McGill University
Juan Carrasquilla, Vector Institute for Artificial Intelligence
Giulio Chiribella, The University of Hong Kong
Gil Young Cho, Pohang University of Science and Technology
David Curtin, University of Toronto
Bartek Czech, Tsinghua University
Gemma De Las Cuevas, University of Innsbruck
Lidia del Rio, University of Bristol
Claudia de Rham, Imperial College London
Fay Dowker, Imperial College London
Sergei Dubovsky, New York University
Astrid Eichhorn, University of Southern Denmark
Jerome Gauntlett, Imperial College London
Ghazal Geshnizjani, University of Waterloo
Tarun Grover, University of California, San Diego
Giulia Gubitosi, Universidad de Burgos
Razvan Gurau, Centre de Physique Théorique de l'Ecole Polytechnique
Hal Haggard, Bard College
Gilbert Holder, University of Illinois at Urbana-Champaign
Daniel Holz, Kavli Institute, University of Chicago
Isaac Kim, University of California, Davis
Andreas Lauchli, Leopold-Franzens Universität Innsbruck
Matthew Leifer, Chapman University
Si Li, Tsinghua University
Etera Livine, École Normale Supérieure de Lyon
Katherine Mack, North Carolina State University
Brian Metzger, Columbia University
Emil Mottola, Los Alamos National Laboratory
Markus Mueller, Institute for Quantum Optics and Quantum Information – Vienna
Alejandro Perez, Centre de Physique Théorique
Jocelyn Read, California State University, Fullerton

Katarzyna Rejzner, University of York
Rachel Rosen, Columbia University
Philip Schuster, SLAC National Accelerator Laboratory
Phiala Shanahan, Massachusetts Institute of Technology
Sarah Shandera, Pennsylvania State University
Brian Shuve, Harvey Mudd College
Jon Sievers, McGill University
Sumati Surya, Raman Research Institute
Sherry Suyu, Max Planck Institute for Astrophysics
Andrew Tolley, Imperial College London
Natalia Toro, Stanford University
Thomas Vidick, Institute for Quantum Information and Matter
Aaron Vincent, Queen's University
Yidun Wan, Fudan University
Chenjie Wang, The University of Hong Kong
Silke Weinfurtner, University of Nottingham