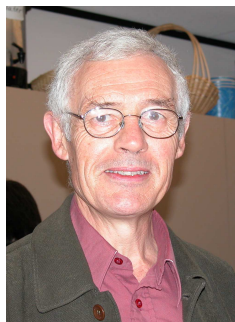


THE BANFF INTERNATIONAL RESEARCH STATION



Corbett Hall at the Banff Centre on a fall morning.



Robert V. Moody, BIRS
Scientific Director

The official announcement of the Banff International Research Station (BIRS) occurred on September 24, 2001 at the Banff Centre in Banff, Alberta, and at the National Science Foundation in Washington D.C. The ceremony included speeches by: Dr. Rita Colwell (Director, NSF), Dr. Tom Brzustowski (President, NSERC), Dr. Robert Church (Chair of Board, Alberta Science and Research Agency), Dr. Philippe Tondeur (Director of Division for the Mathematical Sciences, NSF), Hon. Cindy Ady (MLA for Calgary Shaw), Ms. Mary Hofstetter (President and CEO of The Banff Centre) and Mr. Raul E. Chavera (US Consul General in Calgary). The ceremony is available in realvideo from www.pims.math.ca/birs/past_menu/announce/.

The Location of BIRS

BIRS is located in two adjacent buildings at the Banff Centre: the Max Bell building will have two lecture rooms and several smaller meeting and discussion rooms, and Corbett Hall, which will be entirely taken over by BIRS, will house the living quarters for all BIRS visitors.

Modes of Operation

Five-Day Workshops

The fundamental mode of BIRS is the five-day workshop, which runs from Sunday a.m. through to Thursday p.m. 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.

Two-day Workshops

The normal scheduling of the five-day workshops will leave 2 day periods open (Friday and Saturday) that may be used for a variety of shorter meetings such as Pacific Northwest Seminars and special events.

Research in Teams

In addition to its ongoing workshops, the station may host teams of 2–4 researchers for periods of 2–4 weeks. This programme 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.

Focused Research Groups

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 10–15 mathematicians each, up to 8 of them being in residence at BIRS for 2–4 weeks. 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 research schools directed principally towards graduate students and postdoctoral fellows.

The Opening of BIRS

BIRS will open its doors on March 15, 2003. To celebrate the remarkable achievement of creating this new institution there will be a reception on February 28, 2002 at the Banff Centre. This will be a gala affair involving the Boards of Trustees of PIMS, MSRI

The BIRS Scientific Advisory Board

- Robert V. Moody (Chair, U. Alberta): **Lie Theory and Mathematical Physics**
- Doug Arnold (U. Minnesota): **PDE and Numerical Analysis**
- James Arthur (U. Toronto): **Representation Theory**
- Jennifer Chayes (Microsoft Research): **Complexity theory and Statistical Mechanics**
- Richard Cleve (U. Calgary): **Quantum Computing**
- Ronald Coifman (Yale): **Harmonic Analysis**
- Henri Darmon (McGill): **Number Theory**
- David Gross (UC, Santa Barbara): **Quantum Field Theory and String Theory**
- Peter Guttorp (U. Washington): **Environmental Stats**
- Craig Huneke (U. Kansas): **Algebra**
- Nancy Kopell (Boston University): **PDE and Applied Mathematics**
- Mark Lewis (U. Alberta): **Math Biology and Ecology**
- László Lovász (Microsoft Research): **Combinatorial Optimization, Algorithms and Complexity**
- Jitendra Malik (UC, Berkeley): **Computer Vision**
- Dusa McDuff (SUNY, Stony Brook): **Topology and Symplectic Geometry**
- David Mumford (Brown University): **Machine and Natural Intelligence**
- Robert Myers (McGill and Perimeter Institute): **Superstring Theory and Quantum Gravity**
- Edwin Perkins (UBC): **Probability Theory**
- Nicholas Pippenger (UBC): **Computer Science**
- Ian Putnam (U. Victoria): **Dynamics and Operator Algebras**
- Nancy Reid (U. Toronto): **Statistics**
- Gang Tian (MIT): **Geometry**
- Robert Tibshirani (Stanford): **Data Mining and Computational Statistics**
- Margaret Wright (Courant Institute): **Algorithmic Optimization**
- David Eisenbud (Director, MSRI): **Commutative Algebra, Algebraic Geometry, Computation**
- Nassif Ghoussoub (Director, PIMS): **Non-linear Analysis, PDE**
- Arvind Gupta (Program leader, MITACS): **Combinatorics, Optimization, Complexity Theory**
- Ken Davidson (Director, Fields Institute): **Operator Theory, Nonselfadjoint operator algebras, C^* -algebras**
- Jacques Hurtubise (Directeur, CRM): **Topology, Geometry**

and MITACS, the Academic Sponsors of MSRI, the Scientific Advisory Board of BIRS, and representatives of NSERC, ASRA, and the NSF—approximately 150 people. The speakers will include James J. Heckman (U. Chicago), Jay Ingram (Discover Channel) and Donald Saari (UC, Irvine).

The Evaluation of the BIRS 2003 Programme

The Call for Proposals for workshops at BIRS in 2003 was very enthusiastically received, resulting in 108 proposals. The overall level of proposals was outstanding. The various committees were guided by the principle that BIRS has to be inclusive of all the mathematical sciences and that each year its programme should provide a broad sampling of these. Thus the proposals were broken down into some 22 areas, and within each area the proposals were evaluated and compared against each other. The committee then made sure that these were represented and that no area was grossly over- or underrepresented. Not surprisingly many fine proposals were omitted in this process.

The features the committees look for when making their selections were:

- The proposal should be well focused.
- The set of proposed applicants should be realistic and should be logical to the coherence and goals of the workshop.
- The workshop ought to be sufficiently innovative or sufficiently timely that holding it has significant potential to make a difference to the subject.
- The organizers (at least some) should be of recognized stature.
- The proposal should be written carefully, placing the above points clearly in the context of the present state of the subject.

The following points, although not of primary importance, were also considered:

- The committee would like to see each workshop make some effort to involve young and emerging talent in the form of post-docs or advanced graduate students.

- It is always good to keep in mind the appropriate representation of women in the list of participants.
- Priority will be given to those workshops that promote Canada-US research collaboration. Therefore each workshop ideally would have at least one organiser from a Canadian institution and one from an institution in the US.

The Other Programmes at BIRS

There were also about fifteen proposals for the other aspects of the BIRS programme: Focused Research Groups and Research in Teams. These were all very worthwhile proposals and it was possible to satisfy all these requests, including hosting the Canadian Mathematical Olympiad Team for 2 weeks in the summer of 2003.

The Review Process

The selection process is a multistage process. All incoming proposals are placed in one master file and all 27 members of the BIRS Scientific Advisory Board (SAB) can provide their written evaluations online about any proposal they wish to comment on.

In addition, each proposal gets reviewed by two members of the SAB, assigned by the Scientific Director according to expertise in the subject area. In some cases, external refereeing was also solicited.

All available information goes to the scientific panels of PIMS (resp., MSRI) who have the responsibility to select 12 (resp., 6) BIRS proposals of interest to their own scientific programmes from this file. The BIRS Scientific Steering Committee finishes off the selection process choosing another 22 workshops, based on the recommendations of its SAB and on the input of the MITACS Scientific Director so that there are at least two weeks of industrially oriented workshops.

The PIMS Proposals

The PIMS Scientific Review Panel has the responsibility of selecting 12 of the full set of proposals. An appropriate BIRS workshop proposal for the PIMS Scientific Review Panel has to satisfy all criteria of excellence and innovation that are required by the BIRS evaluation process. In addition, they have to be

compatible with the PIMS scientific, industrial and educational programmes, as dictated by the provincial funding sources for the institute and of BIRS.

Priority is given to events that fit into other parallel PIMS activities—particularly the Graduate Industrial Modelling Camps, the Periods of Concentration for Collaborative Research Groups, the Thematic Programmes, as well as various educational activities. Beyond that the proposals should also have a strong connection to groups, strengths, or ongoing activities within the PIMS participating universities in Canada and the US.

BIRS Calendar for 2003

From the 118 proposals that were received the following were selected.

2003 Programme for 5-day Workshops

Mar 15–20: **Recent Developments in Superstring Theory**

Organizers: Jim Bryan, Moshe Rozali, Gordon W. Semenoff, Mark Van Raamsdonk (UBC), Steve Giddings (UC, Santa Barbara), Mikhail Kapranov, Amanda W. Peet (Toronto), Andreas Karch (Washington), K. Viswanathan (SFU)

Mar 22–27: **Scattering and Inverse Scattering**

Organizers: Richard Froese (UBC), Gunther Uhlmann (Washington)

Mar 29–Apr 3: **Commutative Algebra and Geometry**

Organizers: Mark Green (IPAM), Jürgen Herzog (Gesamthochschule-Essen), Bernd Sturmfels (UC, Berkeley)

Apr 5–10: **BIRS Workshop on Noncommutative Geometry**

Organizers: Alain Connes (IHES), Joachim Cuntz (Muenster), George Elliott (Toronto), Masoud Khalkhali (Western Ontario), Boris Tsygan (Penn State)

Apr 12–17: **Quantum Mechanics on the Large Scale**

Organizers: P.C.E. Stamp, G.A. Sawatzky (UBC) A.J. Leggett (Illinois, Urbana), T. Havel (MIT), S. Popescu (HH Wills Lab), R. Gill (Utrecht)

Apr 19–24: **Computational Fuel Cell Dynamics—II**

Organizers: John Kenna (Ballard), Trung Van Nguyen (Kansas), Keith Promislow (SFU), Brian Wetton (UBC)

Apr 26–May 1: **The Many Aspects of Mahler’s Measure**
Organizers: David Boyd (UBC), Doug Lind (Washington), Fernando Rodriguez Villegas (Texas, Austin), Christopher Deninger (Muenster)

May 3–8: **Recent Advances in Algebraic and Enumerative Combinatorics**

Organizers: Sara Billey (MIT), Ian Goulden, David Jackson (Waterloo), Curtis Greene (Haverford College), Richard Stanley (MIT)

May 10–15: **Statistical Mechanics of Polymer Models**

Organizers: Christine E. Soteris (Saskatchewan), De Witt Summers (Florida State), Stuart G Whittington (Toronto)

May 24–29: **Constraint Programming, Belief Revision, and Combinatorial Optimization**

Organizer: Randy Goebel (Alberta)

May 31–Jun 5: **Symmetry and Bifurcation in Biology**

Organizers: Martin Golubitsky (Houston), William F. Langford (Guelph), Ian Stewart (Warwick)

Jun 7–12: **Applicable Harmonic Analysis**

Organizers: Rong-Qing Jia (Alberta), Sherman D. Riemenschneider (West Virginia), M. Victor Wickerhauser (Washington)

Jun 14–19: **Integration on Arc Spaces, Elliptic Genus and Chiral de Rham Complex**

Organizers: Mikhail Kapranov (Toronto), Anatoly Libgober (Illinois at Chicago), François Loeser (ENS),

Jun 21–26: **Point Processes—Theory and Applications**

Organizers: Peter Guttorp (Washington), Bruce Smith (Dalhousie)

Jun 28–Jul 3: **Joint Dynamics**

Organizers: Douglas Lind, Boris Solomyak (Washington), Daniel Rudolph (Maryland), Klaus Schmidt (Vienna)

Jul 5–10: **Mathematical Biology: From Molecules to Ecosystems; The Legacy of Lee Segel**

Organizers: Leah Keshet (UBC), Simon A. Levin (Princeton), Mark Lewis (Alberta)

Jul 12–17: **Perspectives in Differential Geometry**

Organizers: Richard Schoen (Stanford), Gang Tian (MIT), Jingyi Chen (UBC)

Jul 19–24: **Differential Invariants and Invariant Differential Equations**

Organizers: Niky Kamran (McGill), Peter J. Olver (Minnesota)

Jul 26–31: **Analysis and Geometric Measure Theory**

Organizers: Ana Granados (UBC), Hervé Pajot (U. Cergy-Pontoise), Tatiana Toro (Washington)

Aug 2–7: **Monge-Ampere Type Equations and Applications**

Organizers: Alice Chang, Paul Yang (Princeton), Pengfei Guan (McMaster)

Aug 9–16: **Localization Behavior in Reaction-Diffusion Systems and Applications to the Natural Sciences** (1/2 workshop)

Organizers: A. Bernoff (Harvey Mudd College), P. Fife (Utah), T. Hillen (Alberta), M. J. Ward (UBC), J. Wei (Chinese U.)

Aug 9–16: **Defects and their Dynamics** (1/2 workshop)

Organizers: Peter W. Bates (Brigham Young), Lia Bronsard (McMaster), Changfeng Gui (Connecticut)

Aug 16–21: **Current Trends in Arithmetic Geometry and Number Theory**

Organizers: Imin Chen (SFU), Brian Conrad, Chris Skinner (Michigan), Eyal Goren (McGill), Adrian Iovita (Washington), Nike Vatsal (UBC)

Aug 23–28: **Computational Techniques for Moving Interfaces**

Organizers: Randy LeVeque (Washington), Robert D. Russell, Steven Ruuth (SFU)

Aug 30–Sep 4: **A Scientific Creative Writing Workshop at BIRS** (1/2 workshop)

Organizers: Marjorie Senechal (Smith College), Chandler Davis (Toronto)

Aug 30–Sep 4: **Locally Finite Lie Algebras** (1/2 workshop)

Organizers: Yuri Bahturin (Memorial Newfoundland), Georgia Benkart (Wisconsin-Madison), Ivan Penkov (UC-Riverside), Helmut Strade (Hamburg), Alexander Zaleskii (Northern Anglia)

Sep 6–11: **Regularization in Statistics**

Organizers: Ivan Mizera (Alberta), Roger Koenker (Illinois)

Sep 13–18: **Topology in and around Dimension Three**

Organizers: Steve Boyer (Quebec), Martin Scharlemann (UC Santa Barbara), Abigail Thompson (UC Davis)

Sep 20–25: **Structural and Probabilistic Approaches to Graph Colouring**

Organizers: Professor Bruce Reed (McGill), Paul Seymour (Princeton)

Sep 27–Oct 2: **Stochastic Partial Differential Equations**

Organizers: Martin Barlow, Edwin Perkins (UBC), Krzysztof Burdzy (Washington), Robert Dalang (Ecole Polytechnique Fédérale)

Oct 4–9: **Quadratic forms, Algebraic Groups, and Galois Cohomology**

Organizers: R. Elman, A.S. Merkurjev (UCLA), J. Minac (Western Ontario), C. Riehm (McMaster)

Oct 11–16: BANFF Credit Risk Conference 2003

Organizers: Tom Astebro (Waterloo), Peter Beling (Virginia), David Hand (Imperial College), Robert Oliver (Fair Isaac Companies), Lyn Thomas (Southampton)

Oct 18–23: MITACS Special Industrial Forum

Organizer: Arvind Gupta (MITACS)

Oct 25–30: Current Trends in Representation Theory of Finite Groups

Organizers: Jonathan L. Alperin (Chicago), Michel Broue (Paris VII), Gerald Cliff (Alberta)

Nov 1–6: PIMS HOT TOPICS: Galaxy Formation; a Herculean Challenge

Organizers: Arif Babul, Julio Navarro, Frank van den Bosch (Victoria), Jeremiah Ostriker (Cambridge), Tom Quinn (Washington), Neal Katz (Massachusetts)

Nov 8–13: MSRI HOT TOPICS

Organizer: Michael Singer (MSRI)

Nov 15–20: The Interaction of Finite Type and Gromov-Witten Invariants

Organizers: Jim Bryan (UBC), David Auckly (Kansas State)

Nov 22–27: Theory and Numerics of Matrix Eigenvalue Problems

Organizers: J. W. Demmel (UC Berkeley), N.J. Higham (Manchester), P. Lancaster (Calgary)

Nov 29–Dec 4: Nonlinear Dynamics of Thin Films and Fluid Interfaces

Organizers: A. L. Bertozzi, R. P. Behringer, T.P. Witelski (Duke), R. Almgren, M. C. Pugh (Toronto), M. Shearer (NC State)

Dec 6–11: Calabi-Yau Varieties and Mirror Symmetry

Organizers: Victor Batyrev (Tübingen), Shinobu Hosono (Tokyo), James D. Lewis (Alberta), Bong H. Lian (Brandeis), S.-T. Yau (Harvard), Noriko Yui (Queen's), Don Zagier (Max-Planck)

Dec 13–18: p-adic Variation of Motives (1/2 workshop)

Organizers: Kevin Buzzard (Imperial College), Robert Coleman (UC Berkeley), Matthew Emerton (Northwestern), Eyal Goren (McGill)

Dec 13–18: Coordinate Methods in Nonselfadjoint Operator Algebras (1/2 workshop)

Organizers: Allan Donsig (Nebraska), Michael Lamoureaux (Calgary)

2003 Programme for Focused Research Groups (FRG), Research in Teams (RIT), Summer Schools (SS) and 2-Day Workshops

Mar 28–29: Northwest Functional Analysis Symposium (2-day workshop)

Organizers: Michael Lamoureaux (Calgary), Tony Lau, Nicole Tomczak-Jaegermann (Alberta), Ian Putnam (Victoria)

Apr 3–6: Restricting syzygies of algebraic varieties (RIT)

Organizer: David Eisenbud (MSRI)

Apr 11–12: Mathfair Workshop (2-day workshop)

Organizers: Ted Lewis, Andy Liu (Alberta)

Apr 26–May 10: Topological Orbit Equivalence for Dynamical Systems (RIT)

Organizers: T. Giordano (Ottawa), C. Skau (Norwegian Science & Technology), I. Putnam (Victoria)

Apr 26–May 10: Field Theory & Cohomology of Groups (RIT)

Organizers: J. Minac (Western Ontario), A. Adem (Wisconsin-Madison), D. Karagueuzian (Binghamton)

May 10–24: Regularity for Hypergraphs (FRG)

Organizers: P. Haxell (Waterloo), V. Rodl (Emory), J. Skokan (Illinois Urbana-Champaign), L. Thoma (Rhode Island)

May 15–17: The regression discontinuity method in economics: theory and applications (2-day workshop)

Organizer: Thomas Lemieux (UBC)

May 17–22: PIMS Graduate Industrial Mathematics Modelling Camp (SS)

Organizers: R. Kuske (PIMS), F. Santosa (IMA)

May 24–Jun 7: Topology and Analysis: Complementary Approaches to the Baum-Connes and Novikov Conjectures (FRG)

Organizers: N. Higson (Penn State), J. Kaminker (Indiana-Purdue), S. Weinberger (Chicago)

Jun 7–21: Quantum Algorithms & Complexity Theory (FRG)

Organizer: R. Cleve (Calgary)

Jun 21–27: Summer School in Differential Geometry (SS)

Organizer: R. Bryant (UC Berkeley)

Jun 28–Jul 10: 2003 Summer IMO Training Camp (SS)

Organizer: W. Sands (Calgary)

Jul 12–26: Problems in Discrete Probability (FRG)

Organizers: R. Pemantle (Ohio State), Y. Peres (UC Berkeley), P. Winkler (Bell Labs)

Jul 26–Aug 16: **Representation Theory of Linearly Compact Lie Superalgebras and the Standard Model** (RIT)

Organizers: V. Kac (MIT), A. Rudakov (NTNU)

Aug 2–16: **Variance of Quasi-coherent Torsion Cousin Complexes** (RIT)

Organizers: J. Lipman (Purdue), S. Nayak (Harish-Chandra Research Inst.), P. Sastry (Toronto)

Aug 16–30: **Invariant Manifolds for Stochastic PDEs** (RIT)

Organizers: T. Caraballo (Universidad de Sevilla), J. Duan (Illinois Tech), K. Lu (Brigham Young), B. Schmalfuss (Merseburg)

Aug 16–Sep 6: **Local Uniformization and Resolution of Singularities** (RIT)

Organizers: S.D. Cutkosky (Missouri-Columbia), F.-V. Kuhlmann (Saskatchewan)

Aug 28–30: **Theoretical Physics Institute, University of Alberta Symposium** (2-day workshop)

Organizer: Helmy Sherif (Alberta)

Sep 6–20: **Arithmetic of Fundamental Groups** (RIT)

Organizers: D. Harbater (Pennsylvania), F. Pop (Bonn)

Sep 18–20: **Canadian Mathematics Chairs Meeting** (2-day workshop)

Organizer: Ted Bisztriczky (Calgary)

Sep 20–Oct 2: **Mathematical Models for Plant Dispersal** (FRG)

Organizers: M. Lewis (Alberta), J. Bullock (NERC Centre for Ecology and Hydrology)

Oct 2–4: **West Coast Operator Algebra** (2-day workshop)

Organizer: B. Brenkan (Calgary)

BIRS Calendar for 2004

2004 Programme for 5-day Workshops

Mar 13–18: **Interactions between model theory and geometry**

Organizers: Deirdre Haskell (McMaster), Jan Denef (Leuven), Ehud Hrushovski (Hebrew U.), Angus Macintyre (Edinburgh), Anand Pillay (UIUC), Patrick Speissegger (Wisconsin & McMaster)

Mar 20–26: **Topology of Manifolds and Homotopy Theory**

Organizers: Ian Hambleton (McMaster), Erik Pedersen (SUNY, Binghamton), Gunnar Carlsson (Stanford)

Mar 27–Apr 1: **Orthogonal Polynomials; Interdisciplinary Aspects**

Organizers: Jacek Szmigielski (Saskatchewan), Percy Deift (Courant), Lance Littlejohn, David Sattinger (Utah State)

Apr 3–8: **Model Reduction Problems and Matrix Methods**

Organizers: Anne Greenbaum (Washington), Gene Golub (Stanford), Jim Varah (UBC)

Apr 10–15: **Analytic and Geometric Aspects of Stochastic Processes**

Organizers: Martin Barlow (UBC), Alexander Grigoryan (Imperial College), Elton Hsu (Northwestern)

Apr 17–22: **Celestial Mechanics** (1/2 workshop)

Organizers: Florin Diacu (Victoria), Donald Saari (UC, Irvine)

Apr 17–22: **BIRS Workshop in Creative Scientific Writing** (1/2 workshop)

Apr 24–29: **Microeconometrics of Spatial and Grouped Data**

Organizers: Thomas Lemieux (UBC), David Card (UC, Berkeley)

May 1–6: **Mathematical structures in economic theory and econometrics** (1/2 workshop)

Organizers: Ivar Ekeland (UBC), Pierre-Andre Chiappori (Chicago)

May 1–6: **Singular Cardinal Combinatorics** (1/2 workshop)

Organizers: Claude Laflamme (Calgary), Matthew Foreman (UC, Irvine), Stevo Todorovic (Toronto, CNRS Paris)

May 8–13: **Knots and their manifold stories**

Organizers: Orr Kent (Indiana), Tim Cochran (Rice), Dale Rolfsen (UBC)

May 15–20: **New developments on variational methods and their applications**

Organizers: Changfeng Gui (Connecticut), Kung-Ching Chang (Peking), Paul Rabinowitz (Wisconsin, Madison), Jingyi Chen (UBC)

May 22–27: **Mathematical Foundations of Scientific Visualization, Computer Graphics, and Massive Data Exploration**

Organizers: Torsten Moller, Robert Russell (SFU), Bernd Hamann (UC, Davis)

May 29–Jun 3: **Aperiodic Order: Dynamical Systems, Combinatorics, and Operators**

Organizers: Michael Baake (Institut fuer Mathematik), David Damanik (Caltech), Ian Putnam (Victoria), Boris Solomyak (Washington)

Jun 5–10: **Semimartingale Theory and Practice in Finance**

Organizers: Tom Hurd (McMaster), Thaleia Zarihopoulou (Texas, Austin), Philip Protter (Cornell), Lane Hughston (King's College)

Jun 12–17: **New Horizons in String Cosmology**

Organizers: James Cline (McGill), Robert Brandenberger (Brown), Steve Giddings (UC, Santa Barbara), Brian Greene (Columbia), Rob Myers (Perimeter Institute), Gordon Semenoff (UBC)

Jun 19–24: **PIMS Hot Topic Workshop**

Jun 26–Jul 8: **PIMS International Summer School** (2 weeks)

Jul 10–15: **Convex Geometric Analysis**

Organizers: Nicole Tomczak-Jaegermann (Alberta), Vitali Milman (Tel Aviv), Elisabeth Werner (Case Western Reserve)

Jul 17–22: **Modeling Protein Flexibility and Motions**

Organizers: Walter Whiteley (York), Michael Thorpe, Leslie Kuhn (Michigan State)

Jul 24–29: **Geometric Evolution Equations**

Organizers: Christine Guenther (Pacific University), Jingyi Chen (UBC), Bennett Chow (UC, San Diego), Klaus Ecker (Freie Universitaet Berlin)

Jul 31–Aug 5: **Conformal Geometry**

Organizers: Thomas Branson (Iowa), Michael Eastwood (Adelaide), McKenzie Wang (McMaster)

Aug 7–12: **Stochastic processes in evolutionary and disease genetics**

Organizers: Ellen Baake (Greifswald), Don Dawson (Carleton), Warren Ewens (Pennsylvania), Bruce Rannala (Alberta)

Aug 14–19: **Statistical Science for Genome Biology**

Organizers: Jennifer Bryan (UBC), Sandrine Dudoit, Mark van der Laan (UC, Berkeley)

Aug 21–26 : **Computation and Dynamics in Genetic and Metabolic Networks, and Mathematical Control Theory in Systems Biology**

Organizers: Leon Glass (McGill), Erik Winfree (Caltech), John Reinitz (SUNY, Stony Brook), Brian Ingalls (Waterloo), Eduardo Sontag (Rutgers), Jim Collins (Boston)

Aug 28–Sep 2: **Combinatorial Hopf Algebras**

Organizers: Frank Sottile (Massachusetts), Nantel Bergeron (York), Louis Billera (Cornell), Stephanie van Willigenburg (UBC)

Sep 4–9: **Pluripotential Theory and its Applications**

Organizers: Len Bos, Alex Brudnyi (Calgary), Eric Bedford (Indiana), Al Taylor (Michigan)

Sep 11–16: **Commutative Algebra: Homological and Birational Theory**

Organizers: Ragnar-Olaf Buchweitz (Toronto), Paul Roberts (Utah), Bernd Ulrich (Purdue)

Sep 18–23: **Quantum Computation and Information Theory**

Organizers: John Watrous, Richard Cleve (Calgary), Umesh Vazirani (UC, Berkeley)

Sep 25–30: **Interaction of Finite Dimensional Algebras with other areas of Mathematics**

Organizers: Vlastimil Dlab (Carleton), Claus Ringel (Bielefeld), Leonard Scott (Virginia)

Oct 2–7: **Self-Stabilizing Distributed Systems**

Organizers: Lisa Higham (Calgary), Anish Arora (Ohio State), Faith Fich (Toronto), Maurice Herlihy (Brown), Ted Herman (Iowa),

Oct 9–14: **Free probability theory**

Organizers: Alexandru Nica (Waterloo), Roland Speicher (Queen's), Dan Voiculescu (UC, Berkeley)

Oct 16–21: **Braid Groups and Applications**

Organizers: Dale Rolfsen (UBC), Joan Birman (Columbia), Patrick Dehornoy (Caen), Roger Fenn (Sussex), Vaughan Jones (UC, Berkeley)

Oct 23–28: **Mathematical Image Analysis and Processing**

Organizers: Mary Pugh (Toronto), Selim Esedoglu (UCLA), Sung Ha Kang (Kentucky), Jackie Shen (Minnesota)

Oct 30–Nov 4: **The structure of amenable systems**

Organizers: George Elliott (Toronto), Andrew Dean (Lakehead), Thierry Giordano (Ottawa), Guihua Gong (Puerto Rico), Huaxin Lin, N. Christopher Phillips (Oregon)

Nov 6–11: **New Techniques in Lorentz Manifold** (1/2 workshop)

Organizers: Virginie Charette (Manitoba), Todd Drumm (Swarthmore College), William Goldman (Maryland)

Nov 6–11: **Functional Differential Equations** (1/2 workshop)

Organizers: Jianhong Wu (York), Hans-otto Walther (Giessen), John Mallet-paret (Brown)

Nov 13–18: **Explicit Methods in Number Theory**

Organizers: Peter Borwein (SFU), H. W. Lenstra (UC, Berkeley), P. Stevenhagen (Leiden), H. Williams (Calgary)

Nov 20–25: **Diophantine approximation and analytic number theory**

Organizers: Michael Bennett, Greg Martin (UBC), John Friedlander (Toronto), Andrew Granville (Montreal), Cameron Stewart (Waterloo), Trevor Wooley (Michigan)

Nov 27–Dec 2: **Mathematical Models for Biological Invasions**

Organizers: Mark Lewis (Alberta), Mark Kot (Washington), Pauline van den Driessche (Victoria)

Dec 4–9: **Numeracy and Beyond** (1/2 workshop)

Organizers: Klaus Hoechsmann (PIMS), Tony Gardiner (Birmingham), Yarom Sagher (Illinois), Guenter Toerner (Duisburg)

Dec 4–9: **Generalizations of de Bruijn Cycles and Gray Codes** (1/2 workshop)

Organizers: Brett Stevens (Carleton), Joe Buhler (Reed College), Persi Diaconis (Stanford), Fan Chung, Ronald Graham (UC, San Diego), Frank Ruskey (Victoria)

Dec 11–16: **Workshop on resolution of singularities, factorization of birational mappings, and toroidal geometry**

Organizers: Kenji Matsuki, Jaroslaw Włodarczyk (Purdue), Dan Abramovic (Boston), Edward Bierstone, Pierre Milman (Toronto), Steven Dale Cutkosky (Missouri)

2004 Programme for Focused Research Groups (FRG), Research in Teams (RIT), Summer Schools (SS) and 2-Day Workshops

Jun 5–19: **Robust Analysis of Large Data Sets** (FRG)

Organizers: Ruben Zamar (UBC), Stefan Van Aelst

(U. Ghent, Belgium)

Jul 10–24: **String Field Theory Camp** (FRG)

Organizers: Gordon Semenoff, Mark van Raamsdonk, Moshe Rozali (UBC)

May 15–Jun 5: **Maximal functions in non-commutative analysis** (RIT)

Organizers: Marius Junge (U. Illinois, Urbana-Champaign), Quanhua Xu (Besancon, France)

May 22–Jun 5: **Geometric analysis of One and Several Complex Variables** (RIT)

Organizers: Steven Krantz (Washington U. St. Louis), Joseph Cima (North Carolina), Ian Graham (Toronto), Kang-Tae Kim (Pohang Institute, Korea)

Jul 24–Aug 7: **Stability and Computations for Stochastic Delay Differential Equations** (RIT)

Organizers: Salah Mohammed (Southern Illinois), Evelyn Buckwar (Humboldt), Tony Shardlow (Manchester), Rachel Kuske (UBC)

Jul 25–Aug 22: **Modular Invariants and NIM-Representations** (RIT)

Organizers: Terry Gannon (Alberta), Matthias Gaberdiel (Kings College)

Mar 18–20: **Retreat on Mathematical Ecology and Evolution** (2-day workshop)

Organizers: Mark Lewis, Thomas Hillen (Alberta), Ed McCauley (Calgary), Michael Doebeli (UBC), Mark Kot (Washington)

Mar 25–27: **Human Infant Speech Perception and Language Acquisition** (2-day workshop)

Organizers: Janet Werker (UBC)

May 6–8: **Directions in Combinatorial Matrix Theory** (2-day workshop)

Organizers: Shaun Fallat, Steve Kirkland (Regina), Hadi Kharaghani (Lethbridge), Bryan Shader (Wyoming), Michael Tsatsomeros (Washington State), Pauline van den Driessche (Victoria)

May 12–14: **Decentralized Discrete Event Systems: Structure, Communication and Control** (2-day workshop)

Organizers: Peter Caines (McGill), Stephane Lafortune (Michigan), Laurie Ricker (Mount Allison), Karen Rudie (Queen's), John Thistle (Waterloo)

