Pacific Institute for the Mathematical Sciences

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The Banff International Research Station for Mathematical Innovation and Discovery

Pacific Institute for the Mathematical Sciences

Mathematical Sciences Research Institute

Newsletter Banff Special Issue EMISSARY

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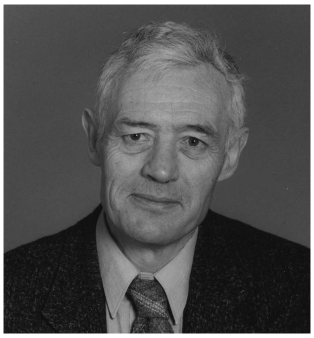
Overview

The Banff International Research Station (BIRS) is a collaborative Canada-US venture to provide an environment that optimizes opportunities for creative interaction and the exchange of ideas, knowledge, and methods within the mathematical sciences and with related sciences and industry.



The first BIRS Scientific Director is **Robert V. Moody** from the University of Alberta.

The US participation will be led by the Mathematical Sciences Research Institute (Berkeley, CA) while the Canadian effort will be coordinated by the Pacific Institute of the Mathematical Sciences (PIMS) with the help and participation of the Mathematics of Information Technology and Complex Systems Network of Centers of Excellence (MITACS) as well as other related institutes and professional organisations. BIRS will be a truly international venture.

Applications for the funding of BIRS have been submitted to the Natural Science and Engineering Research Council of Canada (NSERC), the US National Science Foundation (NSF) and the Alberta Science Research Authority (ASRA). The implementation of the BIRS programs is contingent upon receiving appropriate levels of funding from these three organizations.

*Please see **Overview,** page 3.*

The Scientific Advisory Board

- Robert V. Moody (Chair), **Lie Theory and Mathematical Physics**, University of Alberta
- James Arthur, **Representation Theory**, University of Toronto
- Jennifer Chayes, **Complexity theory and Statistical Mechanics**, Microsoft Research
- Richard Cleve, **Quantum Computing**, University of Calgary
- Henri Darmon, **Number Theory**, McGill University
- David Gross, **Quantum Field Theory and String Theory**, University of California, Santa Barbara
- Peter Guttorp, **Environmental Statistics**, University of Washington
- Craig Huneke, **Algebra**, University of Kansas
- Nancy Kopell, **PDE and Applied Mathematics**, Boston University
- Mark Lewis, **Mathematical Biology and Ecology**, University of Alberta
- László Lovász, **Combinatorial Optimization, algorithms and complexity**, Microsoft Research
- Jitendra Malik, **Computer Vision**, University of California, Berkeley
- Dusa McDuff, **Topology and Symplectic Geometry**, SUNY, Stony Brook
- David Mumford, **Machine and Natural Intelligence**, Brown University
- Robert Myers, **Superstring Theory and Quantum Gravity**, McGill University and Perimeter Institute
- Edwin Perkins, **Probability Theory**, University of British Columbia
- Nicholas Pippenger, **Computer Science**, University of British Columbia
- Ian Putnam, **Dynamics & Operator Algebras**, University of Victoria
- Nancy Reid, **Statistics**, University of Toronto
- Gang Tian, **Geometry**, Massachusetts Institute of Technology
- Robert Tibshirani, **Data Mining and Computational Statistics**, Stanford University
- Margaret Wright, **Algorithmic Optimization**, AT & T Bell labs
- David Eisenbud, Director, MSRI
- Nassif Ghoussoub, Director, PIMS
- Arvind Gupta, Program leader, MITACS
- Bradd Hart, Acting Director, FI
- Jacques Hurtubise, Directeur, CRM

PIMS Director's Notes

Nassif Ghoussoub, FRSC

I will always remember how quickly Uffe Haagerup solved our problem. It was in 1986, late at night in one of the many memorable visits to Oberwolfach. My main contribution was simply to realize that a great specialist in Von Neumann Algebras was living among us.

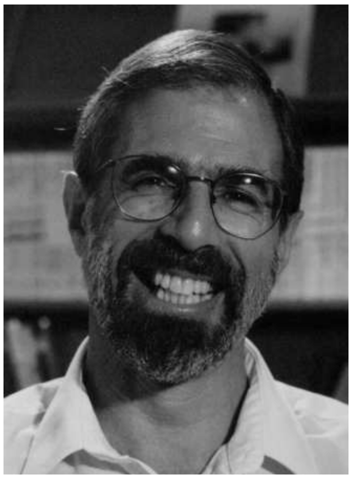
My first visit to Luminy came much later during a sabbatical leave from PIMS in the fall of 1999. By then, I had a new angle or perspective on mathematical research. Now, I was not only interested in how to practice it as a researcher, but also in how to facilitate it as an institute director. It soon became clear to me that the time had arrived for North America to develop its own Oberwolfach/Luminy center. Soon after, the PIMS executive committee enthusiastically endorsed the idea and here we are, almost 18 months later, awaiting a crucial site visit on June 15 and a historic decision by NSERC, ASRA and the NSF.

The arduous journey of building PIMS wouldn't have been accomplished without the unconditional support and commitment of friends like Arvind Gupta and Ed Perkins. The road to the MITACS network couldn't have been travelled without visionary companions like Don Dawson, Luc Vinet and Steve Halperin. Here again, call it luck, I feel extraordinarily priviledged to be working on this initiative with colleagues like Robert V. Moody and David Eisenbud. With their outstanding scientific credentials, vision, dedication and integrity, the Banff station will soon be ready to be a great new resource for the world's scientific community.

Many hurdles remain but whether successful or not, this effort should always be remembered as the culmination of a joint effort by a remarkable group of people who happen to be in leadership positions. Most of them are not mathematical scientists but simply great believers in the role of mathematics, its ramifications and its applications: Senior NSERC and NSF officials (Brzustowski, Lloyd, Menard, Colwell, Eisenstein, Tondeur and others) who are determined to encourage international collaborations in order to multiply the opportunities for their researchers; Senior Alberta officials (Taylor, Church, Palmer, Hill and others) who are totally committed to the R&D effort in their province; Senior administrators in the major Alberta and BC universities (Archer, Smith, Clayman, Taylor, Samarasekera, Peter, Boorman, McBride, Klawe) who were so instrumental in getting PIMS on its feet and who are now back again actively helping us build the Banff International Research Station.

MSRI Director's Notes

David Eisenbud



Over many years the conference centers at Oberwolfach and Luminy have meant a great deal in my life. In 1970, when I got my PhD, I was lucky enough to have one of my first papers noticed by Friedrich Kasch, who organized a series of meetings at Oberwolfach, and who invited me to come. It was a career-defining experience. I fell in love with the setting and met quite a few of the European mathematicians who have been my friends and collaborators ever since. I've been back about once a year, and my pleasure in the place has been renewed each time.

An American mathematician, Graham Evans, likes to stand at the door of Oberwolfach when a new arrival comes and say "Welcome to heaven!" My feeling about the place is the same. I know that when I go to Oberwolfach it is for a week of complete immersion in mathematics, in the company of congenial people, with long reflective walks along the hills, amidst fir trees and farms. My encounters at Oberwolfach, and more recently at Luminy, have led to the results in at least 6 of my papers – many more if you count vaguer influences.

At the time I first went to Oberwolfach, most meetings there took place once a year in series that were expected to go on for ever. Typically a grand old professors and their mathematical offspring got together for a sort of wonderful mathematical picnic. Now by contrast there is intense competition for meeting times, and even established groups can find space only once in several years. As an occasional organizer of meetings at Oberwolfach and Luminy I know how hard it is to narrow the field and narrow the invitees to fit into the space available. There is plenty of excellent mathematics and a crowd of excellent mathematicians that are not accomodated. And despite the strong internationalism of these places, they naturally favor germans and french; although there is a group of North American mathematicians who go regularly, I know many fine workers in this country who have never been invited, or never had the opportunity to go.

The formation of the Banff International Research Station will give many more North American mathematical scientists the opportunity to meet with peers from the US, Canada, and abroad, in a beautiful setting for intense exchange and work. All kinds of mathematics will be at home there, and I think that the Station will be a source of many new collaborations and intense partnerships, crossing national boundaries and disciplines.

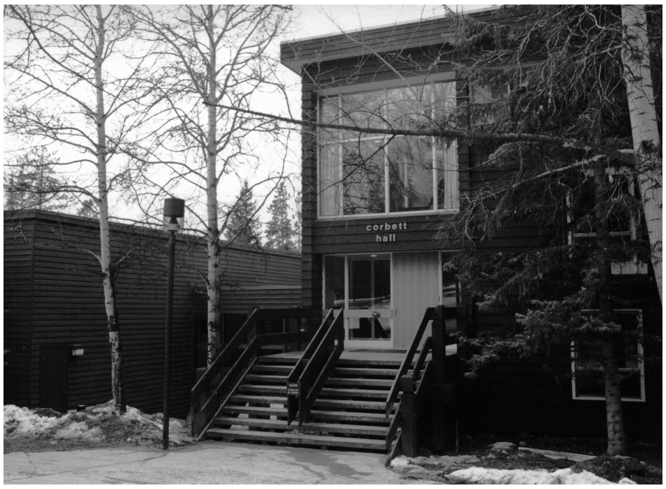
Overview

Continued from page 1.

BIRS will pursue an extremely broad program. It will embrace all aspects of the mathematical and statistical sciences, from the most fundamental work on the great problems of algebra, number theory, geometry and analysis to modern pure and applied mathematics, theoretical and applied statistics, financial and industrial mathematics, the mathematics of information technology and computer science, and bio-mathematics.

The initial operation of BIRS will be for forty weeks a year beginning in the Spring of 2003. The main mode will be five-day workshops ("Oberwolfach-Luminy mode"), but there is also provision for two or three-day events suitable for promoting industry-academic collaborations, for "Research in Teams", and for focused research groups to live and to do research together ("Aspen mode") in a non-workshop/non-conference style setting at the BIRS Facility for periods of 2 to 4 weeks.

Applications will be selected on a competitive international basis, by a rotating Scientific Panel of experts from the breadth of the mathematical sciences.



Visitors to BIRS will be accommodated in Corbett Hall.

A Long-desired Facility

One of the most successful mathematical institutes in the world is the Mathematisches Forschungsinstitut in Germany. Nestled in the small village of Oberwolfach in the Black Forest, the MFO holds weekly workshops year-round which attract the finest mathematical scientists in the world. France followed suit in the eighties by establishing a similar center at Luminy in southern France. Oberwolfach and Luminy are international treasures, but it is not hard to see that it is the European mathematical community that is the main beneficiary.

It has long been a dream to have a North American counterpart, worthy of the enormous strengths of the mathematical sciences on this continent. This is what the Banff Station will be. The research facilities that BIRS will offer, such as lecture rooms, break-out rooms, high-speed internet connectivity for effective communication and interaction, are also available at universities and institutes, but the Station offers several additional elements. The crucial features that will make the International Research Station a premier place for research and innovation are:

- The quality and timeliness of the programs, guaranteed by the high standard of the Scientific Advisory Board;
- The breadth of coverage of the mathematical sciences and their applications;
- The beautiful and secluded setting;
- The intensity of interaction provided by a facility in which all participants live, work, and eat together;
- The ready-made infrastructure which will make it easy to organize smoothly-running meetings and allow the scientific organizers to concentrate on the science.

Vision of the Station

BIRS is to be a center for scientific interaction, a place where promising ideas develop, where lines of thought that appear unrelated converge. The sources of inspiration should come from many sorts of mathematics (Pure, Applied, Computational and Conceptual), different motivations (Intellectually driven or industrially motivated). People interested in similar problems will unite their potentials and join their efforts in order to work on common research projects.

A Model that Complements Institutes' Activities

The new Research Station will complement, not compete with present institutes in Canada and the United States.

The primary mode of operation of these institutes is long (3, 6, or even 12 month) thematic programs with satellite conferences and workshops. This means in-depth years devoted to a relatively small set of topics. In this, they have been wonderfully successful, providing outstanding environments for extended research collaborations, and being the catalysts for major and sustained advances of the fields in question.

In contrast, the Banff Research Station will provide a setting for relatively short but intense, easily organized research and innovation meetings, each year covering a broad range of the mathematical sciences, and capable of responding quickly to new and exciting developments.

A Unique Common Forum for the Partner Organizations

The Institutes have developed strong links between their sponsoring universities, local industries and provincial governments. BIRS will build on these linkages by providing a setting for the integration of some of the Institutes' regional networks into a common framework for scientific and industrial cooperation. The Institutes and the MITACS network will serve as a catalyst for bringing together at BIRS, academic and industrial researchers into a potentially highly beneficial joint research activities.

A Cost-effective Research Facility

BIRS will provide a highly cost-effective means of supporting research and training in the mathematical sciences. By securing dedicated space for long term use, and putting into place a trained staff to organize such events, the partners can achieve an economy of scale of large magnitude. This will allow BIRS to run events for considerably less cost than the typical "hotel plus per diem" costs elsewhere. Such savings and the resources obtained by pooling the resources of several organizations, 2 federal governments and 2 provincial governments (BC and Alberta), allow BIRS to greatly multiply the new opportunities for researchers.

Lecture room in the Max Bell Building at the Banff Conference Centre.

A Place Where Mathematics Will Interact with Other Areas of Culture

The Banff Centre is internationally recognized as a place of high culture. Every year its programs in music and sound, the written, visual and performing arts, leadership and management, and mountain culture draw in many hundreds of artists, students, and intellectual leaders from around the world. The Centre already includes a full-scale television production facility and a unit that focuses on computers in art. The introduction of BIRS, with its stream of incredibly creative and imaginative people, into this rich and fertile environment will provide opportunities for unique synergies. Both the Banff Centre and the BIRS are excited about exploring the possibilities. It is easy to imagine activities around 3D-computer graphics, the mathematics involved in archiving art (the recent destruction in Afghanistan serve to highlight the importance of this), the use of fractals and other mathematical structures in virtual reality, the mathematics in the biology and ecosystems of mountain environments, the inclusion of parts of risk management and complexity in the connection with the management programs, or the study of mathematics in architecture. There are also possibilities for dissemination of mathematical culture to a wider community and the promotion of mathematical/scientific writing for the lay public, both of which are desperately needed to heal the widening gap between the practitioners and the users of modern science and technology.

A Highly Attractive Destination

As a World Heritage Site and a place of immense natural beauty, Banff will provide immediate recognition and high profile to the Research Station, ensuring that it will be an attractive destination for the best researchers from around the world.

The Breadth of the Mathematical Sciences

From the times of the ancient Greeks, there have been two overlapping sources of mathematics: problems posed from the physical world (including things like communication and information) and problems posed from the pure imagination of mathematicians. Both these sources lead to mathematics which has found major practical applications. It is important for the health of mathematics and eventually for the health of all science and technology that both these streams of inspiration be supported and encouraged. For the new Station, this means conferences ranging from traditional core disciplines of mathematics to the immediate, multidisciplinary applications of mathematics. In addition, the future of the mathematical sciences is not secure unless extremely talented young people continue to enter the profession; so education will also be an important theme.

The Challenge of Cross-disciplinary Research

The "mathematization of all of science" is proceeding at an extraordinary rate. Channels which can disseminate, nurture, and exchange ideas between the host of different mathematical disciplines and the even vaster array of areas of science and technology that depend on them are important as never before.

All cross-disciplinary efforts face the extraordinary tasks of bridging the gaps of language and concept that separate the thinking and practice of different fields. When mathematics is involved, with its daunting abstraction, its conciseness and precision, and its extraordinary depth and wealth of knowledge from 2000 years of ever-accelerating work, the difficulties are enormous. The Institutes have considerable experience in managing this difficult task.

Need for a Hub for Industrial Collaboration

With the establishment of the MITACS Network of Centres of Excellence, Canadian mathematicians have embarked on a major program of industrial collaboration that is already having an impact on the global competitiveness of Canada-based industries. The MSRI is also a leader in the outreach efforts of the US mathematical sciences community. The industrial partners appreciate and relate well to the concept of a research station hosting focused workshops on key mathematical problems that are relevant to their business operations. BIRS will act as a hub for many of these industrial collaborations and will provide a physical home that researchers in industrial centres will identify as a hotbed of activities relevant to their work. No comparable dedicated facility is currently available on the continent, nor is one likely to be developed via any collaborative effort of such diverse parties.

Provincial and Industrial Support for Research

We anticipate a significant level of financial support from the government of the Province of Alberta, which stands to benefit directly from this new, high-profile research centre within its borders. This support will be both direct, in the forms of a grant for operating costs of the centre, as well as indirect, in the form of funds supplied to the Banff Centre for necessary renovations to accommodate the activities of BIRS. These, as well as the expected support from the industrial partners constitute new resources to support mathematical research and its applications.

Ensuring High Calibre Research

Every year, an international call for proposals will be made, soliciting applications for workshops and organizers from every field of the mathematical sciences and its applications [1]. Proposals will be accompanied by a summary of the important developments of the field in question and a preliminary list of possible participants.

A subset of some 10 members of the BIRS Scientific Advisory Board will serve as a *Steering Committee*. The Steering Committee is responsible for the Scientific Program of the Station. It will accept the recommendations of the Scientific Advisory Board and will schedule and coordinate the successful proposals.

Modes of Operation

Five-day Workshops (Oberwolfach-Luminy Mode)

The fundamental mode of BIRS is the Five-day Workshop [2]. Each workshop is devoted to one specific area of high research interest. About 40 expert-participants from around the world are invited to attend. The objective is to exchange the latest advances in the field and to provide an environment which fosters new collaborations and new ideas, and which provides a forum for lively and vigorous discussion for the latest theories and proposals.

The five-day workshop mode will also include industrial case study and problem solving workshops, an extension of the highly successful PIMS events.

Each workshop will have at least two organizers, normally including at least one from a Canadian institution and one from an American institution. They should be internationally respected experts in the area of the workshop, with broad scientific culture and connections. Their job is to form the list of invitations, which must be approved by the Scientific Director, and to run the program during the workshop.

Within the five-day format, two half-workshops may also run side-by-side. This may be especially appropriate for newly emerging fields, for more narrowly focused groups, or to fit in an exciting development.

For workshops in some disciplines where participants cannot easily leave their jobs or laboratories for more than a few days, a two or three-day format will be more suitable.

Two-day Workshops

The normal scheduling of the five-day workshops will leave 2 day periods open [3] that may be used for a variety of special events:

- Special workshops to respond to unexpected new developments or new opportunities.
- Industry/university round table workshops.
- Weekend seminars and mini-conferences.
- Special interactions with other cultural or intellectual activities of the Banff Centre.

Research in Teams

In addition to its on-going workshops, the Station may host teams of two to four researchers for periods of two to four weeks. This *Research in Teams* program will offer individuals from different institutions who are collaborating together, the location and freedom from distraction to concentrate on their research or to finish major projects.

BIRS plans to keep several of its rooms available for the accommodation and activities of such Research in Teams. The RIT program will accept proposals and make decisions on them on a competitive basis through its Scientific Board. We would hope to have 1 or 2 RIT groups working most of the time.

Focused Research Groups ("Aspen Mode")

There will be possibilities to have research collaborative groups in residence together for longer stays (Aspen mode) and some with other formats. A typical configuration might be groups of 10 to 15 mathematicians each, up to 8 of them being in residence at BIRS for 2 to 4 weeks.

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[1] A call for proposals for the 2003 program year has been made in April 2001 with an October 1, 2001 deadline. The BIRS Scientific Advisory Board will meet early December 2001 to make the final recommendations for the 2003 cycle

[2] These will run from Sunday A.M. through to Thursday P.M. with Saturday night arrival, in order to get a Saturday night stay over on airline flights.

[3] namely Friday and Saturday

This would provide a good venue for collaborative work for teams of mathematical researchers like those identified and supported by NSF's Focused Research Groups program and NSERC's Collaborative Research Opportunities program.

Summer Schools

BIRS will run some longer events (10-12 days) in the form of (normally summer) schools.

Thematic Summer Schools: These summer schools will continue the tradition already established (at Banff) of starting an Institute's thematic program with a 2-week program at the Banff Station. The goal is to prepare graduate students, postdoctoral fellows and non-experts for the high level material of the thematic programs.

Graduate Camps: The Station provides an ideal setting for graduate summer camps. These can be introductory to classical topics of mathematics like the upcoming Commutative Algebra program at MSRI or to emerging areas of the mathematical sciences and their applications like MSRI's summer graduate program on Signal Processing or PIMS annual senior undergraduate and graduate industrial modeling Camps.

Industrial Activities

The Industrial mathematics component will be initially coordinated by the director of the *Mathematics of Information Technology and Complex Systems Network of Centres of Excellence* (MITACS). MITACS is sponsored by a large consortium of companies interested in partnering with Universities and government, and its participation ensures a strong industrial and cross-disciplinary basis.

BIRS will provide the ideal setting for a myriad of industrial activities in the mathematical sciences. While these activities will often follow the same format as the other scientific activities, the focus will be on applied and industrial mathematics with participation from graduate students, postdocs, and academic and industrial scientists.

Arvind Gupta, MITACS Programme Leader

MITACS Theme Meetings

The MITACS Research Program brings together academic scientists with the business community to address significant problems arising in five key sectors of the economy:

Biomedical: MITACS teams are working with pharmaceutical firms, hospitals, foundations, and provincial agencies on research such as multiple disease factors and genetics, arrhythmia of the heart, epidemiology, drug delivery, and cellular and organ physiology.

Commercial/Industrial: Any organization seeks optimal allocation of resources. Researchers use models for resource allocation such as column generation, probabilistic methods, and techniques from computational geometry to help partner companies reduce their costs and thereby gain a distinct competitive edge.

Information Technology: This sector, accounting for much of the employment growth in the economy, is affecting almost every field of science and engineering. MITACS research emphasize both the design and application of software and hardware tools. This diversity of applications creates new possibilities, directions and ideas for the application of mathematical methodologies. Projects focus on topical issues such as symbolic computing, network designs, data mining, and prediction in interacting systems.

Trade and Finance: Traders, portfolio managers, and others in the financial industry must make daily decisions regarding asset allocation, security and derivative pricing and risk management in general. Projects in this sector aim to provide decision makers with new mathematical and/or financial models, or statistical and econometric tools, to improve their ability to understand and manage risks in a variety of economic contexts.

Manufacturing: This sector remains a central part of the modern economy. Research problems include the modeling of flows in fuel cells and the application of pseudo-differential operators to help develop new techniques for seismic imaging and oil exploration.

These five "themes" each hold a 2-3 day annual meeting of graduate students, faculty, and industry. The meetings are ideal for networking, knowledge exchange, and staying abreast of new developments. BIRS, as the permanent site for these meetings, will draw additional industrial members and is an excellent venue for networking and stimulating discussions.

Graduate Modeling Camps

This will follow the model of the highly successful PIMS Graduate Math Modeling Camp. This one week event will feature approximately 40 graduate students being taught modern techniques in industrial mathematics by five or six leading world experts. The students will work in teams looking at actual case studies with the experts acting as mentors throughout the process.

Industry Specific Courses

The industrial partners of BIRS will be invited to hold short workshops or graduate courses on mathematical tools and techniques of particular interest to that partner. Attended by graduate students and postdoctoral fellows, these will be an ideal way of disseminating knowledge from industrial scientists back into academia. We expect Microsoft, Boeing and leading Canadian firms such as Nortel and Telus to be involved in this model.

Industry-University Round Tables

BIRS is the ideal setting for high level meetings of senior industry representatives with academics to develop strategic plans for curricula, research thrusts, and responses to new opportunities.

Training of Highly Qualified Personnel

The sustenance of science and technology depends on capturing the minds and enthusiasm of young people and offering them the training to become future researchers. Both PIMS and MSRI take these responsibilities seriously. For this reason the International Research Station will make opportunities for programs devoted to education in the mathematical sciences.

Summer Mathematics Camps

Both in Canada and the US there are summer mathematics camps for students of junior/senior high schools. Offering a mix of study, training, competition, recreation, and comradeship. These programs promote enthusiasm for the world of sciences and mathematics. BIRS is a good place for such activities (one or two weeks at a time) and the Station will endeavour to attract such events and similar ones from across North America and internationally too (e.g. the International Mathematical Olympiads, and the training camps for them).

Teacher Training

Beyond all else, the elementary school and high school teachers are the ones whom we must rely on for future researchers. The present environment is one in which mathematics/science teachers in the schools need all the help they can get, and professional mathematical scientists must make the effort to engage in the process. The Research Station will cooperate and expand upon the outreach efforts of the institutes and the professional societies towards mathematical education.

Graduate and Senior Undergraduate Summer Camps

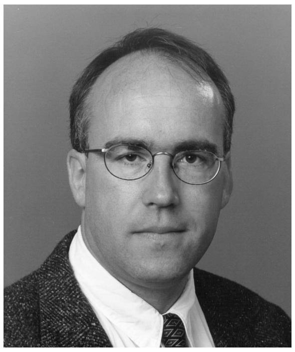
There will be special emphasis on graduate and senior undergraduate summer schools. These can be introductory to emerging areas of the mathematical sciences and their applications, or in preparation for the institutes own thematic programs. The Station will offer an ideal setting for these events which are at the core of the mission of each of the partner institutes.

Communication and Dissemination

Not everyone who should be, or would like to be, at the BIRS workshops will be able to be there. In order to disseminate its activities to the outside world, BIRS will videotape a number of the prominent seminars from each workshop and quickly prepare these materials for remote access via video streaming (accessible from the PIMS and MSRI webpages). A full time IT person, part of whose responsibilities is to manage the videos side of things, will be employed by the Station. In addition, BIRS will keep permanent record of its activities by requesting that each workshop provide a 10-15 page scientific paper that surveys the important developments in the field as represented by the activities and participants of the workshop. These will uniformly edited and appear as yearly bound volumes.

Management Structure of BIRS

The Banff International Research Station will have a **Scientific Director** who is appointed for a renewable 3 years term by the Board of directors of PIMS at the recommendation of the BIRS Executive Committee (see below) after consultation with the sitting members of the Scientific Advisory Board.



Michael Lamoureux, first BIRS Managing Director.

The Executive Committee of BIRS

This committee is responsible, and has the ultimate authority, for overseeing and coordinating the whole operation of the Station. It consists of the PIMS Director (Chair), the MSRI Director and the BIRS Scientific Director. The committee will report to the Boards of PIMS (resp., MSRI) through the director of PIMS (resp., MSRI). Its responsibilities are the overall planning of the activities and direction of BIRS, coordinating all aspects of the collaborative effort between the Canadian and US partners, maintaining and finding new funding opportunities for BIRS, as well as coordinating the process of selecting and recommending to the PIMS and MSRI Boards, the membership of the Scientific Advisory Board.

The Scientific Advisory Board and Its Steering Committee

The research and intellectual side of the BIRS program is handled by the **Scientific Advisory Board** of BIRS which is comprised of up to 26 members representing a broad and expert coverage of the Mathematical Sciences. The BIRS Scientific Advisory Board is chaired by the BIRS Scientific Director and will include the directors of

PIMS, MSRI and MITACS. It will also have at least 8 members from Canadian institutions and another 8 from US institutions. Appointments are normally for a 3-year term. This board will be responsible for soliciting and ranking proposals for the Station.

The Scientific Advisory Board will have a **Steering Committee**, also chaired by the BIRS Scientific Director, which will make the final selection and schedule the conferences. It will consist of the BIRS Executive Committee as well as seven members of the Scientific Advisory Board. The membership will cover a broad range of expertise as well as the scientific interests of all major users.

Administrative Management of BIRS

The Pacific Institute of the Mathematical Sciences will assume the responsibility for the administrative management of BIRS, including the appointment of a managing director who will oversee day-to-day operation of the Station. The first Managing Director will be Professor Michael Lamoureux of the Department of Mathematics and Statistics at the University of Calgary.

Financial Support

To start and run the Station, PIMS and MSRI are seeking funds from the following sources:

- NSERC (through the Major Facilities Access Program)
- NSF (through a supplement to MSRI's Cooperative Agreement)
- Alberta Science Research Authority
- Various users, including other institutes, industrial partners and professional mathematical, statistical and computer science societies.
- The Alberta Ministry of Innovation and Science (through a proposal for the renovation costs of the Station, including equipment and computer lab infrastructure that will be submitted in 2001 by the Banff Centre with the support of PIMS, the University of Alberta and University of Calgary. This grant will include costs of modifying accommodation space to meet the needs of 45 to 50 regular guests.

The success of the BIRS proposal requires support from each major partner in the venture.

From left, **Robert V. Moody** (BIRS Scientific Director), **Nassif Ghoussoub** (PIMS Director) and **Michael Lamoureux** (BIRS Managing Director) in front of the Max Bell Building.

Contact Information

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