

Title: Research, Outreach & Beyond

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Abstract: <kw>Howard Burton, Mike Lazaridis, RIM, Perimeter Institute, mandate, research, outreach </kw>



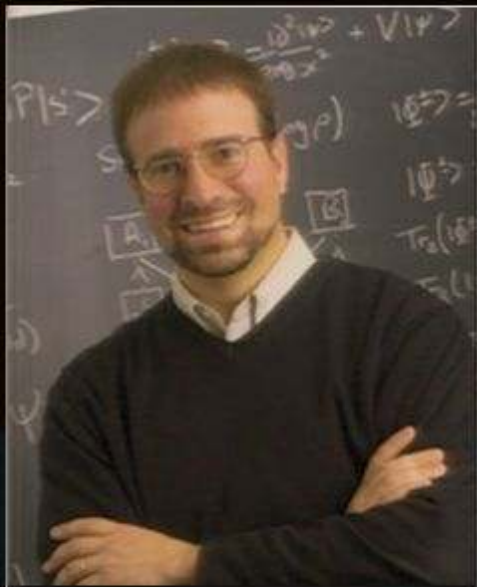
PERIMETER **PI** INSTITUTE FOR THEORETICAL PHYSICS

Talk Overview

- What Have We Done and Why?
- Twin Mandates
 - Research
 - Outreach
- Why it Matters to You

What have we done and why?

➤ Origins



Howard
Burton



Mike
Lazaridis

What Have We Done and Why?

- Mike and I meet – August, 1999
- Appointment of Board – October, 1999
- Institutional Travels – Jan-June, 2000



What Have We Done and Why?

- Independent
- Public-Private Partnership
- Fresh, flexible and productive approaches to research and outreach



Ontario



Canada
Foundation for
Innovation



**NSERC
CRSNG**

Canada 

What Have We Done and Why?

➤ The Mandate:

...independent, resident-based research institute devoted to foundational issues in theoretical physics at the highest levels of international excellence. We strive to create a lively and dynamic research atmosphere where many approaches to fundamental questions, ***both orthodox and unorthodox***, are pursued simultaneously and where a balance between ***formal and phenomenologically-oriented*** research is established. We are further determined to interact constructively with the surrounding academic community whenever possible, particularly with regards to the inclusion of ***graduate students***, and are equally determined to promote a world-class ***outreach program*** to disseminate the mysteries and wonder of the physical world to the general public throughout Canada and beyond.

What Have We Done and Why?

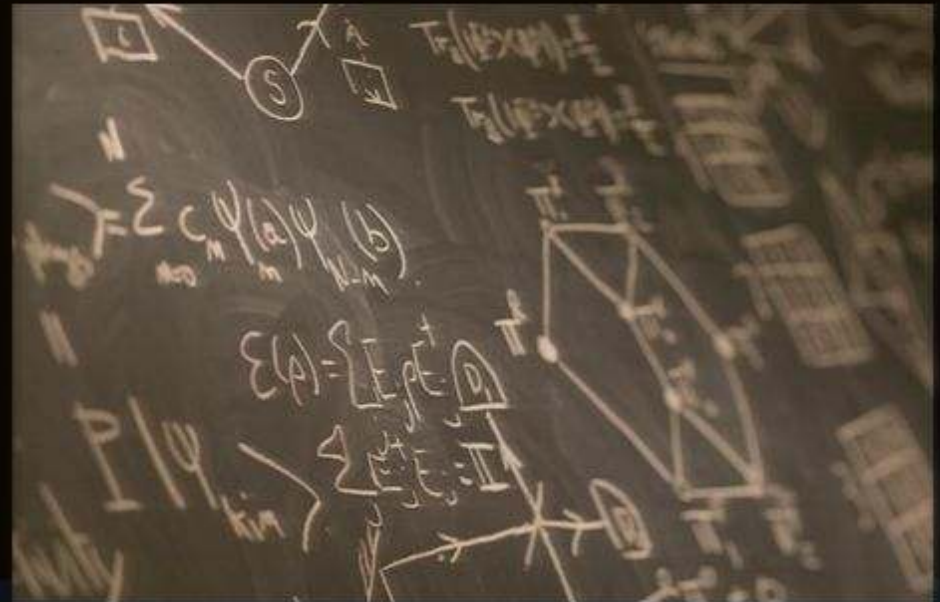
➤ Milestones

- ◆ Public Announcement of PI – October, 2000
- ◆ First Meeting of SAC – March, 2001
- ◆ Research Operations Begin – October, 2001



The Research

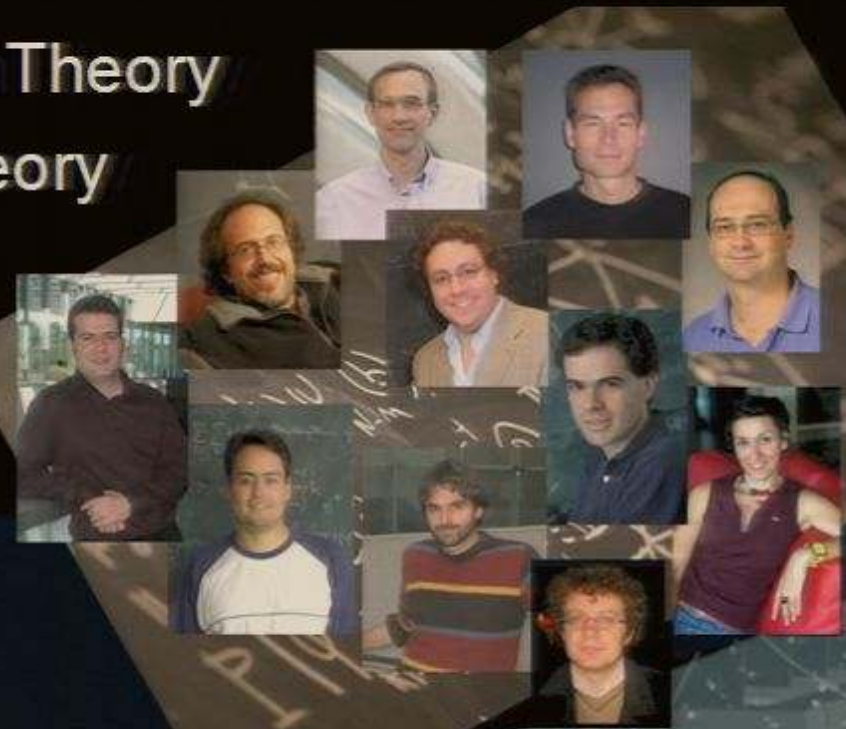
- Foundational Issues
 - ◆ The essence of space, time, matter and information



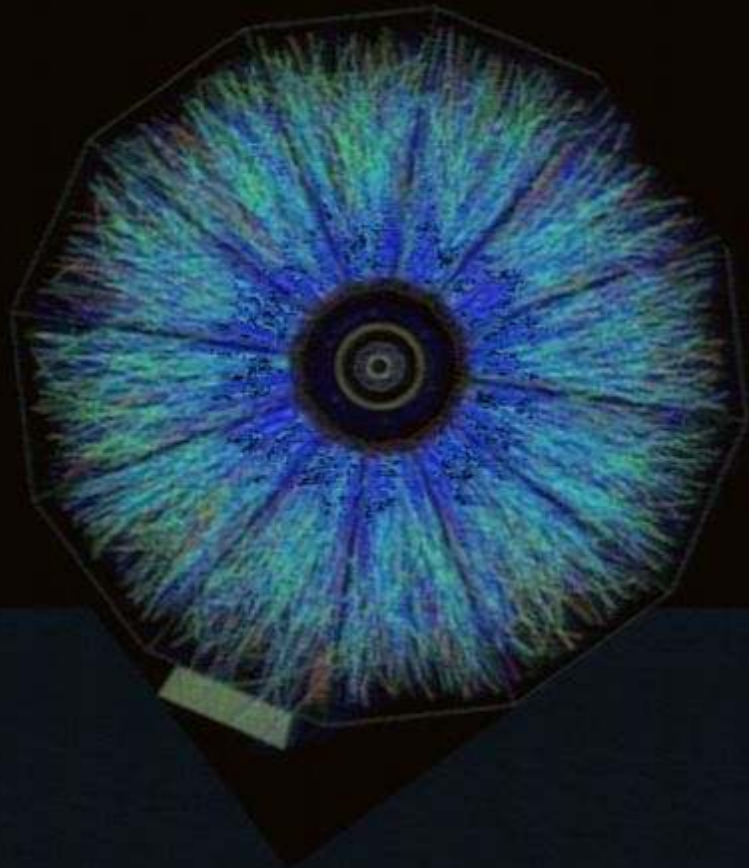
The Research

➤ Cross Disciplines in:

- ◆ Foundations of Quantum Theory
- ◆ Quantum Information Theory
- ◆ Quantum Gravity
- ◆ Superstring Theory
- ◆ Particle Physics
- ◆ Cosmology



The Research



➤ Particle
Physics

Outreach

- Why Do It?
- Can We Address Societal Concerns?
- What Exactly Do We Do?



Outreach

- Programs for:
 - ◆ Students
 - ◆ Teachers
 - ◆ General Public



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Outreach

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Outreach

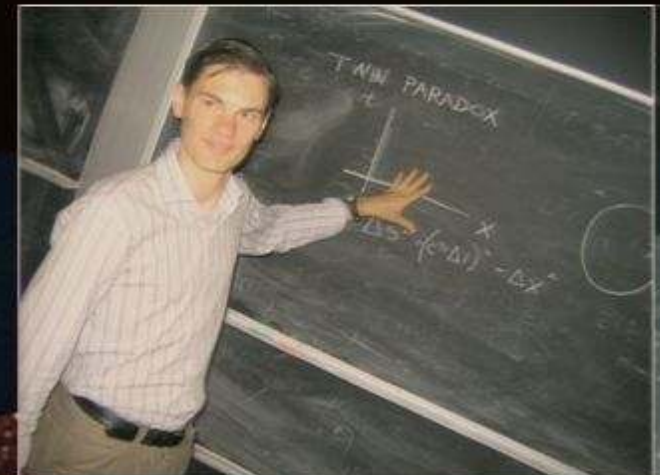
➤ Programs for Students

◆ ISSYP

- High school students from Canada and around the world
- Expanded to two 14-day programs held at PI
- Includes lectures, mentorship, tours and cultural events

◆ Physica Phantastica

- Interactive classroom lectures in schools nationwide
- Topics include: *Quantum Theory*, *Electromagnetism*, and *Special Relativity*



Outreach

➤ Programs for Teachers

- ◆ Einstein Plus
 - Expanded to two, week-long workshops held at PI
 - Focus on key concepts in modern physics
- ◆ Regional Teacher Workshops
 - Conducted on location nationwide
 - Fosters inspirational teaching



Outreach

➤ Programs for General Public

◆ Public Lectures

- Monthly public lectures attract 600+ (WCI)
- Speakers include Edward Witten, Leonard Susskind, Lisa Randall, Anton Zeilinger, Paul Steinhardt, Scott Tremaine
- Topics include Canada's international scientific reputation, science in the media, history of science, quantum computing, superstring theory

Outreach

➤ Programs for General Public

- ◆ Black Hole Sessions (Continuing Education)
 - Monthly drop-in sessions at PI
 - More technical, interactive discussions on various aspects of modern physics



Outreach

➤ Programs for General Public

◆ Open House

- October/04 one-day Open House attracted 8000+
- Included tours, interactive group discussions and lectures from Roger Penrose, Anthony Leggett, Margaret Geller, Steven Weinberg and other prominent scientists



Outreach

➤ Programs for General Public

◆ Festival

- October/05 EinsteinFest attracted 28,000 international guests
- Program celebrated life, science, times and legacy of Einstein through lectures, exhibits, interactive experiments and performances



Outreach

➤ Programs for General Public

◆ Event Horizons

- Talks, performances and exhibitions
- Series includes Kronos Quartet, Pascal Rogé, Emanuel Ax, Emerson String Quartet, Bang on a Can, Juilliard String Quartet, Beaux Arts Trio, Art Talks with Ed Burtynsky, Jim Dine.
- Post-performance interaction in the Black Hole Bistro



Outreach



➤ Milestones

- ◆ First Public Lecture (Penrose) - October, 2001



- ◆ Student and Teacher Programs – January, 2002

Outreach

➤ Milestones

- ◆ Monthly Public Events Series Begins – Oct, 2002
- ◆ International Student Camp – August, 2003
- ◆ National Teachers' Workshop – August, 2004
- ◆ Grand Opening of New Building – October, 2004
- ◆ Event Horizons Begins – January, 2005
- ◆ EinsteinFest – October, 2005

Outreach

➤ Milestones

- ◆ Face to face interaction with:
 - 2000 students
 - 1000 teachers
 - 62,000 members of general public
- ◆ Participation Involves
 - 10 Provinces and Regions
 - 29 Countries

Outreach

➤ Milestones

◆ Endorsed by:

- Government of Ontario
- Government of Canada
- UNESCO



Ontario

Canada



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Why it Matters to You

- Next Steps
- How to take part



Why it Matters to You

➤ Research – Next Steps

- ◆ Prudently hire additional 25 to 30 Researchers
- ◆ Further Incorporate Graduate Students
- ◆ Grow Partnerships Among International Institutes

Why it Matters to You

➤ Outreach – Next Steps

- ◆ Expand Programs, Products and Staff to Provide:
 - Continuing Education Courses
 - Elementary Programming
 - Books
 - TV Documentaries
 - “Lessons-In-A-Can” for Teachers
 - “Critical Conversations”
 - Improved Website Content