

Profile

Banff International Research Station for Mathematical Innovation and Discover (BIRS)

The Banff International Research Station for Mathematical Innovation and Discovery (BIRS) fosters collaborative and cross-disciplinary research with a focus on the mathematical sciences and their applications across the sciences and in society. The station facilitates intense and prolonged interactions between scientists in a secluded environment, complete with accommodation and board, and the necessary facilities, for uninterrupted research activities in a variety of formats, all in a magnificent mountain setting.

BIRS embraces all aspects of the mathematical, computational and statistical sciences from the most fundamental challenges of pure and applied mathematics, theoretical and applied computer science, statistics, and mathematical physics, to financial and industrial mathematics, as well as the mathematics of information technology, and the life sciences.

Inaugurated in 2003, BIRS is a joint Canada-US-Mexico initiative that came about as the result of a remarkably concerted effort led, at the outset of the new millennium, by the Pacific Institute for the Mathematical Sciences (PIMS, Canada) and the Mathematical Sciences Research Institute (MSRI, Berkeley, USA), along with the support of the Mathematics of Information Technology and Complex Systems Network of Centres of Excellence (MITACS, Canada).

Initial funding for BIRS came from generous support of the Government of Alberta through Alberta Innovation, the Government of Canada through the Natural Science and Engineering Research Council (NSERC), and the US government through the National Science Foundation (NSF). In 2005, Mexico's National Council for Science and Technology (CONACYT) also joined in becoming a BIRS sponsor.

In 2015, the Casa Matemática Oaxaca (CMO) in Mexico became an affiliated mathematical research centre of BIRS. This unique arrangement stipulates that the CMO develop facilities in Oaxaca at the same standard of those at BIRS with BIRS taking responsibility for the scientific program at CMO. In 2020, a second affiliated mathematical research centre, IAS-Hangzhou, will be launched (see below for more information about the affiliated research centres).

BIRS provides a wealth of new and exciting opportunities for faculty, students, and practitioners from around the world, giving them access to their international counterparts at the highest levels and across all mathematical disciplines. Every year, BIRS and its affiliated stations host more than 3500 researchers from 400 institutions in more than 60 countries who participate in well over 100 different programs.

The principal BIRS activities are its annual series of 85 five-day workshops, each hosting up to 42 researchers in disciplines in which mathematics, computer science and statistics are used in novel ways. The format allows scientists to exchange the latest advances in their fields of study and provides an environment that fosters new collaborations and ideas. BIRS also frequently accommodates two-day events, suitable for promoting industry-academic collaborations, and Research in Teams/Focused Research Groups, who are given the opportunity to live and to do research together in a non-workshop/non-conference style setting for periods of 1 to 2 weeks. Other activities include graduate summer schools and graduate training camps.

BIRS is located at the world-renowned campus of The Banff Centre for Arts and Creativity in Banff, Alberta. Corbett Hall is exclusively for housing BIRS participants which allows for informal collaborations. The TransCanada Pavilion of The Banff Centre for Arts and Creativity is entirely dedicated to the scientific meetings of BIRS. This arrangement allows BIRS to provide cost-effective access to collaborative research through dedicated long-term space in an ideal setting.

The Banff Centre for Arts and Creativity is internationally recognized as a place of high culture. Its programs in music and sound, the written, visual and performing arts, leadership and management draw in many hundreds of artists, students, and intellectual leaders from around the world. The introduction of BIRS, with its stream of creative and imaginative people, into this rich and fertile environment provides opportunities for some unique synergies. This has led to a number of high-quality and impactful joint activities that interleave the mathematical sciences with art, culture, and music, all the forte of the Banff Centre.

Governance of BIRS

BIRS is a federally incorporated Canadian not-for-profit. As such, the station adheres to national rules and regulations governing not-for-profit corporations. The Station's by-laws codify the legal governance of the station. Critical components of this governance are:

The Board of Directors takes fiduciary responsibility for BIRS. As such, the Board appoints the Scientific Director and oversees all aspects of the Station's operations. The Board is directly responsible for ensuring BIRS is in compliance with all government and funding agency rules and regulations.

The Scientific Director ensures the overall scientific and operational excellence of activities at the Station. The Scientific Director also acts as the CEO of the corporation, responsible to the Board of Directors for all aspects of the station. The Scientific Director solicits activities from the international scientific community, oversees the selection process for these activities, fosters and maintains critical partnerships, oversees all funding applications, and acts as the chief spokesperson for the station.

The Scientific Advisory Board is comprised of 30 international experts, broadly covering all aspects of research in the mathematical sciences. Chaired by the Scientific Director, this Board provides expert advice on solicited programs, oversees development of cooperative programs between BIRS and international mathematical sciences institutes, and fosters collaborations with the Banff Centre.

The Program Committee is a 10-member subcommittee of the Scientific Advisory Board. Chaired by the Scientific Director, this committee is responsible for the final selection and scheduling of programming at both BIRS and at the BIRS affiliated stations.

Affiliated Research Centres

In 2015, BIRS welcomed Casa Matemática Oaxaca (CMO) as a BIRS-affiliated research centre, located in the city of Oaxaca, Mexico. Oaxaca is a UNESCO designated world heritage site and boasts a vibrant cultural and is well known as a gastronomic destination. The scientific programming at CMO mirrors that at BIRS with activities chosen through the BIRS governance structure while operations and finances are separate from BIRS and maintained by a dedicated

and independent staff. Currently CMO activities operate out of the Hotel Hacienda Los Laureles and Hotel Angel Inn with new dedicated facilities in the planning stages.

In 2020, a new BIRS-affiliated research centre IAS-Hangzhou will launch its inaugural workshops in Hangzhou, China. IAS-Hangzhou follows the CMO model whereby BIRS provides scientific governance so as to ensure equally high standards as those at Banff and CMO while all logistics are handled locally.

Administration of BIRS

As well as the Scientific Director, BIRS is administered by a six-person team situated at the University of British Columbia and on-site at the BIRS facilities in the Banff Centre. Key roles include the:

- Administrator, responsible for all financial and administrative aspects of the station as well as all HR support.
- Station Manager, responsible for smooth functioning of the station on-site in Banff.
- Station Facilitator, to assist the Station's on-site manager in Banff.
- Scientific Program Assistant, who provides administrative support to the Scientific Director and handles publications, scientific reporting, and the website.
- Scientific Program Coordinator, who provides scientific support for the Scientific Director including proposal reviews and workshop organization including communication with participants.
- Technology Manager, responsible for all aspects of BIRS technology, both for programs and for participants.

Sample BIRS Activities (Recent, Current and Upcoming)

Women In Numerical Methods for PDEs and their Applications (19w5189)

May 12-17, 2019, in Banff

<https://www.birs.ca/events/2019/5-day-workshops/19w5189>

Computational Harmonic Analysis and Data Science (19w5061)

Oct 27-Nov 1, 2019, in Oaxaca

<https://www.birs.ca/events/2019/5-day-workshops/19w5061>

Geometry and Physics of Quantum Toroidal Algebra (20w5024)

Sep 6-11, 2020, in Hangzhou

<https://www.birs.ca/events/2020/5-day-workshops/20w5024>

Mathematical Modelling in Glaciology (20w5198)

Jan 12-17, 2020, in Banff

<https://www.birs.ca/events/2020/5-day-workshops/20w5198>

Calendar of all events:

<https://www.birs.ca/events/calendar>