BIRS-CMO 2015 Annual Report

Banff International Research Station
for Mathematical Innovation and Discovery
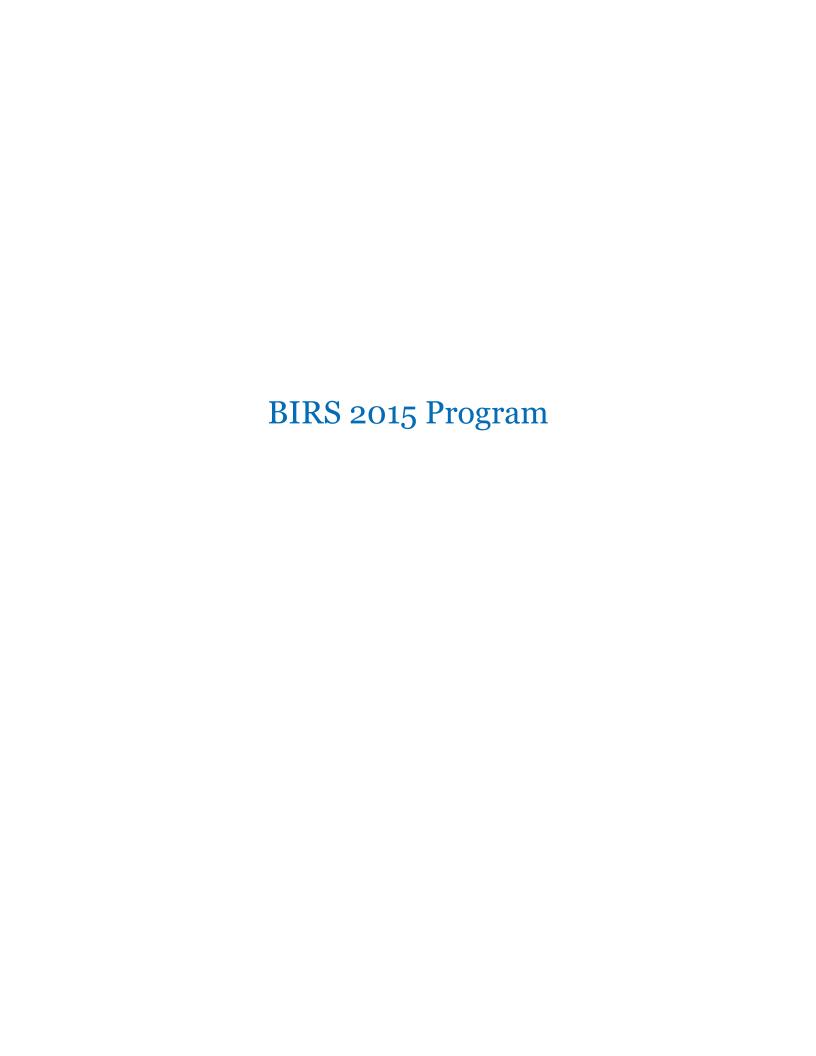

Casa Matemática Oaxaca
Centro de investigación y enseñanza

BIRS 2015 Program

5-Day Workshops 2015

Jan 11 Jan 16 Modern Applications of Complex Variables: Modeling, Theory and Computation
Jan 18 Jan 23 Random Dynamical Systems and Multiplicative Ergodic Theorems
Jan 25 Jan 30 Mathematics of Communications: Sequences, Codes and Designs
Feb 1 Feb 6 Partial Differential Equations in Cancer Modelling
Feb 8 Feb 13 Discrete Geometry and Symmetry
Feb 15 Feb 20 Advances in Numerical Optimal Transportation
Feb 22 Feb 27 Hypercontractivity and Log Sobolev Inequalities in Quantum Information Theory
Mar 1 Mar 6 Between Shannon and Hamming: Network Information Theory and Combinatorics
Mar 8 Mar 13 Computability, Analysis, and Geometry
Mar 15 Mar 20 Distribution of Rational and Holomorphic Curves in Algebraic Varieties
Mar 22 Mar 27 Laplacians and Heat Kernels: Theory and Applications
Mar 29 Apr 3 Perspectives on Parabolic Points in Holomorphic Dynamics
Mar 29 Apr 3 Towards a Unified Treatment of Dynamic Graphs
Apr 5 Apr 10 Multivariate Operator Theory
Apr 12 Apr 17 Geometric Flows: Recent Developments and Applications
Apr 19 Apr 24 New Perspectives for Relational Learning
Apr 26 May 1 Stochasticity and Organization of Tropical Convection
May 3 May 8 Groups and Geometries
May 10 May 15 Higher Order Numerical Methods for Evolutionary PDEs: Applied Mathematics Meets
               Astrophysical Applications
May 17 May 22 Dispersive Hydrodynamics: The Mathematics of Dispersive Shock Waves and Applications
May 24 May 29 Geometric Unification from Six-Dimensional Physics
May 31 Jun 5 Applied Probability Frontiers: Computational and Modeling Challenges
Jun 7 Jun 12 Advances and Challenges in Protein-RNA: Recognition, Regulation and Prediction
Jun 14 Jun 19 Hybrid Methods in Imaging
Jun 21 Jun 26 Groups, Graphs and Stochastic Processes
Jun 28 Jul 3 Frontiers in Functional Data Analysis
Jul 5 Jul 10 Beyond I.I.D. in Information Theory
Jul 12 Jul 17 Advances in Combinatorial and Geometric Rigidity
Jul 19 Jul 24 Combinatorics Meets Ergodic Theory
Jul 26 Jul 31 Developments in the Theory of Homogenization
Aug 2 Aug 7 Statistical and Computational Challenges In Bridging Functional Genomics, Epigenomics,
               Molecular QTLs, and Disease Genetics
Aug 9 Aug 14 Factorizable Structures in Topology and Algebraic Geometry
Aug 16 Aug 21 Lifting Problems and Galois Theory
Aug 23 Aug 28 Methods and Challenges in Extremal and Probabilistic Combinatorics
Aug 30 Sep 4 New Trends in Nonlinear Elliptic Equations
Sep 6 Sep 11 Nichols Algebras and Their Interactions with Lie Theory, Hopf Algebras and Tensor
               Categories
Sep 13 Sep 18 The Use of Linear Algebraic Groups in Geometry and Number Theory
Sep 20 Sep 25 Strongly Interacting Topological Phases
Sep 27 Oct 2 Approximation of High-Dimensional Numerical Problems - Algorithms, Analysis and
               Applications
Oct 4 Oct 9 The Geometry, Algebra and Analysis of Algebraic Numbers
Oct 11 Oct 16 Mathematical Coding Theory in Multimedia Streaming
Oct 18 Oct 23 Multiscale Modeling of Cell Wall Mechanics and Growth in Walled Cells
Oct 25 Oct 30 Viscoplastic Fluids: From Theory to Application
Nov 1 Nov 6 Women in Geometry
Nov 8 Nov 13 Homogeneous Structures
Nov 15 Nov 20 Current and Future Challenges in Robust Statistics
Nov 22 Nov 27 International Math Outreach Workshop
Nov 22 Nov 27 BIRS First Nations Math Education
Nov 29 Dec 4 Approximation Algorithms and Parameterized Complexity
Dec 6 Dec 11 Connecting Network Architecture and Network Computation

2-Day Workshops 2015

Jan 16 Jan 18 Incorporating 'Computational Thinking' into the Grade-school Classroom
Feb 13 Feb 15 Combinatorial and Convex Geometry Fest
Feb 27 Mar 1 Integer Sequences K-12
Apr 10 Apr 12 The Sixth Northwest Functional Analysis Seminar
Apr 24 Apr 26 Ted Lewis Math Fair Workshop 2015
Jun 12 Jun 14 Alberta Number Theory Days VII
Jul 17 Jul 19 Global Rigidity
Jul 24 Jul 26 Advances in interactive Knowledge Discovery and Data Mining in Complex and Big Data Sets
Aug 7 Aug 9 Prairie Discrete Math Workshop
Aug 14 Aug 16 Positivity in Algebraic Combinatorics
Aug 28 Aug 30 First Canadian Summit on Applications of Partial Differential Equations in the Sciences
Sep 18 Sep 20 Postdoctoral Retreat in Stochastics
Sep 25 Sep 27 Canadian Statistical Sciences Institute Leadership Retreat
Dec 4 Dec 6 2015 Canadian Math Kangaroo Contest

Summer Schools

Jun 21 Jul 5 2015 Summer IMO Training Camp

Research In Teams

Apr 26 May 3 Multi-norms, Banach lattices, and the Fourier Algebra
May 3 May 10 Holomorphic functions on products and on ℓ_∞
May 24 May 31 Subconvexity Bounds and Simple Zeros of Modular L-Functions
Jul 12 Jul 19 Analysis and Computation of Vector Functionalized Cahn Hilliard Equations and Application to Amphiphilic Materials
Aug 9 Aug 16 Low-lying Zeros of Quadratic Dirichlet L-Functions
Aug 16 Aug 23 Uniqueness Results in Geometric Tomography

Focused Research Groups

Mar 27 Apr 4 Localization of Eigenfunctions of Elliptic Operators
May 10 May 17 Classification of Multiplicity-Free Kronecker Products
Aug 2 Aug 9 Local Properties in Graphs that Imply Global Cycle Properties
Aug 23 Aug 30 Unipotent Geometry
Oct 25 Nov 1 Geophysical Viscoplastic Flows
Nov 8 Nov 15 Current Challenges for Mathematical Modelling of Cyclic Populations

5-Day Workshops

Modern Applications of Complex Variables: Modeling, Theory and Computation
January 11-16, 2015

Organizers:

Linda Cummings (New Jersey Institute of Technology)
Stefan Llewellyn Smith (UC, San Diego)
Paul Martin (Colorado School of Mines)
Bartosz Protas (McMaster University)

This workshop brought together world-leading experts from the mathematics, physics and engineering communities, whose research shares a common theme of using complex analysis to attack real-world problems. In addition to exploring new applications of complex variable theory, the workshop focused on drawing out the unexpected connections between different branches of complex analysis that have been emerging over the past few years.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5052

Participants:

Antipov, Yuri (Louisiana State University)
Booty, Michael (New Jersey Institute of Technology)
Buckingham, Robert (University of Cincinnati)
Chapman, Jon (Oxford University)
Clarkson, Peter (University of Kent)
Crowdy, Darren (Imperial College London)
Cummings, Linda (New Jersey Institute of Technology)
Davis, Tony (UC, San Diego)
Deconinck, Bernard (University of Washington)
DeLillo, Thomas (Wichita State University)
Driscoll, Tobin (University of Delaware)
Fornberg, Bengt (University of Colorado, Boulder)
Godin, Yuri (University of North Carolina at Charlotte)
Green, Christopher (UC, San Diego)
Howls, Chris (University of Southampton)
King, John R. (University of Nottingham)
Kornev, Konstantin (Clemson University)
Lee, Seung-Yeop (University of South Florida)
Llewellyn Smith, Stefan (UC, San Diego)
Marshall, Donald (University of Washington)

Martin, Paul (Colorado School of Mines)
McCue, Scott (Queensland University of Technology)
McDonald, Robb (University College London)
Minakov, Alexander (Czech Technical University in Prague)
Mityushev, Vladimir (Pedagogical University of Krakow)
Mogilevskaya, Sofia (University of Minnesota)
Norris, Andrew (Rutgers University)
Odesskii, Alexander (Brock University)
Olver, Sheehan (University of Sydney)
Protas, Bartosz (McMaster University)
Rycroft, Chris (Harvard University)
Sakajo, Takashi (Kyoto University)
Siegel, Mike (New Jersey Institute of Technology)
Tanveer, Saleh (Ohio State University)
Trefethen, Nick (University of Oxford)
Trogdon, Tom (New York University)
Van-den-Broeck, Jean-Marc (University College London)
Wegert, Elias (Technische Universität Bergakademie Freiberg)
Weideman, Andre (Universiteit Stellenbosch)
Zemlyanova, Anna (Kansas State University)

Random Dynamical Systems and Multiplicative Ergodic Theorems
January 18-23, 2015

Organizers:

Beniamin Goldys (University of Sydney)
Cecilia Gonzalez-Tokman (University of New South Wales)

Anthony Quas (University of Victoria)

This workshop brought together specialists from around the world in Random Dynamical Systems, Multiplicative Ergodic Theorems and those who apply these tools to concrete physical systems, such as oceans, the atmosphere etc. The goal was to foster expanded research collaborations between the groups.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5059

Participants:

Blumenthal, Alex (New York University)
Bochi, Jairo (Pontificia Universidad Católica de Chile)
Bose, Chris (University of Victoria)
Brzezniak, Zdzislaw (York University)
Cherubini, Anna Maria (University of Salento, Italy)
Chojnowska-Michalik, Anna (University of Lodz)
Crauel, Hans (Johann Wolfgang Goethe-Universität Frankfurt)
Doan, Thai Son (Imperial College London)
Engel, Maximilian (Imperial College London)
Froyland, Gary (University of New South Wales)
Gentz, Barbara (University of Bielefeld)
Gess, Benjamin (University of Chicago)
Ginelli, Francesco (University of Aberdeen)
Gonzalez-Tokman, Cecilia (University of New South Wales)
Gottwald, Georg (University of Sydney)
Hammerlindl, Andy (University of Sydney)
Homburg, Ale Jan (University of Amsterdam)

Horan, Joseph (University of Victoria)
Imkeller, Peter (Humboldt University)
Kaijser, Thomas (Linköping University)
Kalle, Charlene (Leiden University)
Kawan, Christoph (New York University)
Lian, Zeng (Loughborough University)
Lu, Kening (Brigham Young University)
Melbourne, Ian (University of Warwick)
Morris, Ian (University of Surrey)
Newman, Julian (Imperial College London)
Nicol, Matthew (University of Houston)
Peszat, Szymon (Jagiellonian University)
Quas, Anthony (University of Victoria)
Rasmussen, Martin (Imperial College London)
Scheutzow, Michael (Technische Universitat Berlin)
Terhesiu, Dalia (University of Vienna)
Török, Andrew (University of Houston)

Mathematics of Communications: Sequences, Codes and Designs
January 25-30, 2015

Organizers:

Shamgar Gurevich (University of Wisconsin-Madison) **Dieter Jungnickel** (Universität Augsburg)
Jonathan Jedwab (Simon Fraser University) **Vladimir Tonchev** (Michigan Technological University)

Modern society depends crucially on the ability to store and transmit large amounts of digital information at high speed. Satellite communication, movies on demand, portable music players, flash drives and cellphones all rely on the mathematical theory of coding to ensure that the original images, speech, music or data can be recovered perfectly even if mistakes are introduced during storage or transmission. This workshop brought together two communities of experts whose research allows existing communications technologies to be improved and new ones to be developed: engineers who understand the practical aspects and mathematicians who focus on the theoretical aspects. This workshop encouraged new collaborations between these communities and identified new research directions.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5139

Participants:

Carlet, Claude (University Paris 8)
Caullery, Florian (Institut de Mathématiques de Marseille)
Colbourn, Charles (Arizona State University)
Crnković, Dean (University of Rijeka)
Davis, James (University of Richmond)
Dynerman, David (University of Wisconsin-Madison)
Etzion, Tuvi (Technion IIT)
Fish, Alexander (University of Sydney)
Fujiwara, Yuichiro (California Institute of Technology)
Gurevich, Shamgar (University of Wisconsin-Madison)
Helleseth, Tor (University of Bergen)
Jedwab, Jonathan (Simon Fraser University)
Jurrius, Relinde (University of Neuchâtel)
Kantor, William (Brookline, MA)
Katz, Daniel (California State University, Northridge)
Kharaghani, Hadi (University of Lethbridge)
Kim, Jon-Lark (Sogang University)
Kodalen, Brian (Worcester Polytechnic Institute)
Leemans, Dimitri (University of Auckland)
Leung, Ka Hin (National University of Singapore)
Lisoněk, Petr (Simon Fraser University)

Martin, William (Worcester Polytechnic Institute)
Panario, Daniel (Carleton University)
Parker, Matthew (University of Bergen)
Poskin, Jeff (University of Wisconsin-Madison)
Pott, Alexander (Otto-von-Guericke-University)
Rodrigues, Bernardo (Universuty of Kwazulu-Natal)
Sahai, Anant (University of California Berkeley)
Schmidt, Kai-Uwe (Otto-von-Guericke University)
Schmidt, Bernhard (Nanyang Technological University)
Sheekey, John (University of Ghent)
Soljanin, Emina (Bell Labs Research)
Stevens, Brett (Carleton University)
Tan, Yin (University of Waterloo)
Thomson, David (Carleton University)
Tonchev, Vladimir (Michigan Technological University)
Trautmann, Anna-Lena (University of Melbourne)
Wiebe, Amy (University of Washington)
Winterhof, Arne (Austrian Academy of Sciences)
Xiang, Qing (University of Delaware)
Zhou, Yue (Otto-von-Guericke University)

Partial Differential Equations in Cancer Modelling
February 1-6, 2015

Organizers:

Robert Gatenby (Moffitt Cancer Centre)   **Peter Hinow** (University of Wisconsin)
Thomas Hillen (University of Alberta)

Cancer is not just one disease, but rather a complicated interaction of many abnormal features and many different cell types, which are situated in a heterogeneous habitat of normal tissue. The mathematical modelling of cancer growth and treatment is at full swing, and a significant challenge arises due to the interactions of cancer with a complicated and structured microenvironment of healthy tissue. This workshop brought together experts from PDE modelling in mathematics, medicine and biology to make progress on the analysis of PDE models for cancer.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5072

Participants:

Buttenschoen, Andreas (University of Alberta)
Byrne, Catherine (University of British Columbia)
Clairambault, Jean (INRIA Paris-Rocquencourt & Lab Jacques-Louis Lions, UPMC, Paris)
de Pillis, Lisette (Harvey Mudd College)
Everett, Rebecca (Arizona State University)
Hillen, Thomas (University of Alberta)
Kim, Peter (University of Sydney)
Kim, Yangjin (Konkuk University)
Knutsdottir, Hildur (University of British Columbia)
Lam, King-Yeung (Ohio State University)
Lorenzi, Tommaso (École normale supérieure de Cachan)
Maini, Philip (University of Oxford)
Mondaini, Leonardo (Federal University of the State of Rio De Janeiro)

Morales-Barcenas, Jose-Hector (Universidad Autonoma Metropolitana)
Olobatuyi, Oluwole Victor (University of Alberta)
Phan, Tuoc (University of Tenessee)
Pillay, Samara (University of Oxford)
Scurll, Josh (University of British Columbia)
Sivaloganathan, Siv (Waterloo University)
Stepien, Tracy (Arizona State University)
Strehl, Robert (Ryerson University)
Swan, Amanda (University of Alberta)
Taylor-King, Jake (University of Oxford)
Tuszynski, Jack (University of Alberta)
Wodarz, Dominik (University of California, Irvine)

Discrete Geometry and Symmetry
February 8-13, 2015

Organizers:

Karoly Bezdek (University of Calgary)   **Asia Ivic Weiss** (York University)
Egon Schulte (Northeastern University)

The workshop focused on aspects of symmetry in the analysis and classification of such structures, and exploits symmetry as a unifying theme. It gathered experts and emerging researchers in discrete geometry and related areas, to discuss recent developments (over the last 5-10 years) in the study of highly-symmetric discrete geometric structures, encourage new collaborative ventures, and achieve further progress on fundamental questions in the field. The last three decades have seen a revival of interest in discrete geometry and symmetry and have produced ground-breaking new discoveries. Exciting new directions of research are pointing to a fascinating world of highly-symmetric space structures still to be discovered. This workshop was timely and capitalized on this momentum.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5019

Participants:

Abrosimov, Nikolay (Sobolev Institute of Mathematics)
Berman, Leah (University of Alaska Fairbanks)
Bezdek, Karoly (University of Calgary)
Bisztriczky, Ted (University of Calgary)
Bracho, Javier (UNAM)
Carrancho Fernandes, Maria Elisa (University of Aveiro)
Conder, Marston (University of Auckland)
Dawson, Robert (St. Mary's University)
Ens, Eric (York University)
Finbow-Singh, Wendy (St. Mary's University)
Foerster, Melanie (University of Calgary)
Friese, Erik (University of Rostock)
Hubard, Isabel (UNAM)
Khan, Muhammad (University of Calgary)
Ladisch, Frieder (University of Rostock)
Leemans, Dimitri (University of Auckland)
Leopold, Undine (Technische Universitaet Chemnitz)
Litvak, Alexander (University of Alberta)
Matteo, Nicholas (Northeastern University)
Meyer, Kyle (Northeastern University)

Mixer, Mark (Wentworth Institute of Technology)
Monson, Barry (University of New Brunswick)
Naszodi, Marton (EPFL and Eotvos University)
O'Reilly-Regueiro, Eugenia (UNAM)
Oliveros, Deborah (UNAM)
Pach, Janos (EPFL and Renyi Institute)
Pellicer, Daniel (Universidad Nacional Autonoma de Mexico)
Richter, David A. (Western Michigan University)
Ryabogin, Dmitry (Kent State University)
Schulte, Egon (Northeastern University)
Senechal, Marjorie (Smith College)
Swanepoel, Konrad (London School of Economics and Political Science)
Toledo, Micael (UNAM)
Trelford, Ryan (York University)
Tucker, Thomas (Colgate University)
Weiss, Asia Ivic (York University)
Williams, Gordon (University of Alaska Fairbanks)
Williams, Abigail (Northeastern University)
Yaskin, Vladyslav (University of Alberta)

Advances in Numerical Optimal Transportation
February 15-20, 2015

Organizers:

Jean-David Benamou (INRIA Rocquencourt)   **Adam Oberman** (McGill University)
Yann Brenier (CNRS, Ecole Polytechnique)

Optimal Transportation is a mathematical research topic which began two centuries ago with Monge's work on "des remblais et deblais." This engineering problem consists of minimizing the transport cost between two given mass densities. The community of numericians interested in this problem is developing rapidly as well as the applications of Optimal Transport in many fields: image warping; frontongenesis models in meteorology; mesh adaptation in fluid models; cosmology; reflector design; finance and mathematical economics... The meeting addressed this modelization problem as well as the proposed methods to solve them on computers.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5067

Participants:

Abbasi, Bilal (McGill University)
Agueh, Martial (University of Victoria)
Benamou, Jean-David (INRIA Rocquencourt)
Blanchet, Adrien (Université de Toulouse)
Brenier, Yann (CNRS, Ecole Polytechnique)
Budd, Chris (University of Bath)
Carlier, Guillaume (Université Paris Dauphine)
Chizat, Lénaïc (Université Paris Dauphine)
Chugunova, Marina (Claremont Graduate University)
Cullen, Michael (UK Met Office)
Cuturi, Marco (Kyoto University)
Duval, Vincent (Université Paris Dauphine)
Engquist, Bjorn (University of Texas at Austin)
Finlay, Chris (McGill University)
Gangbo, Wilfrid (Georgia Institute of Technology)
Gutierrez, Cristian (Temple University)
Kitagawa, Jun (University of Toronto)
Levy, Bruno (Inria Lorainne)
Maury, Bertrand (University of Paris XI)

Mérigot, Quentin (Université de Grenoble, CNRS)
Mirebeau, Jean-Marie (Laboratory Ceremade, Dauphine University)
Moameni, Abbas (Carleton University)
Nenna, Luca (INRIA)
Osberger, Horst (TU Munchen)
Pass, Brendan (University of Alberta)
Patacchini, Francesco Saverio (Imperial College London)
Peyré, Gabriel (CNRS, Université Paris-Dauphine)
Ruan, Yuanlong (McGill University)
Santambrogio, Filippo (Université Paris-Sud)
Saumier, Louis (University of Victoria)
Solomon, Justin (Stanford University)
Ten Thije Boonkkamp, Jan (University of Eindhoven)
Thibert, Boris (LJK Universite Grenoble)
Wolfram, Marie-Thérèse (Austrian Academy of Sciences)
Xia, Qinglan (UC, Davis)
Zhao, Hongkai (UC, Irvine)

Hypercontractivity and Log Sobolev Inequalities in Quantum Information Theory
February 22-27, 2015

Organizers:

Patrick Hayden (Stanford University)   **Ashley Montanaro** (University of Bristol)
Christopher King (Northeastern University)   **Mary Beth Ruskai** (delocalized)

This workshop provided an opportunity to bring together several communities: mathematicians who work on hypercontractivity and log Sobolev inequalities; scientists (including physicists and engineers) who work in quantum information theory and computer scientists. It focused on hypercontractivity and log Sobolev inequalities, which were originally developed in connection with quantum field theory but subsequently found applications in fields ranging from theoretical computer science to discrete probability theory. Recently these techniques have been applied to problems in quantum information theory.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5098

Participants:

Beckner, William (University of Texas)
Beigi, Salman (Institute for Research in Fundamental Sciences (IPM))
Bradler, Kamil (Saint Mary's University)
Broadbent, Anne (University of Ottawa)
Buhrman, Harry (CWI, Amsterdam)
Carbone, Raffaella (University of Pavia)
Collins, Benoît (University of Ottawa)
Cubitt, Toby (University of Cambridge (UK))
de Wolf, Ronald (Centrum Wiskunde & Informatica)
Franca, Daniel Stilck (Technische Universität München)
Gavinsky, Dmitry (Czech Academy of Sciences)
Harrow, Aram (Massachusetts Institute of Technology)
Hastings, Matt (Microsoft Station Q)
Kastoryano, Michael (Freie Universitat Berlin)
Kim, Isaac (Perimeter Institute)
King, Christopher (Northeastern University)
Koenig, Robert (TU Munich)
Mančinska, Laura (Centre for Quantum Technologies, National University of Singapore)

Montanaro, Ashley (University of Bristol)
Müller-Hermes, Alexander (TU Munich)
Pérez-García, David (Complutense University of Madrid)
Perrin, Mathilde (Instituto de Ciencias Matemáticas)
Reeb, David (TU Munich)
Saglam, Mert (University of Washington)
Scholz, Volkher (ETH Zurich)
Sutter, David (ETH Zurich)
Szehr, Oleg (University of Cambridge)
Temme, Kristan (Caltech)
Vidick, Thomas (Caltech)
Walter, Michael (Stanford University)
Werner, Reinhard (Leibniz Universität Hannover)
Winter, Andreas (Universitat Autonoma de Barcelona)
Wright, John (Carnegie Mellon University)
Yard, Jon (Microsoft)
Zegarlinski, Boguslaw (Imperial College London)
Zuiddam, Jeroen (Centrum Wiskunde & Informatica)

Between Shannon and Hamming: Network Information Theory and Combinatorics
March 1-6, 2015

Organizers:

Michelle Effros (California Institue of Technology)
Sidharth Jaggi (Chinese University of Hong Kong)

Frank Kschischang (University of Toronto)
Michael Langberg (State University of New York at Buffalo)

The theoretical study of network communication is an extremely challenging field of study that combines in an entangled manner two notions that in most current research and implementations are considered independently and by different research communities -- the notion of *information*, and that of *network topology*. Work over the last decades, in the vibrant field of network communication, has demonstrated several advantages, expressed as improvements in throughput, reliability, and security, in considering "information" and "network topology" together and exploiting the synergy. This workshop brought together researchers from the Information Theory community and that of Combinatorics, to merge ideas, perspectives, analytical tools and proof techniques in a joint effort in advancing the mathematical foundations in the field of network communication.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5130

Participants:

Cohen, Asaf (Ben-Gorion University)
Dey, Bikash Kumar (Indian Institute of Technology Bombay)
Effros, Michelle (California Institute of Technology)
El-Rouayheb, Salim (Illinois Institute of Technology, Chicago)
Gastpar, Michael (Ecole Polytechnique Fédérale)
Jaggi, Sidharth (Chinese University of Hong Kong)
Kadhe, Swanand (Texas A&M University)
Kamath, Sudeep (Princeton University)
Kim, Young-Han (University of California, San Diego)
Kliewer, Joerg (New Jersey Institute of Technology)
Kosut, Oliver (Arizona State University)
Kschischang, Frank (University of Toronto)
Langberg, Michael (State University of New York at Buffalo)
Li, Zongpeng (University of Calgary)

Noorzad, Parham (California Institute of Technology)
Ong, Lawrence (University of Newcastle)
Prabhakaran, Vinod (Tata Institute of Fundamental Research)
Ramamoorthy, Aditya (Iowa State University)
Sarwate, Anand (Rutgers University)
Shanmugam, Karthikeyan (University of Texas at Austin)
Shum, Kenneth W (Chinese University of Hong Kong)
Simonyi, Gabor (Alfred Renyi Institute of Mathematics, HAS and Budapest University of Technology and Economics)
Sprintson, Alex (Texas A&M University)
Vardy, Alexander (University of California, San Diego)
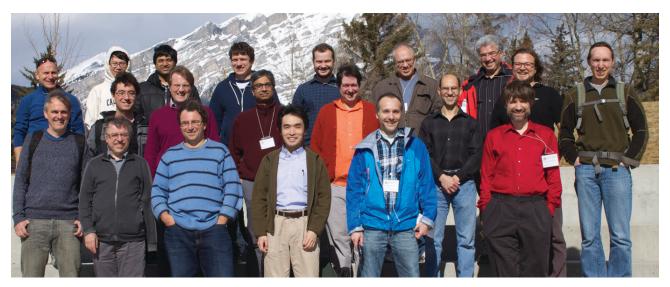**Wang, Lele** (University of California, San Diego)
Wong, Ming Fai (Caltech)

Computability, Analysis, and Geometry
March 8-13, 2015

Organizers:

Mark Braverman (Princeton University)   **Michael Yampolsky** (University of Toronto)

Computation and numerical simulation have become crucial tools in dynamics, and in many branches of analysis. Theory of computation of analytic objects is an emerging field of mathematics which has seen much exciting progress recently. Developing it is important for understanding numerical and theoretical challenges in modeling complex phenomena and systems. The aim of the interdisciplinary workshop was to bring together the experts and top young talent working on different aspects of theory of computation in dynamics, analysis and geometry. Thus, creating a unique opportunity at building new synthesis and identifying new directions within this exciting emerging discipline.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5005

Participants:

Avigad, Jeremy (Carnegie Mellon University)
Basu, Saugata (Purdue University)
Binder, Ilia (University of Toronto)
Brudnyi, Alex (University of Calgary)
Dunfield, Nathan (University of Illinois, Urbana-Champaign)
Galatolo, Stefano (University of Pisa)
Garg, Ankit (Princeton University)
Hirschfeldt, Denis (University of Chicago)
Kawamura, Akitoshi (University of Tokyo)
Lackenby, Marc (University of Oxford)
Nabutovsky, Alexander (University of Toronto)

Nekrashevych, Volodymyr (Texas A&M University)
Nikolov, Sasho (Microsoft Research)
Pak, Igor (University of California, Los Angeles)
Rohde, Steffen (University of Washington)
Rojas, Cristóbal (Universidad Andres Bello)
Rotman, Regina (University of Toronto)
Sapir, Mark (Vanderbilt University)
Schleimer, Saul (University of Warwick)
Schneider, Jon (Princeton University)
Selinger, Nikita (Stony Brook University)
Wu, Hau-tieng (University of Toronto)
Yampolsky, Michael (University of Toronto)

Distribution of Rational and Holomorphic Curves in Algebraic Varieties
March 15-20, 2015

Organizers:

James Lewis (University of Alberta)
Steven Lu (Université du Québec à Montréal)

Michael Roth (Queen's University)
Min Ru (University of Houston)

The search for integral or rational solutions to algebraic equations is a recurring question inherited from the mathematicians of antiquity.

Guiding ideas of Lang and Vojta have built up a vast (and largely conjectural) dictionary between the arithmetic properties of a variety and its purely differential-geometric ones. Recently there has been spectacular progress in establishing parts of this deep and beautiful correspondence.

This workshop brought together the world's top experts in Nevanlinna theory, hyperbolicity and rational curves on varieties in an effort to disseminate and share the latest developments and techniques and stimulate breakthroughs on the substantial questions which remain.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5169

Participants:

Beheshti, Roya (Washington University)
Brotbek, Damian (Université de Strasbourg)
Campana, Frédéric (Universite de Lorraine)
Chen, Xi (University of Alberta)
Cherry, William (University of North Texas)
Claudon, Benoit (Université de Lorraine)
Corvaja, Pietro (Università di Udine)
de Oliveira, Bruno (University of Miami)
Debarre, Olivier (Ecole normale supérieure)
del Angel, Pedro Luis (Center of Investigations in Mathematics)
Dethloff, Gerd (Université de Brest)
Diverio, Simon (CNRS et Institut de Mathématiques de Jussieu - Paris Rive Gauche)
Goswami, Souvik (University of Alberta)
Grieve, Nathan (McGill University)
Heier, Gordon (University of Houston)
Huckleberry, Alan (Ruhr Universität)
Kamenova, Ljudmila (Stony Brook University)

Kobayashi, Ryoichi (Nagoya University)
Lewis, James (University of Alberta)
Lu, Steven (Université du Québec à Montréal)
McKinnon, David (University of Waterloo)
Moriwaki, Atsushi (Kyoto University)
Noguchi, Junjiro (University of Tokyo)
Roth, Michael (Queen's University)
Rousseau, Erwan (Aix-Marseille Université)
Ru, Min (University of Houston)
Russell, Peter (McGill University)
Shiffman, Bernard (Johns Hopkins University)
Starr, Jason (SUNY Stony Brook)
Svaldi, Roberto (Massachusetts Institute of Technology)
Turchet, Amos (Chalmers University of Technology)
Verbitsky, Misha (National Research University HSE)
Wang, Julie Tzu-Yueh (Academia Sinica)
Wang, Xiaowei (Rutgers University)
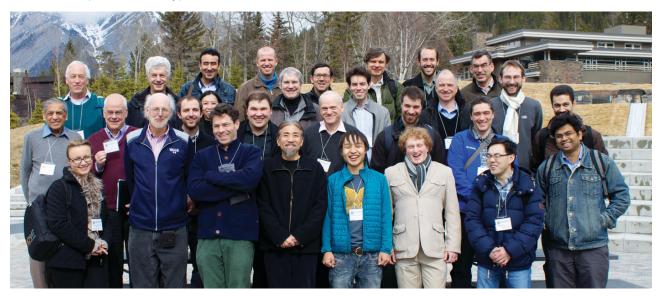**Winkelmann, Joerg** (Ruhr-Universität Bochum)
Zhang, Tong (University of Alberta)

Laplacians and Heat Kernels: Theory and Applications
March 22-27, 2015

Organizers:

Denis Grebenkov (Ecole Polytechnique)   **Naoki Saito** (University of California)
Peter Jones (Yale University)

The workshop's objectives were to: examine our current understanding on certain aspects of the Laplacian eigenvalue problems and heat kernels; provide and promote new collaborations among the participants ranging from the leading experts to young scientists in broad fields related to the Laplacian eigenvalue problems and heat kernels and cross-fertilize the ideas generated in the different fields to make further progress on these problems.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5110

Participants:

Amitai, Assaf (Massachusetts Institute of Technology)
Antunes, Pedro (University of Lisbon)
Ashbaugh, Mark (University of Missouri-Columbia)
Beg, Faisal (Simon Fraser University)
Beliaev, Dmitri (University of Oxford)
Benguria, Rafael (Pontificia Universidad Catolica de Chile)
Berkolaiko, Gregory (Texas A&M University)
Bronstein, Michael (University of Lugano)
Burdzy, Krzysztof (University of Washington)
Cloninger, Alexander (Yale University)
David, Guy (Universite Paris XI)
Dever, John (Georgia Institute of Technology)
Filoche, Marcel (Ecole Polytechnique)
Grebenkov, Denis (Ecole Polytechnique)
Harrell, Evans (Georgia Institute of Technology)
Henrot, Antoine (Institut Elie Cartan)
Hermi, Lotfi (University of Arizona)
Jakobson, Dmitry (McGill University)

Jerison, David (Massachusetts Institute of Technology)
Jones, Peter (Yale University)
Kao, Chiu-Yen (Claremont McKenna College)
Lai, Rongjie (University of California, Irvine)
Laugesen, Richard (University of Illinois)
Maggioni, Mauro (Duke University)
Mahadevan, Rajesh (Universidad de Concepcion)
Maltsev, Anna (University of Bristol)
Mayboroda, Svitlana (University of Minnesota)
Meyer, Francois (University of Colorado at Boulder)
Popuri, Karteek (Simon Fraser University)
Saito, Naoki (University of California)
Shivakumar, Pappur (University of Manitoba)
Shvarts, Eugene (UC Davis)
Siudeja, Bartlomiej (University of Oregon)
Song, Yi-Qiao (Schlumberger-Doll Research)
Suzuki, Mashbat (McGill University)
van den Berg, Michiel (University of Bristol)

Perspectives on Parabolic Points in Holomorphic Dynamics
March 29 - April 3, 2015

Organizers:

Arnaud Cheritat (Institut de Mathématiques de Bordeaux)   **Carsten Lunde Petersen** (Roskilde University)
Adam L. Epstein (Warwick University)

This workshop gathered both experienced researchers and emerging young talents around an activity whose core is devoted to an exposition of the classical parabolic implosion theory and a robust survey of its applications, both old and new. The organizers aimed to take advantage of the diversity of backgrounds and research agendas as an opportunity for cross-fertilization within the subject.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5082

Participants:

Arfeux, Matthieu (Stony Brook University)
Bedford, Eric (Stony Brook University)
Bouillot, Olivier (University of Paris Est - Marne-la-Vallée)
Cheritat, Arnaud (Institut de Mathématiques de Bordeaux)
Dudko, Artem (Stony Brook University, IMS)
Epstein, Adam L. (Warwick University)
Hubbard, John (Cornell University)
Inou, Hiroyuki (Kyoto University)
Lomonaco, Luna (University of Sao Paulo)
Morris, David (University of Warwick)
Mukherjee, Sabyasachi (Jacobs University Bremen)
Peters, Han (University of Amsterdam)
Petersen, Carsten Lunde (Roskilde University)
Resman, Maja (University of Zagreb)
Roesch, Pascale (Institut de Mathématiques de Marseille)
Rousseau, Christiane (Université de Montréal)
Shishikura, Mitsuhiro (Kyoto University)
Uhre, Eva (Roskilde Kathedralskole, Roskilde University)
Yampolsky, Michael (University of Toronto)
Yang, Fei (Université Paul Sabatier Toulouse)

Towards a Unified Treatment of Dynamic Graphs
March 29 - April 3, 2015

Organizers:

Nicholas Harvey (University of British Columbia)
Valerie King (University of Victoria)

Andrew McGregor (University of Massachusetts Amherst)
Mikkel Thorup (University of Copenhagen)

Graphs are crucial models for representing vast collections of data, such as network links between computers, highways between cities, friendships between social network participants, and interactions between proteins. Due to the massive storage and rapid processing of modern computers, many graphs encountered in practice are extremely large and frequently change. Those two aspects have led to research challenges in several areas of computer science and mathematics.

Researchers have been studying large changing graphs from different perspectives, depending on which resources are considered scarce: computation time to process the changes, space to represent the graph, and communication when knowledge of the graph is distributed. This workshop brought together world experts in these areas to address these challenges and identify new research directions.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5162

Participants:

Andoni, Alexandr (Microsoft Research)
Banerjee, Siddhartha (Stanford University)
Bernstein, Aaron (Columbia University)
Censor-Hillel, Keren (Technion)
Chechik, Shiri (Tel-Aviv University)
Elkin, Michael (Ben Gurion University of the Negev)
Guha, Sudipto (University of Pennsylvania)
Harvey, Nicholas (University of British Columbia)
King, Valerie (University of Victoria)
Madry, Aleksander (Massachusetts Institute of Technology)
McGregor, Andrew (University of Massachusetts Amherst)
Nanongkai, Danupon (KTH Royal Institute of Technology)
Roditty, Liam (Bar-Ilan University)
Thorup, Mikkel (University of Copenhagen)
Vassilevska-Williams, Virginia (Stanford University)
Woelfel, Philipp (University of Calgary)
Woodruff, David (IBM)
Wulff-Nilsen, Christian (University of Copenhagen)
Zadimoghaddam, Morteza (Google Research)

Multivariate Operator Theory
April 5-10, 2015

Organizers:

Kenneth R. Davidson (University of Waterloo)
Ronald G. Douglas (Texas A&M University)
Joerg Eschmeier (Universitat des Saarlandes)

J. William Helton (University of California, San Diego)
Mihai Putinar (University of California, Santa Barbara)

A workshop under the same name (10w5081) was held at BIRS in 2010. The extraordinary success of the meeting is partially revealed by the more than 250 research papers authored by the participants in the last few years; a good many of these works were prompted by discussions originating at the Banff workshop.

This meeting did not attempt to replicate the previous one, but rather build on it by emphasizing several new exciting and promising direction with many new people. Continuity was maintained by previous participants, both young and experienced.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5020

Participants:

Ball, Joseph (Virginia Tech)
Bercovici, Hari (Indiana University)
Bickel, Kelly (Bucknell University)
Clouatre, Raphael (University of Waterloo)
Curto, Raul (University of Iowa)
Davidson, Kenneth R. (University of Waterloo)
Douglas, Ronald G. (Texas A&M University)
Dritschel, Michael (University of Newcastle)
Dykema, Ken (Texas A&M University)
Englis, Miroslav (Mathematics Institute AS CR)
Eschmeier, Joerg (Universitat des Saarlandes)
Fang, Quanlei (Bronx Community College)
Fuller, Adam (University of Nebraska-Lincoln)
Gorkin, Pamela (Bucknell University)
Hartz, Michael (University of Waterloo)
Helton, J. William (University of California, San Diego)
Jury, Michael (University of Florida)
Katsoulis, Elias (East Carolina University)
Klep, Igor (The University of Auckland)
Knese, Greg (Washington University)
Kwon, Hyun-Kyoung (University of Alabama)
Liaw, Constanze (Baylor University)

McCarthy, John (Washington University)
Misra, Gadadhar (Indian Institute of Science)
Muhly, Paul (University of Iowa)
Pascoe, James (University of California, San Diego)
Pearcy, Carl (Texas A&M University)
Popescu, Gelu (UT San Antonio)
Putinar, Mihai (University of California, Santa Barbara)
Ramsey, Christopher (University of Virginia)
Rochberg, Richard (Washington University)
Sarkar, Jaydeb (Indian Statistical Institute)
Sawyer, Eric (McMaster University)
Shalit, Orr (Technion)
Shyam Roy, Subrata (IISER Kolkata)
Upmeier, Harald (Philipps-University)
Vasilescu, Florian-Horia (Université des Sciences et Technologies de Lille)
Vinnikov, Victor (Ben Gurion University of the Negev)
Wang, Kai (Fudan University)
Wick, Brett (Georgia Tech)
Xia, Jingbo (SUNY at Buffalo)
Zhang, Genkai (Chalmers University of Technology)

Geometric Flows: Recent Developments and Applications
April 12-17, 2015

Organizers:

Gerhard Huisken (Universitaet Tuebingen)
Jeff Streets (University of California, Irvine)
Peter Topping (University of Warwick)

Toby Wiseman (Imperial College London)
Eric Woolgar (University of Alberta)

This workshop seeks to explore connections between geometric flows and other areas of mathematics and physics. Over the last decade-and-a-half, this field has seen amazing mathematical progress and the number of applications has mushroomed. This workshop will bring together a wide spectrum of mathematicians from within the field, as well as a significant number of physicists working on applications of geometric flows and numericists whose methods can open up new ways to explore areas not easily accessible otherwise. Our hope is that by facilitating an ongoing dialogue between experts in these subjects, we will enable the transfer of the most recent mathematical knowledge to those working on applications, expose mathematicians to applied problems to encourage and motivate further mathematical advances, and develop new mathematical insights through numerical and other novel techniques.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5148

Participants:

Angenent, Sigurd (University of Wisconsin)
Bahuaud, Eric (Seattle University)
Bamler, Richard (University of California, Berkeley)
Bryan, Paul (University of California, San Diego)
Carfora, Mauro (University of Pavia)
Chau, Albert (University of British Columbia)
Chen, Jingyi (University of British Columbia)
Conboye, Rory (Florida Atlantic University)
Daskalopoulos, Panagiota (Columbia University)
Deruelle, Alix (University of Warwick)
Di Nezza, Eleonora (Imperial College)
Figueras, Pau (University of Cambridge)
Gianniotis, Panagiotis (University College London)
Guenther, Christine (Pacific University)
Guo, Siao-Hao (Rutgers University)
Haslhofer, Robert (Courant Institute)
Hershkovits, Or (Courant Institute)
Huisken, Gerhard (Universität Tübingen)
Huxol, Tobias (University of Warwick)
Isenberg, Jim (University of Oregon)
Kotschwar, Brett (Arizona State University)
Lott, John (University of California, Berkeley)

Miller, Warner (Florida Atlantic University)
Mondino, Andrea (Eidgenössische Technische Hochschule)
Mueller, Reto (Queen Mary University of London)
Nguyen, Huy (University of Queensland)
Parkins, Scott (University of Wollongong)
Pulemotov, Artem (University of Queensland)
Rochon, Frédéric (Université du Québec à Montréal)
Schulze, Felix (University College London)
Sesum, Natasa (Rutgers University)
Sharp, Benjamin (Imperial College London)
Simon, Miles (University of Magdeburg)
Streets, Jeff (University of California, Irvine)
Tian, Gang (Princeton University)
Topping, Peter (University of Warwick)
Wang, Bing (University of Wisconsin)
Warnick, Claude (University of Warwick)
Wilking, Burkhard (University of Münster)
Wiseman, Toby (Imperial College London)
Woolgar, Eric (University of Alberta)

New Perspectives for Relational Learning
April 19-24, 2015

Organizers:

Daniel Lowd (University of Oregon)
Sriraam Natarajan (Indiana University Bloomington)

David Poole (University of British Columbia)
Oliver Schulte (Simon Fraser University)

This workshop supported research that extends and enhances computational tools from Machine Learning, Artificial Intelligence, and Complex Network Analysis for modelling relational data. It brought together researchers from different subfields that study relational data to define new directions for the field, including: (1) new application tasks and domains, (2) efficient programs for learning with very large databases and networks, (3) developing high-level probabilistic programming languages to make the development of relational analytics applications faster and more robust.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5080

Participants:

Bach, Stephen (University of Maryland College, Park)
Bertossi, Leopoldo (Carleton University)
Davis, Jesse (Katholieke Universiteit Leuven)
De Raedt, Luc (Katholieke Universiteit Leuven)
Flach, Peter (University of Bristol)
Foulds, James (University of California Santa Cruz)
Getoor, Lise (University of California, Santa Cruz)
Huang, Bert (Virginia Tech)
Jacobs, Abigail (University of Colorado Boulder)
Jaeger, Manfred (Aalborg University)
Kazemi, Seyed Mehran (University of British Columbia)
London, Ben (University of Maryland, College Park)
Lowd, Daniel (University of Oregon)
Pujara, Jay (University of Maryland, College Park)
Qian, Zhensong (Simon Fraser University)
Rettinger, Achim (Karlsruhe Institute of Technology)
Riahi, Fatemeh (Simon Fraser University)
Ruths, Derek (McGill University)
Sanner, Scott (Australian National University)
Santos Costa, Vitor (Universidade do Porto)
Sato, Taisuke (Tokyo Institute of Technology)
Schulte, Oliver (Simon Fraser University)
Suciu, Dan (University of Washington)
Van den Broeck, Guy (Katholieke Universiteit Leuven)

Stochasticity and Organization of Tropical Convection
April 26 - May 1, 2015

Organizers:

Boualem Khouider (University of Victoria)
Andrew J. Majda (New York University)

Chidong Zhang (University of Miami)

The tropical climate is characterized by dramatic variability affecting billions of lives, with sudden storms bringing heavy rainfall and floods or extended droughts resulting in crop failure. Recent developments have significantly improved our understanding of tropical atmosphere dynamics and the associated rainfall variability. It is now recognized in the scientific community that tropical climate is organized into a hierarchy of almost periodic oscillations occurring on different time scales (from days through months to years), and embedded one in the other. On longer timescales lies the celebrated El Nino phenomenon, which repeats on timescales of 3-5 years. The dominant atmospheric signal is known as the Madden-Julian oscillation (MJO, in honor of its discoverers) with a period of 40-50 days. The MJO is characterized by a local rainfall increase and changes in wind strength and directions, as it propagates over Indonesia and across much of the Pacific Ocean. At this workshop, university-based mathematicians and physicists together with scientists from operational climate modeling centres gathered to exchange ideas and look for solutions to the MJO problem.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5023

Participants:

Austin, Phillip (University of British Columbia)
Bellenger, Hugo (Japan Agency for Marine-Earth Science & Technology)
Böing, Steven (University of Leeds)
Brenowitz, Noah (Courant Institute NYU)
Chen, Shengqian (University of Wisconsin Madison)
Chen, Shuyi (University of Miami)
Chen, Nan (Courant Institute NYU)
Christensen, Hannah (University of Oxford)
Craig, George (Ludwig-Maximilians-Universität)
De La Chevrotirere, Michele (University of Victoria)
Giannakis, Dimitris (Courant Institute NYU)
Goswami, Bidyut (University of Victoria)
Hagos, Samson (Pacific Northwest National Laboratory)
Johnson, Richard (Colorado State University)
Khouider, Boualem (University of Victoria)
Kiladis, George (National Atmospheric and Oceanic Administration)
Moncrieff, Mitchell (National Center for Atmospheric Research)

Mukhopadhyay, Parthasarathi (Indian Institute Of Tropical Meteorology)
Ogrosky, Reed (University of Wisconsin-Madison)
Park, SeungBu (Columbia University)
Pauluis, Olivier (Courant Institute NYU)
Ravindran, Ajaya Mohan (NYU Abu Dhabi Institute)
Schumacher, Courtney (Texas A&M University)
Siebesma, Pier (Royal Netherlands Meteorological Institute)
Stachnik, Justin (NASA Jet Propulsion Laboratory)
Stechmann, Samuel (University of Wisconsin-Madison)
Thual, Sulian (Courant Institute NYU)
Tung, Wen-wen (Purdue University)
Waite, Michael (University of Waterloo)
Yang, Qiu (Courant Institute NYU)
Zhang, Chidong (University of Miami)
Zhang, Guang (Scripps Institution of Oceanography)

Groups and Geometries
May 3-8, 2015

Organizers:

Inna Capdebosq (University of Warwick)
Martin Liebeck (Imperial College London)

Bernhard Muehlherr (University of Giessen)

Group theory is an abstract subject, but it is also the mathematical way to investigate symmetry. Thus many problems from various areas of mathematics which involve some sort of symmetry are susceptible to the application of group theory. This workshop covered three main areas: the abstract structure of finite groups; some geometrical aspects of group theory and several recent applications of group theory to other areas of mathematics.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5017

Participants:

Aschbacher, Michael (California Institute of Technology)
Baumeister, Barbara (Universitaet Bielefeld)
Burness, Tim (University of Bristol)
Capdebosq, Inna (University of Warwick)
Caprace, Pierre-Emmanuel (Université catholique de Louvain)
Chermak, Andrew (Kansas State University)
Cohen, Arjeh (Eindhoven University of Technology)
Craven, David (University of Birmingham)
De Medts, Tom (Ghent University)
Devillers, Alice (University of Western Australia)
Gill, Nick (University of South Wales)
Giudici, Michael (University of Western Australia)
Grueninger, Mattias (Université catholique de Louvain)
Henke, Ellen (University of Copenhagen)
Horn, Max (Justus-Liebig-Universität Gießen)
Kassabov, Martin (Cornell University)
Köhl, Ralf (Universität Gießen)
Liebeck, Martin (Imperial College London)
Lynd, Justin (Rutgers University)
Lyons, Richard (Rutgers University)
Magaard, Kay (University Birmingham)

Malle, Gunter (Technische Universität)
Morgan, Luke (University of Western Australia)
Muehlherr, Bernhard (University of Giessen)
Oliver, Bob (Universite Paris 13)
Park, Sejong (National University of Ireland, Galway)
Parker, Chris (University of Birmingham)
Praeger, Cheryl (University of Western Australia)
Pyber, László (Rényi Inst Budapest Hungary)
Radu, Nicolas (Université Catholique de Louvain)
Schillewaert, Jeroen (Imperial College London)
Segev, Yoav (Ben Gurion University)
Seitz, Gary (University of Oregon)
Shpectorov, Sergey (University of Birmingham)
Solomon, Ronald Mark (Ohio State University)
Stewart, David (University of Cambridge)
Stroth, Gernot (University of Halle)
Struyve, Koen (Ghent University)
Testerman, Donna (École Polytechnique Fédérale de Lausanne)
van Maldeghem, Hendrik (Ghent University)
Waldecker, Rebecca (MLU Halle-Wittenberg)
Weiss, Richard (Tufts University)

Higher Order Numerical Methods for Evolutionary PDEs: Applied Mathematics Meets Astrophysical Applications
May 10-15, 2015

Organizers:

Christian Klingenberg (Wurzburg University) **Volker Springel** (Heidelberg University)
Chi-Wang Shu (Brown University)

Understanding the evolution of the universe from its early beginnings up to today has always been quest of mankind. Given today's wealth of astronomical observation and supercomputers, we are truly making progress in this direction. To this end astrophysicists are looking at ever more sophisticated models and are pushing for ever more accurate numerical methods. This meeting brought together experts from applied mathematics and numerical astrophysicists. The mathematicians brought their existing techniques to the table while being challenged by the astrophysicists to develop ever more sophisticated mathematical methods. The progress is needed to overcome this obstacle which make this conference timely.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5134

Participants:

Balsara, Dinshaw (University of Notre Dame)
Chandrashekarappa, Praveen (Tata Institute of Fundamental Research)
Chen, Yuxi (University of Michigan)
Cheng, Yingda (Michigan State University)
Colella, Phillip (Lawrence Berkeley National Laboratory)
Despres, Bruno (UPMC-LJLL)
Endeve, Eirik (Oak Ridge National Laboratory)
Filbet, Francis (Université de Lyon)
Fragile, Chris (College of Charleston)
Gallego Valencia, Juan Pablo (Würzburg University)
Guermond, Jean-Luc (Texas A&M University)
Hauck, Cory D. (Oak Ridge National Laboratory)
Käppeli, Roger (ETH Zürich)
Klingenberg, Christian (Wurzburg University)
Li, Fengyan (Rensselear Polytechnic Institute)
Mabuza, Sibusiso (Universität Würzburg)

McNally, Colin (University of Copenhagen)
Parfrey, Kyle (Princeton University)
Popov, Bojan (Texas A&M University)
Pretorius, Frans (Princeton University)
Roe, Phil (University of Michigan, Ann Arbor)
Röpke, Fritz (Universitaet Wuerzburg)
Shu, Chi-Wang (Brown University)
Toth, Gabor (University of Michigan, Ann Arbor)
Wang, Z J (University of Kansas in Lawrence)
Xia, Yinhua (University of Science and Technology of China)
Xing, Yulong (University of Tennessee and Oak Ridge National Lab)
Xu, Yan (University of Science and Technology of China)
Yang, Yang (Michigan Technological University)
Zhang, Xiangxiong (Purdue University)

Dispersive Hydrodynamics: The Mathematics of Dispersive Shock Waves and Applications
May 17-22, 2015

Organizers:

Mark Ablowitz (University of Colorado, Boulder)
Gino Biondini (SUNY Buffalo)

Gennady El (Loughborough University)
Mark Hoefer (University of Colorado, Boulder)

Thunder, the crack of a whip, and the boom heard from a jet plane surpassing the speed of sound are familiar occurrences in human experience and all result from the generation of viscous shock waves in air. Dispersive shock waves, the subject of this meeting, are of a very different type, lacking dissipation and realized as expanding, oscillatory disturbances in a dispersive medium. Experts from multiple areas of mathematics and physics came together in order to study the emerging field of dispersive hydrodynamics. These systems are attracting rapidly growing interest across a broad range of theoretical and experimental research ranging from ocean waves to fibre optics and superfluid dynamics.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5045

Participants:

Ablowitz, Mark (University of Colorado, Boulder)
Benzoni-Gavage, Sylvie (University of Lyon)
Biondini, Gino (SUNY Buffalo)
Deng, Guo (State University of New York at Buffalo)
Dubrovin, Boris A. (SISSA-ISAS Trieste)
El, Gennady (Loughborough University)
Engels, Peter (Washington State University)
Esler, Gavin (University College London)
Gammal, Arnaldo (University of Sao Paulo)
Gavrilyuk, Sergey (Aix-Marseille University)
Gershenzon, Naum (Wright State University)
Hoefer, Mark (University of Colorado, Boulder)
Ilan, Boaz (University of California, Merced)
Jenkins, Robert (University of Arizona)
Johnson, Edward (University College London)
Khusnutdinova, Karima (Loughborough University)
Klein, Christian (Institut de Mathématiques de Bourgogne)
LeFloch, Philippe (University of Paris 6)

MacNeil, Michael (University of Edinburgh)
Maiden, Michelle (University of Colorado at Boulder)
Mantzavinos, Dionyssis (SUNY Buffalo)
Miller, Peter (University of Michigan)
Mitsotakis, Dimitrios (Victoria University of Wellington)
Moro, Antonio (Northumbria University)
Osborne, Alfred (Nonlinear Waves Research Corporation)
Prinari, Barbara (University of Colorado)
Randoux, Stephane (University of Lille 1)
Salasnich, Luca (Universita di Padova)
Shearer, Michael (North Carolina State University)
Sprenger, Patrick (University of Colorado at Boulder)
Stoilov, Nikola (University of Goettingen)
Suret, Pierre (University of Lille 1)
Tovbis, Alexander (University of Central Florida)
Trillo, Stefano (University of Ferrara)
Wang, Qiao (SUNY Buffalo)
Wetzel, Benjamin (INRS-EMT)

Geometric Unification from Six-Dimensional Physics
May 24-29, 2015

Organizers:

Michael Hopkins (Harvard University)
David Nadler (University of California, Berkeley)

Andrew Neitzke (University of Texas at Austin)
Thomas Nevins (University of Illinois at Urbana-Champaign)

Over the last few years there has been a mini-revolution in theoretical physics, focused around a somewhat mysterious quantum theory which describes phenomena in six dimensions. Physicists carefully analyzing what goes on in that hypothetical six-dimensional universe have made surprising discoveries, not only for six-dimensional physics but also for the usual world of four dimensions (3 space and 1 time).

This workshop brought together physicists and mathematicians with an interest in learning to speak one another's languages and the common goal of better understanding this six-dimensional theory and what else it has to teach us.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5154

Participants:

Abouzaid, Mohammed (Columbia University)
Beem, Christopher (Institute for Advanced Study)
Ben-Zvi, David (University of Texas Austin)
Bryan, Jim (University of British Columbia)
Bryant, Robert (Duke University)
Bullimore, Mathew (Institute for Advanced Study)
Cordova, Clay (Harvard University)
Costello, Kevin (Perimeter Institute for Theoretical Physics)
Dimofte, Tudor (Institute for Advanced Study)
Eager, Richard (McGill University)
Etingof, Pavel (Massachusetts Institute of Technology)
Freed, Dan (University of Texas at Austin)
Gaiotto, Davide (Perimeter Institute)
Goncharov, Alexander (Yale University)
Gukov, Sergei (California Institute of Technology)
Hausel, Tamás (École Polytechnique Fédérale de Lausanne)

Maruyoshi, Kazunobu (Imperial College London)
Mirkovic, Ivan (University of Massachusetts)
Nadler, David (University of California, Berkeley)
Nakajima, Hiraku (Kyoto University)
Neitzke, Andrew (University of Texas at Austin)
Nevins, Thomas (University of Illinois at Urbana-Champaign)
Pascaleff, James (University of Illinois)
Pestun, Vasily (Institut des Hautes Études Scientifiques)
Quigley, Callum (University of Alberta)
Rozenblyum, Nick (University of Chicago)
Safronov, Pavel (Oxford University)
Seidel, Paul (Massachusetts Institute of Technology)
Teschner, Joerg (DESY Theory Group)
Toledano Laredo, Valerio (Northeastern University)
Williams, Harold (University of Texas at Austin)

Applied Probability Frontiers: Computational and Modeling Challenges
May 31 - June 5, 2015

Organizers:

Jose Blanchet (Columbia University)
Shane Henderson (Cornell University)
Donald Iglehart (Stanford University)
Thomas Kurtz (University of Wisconsin)

Pierre L'Ecuyer (Universite de Montreal)
Amy Ward (University of Southern California)
Assaf Zeevi (Columbia University)

This workshop concerned applied probability, broadly defined, but with an emphasis in the study of man-made systems. These include virtually all human-engineered systems that are subject to randomness, as well as other systems in which human agents interact, such as markets. The workshop centered around modern computational advances and challenges in applied probability including: 1) Computation of steady-state performance measures; 2) Numerical methods for SDEs (stochastic differential equations) and related continuous time continuous space models; 3) Rare event Monte Carlo simulation and 4) Simulation optimization techniques. All of these subdisciplines of computational probability have witnessed exciting advances which increasingly use techniques which are widely applicable across these subdisciplines. The areas of applications discussed earlier are of substantial societal impact. Thus, given the high level of activity in the communities represented by these subdisciplines, this workshop represents a timely event which has the potential of sparking significant advances in applied probability.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5160

Participants:

Andradottir, Sigrun (Georgia Institute of Technology)
Araman, Victor (American University of Beirut)
Asmussen, Soren (Aarhus University)
Bambos, Nick (Stanford University)
Blanchet, Jose (Columbia University)
Boxma, Onno (Eindhoven University of Technology)
Calvin, Jim (New Jersey Institute of Technology)
Dai, Jim (Cornell University)
Dawson, Don (Carleton University)
Dieker, Ton (Columbia University/Georgia Tech)
Foss, Sergey (Heriot-Watt University)
Gamarnik, David (Massachusetts Institute of Technology)
Giles, Mike (University of Oxford)
Glynn, Peter (Stanford University)
Henderson, Shane (Cornell University)
Iglehart, Donald (Stanford University)
Juneja, Sandeep (Tata Institute for Fundamental Research)
Kurtz, Thomas (University of Wisconsin)
Lam, Henry (University of Michigan)
Liu, Jingchen (Columbia University)

Mandjes, Michel (University of Amsterdam)
Meyn, Sean (University of Florida)
Moulines, Eric (Institut Telecom-Mines / Télécom ParisTech)
Nakayama, Marvin (New Jersey Institute of Technology)
Nelson, Barry (Northwestern University)
Olvera Cravioto, Mariana (Columbia University)
Ramanan, Kavita (Brown University)
Reiman, Marty (Alcatel-Lucent Bell Labs)
Rhee, Chang-han (Georgia Institute of Technology)
Roberts, Gareth 0. (University of Warwick)
Schmidt, Volker (Ulm University)
Shanbhag, Uday (Pennsylvania State University)
Sigman, Karl (Columbia University)
Szechtman, Roberto (Naval Postgraduate School)
Thorisson, Hermann (University of Iceland)
Ward, Amy (University of Southern California)
Zeevi, Assaf (Columbia University)
Zhang, Xiaowei (Hong Kong University of Science and Technology)

Advances and Challenges in Protein-RNA: Recognition, Regulation and Prediction
June 7-12, 2015

Organizers:

Yael Mandel-Gutfreund (Technion- Israel Institute of Technology)
Gabriele Varani (University of Washington)

The workshop brought together experts in experimental and computational biology to share developments in new methods that study these processes at the whole genome level. It fostered new collaborations between experimental and computational biologists and catalyzed the development of new and improved technologies and ideas to merge experimental analysis with mathematical and computational techniques to address this major challenge of biology and molecular medicine.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5063

Participants:

Ares, Manny (University of California, Santa Cruz)
Backofen, Rolf (University of Freiburg)
Beckmann, Benedikt (Humboldt-Universität Berlin)
Bujnicki, Janusz (International Institute of Molecular and Cell Biology)
Carloni, Paolo (German Research School for Simulation Sciences)
Dobbs, Drena (Iowa State University)
Dror, Iris (Technion)
Dvir, Shlomi (Technion)
Eyras, Eduardo (Pompeu Fabra University)
Fagg, Sam (University of California, Santa Cruz)
Frederic, Allain (Institute of Molecular Biology and Biophysics)
Friedersdorf, Matt (Duke University)
Gerber, Andre (University of Surrey)
Hall, Traci (National Institute of Environmental Health Sciences, National Institutes of Health)
Henn, Arnon (Technion)
Hughes, Tim (University of Toronto)
Jankowsky, Eckhard (Case Western Reserve University)
Keene, Jack (Duke University)
Landthaler, Markus (Max-Delbrueck Center for Molecular Medicine)

Leeper, Thomas C (University of Akron)
Mandel-Gutfreund, Yael (Technion)
Maquat, Lynne (Center for RNA Biology - University of Rochester)
Margalit, Hanah (Hebrew University of Jerusalem)
Milek, Miha (Max Delbrueck Center for Molecular Medicine)
Morris, Quaid (University of Toronto)
Mukherjee, Neelanjan (Berlin Institute for Medical Systems Biology)
Murn, Jernej (Boston Children's Hospital, Harvard Medical School)
Ohler, Uwe (Max Delbrueck Center)
Rabner, Alona (Technion)
Ramos, Andres (University College London)
Sattler, Michael (Helmholtz Zentrum München)
Tolbert, Blanton (Case Western Reserve University)
Tuszynska, Irina (International Institute of Molecular and Cell Biology)
Ule, Jernej (University College London)
Varani, Gabriele (University of Washington)
Westhof, Eric (IBMC/CNRS Strasbourg)
Yeo, Gene (University of California, San Diego)

Hybrid Methods in Imaging
June 14-19, 2015

Organizers:

Guillaume Bal (Columbia University)
Fernando Guevara Vasquez (University of Utah)
Peter Kuchment (Texas A&M University)

Leonid Kunyansky (University of Arizona)
Gunther Uhlmann (University of Washington)

The workshop brought together leading mathematicians, physicists, engineers and experts on biomedical imaging, involved in the development of the most promising "coupled physics" modalities. The topics of interest included Thermoacoustic Tomography, Photo-Acoustic Tomography, Ultrasound Modulated Optical and Impedance Tomographies, Magneto-Acousto-Electric Tomography (MAET) and other magnetic modalities, Current Density Imaging and Elastography. The main goals were (i) to assess the current progress in both theory and technology of the "hybrid" and "combined physics" modalities, (ii) to formulate mathematical problems that need to be resolved to meet the outstanding theoretical challenges in this area, and (iii) to facilitate the discussions and interdisciplinary collaborations between the researchers representing different scientific fields.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5012

Participants:

Acosta, Sebastian (Baylor College of Medicine)
Alberti, Giovanni S. (École Normale Supérieure)
Anastasio, Mark (Washington University)
Bal, Guillaume (Columbia University)
Bardsley, Patrick (University of Utah)
Capdeboscq, Yves (University Of Oxford)
Chen, Jie (Purdue University)
Guevara Vasquez, Fernando (University of Utah)
Hristova, Yulia (University of Michigan Dearborn)
Isaacson, David (Rensselaer Polytechnic Institute)
Kunyansky, Leonid (University of Arizona)
Lai, Ru-Yu (University of Washington)
Mamonov, Alexander (Schlumberger)
Manduca, Armando (Mayo Clinic)
Marinov, Kaloyan (Technical University of Denmark)
McLaughlin, Joyce (Rensselaer Polytechnic Institute)

Moradifam, Amir (University of California, Riverside)
Nakamura, Gen (Inha University)
Nguyen, Linh (University of Idaho)
Oraevsky, Alexander (University of Houston)
Palamodov, Victor (Tel Aviv University)
Quinto, Eric Todd (Tufts University)
Rakesh, Rakesh (University of Delaware)
Ren, Kui (University of Texas at Austin)
Scherzer, Otmar (University of Vienna)
Schotland, John (University of Michigan)
Seppecher, Laurent (Massachusetts Institute of Technology)
Tamasan, Alexandru (University of Central Florida)
Terzioglu, Fatma (Texas A&M University)
Yang, Yang (Purdue University)

Groups, Graphs and Stochastic Processes
June 21-26, 2015

Organizers:

Miklos Abert (Alfred Renyi Institute of Mathematics) **Balint Virag** (University of Toronto)
Omer Angel (University of British Columbia)

The asymptotic behaviour of large finite networks with few edges is important in many fields, including group theory, statistical physics and computer science. In a large network, the local structure near a random node exhibits a statistical symmetry. This workshop was a continuation of a widely successful workshop with the same name, that was held in 2011. The aim was to bring together top experts and young researchers to boost further interaction and make a step towards building a general theory.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5146

Participants:

Abert, Miklos (Alfred Renyi Institute of Mathematics)
Amir, Gidi (Bar-Ilan University)
Angel, Omer (University of British Columbia)
Augeri, Fanny (Université Paul Sabatier)
Backhausz, Agnes (Renyi Institute)
Bordenave, Charles (CNRS & Université de Toulouse)
Bowen, Lewis (University of Texas)
Candellero, Elisabetta (University of Warwick)
Chatterjee, Sourav (Stanford University)
Csikvari, Peter (Massachusetts Institute of Technology)
Elek, Gabor (Lancaster University)
Gamarnik, David (Massachusetts Institute of Technology)
Glasner, Yair (Ben-Gurion University of the Negev)
Harangi, Viktor (Renyi Institute)
Holroyd, Alexander (Microsoft Research)
Hutchcroft, Tom (University of British Columbia)
Kassabov, Martin (Cornell University)
Keller, Matthias (University of Jena)
Kotowski, Michał (University of Toronto)
Kotowski, Marcin (University of Toronto)
Kun, Gabor (Renyi Insitute)
Lee, James (University of Washington)

Lippner, Gabor (Northeastern University)
Lyons, Russell (Indiana University)
Matte Bon, Nicolas (École Normale Supérieure, Paris)
Mellick, Samuel (Central European University)
Pal, Soumik (University of Washington)
Parzanchevski, Ori (Institute for Advanced Study)
Peled, Ron (Tel Aviv University)
Peres, Yuval (Microsoft Research)
Pete, Gabor (Budapest University of Technology and Economics)
Puder, Doron (Institute for Advanced Study)
Rahman, Mustazzee (University of Toronto)
Sava-Huss, Ecaterina (Cornell University)
Sen, Arnab (University of Minnesota)
Silberman, Lior (University of British Columbia)
Sousi, Perla (University of Cambridge)
Stewart, Andrew (University of Toronto)
Tanaka, Ryokichi (Tohoku University)
Toth, Laszlo Marton (Central European University)
Virag, Balint (University of Toronto)
Zheng, Tianyi (Stanford University)

Frontiers in Functional Data Analysis
June 28 - July 3, 2015

Organizers:

Debashis Paul (University of California, Davis)
Surajit Ray (University of Glasgow)

David Ruppert (Cornell University)

In recent years, the field of functional data analysis has been widely used to answer science and policy questions, where the data are typically observed over time, space and other continuous variables. Current methodologies provide sophisticated computational techniques in solving complex problems in a wide range of application areas ranging from biomedical imaging, climate-environment interaction and unravelling networks evolving in time and space. After a period of prolific growth in computational techniques and methodological development, primarily motivated by diverse application areas, the time has come to consolidate the recent progress and provide a platform where researchers could exchange ideas and start collaboration on scientific projects and build a robust inferential framework for functional data analysis that take into account the increasing complexities of the data. This workshop brought together the leaders in this field, representatives of application areas, and promising young researchers to charter the path for future development in the field.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5096

Participants:

Aston, John (Cambridge University)
Aue, Alexander (University of California, Davis)
Cao, Jiguo (Simon Fraser University)
Carey, Michelle (McGill University)
Carmichael, Owen (Pennington Biomedical Research Center)
Carroll, Raymond (Texas A&M University)
Chen, Kehui (University of Pittsburgh)
Ding, Jimin (Washington University)
Ferraty, Frederic (University of Toulouse)
Genton, Marc (King Abdullah University of Science and Technology)
Goldsmith, Jeff (Columbia University)
Greven, Sonja (Ludwig-Maximilians-University)
Heckman, Nancy (University of British Columbia)
Hörmann, Siegfried (Universite libre de Bruxelles)
Huang, Jianhua (Texas A&M University)
Hyndman, Rob (Monash University)
Kauermann, Goran (Ludwig-Maximilians-University of Munich)
Kneip, Alois (University of Bonn)
Kokoszka, Piotr (Colorado State University)

Morris, Jeffrey (MD Anderson Cancer Center)
Müller, Hans-Georg (University of California, Davis)
Nychka, Douglas (National Center for Atmospheric Research)
Ory, Marcia (Texas A&M Health Science Center)
Paul, Debashis (University of California, Davis)
Ramsay, James (McGill University)
Ray, Surajit (University of Glasgow)
Reimherr, Matthew (Pennsylvania State University)
Reiss, Philip (New York University School of Medicine)
Ruppert, David (Cornell University)
Sangalli, Laura (Politecnico di Milano)
Shen, Haipeng (University of North Carolina at Chapel Hill)
Shi, Jian (Newcastle University)
Staicu, Ana-Maria (North Carolina State University)
Sun, Ying (King Abdullah University of Science and Technology)
Wang, Jane-Ling (University of California, Davis)
Yao, Fang (University of Toronto)
Zhu, Hongtu (University of North Carolina at Chapel Hill)
Zhu, Hongxiao (Virginia Tech)

Beyond I.I.D. in Information Theory
July 5-10, 2015

Organizers:

Nilanjana Datta (Cambridge University)
Renato Renner (ETH Zurich)

Mark M. Wilde (Louisiana State University)
Andreas Winter (Universitat Autonoma de Barcelona)

Quantum information science is one of the most exciting areas of investigation today, at the intersection of physics, mathematics, information theory and computer science. This workshop focused on questions of communication via quantum systems, in particular on the practically and conceptually relevant question of the fundamental performance limits in the face of limited availability of resources and non-zero error.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5120

Participants:

Berta, Mario (Caltech)
Christandl, Matthias (Copenhagen University)
Dalai, Marco (University of Brescia)
Datta, Nilanjana (Cambridge University)
Dupuis, Frédéric (Aarhus University)
Faist, Philippe (ETH Zurich)
Fawzi, Omar (ETH Zurich)
Fehr, Serge (Centrum Wiskunde & Informatica)
Frank, Rupert (Caltech)
Furrer, Fabian (Tokyo University)
Garcia-Patron, Raul (Universite Libre de Bruxelles)
Gour, Gilad (University of Calgary)
Guha, Saikat (Raytheon BBN Technologies)
Guillén i Fàbregas, Albert (Universitat Pompeu Fabra Barcelona)
Harrow, Aram (Massachusetts Institute of Technology)
Hayashi, Masahito (Nagoya University)
Hayden, Patrick (Stanford University)
Hsieh, Min-Hsiu (University of Technology Sydney)
Jencova, Anna (Mathematical Institute of the Slovak Academy of Sciences)
Koenig, Robert (Technische Universität München)
Leditzky, Felix (Cambridge University)
Leung, Debbie (University of Waterloo)

Leverrier, Anthony (INRIA Rocquencourt)
Lieb, Elliott (Princeton University)
Matthews, William (University of Cambridge)
Morgan, Ciara (University of Hannover)
Mosonyi, Milan (Universitat Autonoma Barcelona)
Ogawa, Tomohiro (University of Electro-Communications Tokyo)
Oppenheim, Jonathan (University of Cambridge)
Puzzuoli, Daniel (University of Waterloo)
Renner, Renato (ETH Zurich)
Schaffner, Christian (University of Amsterdam and Centrum Wiskunde & Informatica)
Scholz, Volkher (ETH Zurich)
Smith, Graeme (IBM Research)
Sutter, David (ETH Zurich)
Tan, Vincent (National University of Singapore)
Tomamichel, Marco (National University of Singapore)
Touchette, Dave (Université de Montréal)
Wilde, Mark M. (Louisiana State University)
Winter, Andreas (Universitat Autonoma de Barcelona)
Wolf, Michael (Technische Universitaet Muenchen)
Yang, Dong (Universitat Autonoma de Barcelona)
Yunger Halpern, Nicole (Caltech)

Advances in Combinatorial and Geometric Rigidity
July 12-17, 2015

Organizers:

Robert Connelly (Cornell University)
Steven Gortler (Harvard University)
Tibor Jordan (Eotvos University)

Brigitte Servatius (Worcester Polytechnic University)
Meera Sitharam (University of Florida)
Walter Whiteley (York University)

A series of gatherings of people in rigidity, including three previous BIRS 5 day workshops, and two companion 2 day BIRS workshops have played essential roles in the development of a collaborative research community with ongoing exchanges, sharing of methods, conceptual development and results. Each such gathering has generated new collaborations, new conjectures, and new results, while also consolidating other recent work into a form that invited new people to apply and extend the refined methods and results and solve new problems. The primary objective of this workshop was to continue this trajectory. The workshop discussions connected to the five threads above, while leaving space of new areas to emerge

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5114

Participants:

Baker, Troy (University of Florida)
Bereg, Sergey (University of Texas)
Chen, Bryan (Leiden University)
Clinch, Katie (Queen Mary London)
Connelly, Robert (Cornell University)
Cruickshank, James (National University of Ireland)
Eftekhari, Yaser (York University)
Fowler FRS, Patrick (University of Sheffield)
Gortler, Steven (Harvard University)
Guest, Simon (Cambridge University)
Guler, Hakan (Queen Mary, University of London)
Hempel, Maria (ETH Zurich)
Jackson, Bill (Queen Mary, University of London)
Jordan, Tibor (Eotvos University)
Karpenkov, Oleg (University of Liverpool)
Katoh, Naoki (Kwansei Gakuin University)
Király, Csaba (Eotvos University)
Kitson, Derek (Lancaster University)
Lam, Wai Yeung (Technische Universität Berlin)
Lee St.John, Audrey (Mount Holyoke College)
McRobie, Allan (Cambridge University)

Mitchell, Toby (Skidmore Owings & Merril LLP)
Nixon, Tony (Lancaster University)
Power, Stephen (Lancaster University)
Ross, Elissa (MESH Consultants Inc.)
Schulze, Bernd (Lancaster University)
Serocold, Hattie (Lancaster University)
Servatius, Brigitte (Worcester Polytechnic Institute)
Servatius, Herman (Worcester Polytechnic Institute)
Sidman, Jessica (Mount Holyoke)
Sitharam, Meera (University of Florida)
Sljoka, Adnan (Kyoto University)
So, Anthony Man-Cho (Chinese University of Hong Kong)
Tanigawa, Shin-ichi (Kyoto University)
Theran, Louis (Aalto University)
Thorpe, Michael (Arizona State University)
Trelford, Ryan (York University)
Vince, Andrew (University of Florida)
Wang, Menghan (University of Florida)
Whiteley, Walter (York University)
Willoughby, Joel (University of Florida)
Zhou, Shao (Worchester Polytechnic)

Combinatorics Meets Ergodic Theory
July 19-24, 2015

Organizers:

Nikos Frantzikinakis (University of Crete)
Bryna Kra (Northwestern University)

Julia Wolf (University of Bristol)

In the last ten years, both ergodic theory and additive combinatorics have developed and spread in new directions, leading to an explosion of research activity. New applications of these fields have emerged, techniques have been transferred between the various subjects, and multiple connections have been developed with other areas of mathematics. A striking example of these connections is the work of Green and Tao on arithmetic progressions in the primes, which led to important breakthroughs in number theory and in combinatorics. In addition to focusing on recent developments and new open problems, this meeting aimed to bring together mathematicians from the diverse fields of ergodic theory and combinatorics to collaborate on long-standing open problems that have implications for both fields.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5013

Participants:

Bergelson, Vitaly (Ohio State University)
Bloom, Thomas (University of Bristol)
Campbell, James (University of Memphis)
Carnovale, Marc (Ohio State University)
Cyr, Van (Bucknell University)
Donoso, Sebastian (University of Chile)
Fish, Alexander (University of Sydney)
Frantzikinakis, Nikos (University of Crete)
Glasscock, Daniel (Ohio State University)
Goldbring, Isaac (University of Illinois at Chicago)
Green, Ben (Oxford University)
Grisemer, John (Elephant Head Software)
Gutman, Yonatan (Institute of Mathematics, Polish Academy of Sciences)
Haaland Knutson, Inger (University of Agder)
Hatami, Omid (University of Cambridge)
Hughes, Kevin (University of Edinburgh)
Konieczny, Jakub (Oxford University)
Koutsogiannis, Andreas (Ohio State University)
Kra, Bryna (Northwestern University)

Krause, Ben (University of California, Los Angeles)
Lyall, Neil (University of Georgia)
Maass, Alejandro (Universidad de Chile)
Manners, Freddie (Oxford University)
Matthiesen, Lilian (Leibniz Universität Hannover)
Mazur, Przemyslaw (University of Oxford)
McCutcheon, Randall (University of Memphis)
Moreira, Joel (Ohio State University)
Richter, Florian (Ohio State University)
Robertson, Donald (Ohio State University)
Sanders, Tom (Oxford University)
Shao, Fernando (Oxford University)
Sun, Wenbo (Northwestern University)
Tao, Terence (University of California, Los Angeles)
Titichetrakun, Tatchai (University of British Columbia)
Tointon, Matthew (University of Cambridge)
Tserunyan, Anush (University of Illinois at Urbana-Champaign)
Wooley, Trevor (University of Bristol)
Zorin-Kranich, Pavel (University of Bonn)

Developments in the Theory of Homogenization
July 26-31, 2015

Organizers:
Inwon Kim (University of California, Los Angeles)
Claude Le Bris (Ecole Nationale des Ponts et Chaussees)

Fang-Hua Lin (New York University)
Panagiotis Souganidis (University of Chicago)
Yifeng Yu (University of California, Irvine)

Homogenization theory is a classical field of mathematics, and while tremendous progress has been made in both the computational and analytical aspects, much remains to be answered. In light of remarkable recent progress in this area, this workshop brought together active experts from different areas of mathematics to exchange new ideas and techniques. Those areas included PDE, probability and scientific computing.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5164

Participants:

Abdulle, Assyr (École Polytechnique Fédérale de Lausanne)
Armstrong, Scott (Université Paris-Dauphine)
Cardaliaguet, Pierre (Université Paris Dauphine)
Ciomaga, Adina (University of Chicago)
Deuschel, Jean-Dominique (Technische Universität Berlin)
Dirr, Nicolas (Cardiff University)
Feldman, William (University of California, Los Angeles)
Gao, Hongwei (University of California, Irvine)
Gerard-Varet, David (Université Denis Diderot Paris 7)
Gloria, Antoine (Université Libre de Bruxelles)
Gu, Yu (Stanford University)
Jing, Wenjia (University of Chicago)
Josien, Marc (École Nationale des Ponts et Chaussées)
Kim, Inwon (University of California, Los Angeles)
Le Bris, Claude (École Nationale des Ponts et Chaussées)
Legoll, Frédéric (École Nationale des Ponts et Chaussées)
Lin, Jessica (University of Wisconsin-Madison)

Liu, Yu-Yu (National Cheng Kung University)
Mathieu, Pierre (Université d'Aix-marseille)
Mitake, Hiroyoshi (Hiroshima university)
Mourrat, Jean-Christophe (École normale supérieure de Lyon)
Nolen, James (Duke University)
Nouy, Anthony (École Centrale de Nantes)
Novikov, Alexei (Pennsylvania State University)
Pozar, Norbert (Kanazawa University)
Prange, Christophe (University of Chicago)
Rezakhanlou, Fraydon (University of California, Berkeley)
Schwab, Russell (Michigan State University)
Seppalainen, Timo (University of Wisconsin)
Shen, Zongwei (University of Kentucky)
Siconolfi, Antonio (University of Rome)
Smart, Charles (Cornell University)
Souganidis, Panagiotis (University of Chicago)
Tran, Hung (University of Chicago)
Yu, Yifeng (University of California, Irvine)

Statistical and Computational Challenges In Bridging Functional Genomics, Epigenomics, Molecular QTLs, and Disease Genetics
August 2-7, 2015

Organizers:

Manolis Kellis (Massachusets Institute of Technology)
Aurelie Labbe (McGill University)
Jacob Laurent (Centre national de la recherche scientifique)

Stephen Montgomery (Stanford University)
Irina Ostrovnaya (Memorial Sloan-Kettering Cancer Center)
Ingo Ruczinski (Johns Hopkins University)

The genomic revolution has resulted in unprecedented depth and diversity of biological datasets relevant to understanding human biology and disease. This has shifted the bottleneck from data generation to data integration, and from experimental advances to computational and statistical advances. The goal of this workshop was to bring together computational, statistical and experimental scientists spanning the areas of human genetics, epigenomics and personal genomics, in order to directly address the challenges that can only be undertaken by the intersection of their fields.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5142

Participants:

Andrews, Brenda (University of Toronto)
Awadalla, Philip (Ontario Institute of Cancer Research)
Battle, Alexis (Johns Hopkins University)
Brown, Christopher (University of Pennsylvania)
DeGorter, Marianne (Stanford University)
Engelhardt, Barbara (Princeton University)
Gilad, Yoav (University of Chicago)
Goldenberg, Anna (University of Toronto)
Haibe Kains, Benjamin (University Health Network)
Hansen, Kasper (Johns Hopkins University)
Haudry, Annabelle (University of Lyon - CNRS)
Irizarry, Rafael (Dana-Farber)
Kammers, Kai (Johns Hopkins University)
Kellis, Manolis (Massachusetts Institute of Technology)
Knowles, David (Stanford University)
Kuijjer, Marieke (Dana-Farber Harvard School of Public Health)
Labbe, Aurelie (McGill University)
Lappalainen, Tuuli (New York Genome Center & Columbia University)
Laurent, Jacob (Centre national de la recherche scientifique)
Leek, Jeff (Johns Hopkins Bloomberg School of Public Health)
Li, Yue (Massachusetts Institute of Technology)

Listgarten, Jennifer (Microsoft Research)
Montgomery, Stephen (Stanford University)
Moses, Alan (University of Toronto)
Olshen, Adam (University of California, San Francisco)
Papaemmanuil, Elli (Memorial Sloan Kettering Cancer Center)
Platig, John (Dana-Farber Harvard School of Public Health)
Quackenbush, John (Dana-Farber Cancer Institute)
Quon, Gerald (Massachusetts Institute of Technology)
Ruczinski, Ingo (Johns Hopkins University)
Sallari, Richard Cowper (Massachusetts Institute of Technology)
Scharpf, Rob (Johns Hopkins University)
Scheet, Paul **(MD Anderson Cancer Center)**
Segal, Mark (University of California, San Francisco)
Seshan, Venkatraman (Memorial Sloan Kettering Cancer Center)
Shah, Sohrab (University of British Columbia and BC Cancer Research Centre)
Snyder, Michael (Stanford University)
Sunyaev, Shamil (Harvard University)
Vert, Jean-Philippe (Mines ParisTech)

Factorizable Structures in Topology and Algebraic Geometry
August 9-14, 2015

Organizers:

Gregory Arone (University of Virginia)
David Ayala (Montana State University)
John Francis (Northwestern University)

Dennis Gaitsgory (Harvard University)
Owen Gwilliam (Max Planck Institute for Mathematics)

Factorization algebras and factorization homology arose originally from the study of conformal field theories, a class of theories from physics that possess beautiful mathematical properties. In particular, Beilinson and Drinfeld introduced factorization methods to provide a conceptual and geometric approach to the complicated algebraic structures appearing in conformal field theory. These ideas have expanded to offer a common approach to questions in algebraic geometry, the topology of manifolds, and perturbative quantum field theory – notably distinct fields of mathematics. This workshop brought together mathematicians specializing in each of these areas to share the cutting edge of developing research and to foster new collaborations.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5125

Participants:

Ayala, David (Montana State University)
Beilinson, Alexander (University of Chicago)
Ching, Michael (Amherst College)
Cliff, Emily (Oxford University)
Dyckerhoff, Tobias (Universität Bonn)
Elmanto, Elden (Northwestern University)
Francis, John (Northwestern University)
Gepner, David (Purdue University)
Ginot, Gregory (Université Pierre et Marie Curie)
Grady, Ryan (Boston University)
Gwilliam, Owen (Max Planck Institute for Mathematics)
Heluani, Reimundo (Instituto Nacional de Matemática Pura e Aplicada)
Henriques, Andre (Oxford University)
Johnson-Freyd, Theo (Northwestern University)
Jordan, David (University of Edinburgh)
Kapranov, Mikhail (Kavli IPMU, University of Tokyo)
Knudsen, Benjamin (Northwestern University)
Kupers, Alexander (Stanford University)
Lambrechts, Pascal (Université de Louvain)

Leung, Naichung Conan (Chinese University of Hong Kong)
Markarian, Nikita (Higher School of Economics)
Mazel-Gee, Aaron (University of California, Berkeley)
Mirkovic, Ivan (University of Massachusetts)
Morrison, Scott (Australian National University)
Nadler, David (University of California, Berkeley)
Oblomkov, Alexei (University of Massachusetts)
Raskin, Sam (Massachusetts Institute of Technology)
Rozenblyum, Nick (University of Chicago)
Safronov, Pavel (Oxford University)
Scheimbauer, Claudia (Max Planck Institute for Mathematics)
Snyder, Noah (Indiana University)
Stolz, Stephan (University of Notre Dame)
Tanaka, Hiro (Harvard University)
Tsai, Pei-Yu (Caltech)
Turchin, Victor (Kansas State University)
Williams, Brian (Northwestern University)
Zhu, Xinwen (Caltech)

Lifting Problems and Galois Theory
August 16-21, 2015

Organizers:

Frauke Bleher (University of Iowa)
Ted Chinburg (University of Pennsylvania)

Andrew Obus (University of Virginia)
Rachel Pries (Colorado State University)

This workshop brought together researchers and advanced Ph.D. students working on Galois theory in order to advance this field. The lifting problems for curves were the focus of the workshop and have been a central topic in algebraic geometry since the work of Grothendieck, Deligne and Mumford and others on etale fundamental groups and moduli spaces of curves. The subject is undergoing rapid change due to the introduction of new techniques, as in the proof of the Oort conjecture.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5035

Participants:

Acther, Jeff (Colorado State University)
Bary-Soroker, Lior (Tel Aviv University)
Bleher, Frauke (University of Iowa)
Bouw, Irene (University Ulm)
Cadoret, Anna (École Polytechnique**)**
Chinburg, Ted (University of Pennsylvania)
Davis, Rachel (Purdue University)
Debes, Pierre (Université de Lille)
Dupuy, Taylor (Hebrew University/University of Vermont)
Emsalem, Michel (Université de Lille 1)
Fehm, Arno (University of Konstanz)
Frankel, Brett (University of Pennsylvania)
Garuti, Marco (Università Padova)
Guralnick, Robert (University of Southern California)
Harbater, David (University of Pennsylvania)
Holschbach, Armin (Ruprecht-Karls-Universität Heidelberg)
Karemaker, Valentijn (Utrecht University)
Kedlaya, Kiran Sridhara (University of California, San Diego)
Kontogeorgis, Aristides (National and Kapodistrian University of Athens)
Liedtke, Christian (Technische Universität München)

Marques, Sophie (New York University)
Neftin, Danny (University of Michigan)
Obus, Andrew (University of Virginia)
Oort, Frans (Utrecht University)
Park, Jennifer (McGill Univesity)
Pries, Rachel (Colorado State University)
Razafindramahatsiaro, Christalin (African Institute of Mathematical Sciences)
Scherr, Zachary (University of Michigan)
Sijsling, Jeroen (Dartmouth College)
Sonn, Jack (Technion)
Srinivasan, Padmavathi (Massachusetts Institute of Technology)
Symonds, Peter (University of Manchester)
Tomaskovic-Moore, Sebastian (University of Pennsylvania)
Tossici, Dajano (Université de Bordeaux I)
Turchetti, Daniele (Leiden University)
Vincent, Christelle (Stanford University)
Ward, Kenneth (NYU/NYU Shanghai)
Weaver, Bradley (University of Virginia)
Weiss, Benjamin (University of Maine)
Wewers, Stefan (Universität Ulm)
Zieve, Michael (University of Michigan)

Methods and Challenges in Extremal and Probabilistic Combinatorics
August 23-28, 2015

Organizers:

Penny Haxell (University of Waterloo)
Michael Krivelevich (Tel Aviv University)

Benny Sudakov (ETH Zürich)

Combinatorics, sometimes also called discrete mathematics, is a branch of mathematics focusing on the study of discrete objects and their properties. Although combinatorics is probably as old as the human ability to count, the field experienced tremendous growth during the last fifty years and is one of the most active areas in mathematics today. It has many connections to other scientific and mathematical disciplines, and countless practical applications, ranging from designing computer hardware to modeling complex social networks. This workshop discussed some of latest developments in this field, their connections and applications, and recently emerged research directions.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5008

Participants:

Alon, Noga (Tel Aviv University)
Balogh, Jozsef (University of Illinois at Urbana–Champaign)
Bohman, Thomas (Carnegie Mellon University)
Bukh, Boris (Carnegie Mellon University)
Conlon, David (University of Oxford)
Das, Shagnik (Freie Universität Berlin)
Ferber, Asaf (Yale University)
Fox, Jacob (Massachusetts Institute of Technology)
Friedgut, Ehud (Weizmann Institute)
Frieze, Alan (Carnegie Mellon University)
Furedi, Zoltan (University of Illinois at Urbana–Champaign)
Hatami, Hamed (McGill University)
Haxell, Penny (University of Waterloo)
Huang, Hao (University of Minnesota)
Kahn, Jeff (Rutgers University)
Kim, Jeong Han (Korea Institute for Advanced Study)
Kostochka, Alexandr (University of Illinois at Urbana-Champaign)
Krivelevich, Michael (Tel Aviv University)
Kuhn, Daniela (Birmingham University)
Lee, Choongbum (Massachusetts Institute of Technology)

Linial, Nathan (Hebrew University)
Loh, Po-Shen (Carnegie Mellon University)
Lubetzky, Eyal (Courant Institute)
Luczak, Tomasz (Adam Mickiewicz University)
Morris, Robert (Instituto Nacional de Matemática Pura e Aplicada)
Mubayi, Dhruv (University of Illinois at Chicago)
Norin, Sergey (McGill University)
Osthus, Deryk (Birmingham University)
Pikhurko, Oleg (University of Warwick)
Rodl, Vojtech (Emory University)
Samotij, Wojciech (Tel Aviv University)
Schacht, Mathias (University of Hamburg)
Scott, Alex (University of Oxford)
Shapira, Asaf (Tel Aviv University)
Solymosi, Jozsef (University of British Columbia)
Steger, Angelika (ETH Zürich)
Sudakov, Benny (ETH Zürich)
Szabo, Tibor (Freie Universität Berlin)
Szestopalow, Michael (University of Waterloo)
Tetali, Prasad (Georgia Institute of Technology)
Verstraete, Jacques (University of California, San Diego)
Vu, Van (Yale University)
Zhao, Yi (Georgia State University)

New Trends in Nonlinear Elliptic Equations
August 30 - September 4, 2015

Organizers:

Michel Chipot (University of Zurich) **Itai Shafrir** (Technion)

The theory of elliptic equations is concerned with diffusion problems. For instance, diffusion of the temperature in a plate, of a population in some environment, of water in a porous media, etc. Starting from the simple Laplace equation in the 19th century, the theory has expanded and has been able to model complicated situations.

Getting their inspiration from the Laplace equation, generations of mathematicians have attacked various issues of prime importance. It is not possible to quote them all, but one is for instance the complete understanding of the Navier-Stokes equation which models the motion of fluids.

One of the workshop's goals was to deepen the human knowledge in this field.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5004

Participants:

Almog, Yaniv (Louisiana State University)
Cabre, Xavier (ICREA and Universitat Politècnica de Catalunya)
Caraballo, Tomas (Universidad de Sevilla)
Chipot, Michel (University of Zurich)
Dacorogna, Bernard (École Polytechnique Fédérale de Lausanne)
Davila, Juan (Universidad de Chile)
Du, Yihong (University of New England)
Fazly, Mostafa (University of Alberta)
Fischer, Julian (Max Planck Institute for Mathematics in the Sciences)
Jerrard, Robert (University of Toronto)
Kawohl, Bernd (University of Koeln)
Kinderlehrer, David (Carnegie Mellon University)

Kneuss, Olivier (Federal University of Rio de Janeiro)
Lin, Fang-Hua (New York University)
Mardare, Sorin (Université de Rouen)
Mironescu, Petru (University Claude Bernard Lyon 1)
Musso, Monica (Universidad Católica de Chile)
Nguyen, Hoai-Minh (École Polytechnique Fédérale de Lausanne)
Poliakovsky, Arkady (Ben Gurion University)
Sandier, Etienne (Université Paris Est Créteil)
Shafrir, Itai (Technion)
Wang, Changyou (Mathematics, Purdue University)
Wei, Juncheng (University of British Columbia)
Wolansky, Gershon (Technion)
Yanagida, Eiji (Tokyo Institute of Technology)

Nichols Algebras and Their Interactions with Lie Theory, Hopf Algebras and Tensor Categories
September 6-11, 2015

Organizers:

Nicolás Andruskiewitsch (Universidad Nacional de Cordoba)
Pavel Etingof (Massachusets Institute of Technology)
István Heckenberger (University of Marburg)

Julia Pevtsova (University of Washington)
Sarah Witherspoon (Texas A&M University)
James Zhang (University of Washington)

The goal of this workshop was to bring together experts in several different subjects all intrinsically related to Nichols algebras via the underlying techniques and ideas coming from Hopf algebras, Lie theory, conformal field theory and combinatorics. There were participants working in the rapidly developing structural theory of Nichols algebras and related Hopf algebras who produced multiple outstanding results in recent years, as well as specialists working in representation theory, finite tensor categories, cohomology, and invariant theory who benefitted from interaction with those having expertise in Nichols algebras as well as providing new directions and context for the theory of Nichols algebras.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5053

Participants:

Andruskiewitsch, Nicolás (Universidad Nacional de Cordoba)
Angiono, Iván (Universidad de Córdoba Argentina)
Bazlov, Yuri (University of Manchester)
Berenstein, Arkady (University of Oregon)
Brown, Ken (University of Glasgow)
Brzezinski, Tomasz (Swansea University)
Cuadra, Juan (University of Almeria)
Davydov, Alexei (Ohio University)
Etingof, Pavel (Massachusetts Institute of Technology)
Goodearl, Kenneth (University of California, Santa Barbara)
Heckenberger, István (University of Marburg)
Hu, Naihong (East China Normal University)
Khartchenko, Vladislav (Universidad Autónoma de México)
Kirkman, Ellen (Wake Forest University)
Kotchetov, Mikhail (Memorial University)
Lenagan, Tom (University of Edinburgh)
Lu, Di-Ming (Zhejiang University)
Majid, Shahn (Queen Mary University of London)
Mastnak, Mitja (Saint Mary's University)
Masuoka, Akira (University of Tsukuba)
Mombelli, Martin (Universidad Nacional de Córdoba)

Montgomery, Susan (University of Southern California)
Mueger, Michael (Radboud Universiteit Nijmegen, Institute for Mathematics, Astrophysics and Particle Physics)
Natale, Sonia (Universidad Nacional de Córdoba)
Ng, Siu-Hung (Louisiana State University)
Nikshych, Dmitri (University of New Hampshire)
Ostrik, Victor (University of Oregon)
Pevtsova, Julia (University of Washington)
Rowell, Eric (Texas A&M University)
Schneider, Hans-Jürgen (Ludwig-Maximilians-Universität München)
Schweigert, Christoph (University of Hamburg)
Snyder, Noah (Indiana University)
Solberg, Oyvind (Norwegian University of Science and Technology)
Vendramin, Leandro (Universidad de Buenos Aires)
Walton, Chelsea (Temple University)
Wang, Yanhua (Shanghai University of Finance and Economics)
Witherspoon, Sarah (Texas A&M University)
Wu, Quanshui (Fudan University)
Yakimov, Milen (Louisiana State University)
Yamane, Hiroyuki (University of Toyama)
Zhang, James (University of Washington)

The Use of Linear Algebraic Groups in Geometry and Number Theory
September 13-18, 2015

Organizers:

Skip Garibaldi (University of California, Los Angeles) **Raman Parimala** (Emory University)
Nicole Lemire (University of Western Ontario) **Kirill Zainoulline** (University of Ottawa)

This workshop aimed to exploit new emerging applications of algebraic groups, to bring together specialists and young researchers in these areas, and to establish new links and projects.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5016

Participants:

Antieau, Benjamin (University of Illinois at Chicago)
Auel, Asher (Yale University)
Baek, Sanghoon (Korea Advanced Institute of Science and Technology)
Bayer-Fluckiger, Eva (École Polytechnique Fédérale de Lausanne)
Bhaskhar, Nivedita (Emory University)
Borovoi, Mikhail (Tel Aviv University)
Brion, Michel (Institut Fourier)
Calmes, Baptiste (Université d'Artois)
Chernousov, Vladimir (University of Alberta)
Duncan, Alexander (University of Michigan, Ann Arbor)
Gille, Stefan (University of Alberta)
Gordon-Sarney, Reed (Emory University)
Grimm, David (Universidad de Santiago de Chile)
Hartmann, Julia (University of Pennsylvania)
Haution, Olivier (Ludwig Maximilian University of Munich)
Hoffmann, Detlev (Technical University of Dortmund)
Junkins, Caroline (University of Western Ontario)
Karpenko, Nikita (University of Alberta)
Krashen, Daniel (University of Georgia)
Lee, Ting-Yu (École Polytechnique Fédérale de Lausanne)
Lemire, Nicole (University of Western Ontario)
Levine, Marc (Universität Duisburg-Essen)

Lucchini Arteche, Giancarlo (École Polytechnique)
MacDonald, Mark (Lancaster University)
McNinch, George (Tufts University)
Merkurjev, Alexander (University of California, Los Angeles)
Neshitov, Alexander (University of Ottawa and Steklov Institute of Mathematics)
Panin, Ivan (Steklov Mathematical Institute at St.Petersburg)
Parimala, Raman (Emory University)
Pianzola, Arturo (University of Alberta)
Pirisi, Roberto (University of Ottawa)
Popov, Vladimir (Steklov Mathematical Institute, Russian Academy of Sciences)
Rapinchuk, Igor (Harvard University)
Saltman, David J (Center for Communications Research)
Savin, Gordan (Utah University)
Scully, Stephen (University of Alberta)
Stavrova, Anastasia (St. Petersburg State University)
Suresh, Venapally (Emory University)
Williams, Ben (University of British Columbia)
Zainoulline, Kirill (University of Ottawa)
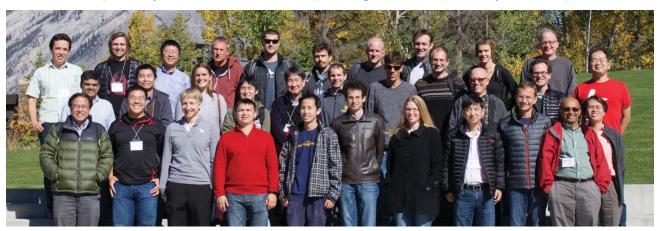**Zhong, Changlong** (University of Alberta)
Zywina, David (Cornell University)

Strongly Interacting Topological Phases
September 20-25, 2015

Organizers:

Jason Alicea (California Institute of Technology)
Matthew Fisher (University of California, Santa Barbara)
Marcel Franz (University of British Columbia)
Yong-Baek Kim (University of Toronto)

This workshop brought together researchers from various disciplines---mathematical physics, theoretical and experimental materials science, and quantum information---to tackle fundamental questions raised by topological phases. It hoped to break new ground in the understanding of these phases in situations where quantum mechanics and strong interactions between the particles in a material give rise to new kinds of topological phenomena. Understanding this regime offers great intellectual challenges to both theory and experiment, but also correspondingly great rewards. Indeed, exploration of this area can push the boundaries of our understanding of quantum mechanics and the organizing principles of nature, and simultaneously generate new technologies with potentially great societal impact.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5051

Participants:

Alicea, Jason (California Institute of Technology)
Barkeshli, Maissam (Microsoft Station Q)
Berg, Erez (Weizmann Institute)
Bernevig, Andrei (Princeton University)
Bonderson, Parsa (Microsoft Station Q)
Burnell, Fiona (University of Minnesota)
Cano, Jennifer (Princeton University)
Chen, Yong (Purdue University)
Fendley, Paul (Oxford University)
Fidkowski, Lukasz (Stony Brook University)
Fisher, Matthew (University of California, Santa Barbara)
Folk, Joshua (University of British Columbia)
Franz, Marcel (University of British Columbia)
Fu, Liang (Massachusetts Institute of Technology)
Gorshkov, Alexey (Joint Quantum Institute)
Hermele, Michael (University of Colorado Boulder)
Hughes, Taylor (University of Illinois)
Kim, Yong-Baek (University of Toronto)
Levin, Michael (University of Chicago)
Lindner, Nate (Technion)

Lu, Yuan-Ming (Ohio State University)
Lutchyn, Roman (Microsoft Station Q)
Marcus, Charles (University of Copenhagen)
Metlitski, Max (Kavli Institute for Theoretical Physics)
Meyer, Julia (CEA Grenoble)
Mong, Roger (University of Pittsburgh)
Nadj-perge, Stevan (Delft University of Technology)
Oshikawa, Masaki (University of Tokyo)
Pikulin, Dmitry (University of British Columbia)
Ryu, Shinsei (University of Illinois at Urbana)
Shtengel, Kirill (University of California Riverside)
Son, Dam (University of Chicago)
Stern, Ady (Weizmann Institute)
Takagi, Hidenori (Max Planck Institute for Solid State Research)
Todadri, Senthil (Massachusetts Institute of Technology)
Vishwanath, Ashvin (University of California, Berkeley)
Wen, Xiao-Gang (Massachusetts Institute of Technology/Perimeter Institute)
Yacoby, Amir (Harvard University)
Yao, Norman (University of California, Berkeley)

Approximation of High-Dimensional Numerical Problems - Algorithms, Analysis and Applications
September 27 - October 2, 2015

Organizers:

Christiane Lemieux (University of Waterloo)
Ian H. Sloan (University of New South Wales)

Henryk Wozniakowski (Columbia University)

With the rapid growth in computational power over the last few years, problems of larger and larger scale are more and more feasible in many application areas, but the bottleneck is often the 'curse of dimensionality' - the tendency for problem difficulty to grow exponentially in the number of variables. This meeting, held after a decade of rapid theoretical advance, provided a timely opportunity for analysts, algorithm designers and application experts to gain a clearer vision of current challenges and opportunities.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5047

Participants:

Dick, Josef (University of New South Wales)
Faure, Henri (Institut de Mathématiques de Marseille)
Gerber, Mathieu (Harvard University)
Gilbert, Alexander (University of New South Wales)
Giles, Mike (University of Oxford)
Griebel, Michael (Universität Bonn)
Heinrich, Stefan (University of Kaiserslautern)
Hickernell, Fred J. (Illinois Institute of Technology)
Hinrichs, Aicke (Johannes Kepler Universität)
Hofer, Roswitha (Johannes Kepler Universität)
Jiménez Rugama, Lluís Antoni (Illinois Institute of Technology)
Kazashi, Yoshihito (University of New South Wales)
Kolkiewicz, Adam (University of Waterloo)
Kritzer, Peter (Johannes Kepler Universität Linz)
L'Ecuyer, Pierre (Université de Montréal)
Lemieux, Christiane (University of Waterloo)
Leobacher, Gunther (Johannes Kepler Universität)
Novak, Erich (Friedrich Schiller Universität Jena)
Nuyens, Dirk (Katholieke Universiteit Leuven)

Owen, Art (Stanford University)
Packham, Natalie (Frankfurt School of Finance and Management)
Pillichshammer, Friedrich (Johannes Kepler Universität)
Plaskota, Leszek (University of Warsaw)
Przybylowicz, Pawel (AGH University of Science and Technology)
Ritter, Klaus (Technische Universität Kaiserslautern)
Rudolf, Daniel (Friedrich Schiller Universität Jena)
Schmid, Wolfgang Ch. (University of Salzburg)
Schwab, Christoph (ETH Zürich)
Sloan, Ian H. (University of New South Wales)
Taniguchi, Yoshihiro (University of Waterloo)
Wasilkowski, Grzegorz (University of Kentucky)
Webster, Clayton (Oak Ridge National Laboratory)
Weimar, Markus (University of Siegen)
Yoshiki, Takehito (University of Tokyo)
Zhu, Houying (University of New South Wales)

The Geometry, Algebra and Analysis of Algebraic Numbers
October 4-9, 2015

Organizers:

Francesco Amoroso (Université de Caen)
Igor Pritsker (Oklahoma State University)

Christopher Smyth (University of Edinburgh)
Jeffrey Vaaler (University of Texas at Austin)

This workshop brought together experts and young scholars from many areas of mathematics to focus on problems in the general area of algebraic numbers. In addition to the classical methods of field theory and Galois theory, the scope of the workshop includes methods from algebraic and toric geometry, combinatorics, dynamical systems and potential theory.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5054

Participants:

Akhtari, Shabnam (University of Oregon)
Amoroso, Francesco (Université de Caen)
Barroero, Fabrizio (Scuola Normale Superiore di Pisa)
Bertin, Marie José (Université Paris 6)
Boyd, David (University of British Columbia)
Bugeaud, Yann (Université de Strasbourg)
Carneiro, Emanuel (Instituto Nacional de Matemática Pura e Aplicada)
Choi, Stephen (Simon Fraser University)
Coons, Michael (University of Newcastle)
Drungilas, Paulius (Vilnius University)
Dubickas, Arturas (Vilnius University)
Dujella, Andrej (University of Zagreb)
Erdelyi, Tamas (Texas A&M University)
Filaseta, Michael (University of South Carolina)
Fili, Paul (Oklahoma State University)
Greaves, Gary (Tohoku University)
Grizzard, Robert (University of Wisconsin)
Guichard, Christelle (Institut Fourier)
Hughes, Adam (University of Texas)
Jankauskas, Jonas (Waterloo University)
Lalin, Matilde (Université de Montrèal)

McKee, James (Royal Holloway, University of London)
Mossinghoff, Michael (Davidson College)
Pinner, Christopher (Kansas State University)
Pottmeyer, Lukas (University of Basel)
Pritsker, Igor (Oklahoma State University)
Ranieri, Gabriele (Pontificia Universidad Católica de Valparaíso)
Rhin, Georges (University of Lorraine)
Roy, Damien (University of Ottawa)
Rumely, Robert (University of Georgia)
Samuels, Charles (Christopher Newport University)
Schinzel, Andrzej (Polish Academy of Sciences)
Sinclair, Christopher (University of Oregon)
Smyth, Christopher (University of Edinburgh)
Stewart, Cameron (University of Waterloo)
Vaaler, Jeffrey (University of Texas at Austin)
Verger-Gaugry, Jean-Louis (Institut Fourier - CNRS, Université Grenoble Alpes)
Widmer, Martin (Royal Holloway, University of London)
Wu, Qiang (Southwest University of China)
Yatsyna, Pavlo (Royal Holloway, University of London)

Mathematical Coding Theory in Multimedia Streaming
October 11-16, 2015

Organizers:

Heide Gluesing-Luerssen (University of Kentucky)
Ashish Khisti (University of Toronto)

Joachim Rosenthal (University of Zürich)
Emina Soljanin (Bell Labs Research)

The workshop brought together researchers working on mathematical coding theory and the communication theory of multimedia systems. It exposed researchers in coding theory to the relevant source and channel abstractions used in multimedia systems and sparked their interest in stimulating research questions involving low-latency streaming codes. Researchers in communication theory were exposed to both classical and modern results in the dynamical systems theory of convolutional codes and new distance metrics that may have operational significance in streaming systems. The workshop was an important step towards our ultimate objective of initiating a general theory of error correction codes for multimedia streaming applications.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5150

Participants:

Badr, Ahmed (University of Toronto)
Barbero, Angela (Universidad de Valladolid)
Bolkema, Jessalyn (University of Nebraska - Lincoln)
Bossert, Martin (Universität Ulm)
Byrne, Eimear (University College Dublin)
Cassuto, Yuval (Technion)
Climent, Joan-Josep (Universitat Alacant)
Costello, Daniel (University of Notre Dame)
Feder, Meir (Tel-Aviv University)
Gluesing-Luerssen, Heide (University of Kentucky)
Gorla, Elisa (University of Neuchatel)
Hansen, Jonas (Aalborg University and Bang and Olufsen)
Hollanti, Camilla (Aalto University)
Joshi, Gauri (Massachusetts Institute of Technology)
Kadhe, Swanand (Texas A&M University)
Kelley, Christine (University of Nebraska - Lincoln)
Khisti, Ashish (University of Toronto)
Kschischang, Frank (University of Toronto)
Kuijper, Margreta (University of Melbourne)
Lentmiaer, Michael (Lund University)

Li, Yao (Akamai Technologies, Inc.)
Lopez-Permouth, Sergio (Ohio University)
Mahdaviani, Kaveh (University of Toronto)
Micheli, Giacomo (University of Zürich)
Napp, Diego (University of Aveiro)
Noori, Moslem (University of Alberta)
Pinto, Raquel (University of Aveiro)
Puchinger, Sven (Universität Ulm)
Randrianarisoa, Tovohery (University of Zürich)
Rawat, Ankit Singh (University of Texas at Austin)
Rosenthal, Joachim (University of Zürich)
Sidorenko, Vladimir (Technische Universität München)
Smarandache, Roxana (University of Notre Dame)
Soljanin, Emina (Bell Labs Research)
Sorensen, Jesper (Aalborg University)
Sprintson, Alex (Texas A&M University)
Subramanian, Vijay (University of Michigan, Ann Arbor)
Vontobel, Pascal (Chinese University of Hong Kong)
Walker, Judy (University of Nebraska)
Ye, Min (University of Maryland, College Park)
Ytrehus, Oyvind (University of Bergen)
Zhou, Cunlu (University of Notre Dame)

Multiscale Modeling of Cell Wall Mechanics and Growth in Walled Cells
October 18-23, 2015

Organizers:

Anja Geitmann (Université de Montréal)   **Kerwyn Huang** (Stanford University)

Understanding the interplay between mechanical form and function in cells is therefore critically important; it may not only help us identify the causes and consequences of different forms of disease, but also design novel treatment strategies. A central challenge in biology, epitomized by the ubiquity of walled growth in different organisms, is to understand growth all the way from the actions of the individual molecules to the behaviour of cells and tissues. To achieve such a goal will require new approaches and the integration of knowledge among several fields. This workshop brought together scientists from different disciplines to address these issues and identify novel pathways and strategies to explore the interaction between cell mechanics and cell biology.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5050

Participants:

Ali, Olivier (École Normale Supérieure de Lyon)
Altartouri, Bara (Université de Montréal)
Barbacci, Adelin (INRA Nantes)
Bartnicki-Garcia, Salomon (Centro de Investigación Científica y de Educación Superior de Ensenada)
Bhalerao, Rishi (Umea Plant Science Center)
Boudaoud, Arezki (École Normale Supérieure de Lyon)
Braybrook, Siobhan (University of Cambridge)
Campas, Otger (University of California, Santa Barbara)
Chang, Fred (Columbia University)
Cook, Douglas (New York University, Abu Dhabi)
Cosgrove, Daniel (Pennsylvania State University)
Crowley, Michael (National Renewable Energy Laboratory)
Dyson, Rosemary (University of Birmingham)
Ehrhardt, David (Carnegie Institution)
Forterre, Yoël (Centre national de la recherche scientifique, Marseille)
Foster, Simon (Sheffield University)
Garner, Ethan (Harvard University)
Geitmann, Anja (Université de Montréal)
Gitai, Zemer (Princeton University)
Gopinathan, Ajay (University of California, Merced)

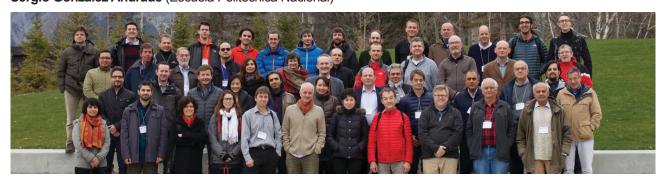**Goriely, Alain** (University of Oxford)
Huang, Kerwyn (Stanford University)
Jafari Bidhendi, Amirhossein (Université de Montréal)
Jönsson, Henrik (University of Cambridge)
Klug, William (University of California, Los Angeles)
Maranas, Janna (Pennsylvania State University)
Nielsen, Erik (University of Michigan)
Petrova, Anna (Kazan Scientific Center of Russian Academy of Sciences)
Prusinkiewicz, Przemyslaw (University of Calgary)
Rincon, Mauricio (University of Queensland)
Rojas, Enrique (Stanford University)
Rui, Yue (Pennsylvania State University)
Shaevitz, Joshua (Princeton University)
Shaw, Sid (Indiana University)
Smith, Richard (Max Planck Institute for Plant Breeding Research)
Stavness, Ian (University of Saskatoon)
Sun, Sean (John Hopkins)
Tierney, Mary (University of Vermont)
Turner, Joseph (University of Nebraska-Lincoln)
Willis, Lisa (University of Cambridge)
Zamil, Shafayet (Université de Montréal)

Viscoplastic Fluids: From Theory to Application
October 25-30, 2015

Organizers:

John de Bruyn (University of Western Ontario)
Ian Frigaard (University of British Columbia)
Sergio Gonzalez Andrade (Escuela Politécnica Nacional)
Ioan Ionescu (Université Paris 13)
Miguel Moyers Gonzalez (University of Canterbury)

Earlier workshops on Viscoplastic Fluids from Theory to Application have been held biannually since 2005, at BIRS (2005), Monte Verita (2007), Cyprus (2009), Rio de Janeiro (2011), and Rueil-Malmaison (2013). Like the previous meetings, this BIRS workshop brought together mathematicians, engineers and scientists working on the fundamental aspects of viscoplastic fluids and connected them with those working on industrial and environmental applications. The meeting expected to stimulate broad and lively discussion of new theoretical developments, analytical and computational methodologies, new and existing applications, and growth in rheological understanding and modelling. In addition, a goal was to collectively identify and discuss key open problems and areas for development, setting broad goals for the field over the next ten years.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5071

Participants:

Alexandrou, Andreas (University of Cyprus)
Bertola, Volfango (University of Liverpool)
Bryan, Matthew (University of Cambridge)
Burghelea, Teodor (Laboratoire de Thérmocinetique de Nantes, Centre national de la recherche scientifique)
Chaparian, Emad (University of British Columbia)
Chateau, Xavier (Laboratoire Navier)
Davaille, Anne (Centre national de la recherche scientifique / Université Paris-Sud)
de Bruyn, John (University of Western Ontario)
De los Reyes, Juan Carlos (Escuela Politécnica Nacional)
de Souza Mendes, Paulo (Pontifícia Universidade Católica do Rio de Janeiro)
Denn, Morton (City College of New York)
Derksen, Jos (Delft University of Technology)
Dinkgreve, Maureen (University of Amsterdam)
Ewoldt, Randy (University of Illinois at Urbana-Champaign)
Frigaard, Ian (University of British Columbia)
Fusi, Lorenzo (University of Florence)
Georgiou, Georgios (University of Cyprus)
Gonzalez Andrade, Sergio (Escuela Politécnica Nacional)
Huilgol, Raja (Flinders University of South Australia)
Ionescu, Ioan (Université Paris 13)
Jalaal, Maziyar (University of British Columbia)
Jossic, Laurent (Grenoble-INP)
Karimfazli, Ida (University of British Columbia)

Lee, Sungyon (Texas A&M University)
Maleki, Amir (University of British Columbia)
Martinez, Mark (University of British Columbia)
McKinley, Gareth (Massachusetts Institute of Technology)
Mollaabbasi, Roozbeh (Université Laval)
Moyers Gonzalez, Miguel (University of Canterbury)
Naccache, Mônica (Pontifícia Universidade Católica do Rio de Janeiro)
Nir, Avinoam (Technion)
Ovarlez, Guillaume (Lab of the Future)
Renardy, Michael (Virginia Tech)
Rogers, Simon (University of Illinois at Urbana-Champaign)
Roustaie, Ali (University of British Columbia)
Saramito, Pierre (Centre national de la recherche scientifique)
Sarmadi, Parisa (University of British Columbia)
Shelukhin, Vladimir (Lavrentyev Institute of Hydrodynamics)
Soares, Edson (Universidade Federal do Espírito Santo)
Taghavi, Mohammad (Laval University)
Thompson, Roney (Universidade Federal Fluminense)
Treskatis, Timm (University of Canterbury)
Tsai, Peichun Amy (University of Alberta)
Tsamopoulos, John (University of Patras)
Vacca, Andrea (Second University of Naples)
Vinay, Guillaume (IFP Energies Nouvelles)
Wilson, Stephen (University of Strathclyde)

Women in Geometry
November 1-6, 2015

Organizers:

Ailana Fraser (University of British Columbia)
Catherine Searle (Wichita State University)

Elizabeth Stanhope (Lewis and Clark College)

Workshop participants joined a tradition of creating original research about the measurement of shapes and the nature of space that is thousands of years old. Modern geometry has grown far beyond Euclid's Elements to include abstract objects that help us understand phenomena ranging from the possible shape of our universe, to how the brain interprets images, to the circulation of air in our atmosphere. The goal of the Women in Geometry (WIG) Workshop was to increase the strength and visibility of active female researchers in Geometry by gathering female geometers at various stages of their careers to create a research environment which will facilitate collaborations, networking and mentorship.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5135

Participants:

Arias-Marco, Teresa (Universidad de Extremadura)
Breiner, Christine (Fordham University)
Callini, Annalisa (College of Charleston)
Clelland, Jeanne (University of Colorado, Boulder)
Di Nezza, Eleonora (Imperial College)
Dryden, Emily (Bucknell University)
Fraser, Ailana (University of British Columbia)
Fraser, Maia (University of Toronto)
Glover, Rebecca (University of Rochester)
Gordon, Carolyn (Dartmouth College)
Guenther, Christine (Pacific University)
Hassannezhad, Asma (Max-Planck Institute for Mathematics)
Huang, Lan-Hsuan (University of Connecticut)
Jaramillo, Maree (University of Connecticut)
Keating, Ailsa (Columbia University)
Kelleher, Casey (University of California, Irvine)
Leschke, Katrin (University of Leicester)
Licata, Joan (Australian National University)
Mari-Beffa, Gloria (University of Wisconsin)
McDuff, Dusa (Barnard College, Columbia University)

Mese, Chikako (Johns Hopkins University)
Moore, Kimberley (University of Cambridge)
Nguyen, Xuan Hien (Iowa State University)
Perales, Raquel (State University of New York at Stony Brook)
Rajan, Priyanka (University of California, Riverside)
Ray, Allie (Trinity College)
Robles, Colleen (Duke University)
Salur, Sema (University of Rochester)
Sandon, Sheila (Université de Strasbourg)
Sargent, Pam (University of British Columbia)
Searle, Catherine (Wichita State University)
Siffert, Anna (Max-Planck-Institute for Mathematics)
Sormani, Christina (City University of New York)
Stanhope, Elizabeth (Lewis and Clark College)
Traynor, Lisa (Bryn Mawr College)
Uhlenbeck, Karen (University of Texas at Austin and Institute for Advanced Study)
Wang, Jing Ping (University of Kent)
Wang, Lu (Imperial College London)
Wei, Guofang (University of California, Santa Barbara)
Zhang, Yingying (Johns Hopkins University)

Homogeneous Structures
November 8-13, 2015

Organizers:

Claude Laflamme (University of Calgary) **Stevo Todorcevic** (University of Toronto)
Lionel Nguyen Van Thé (University of Aix-Marseille) **Robert Woodrow** (University of Calgary)

This workshop brought together leading scientists to identify current and immediate statistical challenges where robust statistics has an important role to play. For example: the analysis of genomics and proteomics data, financial applications, network analysis, functional and object-oriented analysis, cosmology, molecular and evolutionary biology (where the objects of study may be phylogenetic trees), etc. The fast pace of advances in computational biology and other quantitative life-sciences brings additional challenges and a sense of urgency in finding and implementing well-founded and stable statistical methods applicable to their scientific needs.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5100

Participants:

Ackerman, Nathaniel (Harvard University)
Aranda, Andrés (University of Calgary)
Bartosova, Dana (University of Sao Paulo)
Ben Yaacov, Itaï (Université Lyon 1)
Bodirsky, Manuel (Technische Universität Dresden)
Bradley-Williams, David (University of Central Lancashire)
Conant, Gabriel (University of Illinois at Chicago)
Delhomme, Christian (Université Reunion)
Evans, David (University of East Anglia)
Ferenczi, Valentin (Universidade de São Paulo)
Freer, Cameron (Massachusetts Institute of Technology)
Gray, Robert (University of East Anglia)
Gunderson, David S. (University of Manitoba)
Hamann, Matthias (University of Hamburg)
Hartman, David (Charles University in Prague)
Hubička, Jan (University of Calgary)
Kompatscher, Michael (Vienna University of Technology)
Kubis, Wieslaw (Academy of Sciences of the Czech Republic)
Kwiatkowska, Aleksandra (University of California, Los Angeles)

Laflamme, Claude (University of Calgary)
Liprandi, Max (University of Calgary)
Lopez-Abad, Jordi (Instituto de Ciencias Matemáticas)
Lupini, Martino (University of Vienna)
Masulovic, Dragan (University of Novi Sad)
Mbombo, Brice (University of Sao Paulo)
Melleray, Julien (Université Lyon 1)
Nesetril, Jaroslav (Charkes University)
Nguyen Van Thé, Lionel (University of Aix-Marseille)
Panagiotopoulos, Aristotelis (University of Illinois)
Pawliuk, Micheal (University of Toronto)
Pinsker, Michael (Charles University Prague)
Pouzet, Maurice (University Claude-Bernard, Lyon 1)
Saintier, Renaud (Université de la Reunion)
Sauer, Norbert (University of Calgary)
Solecki, Slawomir (University of Illinois at Urbana-Champaign)
Terry, Caroline (University of Illinois at Chicago)
Todorcevic, Stevo (University of Toronto)
Truss, John (University of Leeds)
Tsankov, Todor (Université Paris 7)
Woodrow, Robert (University of Calgary)
Zucker, Andy (Carnegie Mellon University)

Current and Future Challenges in Robust Statistics
November 15-20, 2015

Organizers:

Raymond Carroll (Texas A&M University)
Luisa Fernholz (Temple University)
Steven Marron (University of North Carolina)

Matias Salibian-Barrera (University of British Columbia)
Joseph S. Verducci (Ohio State University)
Ruben Zamar (University of British Columbia)

This workshop brought together researches in scattering theory and geometry to make further progress in geometric scattering theory, which studies scattering in the mathematical setting of Riemannian manifolds. Riemannian manifolds are mathematical models for spaces which occur naturally such as in general relativity and string theory. The main goal was to relate the behavior of the scattered waves to the geometry of the spaces.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5003

Participants:

Adrover, Jorge (Universidad Nacional de Cordoba)
Aeberhard, William (Dalhousie University)
Avella-Medina, Marco (University of Geneva)
Bianco, Ana (Universidad Nacional de Buenos Aires)
Boente, Graciela (Universidad Nacional de Buenos Aires)
Cohen Freue, Gabriela (University of British Columbia)
Croux, Christophe (Katholieke Universiteit Leuven)
Field, Chris (Dalhousie University)
Filzmoser, Peter (Vienna University of Technology)
Garcia-Escudero, Luis Angel (Universidad de Valladolid)
Genton, Marc (King Abdullah University of Science and Technology)
Leung, Andy (University of British Columbia)
Loh, Po-Ling (University of Pennsylvania)
Marazzi, Alfio (University of Lausanne)
Markatou, Marianti (University at Buffalo)
Maronna, Ricardo (University of La Plata)

Marron, Steven (University of North Carolina)
Martin, Doug (University of Washington)
Morgenthaler, Stephan (École Polytechnique Fédérale de Lausanne)
Oja, Hannu (University of Turku)
Peña, Daniel (Universidad Carlos III Madrid)
Rodriguez, Daniela (Universidad de Buenos Aires and CONICET)
Ronchetti, Elvezio (University of Geneva)
Rousseeuw, Peter (Katholieke Universiteit Leuven)
Salibian-Barrera, Matias (University of British Columbia)
Smucler, Ezequiel (University of Buenos Aires - CONICET)
Stahel, Werner (Swiss Federal Institute of Technology)
Sued, Mariela (Universidad Nacional de Buenos Aires)
Tyler, David (Rutgers University)
Van Aelst, Stefan (Katholieke Universiteit Leuven)
Welsch, Roy (Massachusetts Institute of Technology)
Wiens, Douglas (University of Alberta)
Zamar, Ruben (University of British Columbia)

International Math Outreach Workshop
November 22-27, 2015

Organizers:

Melania Alvarez (Pacific Institute for the Mathematical Sciences, University of British Columbia)
Helene Barcelo (Mathematical Sciences Research Institute)
Jean-Marie De Koninck (Mitacs)

Matheus Grasselli (Fields Institute)
Janine McIntosh (Australian Mathematical Sciences Institute)
Luc Vinet (University of Montreal)

Mathematics experts from around the world gathered at BIRS to share their experience in reaching out to youth to show them that mathematics is a lively topic and that it offers many interesting challenges. The participants established the best strategies for showing to kids, their parents and the general public that mathematics is very important in today's society, that it helps us to better understand the world we live in, that it is essential for the good of our economy and that it contributes to improving our quality of life.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5101

Participants:

Adem, Alejandro (Mitacs)
Andler, Martin (Laboratoire de Mathématiques de Versailles & Animath)
Bergeron, Francois (Université du Quebec a Montréal)
Budd, Chris (University of Bath)
Csicsery, George Paul (Zala Films)
De Koninck, Jean-Marie (Mitacs)
Fleury, Jean-Marc (World Federation of Science Journalists)
Grasselli, Matheus (Fields Institute)
Johannesen, Mie (Aarhus Universitet)
Koch, Inge (Australian Mathematical Sciences Institute)
Kramer, Jurg (Humboldt University Berlin)
Lafrenière, Nadia (Université du Québec à Montréal)
McIntosh, Janine (Australian Mathematical Sciences Institute)
Mighton, John (Fields Institute)
Pantano, Alessandra (University of California, Irvine)
Rousseau, Christiane (Université de Montréal)
Stevens, Glenn (Boston University)
White, Diana (Mathematical Sciences Research Institute)

BIRS First Nations Math Education
November 22-27, 2015

Organizers:

Melania Alvarez (Pacific Institute for the Mathematical Sciences / University of British Columbia)
Genevieve Fox (Siksika Board OF Education)

Sharon Friesen (University of Calgary)
Cynthia Nicol (University of British Columbia)

We are a group of Elders, mathematicians, math educators and teachers who have come together to find ways to improve mathematics education among Indigenous people while at the same time acknowledging the importance of traditional culture. Due to the fact that Indigenous people make up a growing portion of the student population, in the future they will become a substantial proportion of the population that should be participating in the workforce. If we do not address the great disparity in educational achievement of Indigenous people compared with the rest of the population, the repercussions will be disastrous.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5170

Participants:

Agawa, Pamala (York Region District School Board)
Alvarez, Melania (Pacific Institute for the Mathematical Sciences / University of British Columbia)
Bruised Head, Annette (Kainai High School)
Desaulniers, Shawn (University of British Columbia)
Doolittle, Edward (First Nations University of Canada)
Fox, Genevieve (Siksika Board OF Education)
Fox, Amanda (Kainai High School)
Franklin, Janine (York Region District School Board)
Friesen, Sharon (University of Calgary)
Guy, Richard (University of Calgary)
Hanoski, Kaleena (Quinte Mohawk School)
Jungic, Veselin (Simon Fraser University)
McDougall, Mary (First Nation Elder)
McDougall, Wilf (First Nation Elder)
Preciado Babb, Paulino (University of Calgary)
Russell, Caroline (Kainai High School)
Verreault, Jocelyn (Yellowhead Tribal College)

Approximation Algorithms and Parameterized Complexity
November 29 - December 4, 2015

Organizers:

Michael Fellows (Charles Darwin University)
Klaus Jansen (University of Kiel)

Hadas Shachnai (Technion)
Roberto Solis-Oba (University of Western Ontario)

This workshop explored relationships between techniques used in the design of approximation and parameterized algorithms to gain a better understanding of what makes a problem difficult to solve, with the aim of developing better tools for tackling NP-hard problems.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5118

Participants:

Berndt, Sebastian (Universität zu Lübeck)
Cai, Liming (University of Georgia)
Casel, Katrin (Universität Trier)
Erlebach, Thomas (University of Leicester)
Evans, Patricia (University of New Brunswick)
Fellows, Michael (Charles Darwin University)
Fürer, Martin (Pennsylvania State University)
Gobbert, Moritz (Universität Trier)
Hajiaghayi, Mohammad Taghi (University of Maryland at College Park)
Iaquinto, Ute (Christian-Albrechts-Universität zu Kiel)
Jansen, Klaus (University of Kiel)
Karakostas, George (McMaster University)
Karpinski, Marek (Universität Bonn)
Khuller, Samir (University of Maryland)
Kratsch, Stefan (University of Bonn)
Land, Felix (Christian-Albrechts-Universität zu Kiel)
Land, Kati (Christian-Albrechts-Universität zu Kiel)
Maack, Marten (University of Kiel)

Mastrolilli, Palmo Monaldo (Instituto Dalle Molle di Studi sull'Intelligenza Artificiale)
McCartin, Catherine (Massey University of New Zealand)
Megow, Nicole (Technische Universität München)
Mitsou, Valia (Hungarian Academy of Sciences)
Mnich, Matthias (University of Bonn)
Nichterlein, André (Technische Universität Berlin)
Nishimura, Naomi (University of Waterloo)
Rosamond, Frances (Charles Darwin University)
Shachnai, Hadas (Technion)
Solis-Oba, Roberto (University of Western Ontario)
Solis-Reyes, Stephen (University of Western Ontario)
Spieksma, Frits (Katholieke Universiteit Leuven)
Stege, Ulrike (University of Victoria)
Wiese, Andreas (Max-Planck-Institut fur Informatik)
Zhang, Guochuan (Zhejiang University)
Zhu, Binhai (Montana State University)

Connecting Network Architecture and Network Computation
December 6-11, 2015

Organizers:

Andrea Barreiro (Southern Methodist University)
Maurice Chacron (McGill University)
Brent Doiron (University of Pittsburgh)

Chris Eliasmith (University of Waterloo)
Krešimir Josić (University of Houston)
Eric Shea-Brown (University of Washington)

As with our previous workshop at BIRS, we ground this meeting with a single, unifying question, and structure talks and research interactions to connect different fields of applied mathematics and theoretical biology toward new answers. We focused on: What features of network architecture subserve specific steps in network-level storage of sensory information, statistical inference, and controlled dynamical output?

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5158

Participants:

Aksay, Emre (Weill Cornell Medical College)
Barreiro, Andrea (Southern Methodist University)
Beggs, John (Indiana University)
Best, Janet (Ohio State University)
Brinkman, Braden (University of Washington)
Brunel, Nicolas (University of Chicago)
Buice, Michael (Allen Institute of Brain Science)
Chacron, Maurice (McGill University)
Cullen, Kathleen (McGill University)
Davidson, Jacob (University of California, Davis)
Diesmann, Markus (Jülich Research Centre)
Doiron, Brent (University of Pittsburgh)
Dragoi, Valentin (University of Texas at Houston)
Dunworth, Jeff (University of Pittsburgh)
Eliasmith, Chris (University of Waterloo)
Fusi, Stefano (Columbia University)
Gjorgjieva, Julijana (Brandeis University)
Harris, Kameron (University of Washington)
Hedrick, Kathryn (Southern Methodist University)
Hofmann, Volker (McGill University)
Josić, Krešimir (University of Houston)

Kilpatrick, Zachary (University of Houston)
Litwin-Kumar, Ashok (Columbia University)
Luczak, Artur (University of Lethbridge)
Ly, Cheng (Virginia Commonwealth University)
Marti, Daniel (École Normale Superieure)
Metzen, Michael (McGill University)
Mihalas, Stefan (Allen Institute of Brain Sciences)
Moreno-Bote, Ruben (University Pompeu Fabra)
Newhall, Katherine (University of North Carolina-Chapel Hill)
Reyes, Alex (New York University)
Rosenbaum, Robert (University of Notre Dame)
Sharpee, Tatyana (Salk Institute for Biological Studies)
Shea-Brown, Eric (University of Washington)
Shew, Woodrow (University of Arkansas)
Stolarczyk, Simon (University of Houston)
Thompson, Aubrey (University of Pittsburgh)
Triesch, Jochen (Frankfurt Institute for Advanced Studies)
Voelker, Aaron (University of Waterloo)
Zylberberg, Joel (University of Colorado)

2-Day Workshops

Incorporating 'Computational Thinking' into the Grade-school Classroom
January 16-18, 2015

Organizers:

Tim Bell (University of Canterbury)   **Geri Lorway** (Thinking 101)
Sean Graves (University of Alberta)

Jeanette Wing, MIT, calls "computational thinking" the fourth "R" in learning. Even basic matters, such as striking the right balance between conceptual exercises like playing a sorting game and actually writing computer programs are still not settled. Doing some coding is essential, says Michael Kölling, a specialist in computing education at the University of Kent: it motivates pupils and means they find out whether their algorithms work. But should pupils start with programming and leave principles till later, or the other way round? This workshop intended for educators at all levels to engage in rich tasks, have deep discussions and begin to collaborate on a framework for connecting within their current instruction and assessment skills being identified as "computational thinking."

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/2-day-workshops/15w2187

Participants:

Arndt, Linda (Teacher Pembina Hills)
Ayres, Trinity (Calgary Catholic School District)
Bell, Tim (University of Canterbury)
Brown, April (Peace Wapiti School Division No. 76)
Bullock, Jordan (Evergreen Elementary School)
Easton, Dianna (Teacher Calgary Board of Education)
Graves, Sean (University of Alberta)
Greer, Annie (Grande Prairie Public Schools)
Hohn, Tiina (MacEwan University)
Kotyk, Nicole (Evergreen Elementary School)
Krasnikoff, Melissa (Teacher Parkland Schools)
Lambert, Lynn (Christopher Newport University)
Layton, Ryan (President of ATA Ed Technology Council)

Lemay, Julie (Alberta Education)
Lomax, Bill (Career and Technology Studies Alberta Education)
Lorway, Geri (Thinking 101)
McNabb, Gail (Teacher Pembina Hills)
McNutt, Kathy (Teacher Wildrose School District AB)
Ostrowerka, Andrew (Teacher FVSD)
Rader, Cyndi (Colorado School of Mines)
Reid, Kris (Government of Alberta)
Rodriguez, Brandon (Colorado School of Mines)
Sauerborn, Mardelle (School District 5)
Simmons, Brian (Calgary Board of Education)
Susan, Crichton (University of British Columbia)
Warr, Johnathan (PWSD76 teacher)

Combinatorial and Convex Geometry Fest
February 13-15, 2015

Organizers:

Abhinav Kumar (Massachusetts Institute of Technology)
Daniel Pellicer (Universidad Nacional Autonoma de México)

Konrad Swanepoel (London School of Economics and Political Science)
Asia Ivic Weiss (York University)

SNAP math fairs are non-competitive events that give teachers an opportunity to have their students do problem solving with a particular goal in mind. The Ted Lewis SNAP Math Fair Workshop was a gathering of teachers and educators who had a common interest in promoting and learning about hosting SNAP Math Fairs. The experienced teachers shared their success stories in hopes to motivate others to adopt SNAP Math Fairs into their classrooms.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/2-day-workshops/15w2177

Participants:

Berman, Leah (University of Alaska Fairbanks)
Bezdek, Karoly (University of Calgary)
Bisztriczky, Ted (University of Calgary)
Bracho, Javier (Universidad Nacional Autónoma de México)
Carrancho Fernandes, Maria Elisa (University of Aveiro)
Conder, Marston (University of Auckland)
Foerster, Melanie (University of Calgary)
Hubard, Isabel (Universidad Nacional Autónoma de México)
Khan, Muhammad (University of Calgary)
Leemans, Dimitri (University of Auckland)
Leopold, Undine (Technische Universität Chemnitz)
Litvak, Alexander (University of Alberta)
Matteo, Nicholas (Northeastern University)
Mixer, Mark (Wentworth Institute of Technology)
Monson, Barry (University of New Brunswick)
Naszodi, Marton (École Polytechnique Fédérale de Lausanne, Eötvös Loránd University)
O'Reilly-Regueiro, Eugenia (Universidad Nacional Autónoma de México)
Oliveros, Deborah (Universidad Nacional Autónoma de México)
Pellicer, Daniel (Universidad Nacional Autónoma de México)
Ryabogin, Dmitry (Kent State University)
Schulte, Egon (Northeastern University)
Senechal, Marjorie (Smith College)
Swanepoel, Konrad (London School of Economics and Political Science)
Weiss, Asia Ivic (York University)
Williams, Gordon (University of Alaska Fairbanks)

Integer Sequences K-12
February 27 - March 1, 2015

Organizers:

Gordon Hamilton (MathPickle)   **Neil Sloane** (OEIS Foundation, Inc.)

The primary objective of Integer Sequences K-12 was to bring together educators and mathematicians to choose 13 curricular sequences - one for each grade K-12. The secondary objective was to initiate a practical campaign to get the selected sequences the wide exposure they deserve. There is a need for fresh ideas to stimulate mathematics education. This is especially true in North America where the average student ability has stagnated. The 2012 PISA (Program for International Student Assessment) tested 15-year-olds from 34 OECD countries.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/2-day-workshops/15w2178

Participants:

Alekseyev, Max (George Washington University)
Anajao, Rosa (University of Alberta)
Cavers, Mike (University of Calgary)
Chan, Vincent (University of Calgary)
Chapman, Olive (University of Calgary)
Cherkowski, Gina (STEM Alberta)
Edgar, Tom (Pacific Lutheran University)
Guy, Richard (The University of Calgary)
Hamilton, Gordon (MathPickle)
James, Gael (River Valley School)
Jungic, Veselin (Simon Fraser University)
Okemakinde, Seun (University of Ibadan)
Picciotto, Henri (Henri Picciotto's Math Education Page)
Preciado Babb, Paulino (University of Calgary)
Robichaud, Zaak (Bearspaw Christian School)
Saarnio, Lora (NuevaSchool)
Serenevy, Amanda (Riverbend Community Math Center)
Vikairaghavan, Rakhee (Calgary Board of Education)
Woodrow, Robert (University of Calgary)
Zucker, Joshua (American Institute of Mathematics)

Ted Lewis Math Fair Workshop
April 24-26, 2015

Organizers:

Sean Graves (University of Alberta)   **Ted Lewis (SNAP Mathematics Foundation)**
Tiina Hohn (MacEwan University)

A SNAP math fair is a non-competitive event that gives teachers an opportunity to have their students do problem solving with a particular goal in mind. The math fair can be adapted to almost any curriculum and set of standards, and has been shown to motivate and inspire all students. This workshop explained to teachers how to organize a SNAP math fair, how some schools have adapted the concept to their particular academic objectives and provided resources and contacts to help the teachers get started.

For details, please refer to the workshop webpage
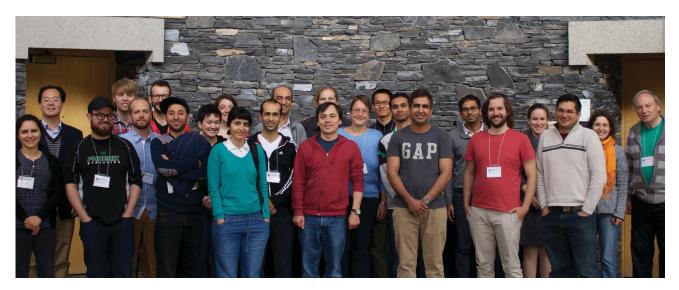*http://www.birs.ca/events/2015/2-day-workshops/15w2195*

Participants:

Armstrong, Maura (Telus World of Science Edmonton)
Bedard, Jaclyn (Edmonton Catholic School District)
Congdon, Sarah (Edmonton Catholic)
Dahl, Tiffany (Calgary Board of Education)
Graves, Sean (University of Alberta)
Hildebrandt, Maxine (Mother Earth's Children's Charter School)
Hoffman, Janice (Edmonton Public Schools)
Hohn, Tiina (MacEwan University)
Kotyk, Nicole (Evergreen Elementary School)
Lewis, Ted (SNAP Mathematics Foundation)
Locke, Jennifer (Calgary Board of Education)
Lorway, Geri (Thinking 101)
Manz, Kirsten (University of Alberta)
Olsen, Shelby (University of Alberta)
Ottaway, Paul (Capilano University)
Pasanen, Trevor (University of Alberta)
Schmidt, Hilary (University of Alberta)
Simmons, Brian (Calgary Board of Education)
Simmons, Sarah (Calgary board of education)
Summers, Ashley (Teacher (Calgary))
Tahmasebi, Nazanin (University of Alberta)

Alberta Number Theory Days
June 12-14, 2015

Organizers:

Nathan Ng (University of Lethbridge)   **Ander Steele** (University of Calgary)
Manish Patnaik (University of Alberta)

Number theory is a broad and central area of research with many connections and applications to other areas of mathematics and science. The subject may be divided into several subdisciplines that range from pure mathematics, such as algebraic number theory, arithmetic geometry, analytic number theory, and automorphic forms and representation theory, to more applied areas such as computational number theory, cryptography, and mathematical physics. All these fields are represented among the Albertan number theorists from Calgary, Edmonton, or Lethbridge.

The annual Alberta Number Theory Days provide a unique venue for these researchers, their students, and their visitors for face to face discussion of ideas and for facilitating collaborations. New connections are made and old associations are renewed. The workshop also allows for the exchange of knowledge, which will improve the progress of current projects.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/2-day-workshops/15w2198

Participants:

Akbary, Amir (University of Lethbridge)
Ali, Abid (University of Alberta)
Aryan, Farzad (University of Lethbridge)
Bauer, Mark (University of Calgary)
Bose, Arnab (University of Lethbridge)
Casselman, Bill (University of British Columbia)
Creutzig, Thomas (University of Alberta)
Cunningham, Clifton (University of Calgary)
Ehlen, Stephan (McGill University)
Fenton, Diane (University of Calgary)
Forrest, Francis (University of Lethbridge)
Gordon, Julia (University of British Columbia)
Guy, Richard (University of Calgary)
Jacobson, Mike (University of Calgary)
Kadiri, Habiba (University of Lethbridge)

Lindner, Sebastian (University of Calgary)
Lumley, Allysa (University of Lethbridge)
Ng, Nathan (University of Lethbridge)
Parks, James (University of Lethbridge)
Patnaik, Manish (University of Alberta)
Puskás, Anna (University of Alberta)
Rezai Rad, Monireh (University of Calgary)
Scheidler, Renate (University of Calgary)
Shahabi, Majid (University of Calgary)
Siavashi, Sahar (University of Lethbridge)
Steele, Ander (University of Calgary)
Yang, Hai (University of British Columbia)
Zhu, Huilin (University of British Columbia)
Zvengrowski, Peter (University of Calgary)

Global Rigidity
July 17-19, 2015

Organizers:

Robert Connelly (Cornell University)
Steven Gortler (Harvard University)
Tibor Jordan (Eotvos University)

Tony Nixon (Lancaster University)
Walter Whiteley (York University)

This is a 2-day extension of the 5-day workshop: 15w5114: Advances in combinatorial and geometric rigidity. It focused on global rigidity, a key rapidly developing area of research in mathematics and several other disciplines.

The focus for this meeting was developments within rigidity theory itself over the range of concepts and structures outlined above.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/2-day-workshops/15w2199

Participants:

Clinch, Katie (Queen Mary University of London)
Connelly, Robert (Cornell University)
Cruickshank, James (National University of Ireland)
Eftekhari, Yaser (York University)
Gortler, Steven (Harvard University)
Guler, Hakan (Queen Mary University of London)
Jackson, Bill (Queen Mary University of London)
Jordan, Tibor (Eötvös Loránd University)
Karpenkov, Oleg (University of Liverpool)
Király, Csaba (Eötvös Loránd University)
Kitson, Derek (Lancaster University)
Lam, Wai Yeung (Technische Universität Berlin)
Nixon, Tony (Lancaster University)
Power, Stephen (University of Lancaster)
Schulze, Bernd (Lancaster University)
Serocold, Hattie (Lancaster University)
Servatius, Herman (Worcester Polytechnic Institute)
Sitharam, Meera (University of Florida)
So, Anthony Man-Cho (Chinese University of Hong Kong)
Tanigawa, Shin-ichi (Kyoto University)
Theran, Louis (Aalto University)
Thorpe, Michael (Arizona State University)
Trelford, Ryan (York University)
Whiteley, Walter (York University)

Advances in Interactive Knowledge Discovery and Data Mining in Complex and Big Data Sets
July 24-26, 2015

Organizers:

Massimo Ferri (University of Bologna)
Randy Goebel (University of Alberta)

Andreas Holzinger (Medical University Graz)
Vasile Palade (Coventry University)

This workshop brought together researchers with diverse backgrounds, complementary competencies, but common interests and a shared vision: to make sense of Big Data by using advanced machine learning with the "human-in-the-loop." This workshop particularly tried to contribute advancements in promising novel areas, e.g. in interactive graph-based, entropy-based and topological data mining. A particular focus was to include also young and early stage researchers into the discussions. This workshop discussed approaches beyond data mining.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/2-day-workshops/15w2181

Participants:

Cesarini, Mirko (Università di Milano Bicocca)
Chawla, Nitesh (University of Notre Dame)
Choi, Sou-Cheng (NORC at the University of Chicago, Illinois Institute of Technology)
Ferri, Massimo (University of Bologna)
Goebel, Randy (University of Alberta)
Hess, Sibylle (Technical University of Dortmund)
Holzinger, Andreas (Medical University of Graz)
Holzinger, Katharina (University of Graz)
Juda, Mateusz (Jagiellonian University)
Lim, Lek-Heng (University of Chicago)
Morik, Katharina (Technical University of Dortmund)
Palade, Vasile (Coventry University)
Tanaka, Yuzuru (Hokkaido University)

Prairie Discrete Math Workshop
August 7-9, 2015

Organizers:

Joy Morris (University of Lethbridge)

Discrete mathematics has applications to computer science. It includes the study of networks, experimental design, and the encoding of data. The prairie provinces have a number of strong research groups within this field. The distances can make it hard to interact, so these groups need a recurring workshop to bring them together, to exchange ideas and expand the excellent research that already takes place here.

This workshop was established to fill this need. The first gathering was held in Regina in 2002 and there have been workshops held almost every year in various locations across the prairies and into BC).

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/2-day-workshops/15w2206

Participants:

Arman, Andrii (University of Manitoba)
Atapour, Mahshid (University of Saskatchewan)
Beaton, Nicholas (University of Saskatchewan)
Breen, Jane (University of Manitoba)
Brewster, Richard (Thompson Rivers University)
Cavers, Mike (University of Calgary)
Craigen, Robert (University of Manitoba)
Currie, James (University of Winnipeg)
Doob, Michael (University of Manitoba)
Gosselin, Shonda (University of Winnipeg)
Gunderson, Karen (University of Manitoba)
Gunderson, David S. (University of Manitoba)
Herman, Allen (University of Regina)
Kharaghani, Hadi (University of Lethbridge)
Kirkland, Stephen (University of Manitoba)

Linek, Vaclav (University of Winnipeg)
Liprandi, Max (University of Calgary)
McGuinness, Sean (Thompson Rivers University)
Meagher, Karen (University of Regina)
Morris, Joy (University of Lethbridge)
Purdy, Alison (University of Regina)
Sands, Bill (University of Calgary)
Sasani, Sara (University of Lethbridge)
Scheidler, Renate (University of Calgary)
Seyffarth, Karen (University of Calgary)
Soteros, Christine (University of Saskatchewan)
Verret, Gabriel (University of Western Australia)
Visentin, Terry (University of Winnipeg)
Yang, Boting (University of Regina)

Positivity in Algebraic Combinatorics
August 14-16, 2015

Organizers:

Angele Hamel (Wilfrid Laurier University)
Stephanie van Willigenburg (University of British Columbia)

The positivity question is a timely one, and advances have recently been made regarding positivity for a diverse range of closely related functions including quasisymmetric functions, Schur Q and P functions and Schubert polynomials. The key goals of the workshop were to exchange ideas and tools on various aspects of this problem, and to create the intense atmosphere that will facilitate new collaborations and jumpstart new research.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/2-day-workshops/15w2208

Participants:

Ahlbach, Connor (University of Washington)
Assaf, Sami (University of Southern California)
Azenhas, Olga (Universidade de Coimbra)
Benedetti, Carolina (Fields Institute-York University)
Bergeron, Nantel (York University)
Billera, Louis (Cornell University)
Billey, Sara (University of Washington)
Hamel, Angele (Wilfrid Laurier University)
Hersh, Patricia (North Carolina State University)
Hicks, Angela (Stanford University)
Mamede, Ricardo (Universidade de Coimbra)
McNamara, Peter (Bucknell University)

Morales, Alejandro (University of California, Las Angeles)
Pang, Chung Yin Amy (Les Amis d'un Coin de l'Inde et du Monde, Université du Québec à Montréal)
Pawlowski, Brendan (University of Minnesota)
Reiner, Victor (University of Minnesota)
Schneider, Lisa (University of California, Riverside)
Swanson, Josh (University of Washington)
Tewari, Vasu (University of British Columbia)
van Willigenburg, Stephanie (University of British Columbia)
Wang, Larry (Nankai University)
Yang, Arthur (Nankai University)

First Canadian Summit on Applications of Partial Differential Equations in the Sciences
August 28-30, 2015

Organizers:

Thomas Hillen (University of Alberta)   **Juncheng Wei** (University of British Columbia)

Partial differential equations are a powerful tool in the mathematical modelling of physical, biological and social phenomena. Over the last decade, the scientific landscape related to partial differential equations in Canada has expanded significantly. New hires and new developments have increased our interest in partial differential equations and their applications. Applications are no longer focussed on fluids alone, instead, applications to biology, medicine, social sciences have been added to the menu. In this 2-day workshop we mapped out interests and talents that are present at Canadian Universities. We identified common interests, joined common goals and explored common funding opportunities.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/2-day-workshops/15w2206

Participants:

Cheviakov, Alexei (University of Saskatchewan)
de Vries, Gerda (University of Alberta)
Fetecau, Razvan (Simon Fraser University)
Hillen, Thomas (University of Alberta)
Iron, David (Dalhousie University)
Kolokolnikov, Theodore (Dalhousie University)
Kuske, Rachel (University of British Columbia)
Kutz, J. Nathan (University of Washington)
Muir, Paul (Saint Mary's University)

Ou, Chunhua (Memorial University)
Spiteri, Ray (University of Saskatchewan)
Szmigielski, Jacek (University of Saskatchewan)
Ward, Michael (University of British Columbia)
Wei, Juncheng (University of British Columbia)
Williams, JF (Simon Fraser University)
Wittenberg, Ralf (Simon Fraser University)
Yi, Yingfei (University of Alberta)

Postdoctoral Retreat in Stochastics
September 18-20, 2015

Organizers:

Mike Kouritzin (University of Alberta)   **Edwin A. Perkins** (University of British Columbia)

This workshop brought together some outstanding young researchers in probability and senior faculty from several universities in western Canada and Washington State. We discussed random models for populations undergoing random migration and reproduction, spatial models for epidemics, and models for percolating fluids in regular and random media, to name a few. Young researchers described their latest results and all presented open problems in the field.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/2-day-workshops/15w2216

Participants:

Angel, Omer (University of British Columbia)
Asadzadeh, Ilnaz (University of Calgary)
Balka, Richard (University of British Columbia)
Barlow, Martin (University of British Columbia)
Chavez Casillas, Jonathan (University of Calgary)
Dong, Chi (University of Alberta)
Junge, Matthew (University of Washington)
Kolesnik, Brett (University of British Columbia)
Kouritzin, Mike (University of Alberta)
Le, Khoa (Mathematical Sciences Research Institute)
Murugan, Mathav (University of British Columbia)
Perkins, Edwin A. (University of British Columbia)
Sadeghi, Samira (University of Alberta)
Sezer, Deniz (University of Calgary)
Swishchuk, Anatoliy (University of Calgary)
Wallace, Ben (University of British Columbia)
Ware, Tony (University of Calgary)

Canadian Statistical Sciences Institute Leadership Retreat
September 25-27, 2015

Organizers:

John Braun (University of British Columbia)   **Mary Thompson** (University of Waterloo)
Nancy Reid (University of Toronto)

The Canadian Statistical Sciences Institute (CANSSI) was established to promote collaborative research teams with leadership by statistical scientists, and partners in areas of science whose progress demands new research in statistical techniques. This workshop was a retreat to brainstorm on future scientific directions for CANSSI, to ensure that it is able to build effective bridges to its many potential partners, and to develop as a national resource for the emerging field of data science.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/2-day-workshops/15w2214

Participants:

Bingham, Derek (Simon Fraser University)
Braun, John (University of British Columbia)
Bull, Shelley (University of Toronto)
Chaubey, Yogendra (Concordia University)
Chipman, Hugh (Acadia University)
Colliander, James (University of British Columbia)
Fraser, Donald (University of Toronto)
Gaffield, Chad (University of Ottawa)
Grasselli, Matheus (Fields Institute)
Gustafson, Paul (University of British Columbia)
Janssen, Jeannette (Dalhousie University)
Kalbfleisch, Jack (Univesity of Michigan)
Leblanc, Alexandre (University of Manitoba)
Lin, Xihong (Harvard University)
McNicholas, Paul (McMaster University)
Moodie, Erica (McGill University)
Plagemann, Angela (Canadian Statistical Sciences Institute)
Reid, Nancy (University of Toronto)
Robert, Christian (Université Paris-Dauphine)
Sedransk, Nell (National Institute of Statistical Sciences and North Carolina State University)
Smith, Richard (University of North Carolina Chapel Hill)
Thompson, Mary (University of Waterloo)
Vinet, Luc (University of Montreal)
Wang, Liqun (University of Manitoba)
Welch, Will (University of British Columbia)
Yung, Wesley (Statistics Canada)

Canadian Math Kangaroo Contest
December 4-6, 2015

Organizers:

Rossitza Marinova (Concordia University)   **Mariya Svishchuk** (Mount Royal University)

The workshop is intended for mathematicians and mathematics educators who are involved with the Canadian Math Kangaroo Contest, the organization administering Math Kangaroo in Canada.

The main objective was to efficiently finalize the English version of the problem sets for the contest on March 29, 2015, including complete solutions to the problems. The total number of problems in the six sets is 162.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/2-day-workshops/15w2191

Participants:

Marinova, Rossitza (Concordia University)
Pandeliev, Todor (AVG Technologies)
Pandelieva, Valeria (Canadian Math Kangaroo Contest)
Pelczer, Ildiko (Concordia University Montreal)
Petterson, Josey (Canadian Math Kangaroo Contest)
Sendov, Hristo (University of Western Ontario)
Svishchuk, Mariya (Mount Royal University)

Summer Schools
Research in Teams
Focussed Research Groups

Summer Schools

2015 Summer IMO Training Camp
June 21 - July 5, 2015

Organizers:

Dorette Pronk (Dalhousie University)   **Jacob Tsimerman** (Princeton)
Lindsey Shorser (University of Toronto)

The International Mathematical Olympiad (IMO) is the "world championship" of high school math contests. It is held every year somewhere in the world, with Canada and up to 100 other countries each sending up to six high school students to compete. The contest lasts two days, and on each day the students are given three very tough math problems to solve within 4 1/2 hours. The IMO Training Camp is an intensive two-week preparation for the six Canadian students attending the upcoming International Mathematical Olympiad, plus several adult trainers. Once again this year, the camp took place at BIRS. Here, our six-student team received intensive training in the form of practice contests and lectures.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/summer-schools/ 15ss009

Participants:

Arthur, David (Google)
Critch, Andrew (University of California, Berkeley)
Huang, Bill (International Mathematical Olympiad)
Pang, Michael (International Mathematical Olympiad)
Rickards, James (Colonel By Secondary School Ottawa)
Shorser, Lindsey (University of Toronto)
Song, Zhuo Qun (Alex)(International Mathematical Olympiad)
Spink, Hunter (Western Canada H.S. Calgary)

Sun, Kevin (International Mathematical Olympiad)
Sun, Kai (A.B. Lucas S.S. London Ont.)
Tsimerman, Jacob (Princeton University)
Whatley, Alexander (International Mathematical Olympiad)
Xu, Jinhao (International Mathematical Olympiad)
Yang , Rui Zhou (International Mathematical Olympiad)

Research in Teams

The Sixth Northwest Functional Analysis Seminar
April 10-12, 2015

Organizers:

Martin Argerami (University of Regina)   **Ian Putnam** (University of Victoria)
Michael Lamoureux (University of British Columbia)   **Vladyslav Yaskin** (University of Alberta)

The Northwest Functional Analysis Seminar (NWFAS) is a bi- annual regional scientific meeting of researchers (faculty and postdoctoral) and graduate students in functional analysis. Participants are drawn from universities in Western Canada and the American Northwest. The two main goals of the meeting are to enable researchers from a large geographical area to stay in touch with developments in the general field but outside their respective areas of specialization, and to provide a forum for junior researchers (junior faculty, postdocs, and graduate students) to present their results to a wider audience and to form contacts with other functional analysts within the region. Most of the talks will be given by junior researchers and there will be a few presentations by senior researchers on topics currently attracting high levels of interest.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/research-in-teams/15w2192

Participants:

Argerami, Martin (University of Regina)
Brenken, Berndt (University of Calgary)
Brudnyi, Alex (University of Calgary)
Chen, Xiao (University of Alberta)
Emerson, Heath (University of Victoria)
Girard, Mark (University of Calgary)
Ivanescu, Cristian (Grant MacEwan University)
Killough, Brady (Mount Royal University)
Kim, Jaegil (University of Alberta)
Laca, Marcelo (University of Victoria)
Lamoureux, Michael (University of British Columbia)
Phillips, John (University of Victoria)
Putnam, Ian (University of Victoria)
Raouafi, Samir (University of Regina)
Runde, Volker (University of Alberta)
Sourour, Ahmed R. (University of Victoria)
Tahmasebi, Nazanin (University of Alberta)
Tanko, Zsolt (University of Alberta)
Williamson, Peter (University of Victoria)
Yaskin, Vladyslav (University of Alberta)
Zizler, Peter (Mount Royal College)

Multi-norms, Banach lattices, and the Fourier Algebra
April 26 - May 3, 2015

Organizers:

H. Garth Dales (University of Lancaster)   **Anthony To-Ming Lau** (University of Alberta)

Dales and others have been working for some time on a generalization of the notion of a `distance' on a linear space to a sequence of `distances' on successive powers of the linear space; that is, we replace a `norm' by a `multi-norm'. This has led to several publications that include solutions to known problems in functional analysis and, in particular, the theory of operators on Banach lattices.

We now wish to explore the possibility of using these techniques to attack problems in abstract harmonic analysis. The meeting at BIRS sought to set out a programme of future research in this area.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/research-in-teams/15rit182

Participants:

Dales, H. Garth (University of Lancaster)   **Troitsky, Vladimir** (University of Alberta)
Lau, Anthony To-Ming (University of Alberta)

Holomorphic functions on products and on $\ell\infty$
May 3-10, 2015

Organizers:

Richard Aron (Kent State University)   **Manuel Maestre** (Universidad de Valencia)
Paul Gauthier (Université de Montréal)   **Vassili Nestoridis** (University of Athens)

Some people have difficulty understanding what mathematicians mean by spaces of more than three dimensions. Our team wished to investigate spaces of arbitrary dimension, even infinite dimensional spaces. The difficulty in accepting more than three dimensions, comes from the questionable decision by mathematicians to speak of various dimensions of a physical phenomenon, when it would perhaps be preferable to speak of various parameters. For example, weather depends on the usual three spatial dimensions, but it also depends on many other parameters, for example, pressure, humidity, etc. In fact, it can be argued that our reality is infinitely complicated and so a study of mathematical models of the universe having infinitely many parameters may be necessary.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/research-in-teams/15rit180

Subconvexity Bounds and Simple Zeros of Modular L-Functions
May 24-31, 2015

Organizers:

Andrew Booker (University of Bristol)   **Nathan Ng** (University of Lethbridge)
Micah Milinovich (University of Mississippi)

This research in teams meeting focused on studying modular form L-functions $Lf(s)Lf(s)$ which are a special subclass of L-functions. We attempted to prove a non-trivial upper bound for $Lf(s)Lf(s)$ on the critical line and we also attempted to prove a good lower bound for the number of simple zeros of $Lf(s)Lf(s)$.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/research-in-teams/15rit201

Analysis and Computation of Vector Functionalized Cahn Hilliard Equations and Application to Amphiphilic Materials
July 12-19, 2015

Organizers:

Arjen Doelman (Leiden University)   **Brian Wetton** (University of British Columbia)
Keith Promislow (Michigan State University)

The meeting allowed the group to consolidate recent preliminary work that will lead to an overview of the rich bifurcation structure present in multi-component activated polymers. The key goals were to derive analyzable scaling limits whose structure is sufficiently rich to capture parts of the experimental morphology, and to develop computational strategies that can exploit these scaling limits.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/research-in-teams/15rit196

Participants:

Doelman, Arjen (Leiden University)   **Wetton, Brian** (University of British Columbia)
Promislow, Keith (Michigan State University)   **Wu, Qiliang** (Michigan State University)

Low-lying Zeros of Quadratic Dirichlet L-Functions
August 9-16, 2015

Organizers:

Daniel Fiorilli (University of Ottawa)
James Parks (University of Lethbridge)

Anders Södergren (University of Copenhagen)

In 1973, Hugh Montgomery noticed that certain statistics about the zeros of the Riemann zeta function bear a striking similarity to statistics coming from random matrices. In recent years, these similarities were seen to be present for other families of L-functions as well. On such statistic of interest is called the 1-level density. In this project, we studied delicate properties of the 1-level density for the family of quadratic Dirichlet L-functions.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/research-in-teams/15rit197

Uniqueness Results in Geometric Tomography
August 16-23, 2015

Organizers:

Alexander Koldobsky (University of Missouri)
Dmitry Ryabogin (Kent State University)

Vladyslav Yaskin (University of Alberta)
Artem Zvavitch (Kent State Univesrity)

The study of geometric properties of convex bodies based on information about sections or projections of these bodies belongs to the area of geometric tomography and has important applications to many areas of mathematics and science, in general. Of paramount importance are questions about unique determination of convex bodies from the size of their sections or projections. For many years the dominating tools for proving uniqueness were those involving spherical harmonics and direct geometric methods. In recent years, we have seen a rapid development of new methods, based on Fourier analysis, which allowed to solve many open problems in convex geometry. The general idea is to express geometric characteristics of a body in terms of the Fourier transform and then use methods of harmonic analysis to solve geometric problems.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/research-in-teams/15rit189

Focussed Research Groups

Localization of Eigenfunctions of Elliptic Operators
March 27 - April 4, 2015

Organizers:

Guy David (Universite Paris XI, France)
Marcel Filoche (Ecole Polytechnique; France)

David Jerison (Massachusetts Institute of Technology)
Svitlana Mayboroda (University of Minnesota)

The goal of this project was to reveal mathematical mechanisms governing wave localization, to be able to predict location and frequencies of the confined vibrations, and to establish mathematical tools which would enable scientists and engineers to design the systems with the desired localization properties.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/focussed-research-groups/15frg188

Participants:

Arnold, Douglas (University of Minnesota)
David, Guy (Universite Paris XI)
Filoche, Marcel (Ecole Polytechnique)
Jerison, David (Massachusetts Institute of Technology)
Mayboroda, Svitlana (University of Minnesota)

Classification of Multiplicity-Free Kronecker Products
May 10-17, 2015

Organizers:

Christine Bessenrodt (Leibniz University Hannover)
Jeffrey Remmel (University of California, San Diego)

Stephanie van Willigenburg (University of British Columbia)

The P versus NP problem is one of the 7 Millennium Prize Problems (each worth $1,000,000) set up by the Clay Mathematics Institute. These are considered to be the most important open problems in Mathematics (only one of them has been solved). Geometric Complexity Theory is a new approach that seeks to settle the P versus NP problem. At the heart of this approach lie the Kronecker coefficients, a family of coefficients which arise in the mathematical study of symmetry. It is conjectured that understanding these coefficients could lead to a resolution of the P versus NP problem and the permanent versus determinant conjecture of Valiant. The team of Assaf, Bessenrodt, Bowman, Hicks, Remmel, Tewari and van Willigenburg intended to make progress on the problem of determining Kronecker coefficients by classifying multiplicity-free and near multiplicity-free Kronecker products using a combination of classical and cutting-edge techniques.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/focussed-research-groups/15frg193

Participants:

Assaf, Sami (University of Southern California)
Bessenrodt, Christine (Leibniz University Hannover)
Bowman, Christopher (City University London)
Hicks, Angela (Stanford University)
Remmel, Jeffrey (University of California, San Diego)
Tewari, Vasu (University of British Columbia)
van Willigenburg, Stephanie (University of British Columbia)

Local Properties in Graphs that Imply Global Cycle Properties
August 2-9, 2015

Organizers:

Ortrud Oellermann (University of Winnipeg)

The main purpose of this workshop was to investigate local properties that provide information about the global cycle structure of a graph. We aimed to make further progress towards settling the longstanding conjectures of Oberly and Sumner and Ryjacek and the weaker conjectures.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/focussed-research-groups/15frg184

Participants:

deWet, Johan (University of South Africa)
Dunbar, Jean (Converse College, South Carolina)
Frick, Marietjie (University of South Africa)

Oellermann, Ortrud (University of Winnipeg)
van Aardt, Susan (University of South Africa)

Unipotent Geometry
August 23-30, 2015

Organizers:

Rajendra Gurjar (Tata Institute of Fundamental Research)
Masayoshi Miyanishi (Kwansei Gakuin University)

Peter Russell (McGill University)

The project studied actions of the additive group of complex numbers on varieties defined by vanishing of finitely many polynomials in arbitrary number of variables. It involved algebraic, geometric, topological considerations in establishing important new results in the newly emerging Unipotent Geometry.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/focussed-research-groups/15frg175

Participants:

Gurjar, Rajendra (Tata Institute of Fundamental Research)
Koras, Mariusz (Warsaw University)

Masuda, Kayo (Kwansei Gakuin University)
Miyanishi, Masayoshi (Kwansei Gakuin University)
Russell, Peter (McGill University)

Geophysical Viscoplastic Flows
October 25 - November 1, 2015

Organizers:

Neil Balmforth (University of British Columbia)

The aim of this focussed Research Group was to assemble a team to develop the detailed mathematical modelling of environmental hazards like mud flows, outbursts from tailing ponds and granular avalanches.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/focussed-research-groups/15frg215

Participants:

Balmforth, Neil (University of British Columbia)
Craster, Richard (Imperial College London)
Hewitt, Duncan (University of Cambridge)
Hogg, Andy (University of Bristol)

Hormozi, Sarah (Ohio University)
McElwaine, Jim (Durham University)
Pritchard, David (University of Strathclyde)
Wachs, Anthony (IFP Energies nouvelles)

Current Challenges for Mathematical Modelling of Cyclic Populations
November 8-15, 2015

Organizers:

Frederic Barraquand (University of Bordeaux)
Donald De Angelis (University of Miami)

Jonathan Sherratt (Heriot-Watt University)
Rebecca Tyson (University of British Columbia, Okanagan)

The objective was to finish and submit the review paper arising from the successful BIRS 5-day workshop entitled "Current Challenges for Mathematical Modelling of Cyclic Populations" held in November, 2013. That workshop brought together a group of 20 ecologists and mathematicians with expertise in cyclic populations to discuss recent advances in the theoretical understanding of the causes and implications of population cycles from both ecological and mathematical points of view.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/focussed-research-groups/15frg202

Participants:

Abbott, Karen (Case Western Reserve University)
Barraquand, Frederic (University of Bordeaux)
De Angelis, Donald (University of Miami)
Elderd, Bret (Louisiana State University)
Greenwood, Priscilla (University of British Colombia)

Louca, Stilianos (University of British Columbia)
Tyson, Rebecca (University of British Columbia, Okanagan)
Wolkowicz, Gail (McMaster University)

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The **Banff International Research Station** for Mathematical Innovation and Discovery (BIRS) is a collaborative Canada-US-Mexico venture that provides an environment for creative interaction as well as the exchange of ideas, knowledge, and methods within the Mathematical Sciences, with related disciplines and with industry. The research station is located at The Banff Centre in Alberta and is supported by Canada's Natural Science and Engineering Research Council (NSERC), the US National Science Foundation (NSF), Alberta's Advanced Education and Technology, and Mexico's Consejo Nacional de Ciencia y Tecnología (CONACYT).

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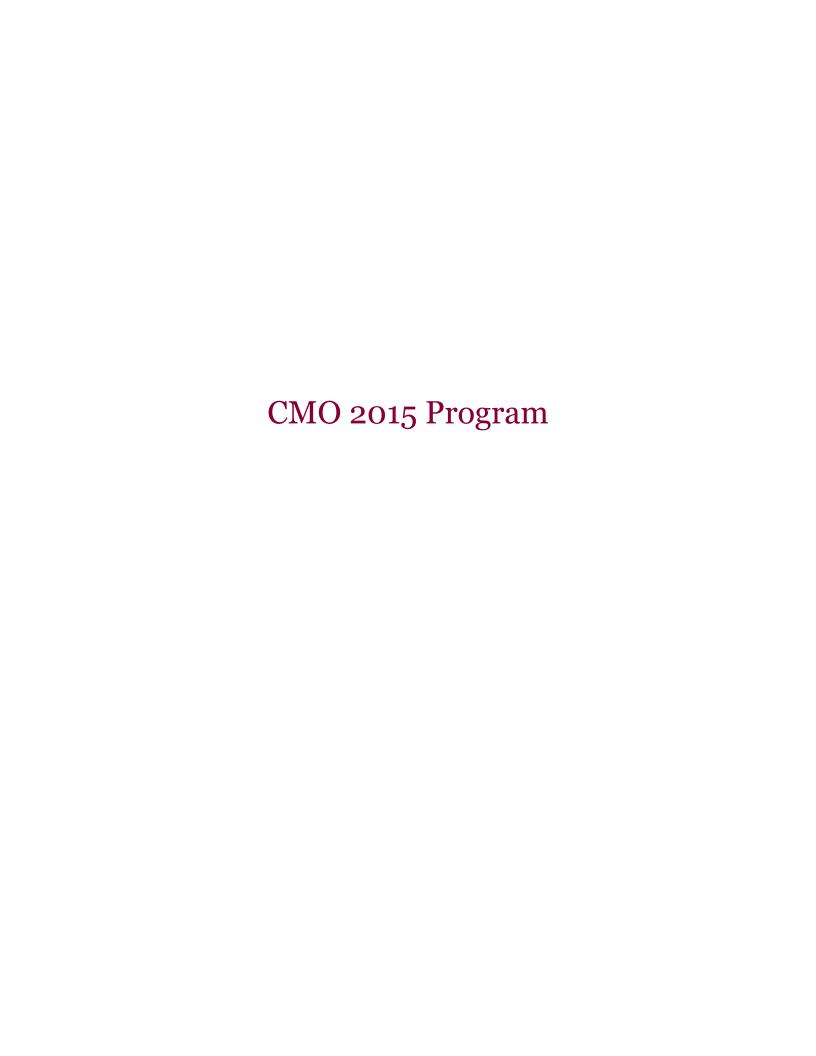Phone: 403-763-6997 Fax: 403-763-6990
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CMO 2015 Program

5-Day Workshops 2015

Jun 21   Jun 26   Rules of Protein-DNA Recognition: Computational and Experimental Advances
Jun 28   Jul 3   Applied Functional Analysis
Jul 5   Jul 10   Kinetic and Related Equations
Jul 12   Jul 17   Neostability Theory
Jul 19   Jul 24   Free-Energy Calculations. A Mathematical Perspective
Jul 26   Jul 31   The Political Economy of Social Choices
Aug 2   Aug 7   Viral Dynamics and Cancer: Modeling Oncogenic and Oncolytic Viruses
Aug 9   Aug 14   Orthogonal and Multiple Orthogonal Polynomials
Aug 23   Aug 28   Quantum Markov Semigroups in Analysis, Physics and Probability
Aug 30   Sep 4   Concept Study - Profound Understanding of Teachers' Mathematics
Sep 6   Sep 11   Hamiltonian Systems and Celestial Mechanics
Sep 20   Sep 25   Affine Geometric Analysis
Sep 27   Oct 2   Spectral Properties of Quasicrystals via Analysis, Dynamics, and Geometric Measure Theory
Sep 27   Oct 2   GAMBIT: Towards a Global and Modular Beyond-the-Standard-Model Inference Tool
Oct 4   Oct 9   Preprojective Algebras Interacting with Singularities, Cohen-Macaulay Modules and Weighted projective Spaces
Oct 11   Oct 16   Searching and Routing in Discrete and Continuous Domains
Oct 18   Oct 23   Harmonic Analysis, $\bar{\partial}$, and CR Geometry
Oct 25   Oct 30   Recent Advances in Actuarial Mathematics
Nov 1   Nov 6   Modern Techniques in Discrete Optimization: Mathematics, Algorithms and Applications
Nov 8   Nov 13   The Mathematics of Layers and Interfaces
Nov 15   Nov 20   Sandpile Groups

Rules of Protein-DNA Recognition: Computational and Experimental Advances
June 21-26, 2015

Organizers:

Harmen J. Bussemaker (Columbia University)   **Remo Rohs** (University of Southern California)

This workshop focused on recent progress in understanding structural and energetic mechanisms that enable DNA-binding proteins (such as transcription factors) to bind their cognate genomic sites with high affinity and specificity. The main purpose was to bring together researchers with diverse approaches and perspectives to studying protein-DNA recognition, not just experimental versus computational but also different approaches within each of those areas. One goal was to obtain a better understanding of how transcription factors achieve specificity and how specificity can be modeled and predicted. A second goal was to improve the methods for the design of proteins with novel DNA-binding interfaces and specificities.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5167

Participants:

Ansari, Aseem (University of Wisconsin-Madison)
Barrera-Rodríguez, Carlos (Instituto de Matemáticas, Universidad Nacional Autónoma de México)
Biggin, Mark (Lawrence Berkeley National Laboratory)
Bradley, Phil (Fred Hutchinson Cancer Research Center)
Bulyk, Martha (Brigham & Women's Hospital and Harvard Medical School)
Bussemaker, Harmen J. (Columbia University)
Cohen, Barak (Washington University)
Dantas, Carolina (University of Southern California)
Fordyce, Polly (Stanford University)
Gómez Soto, José Manuel (Universidad Autónoma de Zacatecas)
Gordan, Raluca (Duke University)
Hughes, Tim (University of Toronto)
Kaptein, Robert (Utrecht University, Bijvoet Center for Biomolecular Research)
Kribelbauer, Judith (Columbia University)
Leslie, Christina (Memorial Sloan Kettering Cancer Center)
Levo, Michal (Weizmann Institute of Science)
Meijsing, Sebastiaan (Max Planck Institute for Molecular Genetics)
Melo, Francisco (Pontifical Catholic University of Chile)
Meyer, Cliff (Harvard University)
Morozov, Alexandre (Rutgers University)
Noble, Bill (University of Washington)
Noyes, Marcus (Princeton University)
Olson, Wilma (Rutgers University)

Orenstein, Yaron (Massachusetts Institute of Technology)
Perez, Alberto (Stony Brook University)
Pique-Regi, Roger (Wayne State University)
Pufall, Miles (University of Iowa)
Rastogi, Chaitanya (Columbia University)
Riley, Todd (University of Massachusetts Boston)
Rohs, Remo (University of Southern California)
Saha, Baidya Nath (Centro de Investigación en Matemáticas)
Schuebeler, Dirk (Friedrich Miescher Institute for Biomedical Research)
Siggers, Trevor (Boston University)
Singh, Mona (Princeton University)
Slattery, Matt (University of Minnesota)
Stamatoyannopoulos, John (University of Washington)
Stormo, Gary (Washington University in St. Louis)
Taipale, Jussi (Karolinska Institutet)
Tullius, Tom (Boston University)
Viadiu, Héctor (Universidad Nacional Autónoma de México)
Vierstra, Jeff (University of Washington)
Vinson, Charles (National Institutes of Health)
Wasserman, Wyeth (University of British Columbia)
Weirauch, Matt (Cincinnati Children's Hospital)
Weng, Zhiping (University of Massachusetts)
Yang, Lin (University of Southern California)

Applied Functional Analysis
June 28 - July 3, 2015

Organizers:

Feng Dai (University of Alberta)
Ronald DeVore (Texas A & M University)
Sergey Konyagin (Russian Academy of Sciences)

Vladimir Temlyakov (University of South Carolina)
Sergey Tikhonov (Institució Catalana de Recerca i Estudis Avançats, Centre de Recerca Matemàtica)

The objective of the workshop was to provide a unique forum for exchanging ideas and in-depth discussions on different aspects of recent developments in applied functional and harmonic analysis and related areas and to encourage outstanding mathematical contributions in these areas.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5088

Participants:

Aldroubi, Akram (Vanderbilt University)
Andrievskii, Vladimir V. (Kent State University)
Buhmann, Martin (Justus-Liebig University)
De Carli, Laura (Florida International University)
Ditzian, Zeev (University of Alberta)
Dũng, Dinh (Vietnam National University)
Erdelyi, Tamas (Texas A & M University)
Feng, Han (University of Alberta)
González, Jorge Bustamante B. (Universidad Autónoma de Puebla)
Gonzalez-Casanova Henriquez, Pedro (Universidad Nacional Autónoma de México)
Han, Bin (University of Alberta)
Holtz, Olga (University of California, Berkeley)
Ismail, Mourad (University of Central Florida)
Jia, Rong-Qing (University of Alberta)
Kashin, Boris (Steklov Mathematics Institute)
Kopotun, Kirill (University of Manitoba)
Kroó, András (Alfréd Rényi Institute of Mathematics)
Kulikova, Tatiana (Russian Academy of Sciences)
Kutzarova, Denka (University of Illinois at Urbana-Champaign)

Mashreghi, Javad (Laval University)
Noriega, Jorge Rivera (Universidad Autónoma del Estado de Morelos)
Pesenson, Isaac (Temple University)
Pritsker, Igor (Oklahoma State University)
Prymak, Andriy (University of Manitoba)
Schlumprecht, Thomas (Texas A & M University)
Shadrin, Alexei (University of Cambridge)
Sloan, Ian H. (University of New South Wales)
Soto-Bajo, Moises (Instituto Tecnológico Autónomo de México)
Temlyakov, Vladimir (University of South Carolina)
Tikhonov, Sergey (Institució Catalana de Recerca i Estudis Avançats + Centre de Recerca Matemàtica)
Vera, Daniel (Instituto Tecnológico Autónomo de México)
Wang, Heping (Capital Normal University)
Ward, Rachel (University of Texas at Austin)
Ward, Joseph D. (Texas A & M University)
Xu, Yuan (University of Oregon)
Xu, Guiqiao (Tianjin Normal University)
Ye, Wenrui (University of Alberta)

Kinetic and Related Equations
July 5-10, 2015

Organizers:

Jose Antonio Carrillo (Imperial College London)
Hyung-Ju Hwang (Pohang University of Science and Technology)

Reinhard Illner (University of Victoria)
Bernt Wennberg (Chalmers University of Technology)

The first goal of the workshop, was bringing together experts from related kinetic projects for exchange of innovative ideas and to help finding unified mathematical theories for the various application fields. The second, was to give younger researchers (at the doctoral and postdoctoral level) the opportunity to expand their knowledge in kinetic theory and to work and discuss with renowned experts.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5049

Participants:

Aceves Sanchez, Pedro (Universität Wien)
Agueh, Martial (University of Victoria)
Alonso, Ricardo (Pontifical Catholic University of Rio de Janeiro)
Armbruster, Dieter (Arizona State University)
Ben-Artzi, Jonathan (Imperial College London)
Bolley, Francois (Université Paris 6)
Bouin, Emeric (École normale supérieure de Lyon)
Calvez, Vincent (École normale supérieure de Lyon)
Cañizo, José (University of Birmingham)
Carlen, Eric (Rutgers University)
Carlier, Guillaume (Université Paris Dauphine)
Carrillo, Jose Antonio (Imperial College London)
Carvalho, Maria C. (University of Lisbon)
Charles, Frederique (Université Paris 6)
Cruz Barriguete, Victor Alberto (Universidad Tecnologica de la Mixteca)
Dolbeault, Jean (Université Paris Dauphine)
Duan, Renjun (Chinese University of Hong Kong)
Einav, Amit (University of Cambridge)
Filbet, Francis (Université de Lyon)
Frank, Martin (Rheinisch-Westfälische Technische Hochschule Aachen)

Ghoussoub, Nassif (University of British Columbia)
Haskovec, Jan (King Abdullah University of Science and Technology)
Hwang, Hyung-Ju (Pohang University of Science and Technology)
Illner, Reinhard (University of Victoria)
Jung, Jaewoo (Korea Advanced Institute of Science and Technology)
Klar, Axel (Technische Universität Kaiserslautern)
Martin, Stephan (Rheinisch-Westfälische Technische Hochschule Aachen)
Mieussens, Luc (Université de Bordeaux)
Morales Escalante, Jose (University of Texas at Austin)
Pareschi, Lorenzo (Universita di Ferrara)
Shen, Shengyi (University of Victoria)
Thompson, William (University of Victoria)
Wennberg, Bernt (Chalmers University of Technology)
Wolfram, Marie-Thérèse (Austrian Academy of Sciences)
Yang, Tong (City University of HongKong)

Neostability Theory
July 12-17, 2015

Organizers:

Bradd Hart (McMaster University)
Ehud Hrushovski (Hebrew University at Jerusalem)
Alf Onshuus (Universidad de los Andes, Edificio H)

Anand Pillay (University of Notre Dame)
Thomas Scanlon (University of California, Berkeley)
Frank Wagner (Université Claude Bernard Lyon 1)

The main objective is to understand what is known and what needs to be done in the foundational work of four related fields: dependent theories, the topology of generically stable types in dependent theories and its consequences on Berkovichifications, the role of non forking outside stable theories and the applications to additive combinatorics, and the common ideas behind dp-miniality, dp-rank, burden and VC-density and possible applications to statistical learning theory.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5145

Participants:

Andrews, Uri (University of Wisconsin-Madison)
Bello Aguirre, Ricardo Isaac (University of Leeds)
Berenstein, Alexander (Universidad de Los Andes)
Boney, Will (University of Illinois at Chicago)
Carmona, Juan (Universidad de los Andes, Université Lyon 1)
Casanovas, Enrique (Universitat de Barcelona)
Celis Martinez, Alonso Lenin (Universidad Nacional Autónoma de México)
Chernikov, Artem (IMJ - PRG, Univ. Paris Diderot Paris 7)
Conant, Gabriel (University of Illinois at Chicago)
Corredor, Luis (Universidad de los Andes)
Dolich, Alfred (Kingsborough Community College)
García, Darío (Universidad de los Andes)
Goldbring, Isaac (University of Illinois at Chicago)
Goodrick, John (Universidad de los Andes)
Guingona, Vincent (Ben-Gurion University of the Negev)
Harrison-Shermoen, Gwyneth (Wesleyan University)
Haskell, Deirdre (McMaster University)
Hasson, Assaf (Ben Gurion University of the Negev)
Hempel, Nadja (Université Lyon 1)
Johnson, Will (University of California, Berkeley)
Kaplan, Itay (Hebrew University of Jerusalem)
Kim, Byunghan (Yonsei University)
Kolesnikov, Alexei (Towson University)

Krupinski, Krzysztof (Uniwersytet Wroclawski)
Laskowski, Chris (University of Maryland)
Leon Sanchez, Omar (McMaster University)
MacPherson, Dugald (University of Leeds)
Martin-Pizarro, Amador (Centre national de la recherche scientifique)
Mazari Armida, Marcos (Facultad de Ciencias Universidad Nacional Autónoma de México)
Newelski, Ludomir (Uniwersytet Wroclawski)
Onshuus, Alf (Universidad de los Andes, Edificio H)
Pillay, Anand (University of Notre Dame)
Ramsey, Nick (University of California, Berkeley)
Rideau, Silvain (École normale Supéreure, Université Paris-Sud)
Ruiz Guido, Carlos Alfonso (Oxford University)
Rzepecki, Tomasz (Uniwersytet Wroclawski)
Scanlon, Thomas (University of California, Berkeley)
Simon, Pierre (Université Lyon 1)
Starchenko, Sergei (University of Notre Dame)
Steinhorn, Charles (Vassar College)
Sustretov, Dmitry (Hebrew University of Jerusalem)
Vojdani, Somayeh (University of Notre Dame)
Wagner, Frank (Université Claude Bernard Lyon 1)
Walsberg, Erik (University of California, Los Angeles)
Ziegler, Martin (Mathematisches Institut Freiburg)

Free-Energy Calculations. A Mathematical Perspective
July 19-24, 2015

Organizers:

Christophe Chipot (University of Illinois at Urbana-Champaign)
Tony Lelièvre (École des Ponts ParisTech, CERMICS)
Robert Skeel (Purdue University)

The focus of the workshop was clearly mathematical and numerical in nature. Contributions were presented from a theoretical perspective, rather than a mere application of an already well-characterized approach. By establishing a bridge between the mathematical and the physics, chemistry and biology communities, the workshop iprovided a much clearer view on the theoretical bases, the range of applicability and the inherent limitations of commonly utilized free-energy methods.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5128

Participants:

Alvarez, Luis Javier (Universidad Nacional Autónoma de México)
Aristoff, David (Colorado State University)
Athènes, Manuel (Centre CEA de Saclay)
Calvo, Florent (University of Grenoble and Centre national de la recherche scientifique, LiPhy)
Chipot, Christophe (University of Illinois at Urbana-Champaign)
Comer, Jeffrey (Kansas State University)
Dama, James (University of Chicago)
Darve, Eric (Stanford University)
Elber, Ron (University of Texas at Austin)
Fort, Gersende (LTCI, Centre national de la recherche scientifique and Télécom ParisTech)
Garcia, Alejandro Rodriguez (Scuola Internazionale Superiore di Studi Avanzati)
Gilson, Michael (University of California, San Diego)
Gomez Castro, Carlos Zepactonal (Center for Research and Advanced Studies of the National Polytechnic Institute)
Goudenège, Ludovic (Centre national de la recherche scientifique)
Gumbart, James (Georgia Technical Institute)
Guyader, Arnaud (Université Pierre et Marie Curie)
Hénin, Jérôme (Centre national de la recherche scientifique)

Jo, Sunhwan (Argonne National Laboratory)
Jourdain, Benjamin (École Nationale des Ponts et Chaussées)
Laio, Alessandro (Scuola Internazionale Superiore di Studi Avanzati)
Legoll, Frédéric (École Nationale des Ponts et Chaussees)
Leimkuhler, Ben (University of Edinburgh)
Lelièvre, Tony (École des Ponts ParisTech, CERMICS)
Mira, Antonietta (University of Lugano)
Mobley, David (University of California, Irvine)
Moradi, Mahmoud (University of Illinois)
Okamoto, Yuko (Nagoya University)
Paul, Fabian (Freie Universität Berlin)
Pohorille, Andrew (NASA Ames Research Center)
Shirts, Michael (University of Colorado Boulder)
Simonson, Thomas (École Polytechnique)
Skeel, Robert (Purdue University)
Stoltz, Gabriel (École des Ponts)
Weare, Jonathan (University of Chicago)
Yang, Wei (Florida State University)
Zuckerman, Daniel (University of Pittsburgh)

The Political Economy of Social Choices
July 26-31, 2015

Organizers:

Maria Gallego (Wilfrid Laurier University)　　　**Norman Schofield** (Washington University in St. Louis)

The aim of this workshop was to bring together social choice and political economy theorists to present their current research. Recent research on social choice issues by workshop participants include: Additive representation of separable preferences on infinite products; social welfare with incomplete ordinal interpersonal comparisons; and variable population voting rules (Pivato); Informational efficiency of scoring rules (Maniquet & Goetz).

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5108

Participants:

Barutt, Brandon (Washington University in St. Louis)
Brams, Steven (New York Universty)
Brett, Craig (Mount Allison University)
Dellis, Arnaud (Université Laval)
Erikson, Robert (Columbia University)
Gallego, Maria (Wilfrid Laurier University)
Gomberg, Andrei (Instituto Tecnológico Autónomo de México)
González Sánchez, David (Instituto Politéctico Nacional: Escuela Superior de Economía)
Kilgour, Marc (Wilfrid Laurier University)
Magar Meurs, Eric (Instituto Tecnológico Autónomo de México)
Merlin, Vincent (Université de Caen Basse-Normandie & CNRS)
Morton, Rebecca (New York University)
Pivato, Marcus (Université de Cergy-Pontoise)
Schofield, Norman (Washington University in St. Louis)
Shvetsova, Olga (Binghamton University)
Simoneau, William (Washington University in St. Louis)
Weymark, John (Vanderbilt University)
Winer, Stanley (Carleton University)

Viral Dynamics and Cancer: Modeling Oncogenic and Oncolytic Viruses
August 2 -7, 2015

Organizers:

Jessica Conway (Pennsylvania State University)
Mads Kaern (University of Ottawa)

Rafael Meza (University of Michigan)
Jack Tuszynski (University of Alberta)

The workshop brought together internationally recognized experts working at the interface of viral dynamics and cancer. The goal was to facilitate the use of mathematical modeling and simulation to advance the understanding of cancer-causing (oncogenic) natural viruses and the application of cancer-killing (oncolytic) viruses as biopharmaceutical agents.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5095

Participants:

Brouwer, Andrew (University of Michigan)
Capistrán, Marcos A. (Centro de Investigación en Matemáticas)
Castaño Arcila, Mauricio (Cinvestav)
Ciupe, Stanca (Virginia Technical Institute)
Conway, Jessica (Pennsylvania State University)
Diallo, Jean Simon (Ottawa Hospital Research Institute)
Diaz, Edgar (Instituto Nacional de Salud Pública)
Díaz-Hernández, Orlando (Universidad Autónoma de Chiapas)
Dushoff, Jonathan (McMaster University)
Eisenberg, Marisa (University of Michigan, Ann Arbor)
Elbasha, Elamin (Merck Research Laboratories)
Flores de Dios, Estela del Carmen (Universidad Juárez Autónoma de Tabasco)
Forde, Jonathan (Hobart and William Smith Colleges)
Hanson, Shalla (Duke University)
Irani, Joey (University of Ottawa)
Jenner, Adrianne (University of Sydney)
Kaern, Mads (University of Ottawa)
Komarova, Natalia (University of California, Irvine)
Medlock, Jan (Oregon State University)
Méndez González, José Martín (Instituto Potosino de Investigación Científica y Tecnológica)

Meza, Rafael (University of Michigan)
Miller, Anna (University of Utah)
Miller, Amber (Mayo Clinic)
Morales-Barcenas, Jose-Hector (Universidad Autonoma Metropolitana)
Murall, Carmen Lia (Max Planck Institute for Dynamics and Self-Organization)
Núñez López, Mayra (Universidad Autónoma Metropolitana - Unidad Cuajimalpa)
Ooi, James H.K. (University of Ottawa)
Palacio-Mejia, Lina Sofia (Instituto Nacional de Salud Pública)
Ryser, Marc D. (Duke University)
Saenz, Roberto A. (Universidad de Colima)
Santillan, Moises (Centro de Investigacion y de Estudios Avanzados del Instituto Politécnico Nacional)
Valesco Hernandez, Jorge X (Universidad Nacional Autónoma de México)
Villavicencio Pulido, José Geiser (Universidad Autónoma Metropolitana - Unidad Lerma)
Wodarz, Dominik (University of California, Irvine)
Zepeda, Rodrigo (Instituto Tecnológico Autónomo de México)

Orthogonal and Multiple Orthogonal Polynomials
August 9-14, 2015

Organizers:

Jeffrey Geronimo (Georgia Institute of Technology)   **Luc Vinet** (University of Montreal)

The focus of the workshop was quantitative analysis of orthogonal polynomials and multiple orthogonal polynomials including algebraic, analytic, and asymptotic properties of these systems. The conference brought together experts who have different approaches to these questions - for example those using algebraic techniques and those using analytic techniques. This was the first meeting focusing on this cross-section of researchers in these varying directions in the past few years. We expect the communication of ideas and methods from these different approaches will encourage new techniques and research across several topics.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5022

Participants:

Aptekarev, Alexander (Keldysh Institute Applied Mathematics)
Arvesu, Jorge (Universidad Carlos III de Madrid)
Atakishiyev, Natig (Universidad Nacional Autónoma de México)
Baratchart, Laurent (INRIA Sophia Antipolis)
Berg, Christian (University of Copenhagen)
Choque Rivero, Abdon Eddy (Universidad Michoacana de San Nicolás de Hidalgo)
Derevyagin, Maxim (University of Mississippi)
Domínguez de la Iglesia, Manuel (Universidad Nacional Autónoma de México)
Duits, Maurice (Royal Institute of Technology)
Duran, Antonio (Universidad de Sevilla)
Figueroa Cervantes, Carlos Jared (Universidad de Guanajuato)
Garza Gaona, Luis Enrique (Universidad de Colima)
Geronimo, Jeffrey (Georgia Institute of Technology)
Grunbaum, Alberto (University of California, Berkeley)
Henegan, James (University of Mississippi)
Iliev, Plamen (Georgia Institute of Technology)

Ismail, Mourad (University of Central Florida)
Kozlowska, Katarzyna (University of Reading)
Kuijlaars, Arno (Katholieke Universiteit Leuven)
Lapointe, Luc (Universidad de Talca)
Lopez Lagomasino, Guillermo (Universidad Carlos III de Madrid)
Lopez-Garcia, Abey (University of South Alabama)
Lubinsky, Doron (Georgia Institute of Technology)
Miki, Hiroishi (Doshisha University)
Mina-Diaz, Erwin (University of Mississippi)
Roman, Pablo Manuel (Universidad Nacional De Cordoba)
Simanek, Brian (Vanderbilt University)
Stylianopoulos, Nikos (University of Cyprus)
Van Assche, Walter (Katholieke Universiteit Leuven)
van Diejen, Jan Felipe (Universidad de Talca)
Vinet, Luc (University of Montreal)
Wang, Dong (National University of Singapore)
Wolf, Kurt Bernardo (Instituto de Ciencias Físicas, Universidad Nacional Autónoma de México)

Quantum Markov Semigroups in Analysis, Physics and Probability
August 23-28, 2015

Organizers:

Franco Fagnola (Politecnico di Milano)
Roberto Quezada (Universidad Autonoma Metropolitana, Iztapalapa)

Stephen Sontz (Centro de Investigación en Matemáticas)
Aurel Stan (Ohio State University at Marion)

The meeting aimed to identify common research topics and stimulating joint research between mathematicians studying semigroups of completely positive maps on operator algebras and their physical applications to models of quantum open systems. Novel ideas and techniques were expected to emerge from the combination of tools developed in the study of special problems, providing a better understanding of the underlying mathematical models.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5086

Participants:

Accardi, Luigi (University of Roma Tor Vergata)
Acevedo Martínez, Neptali (Universidad Autónoma Metropolitana, Iztapalapa)
Agredo, Julian (Universidad Nacional de Colombia)
Androulakis, George (University of South Carolina)
Arizmendi, Octavio (Centro de Investigacion en Matematicas)
Asai, Nobuhiro (Aichi University of Education)
Barhoumi, Abdessatar (Carthage University-Nabeul Preparatory Engineering Institute)
Bhat, B V Rajarama (Indian Statistical Institute)
Bolaños, Jorge (Universidad Autonoma Metropolitana, Iztapalapa)
Carlen, Eric (Rutgers University)
Carvalho, Maria C. (University of Lisbon)
Cruz de la Rosa, Marco Antonio (Universidad Autónoma Metropolitana, Iztapalapa)
Fagnola, Franco (Politecnico di Milano)
Fidaleo, Francesco (University of Roma Tor Vergata)
Franz, Uwe (University of Franche-Comte)
García, Julio Cesar (Universidad Autonoma Metropolitana, Iztapalapa)
Guerrero Poblete, Fernando (Universidad Autónoma Metropolitana, Iztapalapa)

Heo, Jaeseong (Hanyang University)
Ji, Un Cig (Chungbuk National University)
Kastoryano, Michael (Freie Universitat Berlin)
Kye, Seung-Hyeok (Seoul National University)
Mora, Carlos M. (Universidad de Concepción)
Musulin, Rade (University of South Carolina)
Neumann, Lukas (University of Innsbruck)
Obata, Nobuaki (Tohoku University)
Quezada, Roberto (Universidad Autonoma Metropolitana, Iztapalapa)
Ruskai, Mary Beth (delocalized)
Sinha, Kalyan Bidhan (J.N. Centre for Advanced Scientific Research)
Sontz, Stephen (Centro de Investigación en Matemáticas)
Stan, Aurel (Ohio State University at Marion)
Temme, Kristan (Institute for Quantum Information and Matter, California Institute of Technology)
Torres, Francisco (Universidad Autónoma Metropolitana-Azcapotzalco)
Urbina-Romero, Wilfredo (Rooselvelt University-Chicago)
Wiedemann, Alex (University of South Carolina)
Yoo, Hyun Jae (Hankyong National University)
Ziemke, Matt (University of South Carolina)

Concept Study - Profound Understanding of Teachers' Mathematics
August 30 - September 4, 2015

Organizers:

Brent Davis (Werklund School of Education)
Paulino Preciado Babb (University of Calgary)

Armando Solares (Universidad Pedagógica Nacional)

This workshop nurtured further collaboration for research and teacher education among scholars from Mexico and Canada. A bilingual setting, English and Spanish, and culturally specific representations of mathematical ideas enriched an understanding of concepts as perceived and lived in different cultural backgrounds.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5151

Participants:

Arredondo Ramírez, Estela (Universidad Pedagógica Nacional)
Ávila, Alicia (Universidad Pedagógica Nacional)
Bolaños Ventura, Patricia (Primaria Oaxaca - Red Leo)
Carrillo Catalán, Ramiro (CONACYT)
Carrión Velázquez, Vicente (Cinvestav)
Chapman, Olive (University of Calgary)
Chavarria, Luz del Carmen (Conference Interpreting)
Cruz García, Fanny (Universidad Intercultural de Puebla)
Cruz Ramírez, Francisco (Universidad Intercultural de Puebla)
Davis, Brent (Werklund School of Education)
Díaz Ortiz, Erik Ignacio (CONACYT)
Enriquez, Homero (Escuela Primaria "Benito Juarez")
Fox, Genevieve (Siksika Board OF Education)
Francis, Krista (University of Calgary)
García Campos, Montserrat (Universidad Pedagógica Nacional)
Guerrero, María Elena (Conference Interpreting)
Guzman, Austruberta (Licenciatura de Educación indígena)
Guzmán Domínguez, Mauro Martí (Centro de Maestros)
Hernández Zavaleta, Jesús Enrique (El Instituto de Educación Media Superior)
Ignacio Velasco, Ya'da'o (Primaria Indígena - Oaxaca Red LEO)
Jiménez de la Rosa, Edda (Uiniversidad Pedagógica Nacional)
Jungic, Veselin (Simon Fraser University)
López Ulloa, Gaspar (Primaria Oaxaca - Red LEO)
Lozano Suárez, María de los Dolores (Universidad de las Américas)

MacLean, Mark (University of British Columbia)
Martínez Zárate, Flor Edith (Escuela Primaria "Triunfo de la Revolución", SEP)
Martínez-Hernández, Cesar (Universidad de Colima)
Megginson, Robert (University of Michigan)
Meléndez, Quitzeh Morales (CONACYT)
Navarro, Estela (Universidad Pedagógica Nacional)
Nop Vargas, Xaab (Wejën Kajën)
Núñez, Rafaél (University of California, San Diego)
Ortiz Aguirre, Joaquín (IEEPO Oaxaca)
Padilla Carrillo, Erika (Universidad Pedagógica Nacional)
Pascualeño Bello, Celestina Carmela (Escuela Primaria Indígena "Benito Juárez" Guerrero)
Pérez Santiago, Laura (Red LEO)
Preciado Babb, Paulino (University of Calgary)
Rosdo Ocaña, María del Pilar (Universidad Autónoma de Yucatán)
Ruiz Nakasone, Carmen (Universidad Pedagógica Nacional, Unidad Ajusco)
Sacristán, Ana Isabel (Cinvestav-IPN)
Sandoval Cáceres, Ivonne Twiggy (Universidad Pedagógica Nacional)
Solares, Armando (Universidad Pedagógica Nacional)
Solares Pineda, Diana Violeta (Universidad Autónoma de Querétaro - Red LEO)
Sosa, Leticia (Universidad Autónoma de Zacatecas)
Uicab Ballote, Genny Rocío (Universidad Autónoma de Yucatán)
Verreault, Jocelyn (Yellowhead Tribal College)

Hamiltonian Systems and Celestial Mechanics
September 6-11, 2015

Organizers:

Florin Diacu (University of Victoria)
Jaume Llibre (Universidad Autonoma de Barcelona)

Ernesto Perez-Chavela (Instituto Tecnológico Autónomo de México)

Celestial mechanics is an important branch of mathematics including the theory of Hamiltonian Dynamical Systems, with many applications in Physics, Astronomy, Astrophysics, Satellite Theory, and Launching Missions among others. The workshop brought together several experts working in different aspects of common problems.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5010

Participants:

Arredondo Garcia, John A. (Universidad Konrad Lorenz)
Avendaño Camacho, Misael (Universidad de Sonora)
Benet, Luis (Instituto de Ciencias Físicas, Universidad Nacional Autónoma de México)
Bengochea, Abimael (Universidad Autónoma Metropolitana-I México)
Boatto, Stefanella (Universidade Federal do Rio de Janeiro Brazil)
Burgos, Jaime (Universidad Autónoma Metropolitana-I México)
Calleja, Renato (Instituto de Investigaciones en Matemáticas Aplicadas y en Sistemas - Universidad Nacional Autónoma de México)
Contreras, Gonzalo (Centro de Investigación en Matemáticas)
Corbera, Montserrat (Universitat de Vic-Universitat Central de Catalunya)
Dávila Rascón, Guillermo (Universidad de Sonora)
Delgado, Joaquin (Universidad Autónoma Metropolitana-I México)
Delshams, Amadeu (Universitat Politècnica de Catalunya)
Diacu, Florin (University of Victoria)
Franco-Pérez, Luis (U. Autónoma Metropolitana-C México)
Galán-Vioque, Jorge (Universidad de Sevilla Spain)
García-Azpetia, Carlos (Universidad Nacional Autónoma de México)
Gidea, Marian (Yeshiva University)
Hernández-Garduño, Antonio (UAM-I)
Ibrahim, Slim (University of Victoria)

Levi, Mark (PennState University)
Llibre, Jaume (Universidad Autonoma de Barcelona)
Long, Yiming (Nankai University)
Maderna, Ezequiel (Universidad de la República)
Martínez-Seara, Tere (Universitat Politècnica de Catalunya)
Meyer, Kenneth (University of Cincinnati)
Montgomery, Richard (University of California, Santa Cruz)
Muciño-Raymundo, Jesus (Universidad Nacional Autónoma de México)
Offin, Daniel (Queen's University)
Palacián, Jesús (Universidad Publica de Navarra, Pamplona)
Perez-Chavela, Ernesto (Instituto Tecnológico Autónomo de México)
Portaluri, Alessandro (Università degli Studi di Torino)
Robinson, Clark (Northwestern Univsersity)
Roldán, Pablo (Instituto Tecnologico Autonomo de Mexico)
Rybicki, Slawomir (Nicolaus Copernicus University Poland)
Sánchez-Morgado, Héctor (Universidad Nacional Autónoma de México)
Schmah, Tanya (University of Ottawa)
Schmidt, Dieter (University of Cincinnati)
Stoica, Cristina (Wilfrid Laurier University)
Ureña, Antonio J. (Universidad de Granada)
Valdez, Ferran (Universidad Nacional Autónoma de México)
Wang, Zhiqiang (Sichuan University)
Xie, Zhifu (Virginia State University)

Affine Geometric Analysis
September 20-25, 2015

Organizers:

Monika Ludwig (Technische Universität Wien)　　**Elisabeth Werner** (Case Western Reserve University)
Alina Stancu (Concordia University)

This workshop brought together leading mathematicians working in areas connected to Affine Geometry Analysis. This includes, in particular, researchers working on geometric flows, convex geometry, Sobolev spaces and rearrangement inequalities. The goal was to intensify interactions between different groups which, sometimes due to geographic restrictions, have sporadic meetings. This is a particularly optimal time to benefit from an exchange of expertise as progress has been made in several conjectured problems involving affine invariants without providing a definite answer.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5014

Participants:

Abardia, Judit (Goethe Universität Frankfurt)
Alfonseca-Cubero, Maria de los Angeles (North Dakota State University)
Arelio Ríos, Isaac (Universidad Nacional Autónoma de México)
Besau, Florian (Vienna University of Technology)
Bianchi, Gabriele (Università di Firenze)
Burchard, Almut (University of Toronto)
Cianchi, Andrea (Università di Firenze)
Colesanti, Andrea (University of Florence)
Dann, Susanna (Vienna Institute of Technology)
Deng, Qin (University of Toronto)
Dorrek, Felix (Institut f. Diskrete Mathematik und Geometrie TU Wien)
Florentin, Dan (Weizmann Institute of Science)
Gardner, Richard (Western Washington University)
Ivaki, Mohammad Najafi (TU Wien)
Jimenez, Carlos Hugo (Universidade Federal de Minas Gerais)
Jonard Pérez, Natalia (Universidad Nacional Autónoma de México)

Ludwig, Monika (Technische Universität Wien)
Milman, Vitali (Tel Aviv University)
Mordhorst, Olaf (University of Kiel)
Mussnig, Fabian (Institut f. Diskrete Mathematik und Geometrie TU Wien)
Rotem, Liran (Tel-Aviv University)
Ryabogin, Dmitry (Kent State University)
Schachter, Benjamin (University of Toronto)
Schuett, Carsten (Christian-Albrechts-Universitaet)
Segal, Alex (Tel Aviv University)
Silverstein, Laura (Vienna University of Technology)
Valettas, Petros (Texas A & M University)
Vritsiou, Beatrice-Helen (University of Michigan)
Werner, Elisabeth (Case Western Reserve University)
Xiao, Jie (Memorial University)
Ye, Deping (Memorial University of Newfoundland)
Yepes Nicolás, Jesús (Instituto de Ciencias Matemáticas)
Zhao, Yiming (New York University)
Zvavitch, Artem (Kent State University)

Spectral Properties of Quasicrystals via Analysis, Dynamics, and Geometric Measure Theory
September 27 - October 2, 2015

Organizers:

David Damanik (Rice University)   **Anton Gorodetski** (University of California, Irvine)

Mathematicians from various areas (and also some physicists) came together to push the boundaries of understanding of mathematical quasicrystal models. The goals included a better understanding of the allowed energy levels of a quantum particle moving in a higher-dimensional quasicrystalline environment as well as the speed with which it does so.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5083

Participants:

Arredondo Ruiz, Juan Hector (Universidad Autónoma Metropolitana)
Beckus, Siegfried (University of Jena)
Bedford, Eric (Stony Brook University)
Brambila, Fernando (Universidad Nacional Autónoma de México)
Chen, Joe P. (University of Connecticut)
Damanik, David (Rice University)
del Rio Castillo, Rafael (Universidad Nacional Autónoma de México)
Embree, Mark (Virginia Tech)
Fillman, Jake (Rice University)
Gerbuz, Vitalii (Rice University)
Gorodetski, Anton (University of California, Irvine)

Han, Rui (University of California, Irvine)
Kachkovskiy, Ilya (University of California Irvine)
Kleptsyn, Victor (Centre national de la recherche scientifique, Institut de Recherche Mathematique de Rennes)
Liu, Qing-Hui (Beijing Institute of Technology)
Mei, May (Denison University)
Silva Pereyra, Luis Octavio (Universidad Nacional Autónoma de México)
Takahashi, Yuki (University of California, Irvine)
Teplyaev, Alexander (University of Connecticut)
Yessen, William (Rice University)
Zhang, Shiwen (University of California, Irvine)

GAMBIT: Towards a Global And Modular Beyond-the-Standard-Model Inference Tool
September 27 - October 2, 2015

Organizers:

Pat Scott (Imperial College)
Martin White (Centre of Excellence for Particle Physics at the Terascale)

A group of twenty particle physicists, astronomers, statisticians and computational scientists met to create the computational tools of the future in the search for dark matter, and the broader particle theory it belongs to. Using cutting-edge statistical and computational techniques only developed in the last few years, they combined the results of searches for dark matter and new symmetries from a huge number of different experiments. These range from the LHC to smaller particle colliders, gamma-ray telescopes, cosmic antimatter probes, ultra-clean experiments in the world's deepest mines, and a neutrino telescope embedded in the Antarctic ice at the South Pole. The result will be the first truly comprehensive analysis of theories for dark matter and new physics, painting a much clearer picture of what dark matter is, and what it isn't.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5115

Participants:

Athron, Peter (Monash University)
Balazs, Csaba (Monash University)
Chrzaszcz, Marcin (University of Zurich)
Cornell, Jonathan (University of California, Santa Cruz)
Farmer, Ben (OKC Stockholm University)
Jackson, Paul (Univeristy of Adelaide)
Krislock, Abram (University of Oslo)
Kvellestad, Anders (University of Oslo)
Martinez, Greg (University of California, Los Angeles)
McKay, James (Imperial College London)
Raklev, Are (University of Oslo)
Rogan, Chris (Harvard University)
Scott, Pat (Imperial College)
Weniger, Christoph (GRAPPA, University of Amsterdam)
White, Martin (Centre of Excellence for Particle Physics at the Terascale)

Preprojective Algebras Interacting with Singularities, Cohen-Macaulay Modules and Weighted projective Spaces
October 4-9, 2015

Organizers:

Ragnar-Olaf Buchweitz (University of Toronto Scarorough)

José Antonio de la Peña (Centro de Investigación en Matemáticas)

Osamu Iyama (Nagoya University)

Helmut Lenzing (University of Paderborn)

The workshop took its offspring in the area of representations of finite dimensional algebras with a focus on the algebraic and geometric structure of a class of new d-dimensional spaces. It is expected that the joint efforts of a group of internationally leading experts from many different areas of mathematics is yielding new insight in the difficult nature of their object of study.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5116

Participants:

Ballard, Matthew (University of South Carolina)

Bautista, Raymundo (Universidad Nacional Autonoma de Mexico)

Bobinski, Grzegorz (Nicolaus Copernicus University)

Brüstle, Thomas (Bishop's University and Université de Sherbrooke)

Buchweitz, Ragnar-Olaf (University of Toronto Scarorough)

Chan, Daniel (Univesity of New South Wales)

Chávez, Alfredo Nájera (Max Planck Institute for Mathematics)

Dao, Hailong (University of Kansas)

Darpö, Erik (Mälardalen University)

de la Peña, José Antonio (Centro de Investigación en Matemáticas)

De Thanhoffer de Volcsey, Louis (Hasselt University)

Donovan, Will (Kavli IPMU, University Of Tokyo)

Ebeling, Wolfgang (Leibniz Universität Hannover)

Faber, Eleonore (University of Michigan)

Favero, David (University of Alberta)

Geiss, Christof (Universidad Nacional Autónoma de México)

Gelinas, Vincent (University of Toronto)

Gutiérrez, Osbaldo Mata (Universidad de Guadalajara)

Herschend, Martin (Uppsala University)

Hille, Lutz (University Münster)

Ingalls, Colin (University of New Brunswick)

Iyama, Osamu (Nagoya University)

Jasso, Gustavo (Universität Bonn)

Kanda, Ryo (Nagoya University)

Krause, Henning (Bielefeld University)

Labardini-Fragoso, Daniel (Universidad Nacional Autónoma de México)

Lamberti, Lisa (University of Michigan)

Lenzing, Helmut (University of Paderborn)

Leuschke, Graham (Syracuse University)

Lin, Jyun-Ao (Academica Sinica-Taipei)

Lopez Aguayo, Daniel (Centro de Ciencias Matematicas Universidad Nacional Autónoma de México)

Meltzer, Hagen (University of Szczecin)

Minamoto, Hiroyuki (Osaka Prefecture University)

Miro-Roig, Rosa-Maria (University of Barcelona)

Mori, Izuru (Shizuoka University)

Mróz, Andrzej (Centro de Investigación en Matemáticas)

Oppermann, Steffen (Norwegian University of Science and Technology)

Pauksztello, David (University of Manchester)

Takahashi, Ryo (Nagoya University)

Takahashi, Atsushi (Osaka University)

Thibault, Louis-Philippe (University of Toronto)

Ueda, Kazushi (Osaka University)

Searching and Routing in Discrete and Continuous Domains
October 11-16, 2015

Organizers:

Prosenjit Bose (Carleton University)
Stephane Durocher (University of Manitoba)

Stefan Langerman (Université Libre de Bruxelles)
Ian Munro (University of Waterloo)

This workshop studied both the problems from the discrete setting (networks) and the continuous setting. It used techniques from the discrete setting to solve problems in the continuous setting and vice versa.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5084

Participants:

Aloupis, Greg (Tufts University)
Barba, Luis (Universite Libre de Bruxelles)
Biedl, Therese (University of Waterloo)
Bonichon, Nicolas (Universite Bordeaux)
Bose, Prosenjit (Carleton University)
Carmi, Paz (Ben-Gurion University of the Negev)
Damian, Mirela (Villanova University)
De Carufel, Jean-Lou (Carleton University)
Dujmović, Vida (University of Ottawa)
Durocher, Stephane (University of Manitoba)
Fabila-Monroy, Ruy (Cinvestav)
Flatland, Robin (Siena College)
Flores, David (Universidad Nacional Autónoma de México)
Gavoille, Cyril (University of Bordeaux)
Iacono, John (New York University)
Katz, Matya (Ben-Gurion University)
Khramtcova, Elena (University of Lugano (USI))
Kostitsyna, Irina (TU Eindhoven)

Langerman, Stefan (Université Libre de Bruxelles)
Lubiw, Anna (University of Waterloo)
Maftuleac, Daniela (University of Waterloo)
Maheshwari, Anil (Carleton University)
Morin, Pat (Carleton University)
Munro, Ian (University of Waterloo)
Narayanan, Lata (Concordia University)
Okamoto, Yoshio (University of Electro-Communications)
Pecina, Federico Alonso (Universidad Nacional Autónoma de México)
Pennarun, Claire (Université de Bordeaux)
Rounds, Anika (Tufts University)
Saumell, Maria (University of West Bohemia)
Smid, Michiel (Carleton University)
Taslakian, Perouz (American University of Armenia)
Verdonschot, Sander (Carleton University)
Vosoughpour, Hamideh (University of Waterloo)
Wenk, Carola (Tulane University)

Harmonic Analysis, $\bar{\partial}$, and CR Geometry
October 18-23, 2015

Organizers:

Tatyana Barron (University of Western Ontario)
Siqi Fu (Rutgers University-Camden)
Malabika Pramanik (University of British Columbia)

Andrew Raich (University of Arkansas)
Emil Straube (Texas A & M University)
Alexander Tumanov (University of Illinois at Urbana-Champaign)

The topics covered included: the $\bar{\partial}$-Neumann Laplacian, a prototype of an elliptic operator with non-coercive boundary conditions; the application of real variable harmonic analysis techniques to the study of several complex variables; the spectral theory of the complex Laplacian, a subject closely intertwined with the semi-classical analysis of the Schrödinger operator; and CR geometry, the subtle and critical object in determining the properties of the solutions of the other problems as well as a thriving and fundamental subject in its own right.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5074

Participants:

Baracco, Luca (University of Padova)
Barron, Tatyana (University of Western Ontario)
Benguria, Soledad (University of Wisconsin-Madison)
Blocki, Zbigniew (Jagiellonian University)
Castillo, Sofía Ortega (Centro de Investigación en Matemáticas)
Chakrabarti, Debraj (Central Michigan University)
Esquildo Uvaldo, Mayra Nayeli (Centro de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional)
Fu, Siqi (Rutgers University-Camden)
Gong, Xianghong (University of Wisconsin)
Harrington, Phillip (University of Arkansas)
Haslinger, Friedrich (University of Vienna)
Herrera, Rafael (Centro de Investigación en Matemáticas)
Hoepfner, Gustavo (Federal University of Sao Carlos)
Jacobowitz, Howard (Rutgers University-Camden)
Kossovskiy, Ilya (University of Vienna)
Lanzani, Loredana (Syracuse University)
Liu, Bingyuan (Washington University in St. Louis)
López, Jesús Navarro (Centro de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional)

Marinescu, George (Köln University)
Marmolejo-olea, Emilio (Universidad Nacional Autónoma de México)
McNeal, Jeffery (Ohio State University)
Mendoza, Gerardo (Temple University)
Mir, Nordine (Texas A & M University at Qatar)
Ohsawa, Takeo (Nagoya University)
Pinton, Stefano (University of Padova)
Raich, Andrew (University of Arkansas)
Ramírez-de-Arellano, Enrique (Centro de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional)
Ru, Min (University of Houston)
Sahutoglu, Sonmez (University of Toledo)
Street, Brian (University of Wisconsin–Madison)
Tie, Jingzhi (University of Georgia)
Tumanov, Alexander (University of Illinois at Urbana-Champaign)
Yuan, Yuan (Syracuse University)
Yung, Po Lam (Chinese University of Hong Kong)
Zeytuncu, Yunus (University of Michigan-Dearborn)

Recent Advances in Actuarial Mathematics
October 25-30, 2015

Organizers:

Jan Dhaene (Katholieke Universiteit Leuven)   **Emiliano Valdez** (University of Connecticut)
Sheldon Lin (University of Toronto)

This workshop provided the unique opportunity to bring together researchers in this discipline in the most possibly diverse sense: well experienced, young and fresh graduates and practitioners interested in our research output.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5021

Participants:

Augustyniak, Maciej (University of Montreal)
Badescu, Andrei (University of Toronto)
Bauer, Daniel (Georgia State University)
Bernard, Carole (Grenoble École de Management)
Dhaene, Jan (Katholieke Universiteit Leuven)
Frees, Edward (Jed) (University of Wisconsin-Madison)
Frostig, Esther (University of Haifa)
Gan, Guojun (University of Connecticut)
Garrido, Jose (Concordia University)
Gomez-Hernandez, Denise (Universidad Autónoma de Querétaro)
Landriault, David (University of Waterloo)
Landsman, Zinoviy (Univesity of Haifa)
Lee, Gee Y. (University of Wisconsin- Madison)
Li, Bin (University of Waterloo)
Linders, Daniel (Katholieke Universiteit Leuven)
Liu, Xiaoming (Western University)
Lu, Yi (Simon Fraser University)
Martinez-Ovando, Juan Carlos (Instituto Tecnológico Autónomo de México)

Milevsky, Moshe (York University)
Morales, Manuel (University of Montreal)
Nieto-Barajas, Luis E. (Instituto Tecnológico Autónomo de México)
Peng, Liang (Georgia State University)
Pitacco, Ermanno (University of Trieste)
Ren, Jiaodong (Western University)
Salahnejhad Ghalehjooghi, Ahmad (Maastricht University)
Sherris, Michael (University of New South Wales)
Tang, Qihe (University of Iowa)
Tang, Dameng (University of Toronto)
Valdez, Emiliano (University of Connecticut)
Vanduffel, Steven (Vrije Universiteit Brussel)
Verdonck, Tim (Katholieke Universiteit Leuven)
Villanueva Otamendi, Oscar Antonio (Agroasemex Mexico)
Xu, Di (Cindy) (University of Waterloo)
Yang, Fan (University of Waterloo)
Yao, Jing (Vrije Universiteit Brussel)
Zhang, Huan (University of Iowa)

Modern Techniques in Discrete Optimization: Mathematics, Algorithms and Applications
November 1-6, 2015

Organizers:

Jesús De Loera (University of California, Davis) **Jon Lee** (University of Michigan)

The workshop focused on the most challenging mathematical issues regarding the solution of integer programs. Bringing together researchers interested on the mathematical foundations of discrete optimization to discuss algebraic, analytical, and geometric techniques, with the hope to advance the state-of-the-art of solving difficult optimization problems. The participants represent leading researchers of more than ten countries as well as young promising researchers.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5006

Participants:

Ahmed, Shabbir (Georgia Institute of Technology)
Alfaro Montufar, Carlos Alejandro (Banxico)
Alvarado, Matías (Centro de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional)
Anstreicher, Kurt (University of Iowa)
Araujo, Gabriela (Universidad Nacional Autónoma de México)
Basu, Amitabh (Johns Hopkins)
Bienstock, Daniel (Columbia University)
Blanco, Victor (Universidad de Granada)
Blekherman, Greg (Georgia Institute of Technology)
Bremner, David (University of New Brunswick)
Calvillo, Gilberto (Universidad Nacional Autónoma de México)
Chavez, Laura (Universidad Autónoma Metropolitana)
De Loera, Jesús (University of California, Davis)
Dey, Santanu (Georgia Institute of Technology)
Deza, Antoine (McMaster University)
Dong, Hongbo (Washington State University)
Figueroa Gutiérrez, Ana Paulina (Instituto Tecnológico Autónomo de México)
Gunluk, Oktay (IBM)
Hochbaum, Dorit (University of California, Berkeley)
Koeppe, Matthias (University of California, Davis)
Krishnamoorthy, Bala (Washington State University)
Lee, Jon (University of Michigan)
Merino, Criel (Universidad Nacional Autónoma de México)
Moran, Diego (Virginia Tech)
Morris Jr., Walter D. (George Mason University)

Parrilo, Pablo (Massachusetts Institute of Technology)
Pokutta, Sebastian (Georgia Institute of Technology)
Possani, Edgar (Instituto Tecnológico Autónomo de México)
Puerto, Justo (Universidad de Sevilla)
Rios, Roger (Universidad Autónoma de Nuevo León)
Rodriguez Sanchez, Maria Guadalupe (Universidad Autónoma de la Ciudad de México)
Rodríguez Villalobos, Cynthia (University of Waterloo)
Romero, David (Instituto de Matemáticas | Universidad Nacional Autónoma de México)
Rothvoss, Thomas (University of Washington)
Rubio Montiel, Christian (Universidad Nacional Autónoma de México)
Skipper, Daphne (Georgia Regents University)
Stephen, Tamon (Simon Fraser University)
Toriello, Alejandro (Georgia Institute of Technology)
Tuncel, Levent (University of Waterloo)
Valencia Oleta, Carlos Enrique (National Polytechnic Institute)
Vallejo, Ernesto (Centro de Ciencias Matemáticas)
Vielma, Juan Pablo (Massachusetts Institute of Technology)
Villarreal Marroquín, María Guadalupe (Centro de Investigación en Matemáticas)
Yusun, Timothy (Simon Fraser University)
Zaragoza, Francisco J. (Universidad Autónoma Metropolitana Azcapotzalco)

The Mathematics of Layers and Interfaces
November 8-13, 2015

Organizers:

Neil Balmforth (University of British Columbia)
Nicholas Brummell (University of California, Santa Cruz)
Colm-Cille Caulfield (University of Cambridge)

Pascale Garaud (University of California, Santa Cruz)
Bruce Sutherland (University of Alberta)

The goal was to engage scientists (astrophysicists, oceanographers, applied mathematicians) in learning about recent research progress in answering such questions in these physically distinct, but mathematically intimately related fields. By promoting pedagogy, and the training of young researchers to think in a mathematical and multidisciplinary way from the beginning, we hope to promote "outside-the-box" scientific inquiry, and from there, substantial progress in understanding these complex systems.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5065

Participants:

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Caulfield, Colm-Cille (University of Cambridge)
Cenedese, Claudia (Woods Hole Oceanographic Institution)
Cho, James (Queen Mary University of London)
Diamond, Pat (University of California, San Diego)
Dif-Pradalier, Guilhem (CEA)
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Fried, Eliot (Okinawa Institute of Science and Technology)
Garaud, Pascale (University of California at Santa Cruz)
Hernandez-Duenas, Gerardo (Universidad Nacional Autónoma de México)
Hughes, David (University of Leeds)
Knobloch, Edgar (University of California, Berkeley)
Lelong, Pascale (NorthWest Research Associates)

Linden, Paul (University of Cambridge)
Marston, John (Brown University)
Meiburg, Eckart (University of California, Santa Barbara)
Moll, Ryan (University of California, Santa Cruz)
Paparella, Francesco (Università del Salento)
Peltier, Richard (University of Toronto)
Reali, Jo Fawna (University of California, Santa Cruz)
Schmitt, Ray (Woods Hole Oceanographic Institute)
Stellmach, Stephan (University Muenster Germany)
Sutherland, Bruce (University of Alberta)
Timmermans, Mary-Louise (Yale University)
Venayagamoorthy, Karan (Colorado State University)
Worster, Grae (University of Cambridge)
Wuest, Alfred (Johny) (Eidgenössische Anstalt für Wasserversorgung, Abwasserreinigung und Gewässerschutz)
Young, William (University of California, San Diego)

Sandpile Groups
November 15-20, 2015

Organizers:

Luis Garcia Puente (Sam Houston State University)
Dino Lorenzini (University of Georgia)
Criel Merino (Universidad Nacional Autónoma de México)

David Perkinson (Reed College)
Carlos Enrique Valencia Oleta (National Polytechnic Institute)

The topics of the workshop included the graph-theoretic Riemann-Roch theorem of Baker and Norine and generalizations, the study of critical configurations as matroid invariants, the abelian networks of Dhar and generalizations, and the pattern formation of sandpile aggregations.

For details, please refer to the workshop webpage
http://www.birs.ca/events/2015/5-day-workshops/15w5119

Participants:

Alfaro Montufar, Carlos Alejandro (Banxico)
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Chan, Melody (Brown University)
Chan, Swee Hong (Cornell University)
Corrales Sanchez, Hector Hugo (Center for Research and Advanced Studies of the National Polytechnic Institute)
Corry, Scott (Lawrence University)
Dochtermann, Anton (University of Texas at Austin)
Duval, Art (University of Texas at El Paso)
Florescu, Laura (New York University)
Garay, Cristhian (Universidade Federal Fluminense)
Garcia, Rebecca (Sam Houston State University)
Garcia Puente, Luis (Sam Houston State University)
Glass, Darren (Gettysburg College)
Hincapié Hincapié, Yuliana Maria (Centro de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional)
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Huss, Wilfried (Cornell University)
KALININ, Nikita (University of Geneva)
Kaplan, Nathan (University of California, Irvine)
Keough, Lauren (Davidson College)
Kiss, Viktor (Eötvös Loránd University)
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Koplewitz, Shaked (Yale University)
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Casa Matemática Oaxaca is located in the city of Oaxaca, Mexico. Oaxaca is a UNESCO designated World Heritage site. Construction of new facilities will be underway shortly. In the mean time, CMO is operating out of the Hotel Hacienda Los Laureles and Hotel Angel Inn, in the city of Oaxaca.

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