CMI Supported Conferences

A Celebration of Raoul Bott's Legacy in Mathematics
June 9–13, 2008, Centre de Recherche Mathématiques, Montreal

by Robert Kotiuga, Associate Professor of Electrical and Computer Engineering, Boston University

The background for the conference, its rationale, as well as abstracts and titles of talks are archived on the conference website: www.crm.math.ca/Bott08. The conference was cosponsored at the level of $13,000 by the Clay Mathematics Institute, and was awarded a $25,000 grant from the NSF (USA). Currently, an extended conference proceedings is being planned.

"A Celebration of Raoul Bott's Legacy in Mathematics" was a forward-looking mathematical conference that was not organized around a mathematical topic, but a mathematical personality. Most of the speakers were either students or coauthors of Raoul Bott, or feel that their work clearly reflects the influence Bott had on them. Minimal effort was given to a systematic covering of the topics covered in Bott's collected works published over a decade ago. Rather, Bott's colleagues from six consecutive decades were given a free hand to rework and understand past work in terms of current developments. The abstracts posted on the website summarize the mathematical aspects of the conference and document where the organizational approach leads. One talk out of the mathematical mainstream was the talk by Jim Lambek, who reminisced about Raoul Bott as an engineering student at McGill University in the 1940s. Numerous other anecdotes about Bott were given in the first panel session entitled "Raoul Bott as Teacher, Mentor, and Colleague," and in the banquet speeches.

In addition to being a profound and influential researcher, it is well known that Bott was a wonderful lecturer. This has been documented in many places, and the conference produced some posthumous testimony of this. At the end of the second panel session, "Examining Raoul Bott's Legacy in Mathematics," the conference organizer emphasized that the conference was not organized around a mathematical topic but a mathematician, and asked the younger attendees what they thought of the concept. A student who identified himself as a graduate student working in an unrelated field made what was considered a remarkable comment. He said he learned more in his area of expertise than he did at other mathematics conferences because speakers at this conference seemed to make an extraordinary effort to communicate their ideas in the simplest, and most visual terms possible. What was more remarkable was that the instant consensus in the room was that this was a manifestation of all of the speakers being influenced by Bott's lecturing style and his insistence on understanding deep mathematical concepts in the simplest terms possible.

Another unique aspect of the conference was the visual memory of Bott—from the "picture gallery" on the website, to pictures of him from six distinct decades on the conference poster, to the screening of Vanessa Scott's film—*A Peek into the Book*. The unique combination of forward-looking mathematics and intimate connection to the Bott family would not have been possible without the effort of Bott's daughter, Candace Bott, who spoke at the banquet, introduced her niece's film, and was indispensable in helping with all visual aspects of the conference. In addition to producing an extended conference proceedings, popular demand initiated an attempt to distribute Vanessa Scott's film more widely. The rough cut documentary portrait, as it was screened in its unfinished state, is now available upon written request to the Clay Institute.

Organized by Robert Kotiuga

Scientific Advisory Committee:

Sir Michael Atiyah
Octavian Cornea
David Ellwood
Jacques Hurtubise
Francois Lalonde
David Mumford
Graeme Segal
Stephen Smale
Jim Stasheff
Edward Witten

Speakers :

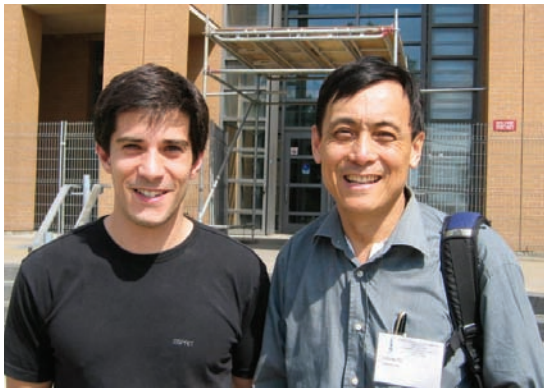
Michael Atiyah
Paul Baum
James Bernhard
Ralph Cohen
Octav Cornea
Marco Gualtieri
James Heitsch
Nancy Hingston
Morris Hirsch
John Hubbard
Lisa Jeffrey
Nitya Kitchloo
Joseph Kohn
Robert Kotiuga
Peter D. Lax
John Morgan
Stephen Smale
András Szenes
Constantin Teleman
Susan Tolman
Loring Tu
Cumrun Vafa
Jonathan Weitsman
Edward Witten

Panelists:

Michael Atiyah
Paul Baum
Nancy Hingston
Jacques Hurtubise
Nitya Kitchloo
James Stasheff
Susan Tolman
Loring Tu

Banquet Speakers:

Michael Atiyah
Candace Bott
Stephen Smale



Conference speakers Cumrun Vafa, Marco Gualtieri, and Loring Tu.

Banquet speakers Candace Bott and John Hubbard.

Photos courtesy of Loring Tu

CMI Supported Conferences

A Celebration of Raoul Bott's Legacy in Mathematics, continued

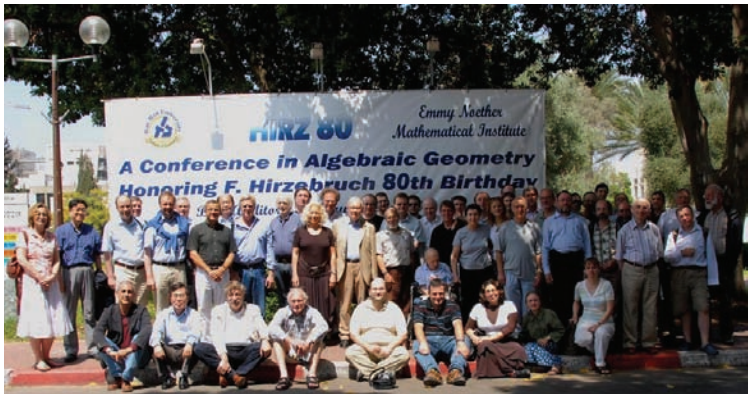
Although this is not the place to summarize the individual talks, it is worth commenting on the unanticipated outcomes of the conference. The masterful presentations of Michael Atiyah were not surprising, in light of his lifetime of outstanding achievements and collaborations. So it was with many of the other talks; the distinguished speakers lived up to their reputations. The speakers who talked about localization and singularity theory clearly built on the last two decades of Bott's research. The talks by Vafa and Witten dwelled on a stream of dualities that quantum field theory has been offering mathematics in recent decades, and the tantalizing new connections to number theory. Many other talks rounded out the conference in other ways. However, there were several unexpected developments where a big picture seemed to evolve magically out of smaller parts, and it is useful to focus on one that was not obvious before the conference. Loosely speaking, it pertains to Chas-Sullivan string topology and its relation to Floer homology via Morse theory. Here, on one hand, the work of Hingston and Goresky recast string topology in terms of Morse theory as applied to loop spaces by Bott in the 1950s. On the other hand, the work of Kitchloo and Cohen build on Morse theory in the context of quantum topology, and refine the use of Morse theory in low dimensional topology. In the talks given by these speakers, as well as those of Cornea and Teleman, one could sense where manifold topology was headed in the next few years, and while many of the new results would be unknown to Bott, the connection to his mathematical perspective and legacy is inescapable!

Finally, the organizer would like to express his gratitude to all involved. What a wonderful bunch of people to work with! The close connections to Raoul Bott clearly had something to do with making this a wonderful event.

A Conference in Algebraic Geometry Honoring F. Hirzebruch 80th Birthday, May 18–23, 2008, ENI, Bar Ilan University, Israel

CMI had the privilege of cosponsoring HIrz80, a Conference on Algebraic Geometry, held at Bar Ilan University, Israel, on the occasion of Professor Fritz Hirzebruch's eightieth birthday. Organized by Professor Mina Teicher of Bar Ilan with funding from the Israel Science Foundation (ISF), the six-day conference brought together forty mathematicians from Israel, the US, England, Canada, Italy, Germany, France, Russia, and Korea. Professor Hirzebruch is well known to us for his many contributions to mathematics, including his Riemann-Roch theorem, proved in 1954. This result is one of the great leaps forward that made algebraic geometry in dimension greater than two possible. Nonetheless, his influence was much wider than his own work in mathematics. He played a major role in the rebuilding of German mathematics after the war, including the founding and operation of the Max Planck Institute in Bonn, the Arbeitstagung, and mentoring many mathematicians just starting their careers.

The range of talks at the conference was broad, e.g., Faltings on p-adic period domains, Lubotzky



on counting arithmetic groups and surfaces, and Griffiths on singularity and enumerative properties of families of Calabi-Yau varieties. Please see http://u.cs.biu.ac.il/~eni/Hirz80.html for a full list of titles and abstracts. The hospitality, meals, and excursions (Sea of Galilee and the Old City in Jerusalem) were beautifully organized by Professor Teicher with the help of Miryam Shabtay. Despite the very full lecture schedule, there was ample time between talks and in the evening to discuss mathematics. This is one of the joys of a good conference, and was notably so at Hirz80.