

BIRS-CMO 2016 Annual Report



Banff International Research Station
for Mathematical Innovation and Discovery



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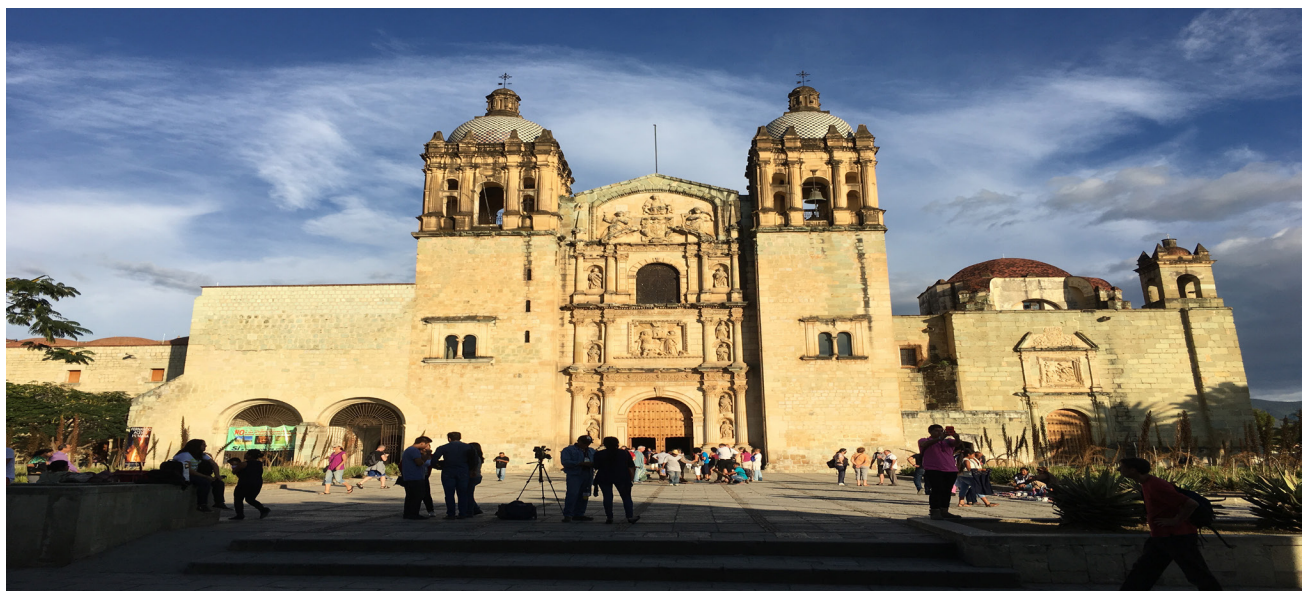


CONACYT
Consejo Nacional de Ciencia y Tecnología

Alberta
Government



Casa Matemática Oaxaca
Centro de investigación y enseñanza



CONACYT
Consejo Nacional de Ciencia y Tecnología

5-Day Workshops 2016

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|--------|--------|--|
| Jan 10 | Jan 15 | Early Career Investigators Meeting on Quantitative Problems in Human Genetics and Health |
| Jan 10 | Jan 15 | Creative Writing in Mathematics and Mathematical Sciences |
| Jan 17 | Jan 22 | Computational and Numerical Analysis of Transient Problems in Acoustics, Elasticity, and Electromagnetism |
| Jan 24 | Jan 29 | Exploiting New Advances in Mathematics to Improve Calculations in Quantum Molecular Dynamics |
| Jan 31 | Feb 5 | Mathematical and Statistical Challenges in Neuroimaging Data Analysis |
| Feb 7 | Feb 12 | Vertex Algebras and Quantum Groups |
| Feb 14 | Feb 19 | Equivariant Derived Algebraic Geometry |
| Feb 21 | Feb 26 | Synchronizing Smooth and Topological 4-Manifolds |
| Feb 28 | Mar 4 | Gauge/Gravity Duality and Condensed Matter Physics |
| Mar 6 | Mar 11 | Homological Mirror Geometry |
| Mar 13 | Mar 18 | Lefschetz Properties and Artinian Algebras |
| Mar 13 | Mar 18 | Improving the Quantitative Interpretation of Simulation Models |
| Mar 20 | Mar 25 | Interactions of Gauge Theory with Contact and Symplectic Topology in Dimensions 3 and 4 |
| Mar 27 | Apr 1 | Women in Noncommutative Algebra and Representation Theory (WINART) |
| Apr 3 | Apr 8 | Free Resolutions, Representations, and Asymptotic Algebra |
| Apr 10 | Apr 15 | Beta Ensembles: Universality, Integrability, and Asymptotics |
| Apr 17 | Apr 22 | Quantum Computer Science |
| Apr 24 | Apr 29 | Women in Topology II |
| May 1 | May 6 | Complex Analysis and Complex Geometry |
| May 8 | May 13 | Variational Models of Fracture |
| May 15 | May 20 | Computational Modeling in Games |
| May 22 | May 27 | Operations in Highly Structured Homology Theories |
| May 29 | Jun 3 | Ion Transport: Electrodifusion, Electrohydrodynamics and Homogenization |
| Jun 5 | Jun 10 | Recent Advances in Hydrodynamics |
| Jun 12 | Jun 17 | Uncertainty Modeling in the Analysis of Weather, Climate and Hydrological Extremes |
| Jun 19 | Jun 24 | Triangulated Categories and Applications |
| Jun 26 | Jul 1 | New Directions in Iwasawa Theory |
| Jul 3 | Jul 8 | Developing a Comprehensive, Integrated Framework for Advanced Statistical Analyses of Observational Studies |
| Jul 10 | Jul 15 | Geometric and Analytic Inequalities |
| Jul 17 | Jul 22 | Geometric Analysis and General Relativity |
| Jul 24 | Jul 29 | Whittaker Functions: Number Theory, Geometry and Physics |
| Jul 31 | Aug 5 | Algebraic and Spectral Graph Theory |
| Aug 7 | Aug 12 | EPIC - Enabling Process Innovation through Computation |
| Aug 14 | Aug 19 | Newest Developments and Urgent Issues in Measurement Error & Latent Variable Problems |
| Aug 21 | Aug 26 | Geometrical Degrees of Freedom in Topological Phases |
| Aug 28 | Sep 2 | Coupled Mathematical Models for Physical and Biological Nanoscale Systems and Their Applications |
| Sep 4 | Sep 9 | Computational Complexity |
| Sep 11 | Sep 16 | Bridges Between Noncommutative Algebra and Algebraic Geometry |
| Sep 18 | Sep 23 | Integro-difference Equations in Ecology: 30 years and counting |
| Sep 25 | Sep 30 | Modular Forms in String Theory |
| Oct 2 | Oct 7 | Painleve Equations and Discrete Dynamics |
| Oct 9 | Oct 14 | Modeling and Quantifying Cell Function: 25 years of Cell Mechanobiology |
| Oct 16 | Oct 21 | New Trends in Graph Coloring |
| Oct 23 | Oct 28 | Workshop in Analytic and Probabilistic Combinatorics |
| Oct 30 | Nov 4 | Theoretical and Computational Aspects of Nonlinear Surface Waves |
| Nov 6 | Nov 11 | Random Geometric Graphs and Their Applications to Complex Networks |
| Nov 13 | Nov 18 | Permutation Groups |
| Nov 20 | Nov 25 | Mathematical Biology for Understanding Emerging Infectious Diseases at the Human-Animal-Environment Interface: a "One Health" Approach |
| Nov 27 | Dec 2 | Fifth Parallel-in-Time Integration Workshop |
| Dec 4 | Dec 9 | Analytic Versus Combinatorial in Free Probability |

2-Day Workshops 2016

Mar 11 Mar 13 Big Data Tsunami at the Interface of Statistics, Environmental Sciences and Beyond
Apr 1 Apr 3 Continuing to Connect: Computational Thinking, Design Thinking, Critical Thinking in the Elementary Classroom
Apr 15 Apr 17 Alberta Number Theory Days VIII
Apr 29 May 1 56th Cascade Topology Seminar
May 6 May 8 Ted Lewis Math Fair Workshop 2016
Jul 22 Jul 24 Surgery and Geometry
Aug 19 Aug 21 Geophysical Simulation and Inversion
Sep 2 Sep 4 Robustness Theory and Methodology: Recent Advances and Future Directions
Sep 23 Sep 25 Retreat for Young Researchers in Stochastics

Summer Schools

Jun 26 Jul 8 2016 Summer IMO Training Camp

Research In Teams

Feb 14 Feb 21 Multi-Banach Algebras and Fourier Algebras
Mar 20 Mar 27 Metastring Theory and Generalized Geometries
Apr 17 Apr 24 Random Partitions and Bayesian Nonparametrics
May 22 May 29 Gorenstein Homological Algebra
Jul 10 Jul 17 New Applications of Menger Curvature to Complex Analysis
Jul 24 Jul 31 Dynamics in Applied Functional Differential Equations
Jul 31 Aug 7 New Examples of Almost Non-Negative Curvature
Aug 28 Sep 4 Bivariate Orthogonal Polynomials and Eigenvalues of Hankel Matrices
Oct 15 Oct 22 Ergodicity in Nonlinear Stochastic Partial Differential Equations with Applications in Turbulent Geophysical Flows

Focused Research Groups

Jun 5 Jun 12 The Inverse Eigenvalue Problem of a Graph
Jun 12 Jun 19 Topological Methods in Model Theory
Jun 19 Jun 26 SYZ mirror symmetry
Aug 7 Aug 14 Entropy Theory in Dynamics
Aug 21 Aug 28 Random Graph Models in Phylogenetics
Sep 25 Oct 2 Ion Channels: Mathematical Modeling and Analysis
Nov 20 Nov 27 The Classification Problem for Quantum Groups

Banff International Research Station

2016

5-Day Workshops

Early Career Investigators Meeting on Quantitative Problems in Human Genetics and Health January 10 - 15, 2016

Organizers:

Noah Zaitlen (University of California San Francisco)
Michael Hoffman (Princess Margaret Cancer Centre/University of Toronto)

Tuuli Lappalainen (New York Genome Center)
Jennifer Listgarten (Microsoft Research)
Julien Ayroles (Princeton University)



The objectives of this workshop were: i) to identify and discuss statistical problems and opportunities afforded by contemporary data collections and cellular technologies; ii) to facilitate interactions between researchers focused on statistical methods and biological applications; iii) to discuss directions of future research in these areas; iv) to bring together early career researchers who specialize in relevant areas to exchange ideas and challenges, with the ultimate goal of establishing collaborations; and v) to share problems and strategies unique to early-stage faculty as well as future visions for the culture of the human genetics community.

For details, please refer to the workshop webpage
<http://www.birs.ca/events/2016/5-day-workshops/16w5078>

Participants:

Ayroles, Julien (Princeton University)
Battle, Alexis (Johns Hopkins University)
Cotsapas, Chris (Yale School of Medicine)
de Koning, Jason (University of Calgary)
Gravel, Simon (McGill University)
Hoffman, Michael (Princess Margaret Cancer Centre/University of Toronto)
Ionita-Laza, Iuliana (Columbia University)
Karlsson, Elinor (University of Massachusetts Medical School)
Khurana, Ekta (Weill Cornell Medicine)

Lappalainen, Tuuli (New York Genome Center)
MacArthur, Daniel (Massachusetts General Hospital)
Neale, Benjamin (MGH/Broad)
Pasaniuc, Bogdan (UCLA)
Pickrell, Joe (New York Genome Center)
Trapnell, Cole (University of Washington)
Ye, Jimmie (UCSF)
Zaitlen, Noah (University of California San Francisco)
Zou, James (MSR)

Creative Writing in Mathematics and Mathematical Sciences January 10 - 15, 2016

Organizers:

Marjorie Senechal (Smith College)

Florin Diacu (University of Victoria)



Creative writing in mathematics and mathematical sciences is an important way to disseminate knowledge and raise awareness among non-experts about how mathematics and science develop. This can be done in various ways, from fiction and popular science to poetry and drama, all involving either mathematical subjects or the people who research these topics. The writers who approach these genres are either journalists trained in mathematics and science or experts with literary talent. The goal of this workshop is to bring together successful and young enthusiastic writers, to discuss the latest trends in this direction of writing, and learn from each other towards producing new and original work that would give the general public a better feeling about how mathematics is done and a more realistic understanding of the people who practice it.

For details, please refer to the workshop webpage
<http://www.birs.ca/events/2016/5-day-workshops/16w5093>

Participants:

Anand, Madhur (University of Guelph)
Chapman, Robin (University of Wisconsin)
Dawson, Robert (St. Mary's University)
Feaver, Amy (The King's University)
Grosholz, Emily (Penn State University)
Growney, JoAnne (independent)
Grundman, Helen (Bryn Mawr College)
Harriss, Edmund (University of Arkansas)
Ingall, Corrie (College of the Atlantic)
Karaali, Gizem (Pomona College)

Maddow, Ellen (independent)
Mazur, Joe (Marlboro College)
Merow, Katharine (Independent)
O'Shea, Donal (New College of Florida)
Ording, Philip (Sarah Lawrence College)
Roberts, Siobhan (Siobhan Roberts)
Senechal, Marjorie (Smith College)
Whitcher, Ursula (American Mathematical Society)
Zimet, Paul (Talking Band)

Computational and Numerical Analysis of Transient Problems in Acoustics, Elasticity, and Electromagnetism

January 17 - 22, 2016

Organizers:

Peter Monk (University of Delaware)

Christian Lubich (University of Tuebingen)



The primary goal of this conference was to bring together experts in time domain integral equations, time domain volume techniques, linear system solvers and absorbing boundary conditions in order to explore the strengths and weakness of the various approaches in a collaborative environment. Researchers from these groups are very rarely together in one venue.

For details, please refer to the workshop webpage
<http://www.birs.ca/events/2016/5-day-workshops/16w5071>

Participants:

Abdulle, Assyr (Ecole Polytechnique Fédérale de Lausanne)
Banjai, Lehel (Heriot-Watt University)
Barucq, Helene (INRIA)
Cools, Kristof (University of Nottingham)
Darrigrand, Eric (University of Rennes)
Davies, Penny (University of Strathclyde)
Dominguez, Victor (Public University of Navarre)
Duncan, Dugald (Heriot-Watt University)
Gander, Martin (Université de Genève)
Groth, Samuel (ENSTA)
Hagstrom, Tom (Southern Methodist University)
Halpern, Laurence (University Paris 13)
Hassell, Matthew (University of Delaware)
Hipp, David (Karlsruhe Institute of Technology)
Hiptmair, Ralf (Swiss Federal Institute of Technology-Zuerich)
Hochbruck, Marlis (Karlsruhe Institute of Technology)
Imbert-Gerard, Lise-Marie (New York University)
Joly, Patrick (ENSTA)
Kovacs, Balazs (University of Tuebingen)
Kray, Marie (University of Basel)
Li, Jichun (University of Nevada Las Vegas)
Lopez Fernandez, Maria (Gran Sasso Science Institute (GSSI))

Lubich, Christian (University of Tuebingen)
Melenk, Markus (Vienna University of Technology)
Michielssen, Eric (University of Michigan)
Moiola, Andrea (University of Reading)
Monegato, Giovanni (Polytechnic University of Turin)
Monk, Peter (University of Delaware)
Moreta, Maria Jesus (University Complutense of Madrid)
Qiu, Tianyu (University of Delaware)
Rapun, Maria-Luisa (Polytechnic University of Madrid)
Rezac, Jake (University of Delaware)
Rodriguez, Jeronimo (University of Santiago de Compostela)
Salles, Nicolas (University College London)
Sanchez-Vizuet, Tonatiuh (University of Delaware)
Sauter, Stefan (University of Zurich)
Sayas, Francisco-Javier (University of Delaware)
Schanz, Martin (Graz University of Technology)
Shaw, Simon (Brunel University UK)
Tsogka, Chrysoula (University of Crete and IACM/FORTH)
Vargas, Arturo (Rice University)
Weile, Daniel (University of Delaware)

Exploiting New Advances in Mathematics to Improve Calculations in Quantum Molecular Dynamics

January 24 - 29, 2016

Organizers:

Tucker Carrington (Queen's University)

George Hagedorn (Virginia Tech)



The motion of atoms in molecules and during reactions is governed by quantum mechanical equations that are easy to write down but extremely difficult to solve. The fundamental mathematical problems that prevent their solution are hampering progress in the field of molecular quantum dynamics. The workshop on exploiting new advances in mathematics to improve calculations in quantum molecular dynamics provided an opportunity for chemists, physicists, and mathematicians who are working in this field to interact and learn from one another. Although they work on similar problems they approach the problems differently and use different language. New interaction will lead to new progress. Understanding the motion of atoms has repercussions in numerous areas, including atmospheric chemistry, drug design, and combustion chemistry.

For details, please refer to the workshop webpage
<http://www.birs.ca/events/2016/5-day-workshops/16w5006>

Participants:

Avila, Gustavo (Queen's University)

Batista, Victor (Yale University)

Betz, Volker (TU Darmstadt)

Brown, James (Queen's University)

Carrington, Tucker (Queen's University)

Christiansen, Ove (Aarhus University)

Csaszar, Attila (Eotvos Lorand University)

Espig, Mike (RWTH Aachen University)

Felker, Peter (UCLA)

Gamble, Stephanie (Virginia Tech)

Gradinaru, Vasile Catrinel (ETH Zurich)

Griebel, Michael (Universitaet Bonn)

Hagedorn, George (Virginia Tech)

Hanna, Gabriel (University of Alberta)

Harbrecht, Helmut (University of Basel)

Joye, Alain (Institut Fourier, Université Grenoble 1)

Kapral, Raymond (University of Toronto)

Keller, Johannes (Technische Universität München)

Lasser, Caroline (Technische Universität München)

Lauvergnat, David (University of Paris-Sud)

Leclerc, Arnaud (Université de Lorraine)

Lubich, Christian (University of Tuebingen)

Manthe, Uwe (Bielefeld University)

Ohsawa, Tomoki (University of Texas at Dallas)

Oseledets, Ivan (Skolkovo Institute of Science and Technology)

Pelaez-Ruiz, Daniel (University of Lille)

Poirier, Bill (Texas Tech University)

Roy, Pierre-Nicholas (University of Waterloo)

Sattlegger, David (Technische Universität München)

Scheurer, Christoph (Technische Universität München)

Schneider, Reinhold (Technische Universität Berlin)

Tannor, David (Weizmann Institute of Science)

Teufel, Stefan (Universitaet Tuebingen)

Thomas, Phillip (Queen's University)

Troppmann, Stephanie (Technische Universität München)

Valeev, Edward (Virginia Tech)

Vanicek, Jiri (Ecole Polytechnique Federale de Lausanne)

Wang, Haobin (University of Colorado at Denver)

Wodraszka, Robert (Queen's University)

Mathematical and Statistical Challenges in Neuroimaging Data Analysis January 31 - February 5, 2016

Organizers:

Brian Caffo (Johns Hopkins University)
Farouk Nathoo (University of Victoria)
Hongtu Zhu (University of North Carolina at Chapel Hill)

Linglong Kong (University of Alberta)
Todd Ogden (Columbia University)



The goal of this workshop was to bring together a diverse group of researchers from different disciplines including statistics, mathematics, computer science, biomedical engineering, psychiatry, psychology, neuroscience, and radiology, among other related sciences, to explore the common structure that underlies such methodologies, to discuss open problems, and to use this knowledge in turn to motivate and synthesize new avenues of research that will provide statistical tools that will help answer some of the biggest questions of modern science.

For details, please refer to the workshop webpage
<http://www.birs.ca/events/2016/5-day-workshops/16w5036>

Participants:

Aston, John (Cambridge University)
Brown, Matthew (University of Alberta)
Chen, Shuo (University of Maryland)
Chung, Moo (University of Wisconsin-Madison)
Cobzas, Dana (University of Alberta)
Cribben, Ivor (Alberta School of Business)
Guindani, Michele (MD Anderson Cancer Center)
Guo, Ying (Emory University)
Harezlak, Jaroslaw (Indiana University)
Heo, Giseon (University of Alberta)
Hobbs, Brian (MD Anderson Cancer Center)
Holroyd, Clay (University of Victoria)
Hu, Jianhua (MD Anderson Cancer Center)
Huang, Chao (University of North Carolina at Chapel Hill)
Jiang, Bei (University of Alberta)
Johnson, Timothy D. (University of Michigan)
Kang, Jian (University of Michigan)
Kong, Linglong (University of Alberta)
Li, Yimei (St. Jude Children's Research Hospital)
Li, Lexin (University of California-Berkeley)
Lindquist, Martin (Johns Hopkins University)
Liu, Kevin (Marquette University)
Morris, Jeffrey (M.D. Anderson Cancer Center)
Muschelli, John (Johns Hopkins University)
Nan, Bin (University of Michigan)
Nathoo, Farouk (University of Victoria)

Ogden, Todd (Columbia University)
Ombao, Hernando (University of California Irvine)
Pan, Wei (University of Minnesota)
Peng, Jie (University of California, Davis)
Polzehl, Joerg (Weierstrass Institute for Applied Analysis and Stochastics)
Risk, Benjamin (Statistical and Applied Mathematical Sciences Institute and University of North Carolina)
Rowe, Daniel (Marquette University)
Shinohara, Russell (University of Pennsylvania)
Singh, Vikas (University of Wisconsin-Madison)
Song, Yin (University of Victoria)
Srivastava, Anuj (Florida State University)
Strother, Stephen (Baycrest/University of Toronto)
Tu, Wei (University of Alberta)
Vannucci, Marina (Rice University)
Wang, Xiao (Purdue University)
Yu, Yang (University of North Carolina at Chapel Hill)
Zhang, Tingting (University of Virginia)
Zhang, Zhengwu (SAMSI)
Zhang, Jingwen (University of North Carolina at Chapel Hill)
Zhao, Yihong (New York University)
Zhu, Hongtu (University of North Carolina at Chapel Hill)

Vertex Algebras and Quantum Groups

February 7 - 12, 2016

Organizers:

Michael Lau (Université Laval)
Antun Milas (State University of New York at Albany)

Kailash Misra (North Carolina State University)
Yuly Billig (Carleton University)



Over the last thirty years, vertex algebras and quantum groups have emerged as important areas of mathematical research with numerous connections to many of the same areas of mathematics and mathematical physics. This meeting aimed to bring together experts in both of these domains in hopes of illuminating some of the connections between these areas. It has the potential to fundamentally impact the development of quantum vertex algebras, and to significantly advance our understanding of the relationship between vertex algebras and quantum groups.

For details, please refer to the workshop webpage
<http://www.birs.ca/events/2016/5-day-workshops/16w5070>

Participants:

Adamovic, Drazen (University of Zagreb)
Andersen, Henning Haahr (Aarhus University)
Angelova, Iana (College of Charleston)
Barron, Katrina (University of Notre Dame)
Bergvelt, Maarten (University of Illinois)
Billig, Yuly (Carleton University)
Creutzig, Thomas (University of Alberta)
Dong, Chongying (University of California)
Gainutdinov, Azat (DESY Hamburg and LMPT Tours (CNRS))
Gannon, Terry (University of Alberta)
Gao, Yun (York University)
Guay, Nicolas (University of Alberta)
Hansen, Brittany (North Carolina State University)
He, Xiao (Université Laval)
Jing, Naihuan (North Carolina State University)
Kanade, Shashank (University of Alberta)
Kawesetsu, Kazuya (University of Tokyo)
Lau, Michael (Université Laval)
Li, Haisheng (Rutgers University at Camden)

Linshaw, Andy (University of Denver)
Malikov, Fyodor (University of Southern California)
McRae, Robert (Peking University)
Milas, Antun (State University of New York at Albany)
Misra, Kailash (North Carolina State University)
Mukhin, Evgeny (Indiana University Purdue University Indianapolis)
Nagatomo, Kiyokazu (Osaka University)
Nakano, Daniel (University of Georgia)
Regelskis, Vidas (University of Surrey)
Toledano Laredo, Valerio (Northeastern University)
van Ekeren, Jethro (Universidade Federal Fluminense (UFF))
Weekes, Alex (University of Toronto)
Wendlandt, Curtis (University of Alberta)
Wood, Simon (Australian National University)
Yang, Yaping (University of Massachusetts)
Zeitlin, Anton (Columbia University)

Equivariant Derived Algebraic Geometry

February 14 - 19, 2016

Organizers:

Michael Hill (University of California Los Angeles)
Andrew Blumberg (University of Texas)

Teena Gerhardt (Michigan State University)
Tyler Lawson (University of Minnesota)



Our primary goal was to bring together equivariant homotopy theorists and [derived] algebraic geometers to attempt to unify approach and strengthen connections. The field of equivariant derived algebraic geometry is relatively new and rapidly expanding, making this the opportune moment to gather researchers in the area, lay foundations, and make the field more accessible to early career researchers.

For details, please refer to the workshop webpage
<http://www.birs.ca/events/2016/5-day-workshops/16w5133>

Participants:

Barwick, Clark (MIT)
Belmont, Eva (MIT)
Bergner, Julie (University of California - Riverside)
Berman, John (University of Virginia)
Blumberg, Andrew (University of Texas)
Bohmann, Anna Marie (Vanderbilt University)
Bonventre, Peter (University of Virginia)
Campbell, Jonathan (University of Texas)
Dotto, Emanuele (MIT)
Dugger, Daniel (University of Oregon)
Dundas, Bjorn (University of Bergen)
Gepner, David (Purdue University)
Gerhardt, Teena (Michigan State University)
Glasman, Saul (MIT)
Goerss, Paul (Northwestern University)
Greenlees, John (University of Sheffield)
Guillou, Bert (University of Kentucky)
Hesselholt, Lars (Nagoya University)
Hill, Michael (UCLA)
Hoyois, Marc (MIT)
Isaksen, Dan (Wayne State University)

Kriz, Igor (University of Michigan)
Lawson, Tyler (University of Minnesota)
Mandell, Michael A. (Indiana University)
Mathew, Akhil (Harvard University)
May, Peter (University of Chicago)
Meier, Lennart (University of Bonn)
Merling, Mona (Johns Hopkins University)
Nakaoka, Hiroyuki (Kagoshima University)
Noel, Justin (University of Regensburg)
Ormsby, Kyle (Reed College)
Osorno, Angelica (Reed College)
Ravenel, Douglas (University of Rochester)
Ricka, Nicolas (Wayne State University)
Royer, Aaron (University of Texas at Austin)
Schwede, Stefan (Universitaet Bonn)
Shipley, Brooke (University of Illinois, Chicago)
Stojanoska, Vesna (University of Illinois Urbana Champaign)
Williams, Ben (University of British Columbia)
Yarnall, Carolyn (University of Kentucky)

Synchronizing Smooth and Topological 4-Manifolds

February 21 - 26, 2016

Organizers:

Matthew Hedden (Michigan State University)
Jen Hom (Columbia University)

Kent Orr (Indiana University)
Mark Powell (Université du Québec à Montréal)



This workshop brought together a diverse collection of researchers, with a particular emphasis on bridging a chasm between the knowledge bases of researchers studying 4-manifolds in the topological and smooth categories.

For details, please refer to the workshop webpage
<http://www.birs.ca/events/2016/5-day-workshops/16w5145>

Participants:

Cha, Jae Choon (POSTECH)
Davis, Christopher (University of Wisconsin - Eau Claire)
Donald, Andrew (Michigan State University)
Feller, Peter (Boston College)
Friedl, Stefan (Universität Regensburg)
Gay, David (University of Georgia)
Hedden, Matthew (Michigan State University)
Hendricks, Kristen (Michigan State University)
Hildum, Alyson (McMaster University)
Hom, Jen (Columbia University)
Jabuka, Stanislav (University of Nevada Reno)
Kim, Taehee (Konkuk University)
Kirby, Robion (University of California)
Kirk, Paul (Indiana University)
Krcatovich, David (Rice University)
Krushkal, Slava (University of Virginia)
Lecuona, Ana (Aix-Marseille Université)
Levine, Adam (Princeton University)
Lewark, Lukas (Universität Bern)
Lin, Francesco (MIT)
Livingston, Charles (Indiana University)

Lobb, Andrew (Durham University)
Meier, Jeffrey (Indiana University)
Melvin, Paul (Bryn Mawr College)
Moore, Allison (Rice University)
Murphy, Emmy (MIT)
Nagel, Matthias (University of Regensburg)
O'Donnol, Danielle (Indiana University)
Orr, Kent (Indiana University)
Pinzon-Caicedo, Juanita (University of Georgia)
Powell, Mark (Université du Québec à Montréal)
Ruberman, Daniel (Brandeis University)
Sato, Kouki (Tokyo institute of Technology)
Schneiderman, Rob (Lehman College)
Song, Minkyung (Handong Global University)
Starkston, Laura (Stanford University)
Stipsicz, Andras (Hungarian Academy of Sciences)
Teichner, Peter (Max Planck Institute for Mathematics Bonn & University of California at Berkeley)
Wang, Shida (Indiana University)
Zupan, Alex (University of Nebraska-Lincoln)

Gauge/Gravity Duality and Condensed Matter Physics

February 28 - March 4, 2016

Organizers:

Johanna Erdmenger (Max Planck Institute, Munich) **Rozali Moshe** (University of British Columbia)



The objective of this five-day workshop was an intensive exchange of ideas between string theorists and condensed matter physicists in order to develop and consolidate the use of gauge/gravity duality for describing strongly coupled systems of relevance in condensed matter physics. Physical systems that may have dual holographic descriptions include quantum critical points, high- T_c superconductors, quantum Hall systems, systems that exhibit parity breaking, non-equilibrium configurations and quantum quenches, entanglement entropy, non-relativistic critical systems as well as fluid mechanics and turbulence.

For details, please refer to the workshop webpage
<http://www.birs.ca/events/2016/5-day-workshops/16w5067>

Participants:

Altman, Ehud (Weizmann Institute of Science)
Ammon, Martin (Jena University)
Andrade, Tomas (University of Oxford)
Arean, Daniel (Max Plack institute Munich)
Cremonini, Sera (Lehigh University)
Erdmenger, Johanna (Max Planck Institute)
Gauntlett, Jerome (Imperial College London)
Gentle, Simon (University of California, Los Angeles)
Gordon, James (University of British Columbia)
Gouteraux, Blaise (Stanford U & APC, CNRS Paris)
Gubser, Steven (Princeton University)
Hernandez, Juan (University of Victoria)
Herzog, Chris (Stony Brook University)
Hubeny, Veronika (University of Durham)
Jeevanesan, Bhilahari (Karlsruhe Institute of Technology)
Jensen, Kristan (Stony Brook University)
Jimenez, Amadeo (Jena University)
Kaminski, Matthias (University of Alabama)
Karch, Andreas (University of Washington)

Kovtun, Pavel (University of Victoria)
Kristjansen, Charlotte (Niels Bohr Institute)
Landsteiner, Karl (IFT-UAM/CSIC Madrid)
Lee, Sung-Sik (McMaster)
Lee, Jaehoon (University of British Columbia)
Liu, Hong (Massachusetts Institute of Technology)
Lucas, Andy (Harvard)
Meyer, Rene (Stony Brook University)
Polkovnikov, Anatoli (Boston University)
Rangamani, Mukund (Durham University)
Rozali, Moshe (University of British Columbia)
Sachdev, Subir (Harvard University)
Semenoff, Gordon (University of British Columbia)
Sonner, Julian (University of Geneva)
Traverso, Niccolo (Wuerzburg University)
Vincart-Emard, Alexandre (University of British Columbia)
Wong, Anson (University of British Columbia)
Wu, Jackson (University of Alabama)
Yarom, Amos (Technion)
Zaanen, Jan (Lorentz Institute University of Leiden)

Homological Mirror Geometry

March 6 - 11, 2016

Organizers:

Matthew Ballard (University of South Carolina)
Colin Diemer (University of Miami)

David Favero (University of Alberta)



This workshop gathered researchers working at the intersection of these themes: the interplay between the birational geometry of varieties with the symplectic geometry of their mirrors, often mediated by categorical considerations. Cutting-edge developments at this intersection include the study of the minimal model program for moduli spaces of sheaves via Bridgeland stability conditions, comparisons between derived categories through Geometric Invariant Theory, the classification of Fano varieties via their Landau-Ginzburg mirrors, and the construction of generalized Theta functions on log Calabi Yau manifolds through mirror symmetry.

For details, please refer to the workshop webpage
<http://www.birs.ca/events/2016/5-day-workshops/16w5062>

Participants:

Addington, Nick (University of Oregon)
Aldi, Marco (Virginia Commonwealth University)
Anno, Rina (Massachusetts Institute of Technology)
Aspinwall, Paul (Duke University)
Ballard, Matthew (University of South Carolina)
Bayer, Arend (University of Edinburgh)
Bolognese, Barbara (Northeastern University)
Clarke, Patrick (Drexel University)
Corti, Alessio (Imperial College London)
Diemer, Colin (University of Miami)
Donovan, Will (Kavli IPMU, University Of Tokyo)
Doran, Charles (University of Alberta, Canada)
Favero, David (University of Alberta)
Halpern-Leistner, Daniel (Columbia University)
Harder, Andrew (University of Miami)
Hori, Kentaro (Kavli Institute for the Physics and Mathematics of the Universe)
Horja, Paul (University of Miami)
Hosono, Shinobu (Gakushuin University)
Ingalls, Colin (University of New Brunswick)

Karzhemanov, Ilya (IPMU)
Kasprzyk, Alexander (University of Nottingham)
Katzarkov, Ludmil (University of Miami)
Kelly, Tyler (University of Cambridge)
Kerr, Gabriel (Kansas State University)
Liu, Yijia (McGill University)
Logvinenko, Timothy (Cardiff University)
Pearlstein, Gregory (Texas A&M)
Rizzardo, Alice (SISSA)
Rozhkovskaya, Natasha (Kansas State University)
Ruddat, Helge (Johannes Gutenberg-Universität Mainz)
Sawon, Justin (University of North Carolina)
Schmidt, Benjamin (The Ohio State University)
Segal, Ed (Imperial College London)
Sharpe, Eric (Virginia Tech)
Toda, Yukinobu (University of Tokyo)
Whitcher, Ursula (American Mathematical Society)
Zharkov, Ilia (Kansas State University)

Lefschetz Properties and Artinian Algebras

March 13 - 18, 2016

Organizers:

Anthony Iarrobino (Northeastern University)
Sara Faridi (Dalhousie University)
Larry Smith (University of Göttingen)

Junzo Watanabe (Tokai University)
Rosa-Maria Miro-Roig (University of Barcelona)



The study of the Lefschetz properties of commutative algebras in their own right began only relatively recently and seems to go back to a paper of R.P. Stanley in 1977 which connected the strong Lefschetz property with diverse combinatorial structures, among them the Sperner property of a finite poset, using a mixture of algebraic geometry, commutative algebra, and combinatorics. It is only in the last dozen years or so that several research teams around the globe have begun reorganizing the theory of commutative Artin algebras from this viewpoint, and a research monograph summarizing portions of this program appeared in 2013. In 2012 Prof. Watanabe organized, with input from the other organizers, a very small workshop with 14 participants in Hawaii at Tokai University college campus. This BIRS workshop was to continue and broaden the participants of this series and facilitate a deepening of this work.

For details, please refer to the workshop webpage
<http://www.birs.ca/events/2016/5-day-workshops/16w5114>

Participants:

Boij, Mats (KTH Royal Institute of Technology)
Cook II, David (Eastern Illinois University)
Faridi, Sara (Dalhousie University)
Gondim Neves, Rodrigo José (Universidade Federal Rural de Pernambuco)
Iarrobino, Anthony (Northeastern University)
Juhnke-Kubitzke, Martina (University of Osnabrück)
Khatami, Leila (Union College)
McDaniel, Christopher (Endicott College)
Mezzetti, Emilia (University of Trieste)
Migliore, Juan (University of Notre Dame)

Miro-Roig, Rosa-Maria (University of Barcelona)
Murai, Satoshi (Osaka University)
Nagel, Uwe (University of Kentucky)
Nevo, Eran (The Hebrew University of Jerusalem)
Schenck, Hal (University of Illinois Urbana Champaign)
Seceleanu, Alexandra (University of Nebraska)
Smith, Larry (University of Göttingen)
Valles, Jean (University of Pau)
Vraciu, Adela (University of South Carolina)
Wachi, Akihito (Hokkaido University of Education)
Watanabe, Junzo (Tokai University)

Improving the Quantitative Interpretation of Simulation Models March 13 - 18 2016

Organizers:

Leonard Smith (London School of Economics (and
Pembroke College Oxford))

Robert Rosner (University of Chicago)



Despite the fact that mathematical simulations are now common place in science, decision making, forward planning, policy, regulation, and litigation, the fundamental connections between a mathematical simulation and the empirical quantities of the world it targets remain vague and wishy-washy. The focus of this meeting was not so much how science and policy draw insights from the general behaviour of complicated simulation modelling, but rather on the mathematical foundation and empirical justification for quantitative interpretation of simulations for use in the real world, the design of computational experiments and model inter-comparisons, the quantitative comparison of simulation and observations under controlled lab conditions, and the end-to-end communication of information between all those involved.

For details, please refer to the workshop webpage
<http://www.birs.ca/events/2016/5-day-workshops/16w5117>

Participants:

Berger, Jim (Duke University)
Bogdan, Tom
Du, Hailiang (U Chicago)
Mason, Simon (The Earth Institute of Columbia
University)
Nissan, Hannah (Columbia University)
Oberkampf, William (WLO Consulting)
Petersen, Arthur (University College London (UCL))
Rosner, Robert (University of Chicago)

Smith, Leonard (London School of Economics (and
Pembroke College Oxford))
Stainforth, Dave (London School of Economics and
Political Science)
Tribbia, Joe (National Center for Atmospheric
Research)
von Hardenberg, Jost (Institute of Atmospheric
Sciences and Climate - National Research Council)
Wehner, Michael (Lawrence Berkeley Lab)

Interactions of Gauge Theory with Contact and Symplectic Topology in Dimensions 3 and 4

March 20 - 25, 2016

Organizers:

Hans Boden (McMaster University)
Denis Auroux (University of California, Berkeley)

Olivier Collin (Université de Québec à Montréal)
John Etnyre (Georgia Institute of Technology)



The workshop brought together researchers working in various areas of geometric topology, symplectic and contact geometry and topology, and gauge theory, in order to foster collaborations between these different groups and explore a variety of approaches to problems in low-dimensional topology. These areas of mathematics have recently had highly fruitful interactions and are poised for more in the future.

For details, please refer to the workshop webpage
<http://www.birs.ca/events/2016/5-day-workshops/16w5096>

Participants:

Auckly, Dave (Kansas State University)
Baldwin, John (Boston College)
Baykur, Inanc (University of Massachusetts)
Boden, Hans (McMaster University)
Boyer, Steven (Université du Québec à Montréal)
Chantraine, Baptiste (Université de Nantes)
Clay, Adam (University of Manitoba)
Colin, Vincent (Université de Nantes)
Collin, Olivier (Université de Québec à Montréal)
Cornwell, Chris (Université de Québec À Montréal)
Duncan, David (McMaster University)
Dunfield, Nathan (University of Illinois (Urbana-Champaign))
Friedl, Stefan (Universität Regensburg)
Ghiggini, Paolo (CNRS - Laboratoire Jean Leray (Nantes))
Gordon, Cameron (University of Texas at Austin)
Greene, Josh (Boston College)
Grigsby, J. Elisenda (Boston College)
Hedden, Matthew (Michigan State University)
Herald, Chris (University of Nevada - Reno)
Hom, Jen (Columbia University)
Hutchings, Michael (University of California)
Karimi, Homayun (McMaster University)
Kazez, William (University of Georgia)
Kirk, Paul (Indiana University)
Kutluhan, Cagatay (University at Buffalo)
Lin, Francesco (MIT)
Lipshitz, Robert (Columbia University)
Matic, Gordana (University of Georgia)
Nagel, Matthias (Université de Québec À Montréal)
Ng, Lenny (Duke University)
Owens, Brendan (University of Glasgow)
Park, Jongil (Seoul National University)
Plamenevskaya, Olga (State University of New York at Stony Brook)
Poudel, Prayat (McMaster University)
Rasmussen, Jacob (University of Cambridge)
Roberts, Rachel (Washington University)
Saveliev, Nikolai (University of Miami)
Sivek, Steven (Princeton University)
Starkston, Laura (Stanford University)
Van Horn-Morris, Jeremy (University of Arkansas)
Watson, Liam (Université de Sherbrooke)

Women in Noncommutative Algebra and Representation Theory

March 27 - April 1, 2016

Organizers:

Georgia Benkart (University of Wisconsin-Madison)
Ellen Kirkman (Wake Forest University)

Chelsea Walton (Temple University)
Susan Montgomery (University of Southern California)



The goal of the workshop, Women in Noncommutative Algebra and Representation Theory (WINART), was to facilitate collaborations among women mathematicians in these areas of research. The compelling need for the workshop is the underrepresentation of women at major research conferences and workshops in the areas of the WINART workshop. The aim of the event was to create an avenue for the participants, especially the early-career ones, to maintain a sustainable research career and to acquaint participants with exciting new directions of research.

For details, please refer to the workshop webpage
<http://www.birs.ca/events/2016/5-day-workshops/16w5023>

Participants:

Balagovic, Martina (Newcastle University)
Baur, Karin (Universität Graz)
Benkart, Georgia (University of Wisconsin-Madison)
Camacho, Ana Ros (Institut de Mathématiques de Jussieu-Paris Rive Gauche)
Daugherty, Zaji (City College of New York)
Faber, Eleonore (University of Michigan)
Fryer, Sian (University of Leeds)
Gorelik, Maria (Weizmann Institute)
Gratz, Sira (Leibniz Universität Hannover)
Halacheva, Iva (University of Toronto)
Harris, Pamela (United States Military Academy)
Hennig, Johanna (University of Alberta)
Im, Mee Seong (USMA)
Kanstrup, Tina (Hausdorff Center for Mathematics)
Kirkman, Ellen (Wake Forest University)
Letzter, Gail (Department of Defense)
Meinel, Joanna (Universität Bonn)
Mejia Castano, Luz Adriana (Universidade federal de Santa Catarina-Brazil)
Montgomery, Susan (University of Southern California)
Natale, Sonia (Universidad Nacional de Córdoba. CIEM-CONICET)

Nguyen, Van (Northeastern University)
Norton, Emily (Kansas State University)
Orellana, Rosa (Dartmouth College)
Patrias, Rebecca (Université du Québec à Montréal)
Pauwels, Bregje (The Australian National University)
Redondo, Maria (Universidad Nacional del Sur)
Schumann, Bea (University of Cologne)
Serganova, Vera (University of California, Berkeley)
Serhiyenko, Khrystyna (UC Berkeley)
Shepler, Anne (University of North Texas)
Sierra, Susan (University of Edinburgh)
Solotar, Andrea (Universidad de Buenos Aires)
Spenko, Spela (University of Edinburgh)
Stroppel, Catharina (Universität Bonn)
Todorov, Gordana (Northeastern University)
Vancliff, Michaela (University of Texas at Arlington)
Vazirani, Monica (University of California, Davis)
Veerapen, Padmini (Tennessee Tech University)
Vega, Maria (United States Military Academy)
Walton, Chelsea (Temple University)
Wiesner, Emilie (Ithaca College)
Witherspoon, Sarah (Texas A&M University)

Free Resolutions, Representations, and Asymptotic Algebra

April 3 - 8, 2016

Organizers:

Daniel Erman (University of Wisconsin-Madison)

Gregory G. Smith (Queen's University)



In commutative algebra, as in many fields of mathematics, many modules of interest naturally occur in families $\{M_n\}$ indexed by the nonnegative integers. Moreover, the numerical invariants or algebraic properties of the modules M_n often stabilize for all sufficiently large n . Inspired by several parallel developments and striking new examples, this workshop aims to solidify, consolidate, and analyze this emerging asymptotic algebraic phenomenon. The novelty of the motivating results and the lack of any comparable conference create a unique opportunity.

For details, please refer to the workshop webpage
<http://www.birs.ca/events/2016/5-day-workshops/16w5155>

Participants:

Avramov, Luchezar (University of Nebraska)

Berkesch Zamaere, Christine (University of Minnesota)

Church, Thomas (Stanford University)

Conca, Aldo (University of Genova)

Draisma, Jan (TU Eindhoven)

Eggermont, Rob (University of Michigan)

Ein, Lawrence (University of Illinois at Chigago)

Eisenbud, David (Mathematical Sciences Research Institute)

Elias, Juan (University of Barcelona Spain)

Ellenberg, Jordan (University of Wisconsin)

Erman, Daniel (University of Wisconsin-Madison)

Farkas, Gavril (Humboldt Universität zu Berlin)

Fulger, Mihai (Princeton University)

Galetto, Federico (McMaster University)

Hering, Milena (Edinburgh University)

Hersh, Patricia (North Carolina State University)

Hillar, Christopher (Redwood Center for Theoretical Neuroscience)

Iyengar, Srikanth (University of Utah)

Jiménez Rolland, Rita (Universidad Nacional

Autónoma de México)

Juhnke-Kubitzke, Martina (University of Osnabrück)

Krone, Robert (Queen's University)

Lazarsfeld, Robert (Stony Brook)

Lehmann, Brian (Boston College)

Leykin, Anton (Georgia Institute of Technology)

Maclagan, Diane (University of Warwick)

Mayer-Tang, Sarah (Quest University)

Nagel, Uwe (University of Kentucky)

Nagpal, Rohit (University of Chicago)

Putman, Andrew (Rice University)

Raicu, Claudiu (University of Notre Dame)

Ramos, Eric (University of Wisconsin Madison)

Sam, Steven (University of Wisconsin, Madison)

Smith, Gregory G. (Queen's University)

Snowden, Andrew (University of Michigan)

Stillman, Mike (Cornell University)

Ullery, Brooke (University of Utah)

Welker, Volkmar (Philipps-Universität Marburg)

Wilson, Jenny (Stanford University)

Wiltshire-Gordon, John (University of Michigan)

Beta Ensembles: Universality, Integrability, and Asymptotics

April 10-15, 2016

Organizers:

Brian Rider (Temple University)
Benedek Valko (University of Wisconsin - Madison)

Peter Forrester (University of Melbourne)
Alice Guionnet (MIT)



Random matrix theory is a vibrant area of probability theory and mathematical physics, with applications across mathematics, physics and engineering. The physically motivated β -ensembles (which can initially be viewed as a models of a coulomb gas) provide one-parameter families of particle systems that interpolate between the eigenvalue distributions of several of the classical models of random matrix theory (realized at $\beta=1,2,4$). In recent years, the introduction of a range of new tools led to a period of intense research activity on the general beta ensembles, and our understanding of their properties continues at a fast pace. The wide range of new results naturally raise many open problems. We are planning to bring together and generate interaction between the various groups working on problems related to β -ensembles.

For details, please refer to the workshop webpage
<http://www.birs.ca/events/2016/5-day-workshops/16w5076>

Participants:

Breuer, Jonathan (Hebrew University of Jerusalem)
Chhaibi, Reda (Institut de Mathématiques de Toulouse)
Dette, Holger (Ruhr-Universität Bochum)
Dumaz, Laure (University of Cambridge)
Dumitriu, Ioana (University of Washington)
Edelman, Alan (MIT)
Guionnet, Alice (MIT)
Holcomb, Diane (University of Arizona)
Janjigian, Christopher (University of Wisconsin - Madison)
Katori, Makoto (Chuo University)
Koev, Plamen (San Jose State University)
Kotowski, Marcin (University of Toronto)
Kozłowski, Karol (Institut de Mathématiques de Bourgogne)
Leblé, Thomas (Université Pierre et Marie Curie)
Liu, Dang-Zheng (University of Science and Technology of China)
Menon, Govind (Brown University)

Moll, Alexander (MIT)
Najnudel, Joseph (Institut de Mathématiques de Toulouse)
Nakano, Fumihiko (Gakushuin University)
Nikula, Miika (Harvard)
Osada, Hirofumi (Kyushu University)
Paquette, Elliot (Weizmann Institute)
Ramirez, Jose (University of Costa Rica)
Rider, Brian (Temple University)
Rouault, Alain (Université de Versailles-Saint-Quentin)
Rumanov, Igor (University of Colorado Boulder)
Sosoe, Philippe (Harvard University)
Tanemura, Hideki (Chiba University)
Valko, Benedek (University of Wisconsin - Madison)
Venker, Martin (Bielefeld University)
Veto, Balint (Budapest University of Technology)
Virag, Balint (University of Toronto)
Waters, Patrick (Temple University)
Webb, Christian (Aalto University)

Quantum Computer Science

April 17 - 22, 2016

Organizers:

Martin Roetteler (Microsoft Research)
Michele Mosca (University of Waterloo)

Peter Selinger (Dalhousie University)



The workshop brought together researchers from quantum computing—in particular those focusing on quantum algorithms and quantum error correction, and classical programming languages. Open questions the group tackled included new methods for circuit synthesis and optimization, compiler optimizations and rewriting, embedded languages versus non-embedded languages, implementations of type systems and error reporting for quantum languages, techniques for verifying the correctness of quantum programs, and new techniques for compiling efficient circuits and protocols for fault-tolerant questions and their 2D layout.

For details, please refer to the workshop webpage
<http://www.birs.ca/events/2016/5-day-workshops/16w5029>

Participants:

Amy, Matt (University of Waterloo)
Axelsen, Holger Bock (University of Copenhagen)
Bernadet, Alexis (Dalhousie University)
Bian, Xiaoning (Dalhousie University)
Broadbent, Anne (University of Ottawa)
Cockett, Robin (University of Calgary)
Dawkins, Hillary (University of Waterloo)
Devitt, Simon (Riken Tokyo)
Di Matteo, Olivia (University of Waterloo)
Draper, Tom (NSA)
Gallagher, Jonathan (University of Calgary)
Gheorghiu, Vlad (Institute for Quantum Computing)
Grassl, Markus (Max Planck Institute for the Science of Light)
Johnson, Blake (Raytheon BBN Technologies)
Jones, Cody (HRL Laboratories)
Kieferova, Maria (University of Waterloo)
Kim, Jungsang (Duke University)
Kliuchnikov, Vadym (Microsoft Research)
Kutin, Samuel (IDA/CCR-Princeton)
Lazarus, Richard (Raytheon BBN Technologies)
Metodi, Tzvetan (Sandia National Labs)

Mislove, Michael (Tulane University)
Mosca, Michele (University of Waterloo)
Obenland, Kevin (Lincoln Laboratory)
Paetznick, Adam (HRL Laboratories)
Parent, Alex (University of Waterloo)
Parzanchevski, Ori (Princeton University)
Roetteler, Martin (Microsoft Research)
Ross, Neil (QULCS University of Maryland)
Sanders, Barry (University of Calgary)
Selinger, Peter (Dalhousie University)
Siirola, John (Sandia National Laboratories)
Soeken, Mathias (École polytechnique fédérale de Lausanne)
Srinivasan, Priyaa (University of Calgary)
Steinwandt, Rainer (Florida Atlantic University)
Thapliyal, Himanshu (University of Kentucky)
Valiron, Benoit (CentraleSupélec - LRI Univ. Paris Saclay)
Van Meter, Rodney (Keio University)
Wiebe, Nathan (Microsoft Research)
Ying, Mingsheng (University of Technology Sydney)

Women in Topology II

April 24 - 29, 2016

Organizers:

Maria Bastera (University of New Hampshire)
Kristine Bauer (University of Calgary)

Kathryn Hess (Ecole Polytechnique Federale de Lausanne)
Brenda Johnson (Union College)



The purpose of the workshop was to support and expand research efforts by female mathematicians in the field of homotopy theory. The workshop was inspired by the success of the networking group WIN of women in number theory and the format of their workshops held at BIRS in 2008 and 2011, and by our own recent success with the WIT: Women In Topology workshop held at BIRS in 2013.

For details, please refer to the workshop webpage
<http://www.birs.ca/events/2016/5-day-workshops/16w5142>

Participants:

Bastera, Maria (University of New Hampshire)
Bauer, Kristine (University of Calgary)
Beaudry, Agnes (University of Chicago)
Bergner, Julia (UC Riverside)
Bobkova, Irina (University of Rochester)
Bohmann, Anna Marie (Vanderbilt University)
Circi, Joana (Freie Universität Berlin)
Egas Santander, Daniela (Freie Universität Berlin)
Ellis, Eugenia (Universidad de la República)
Gerhardt, Teena (Michigan State University)
Halliwell, Gemma (University of Sheffield)
Hess, Kathryn (Ecole Polytechnique Federale de Lausanne)
Höning, Eva (Universite Paris 13)
Høgenhaven, Amalie (University of Copenhagen)
Intermont, Michele (Kalamazoo College)
Johnson, Brenda (Union College)
Kedziorek, Magdalena (EPFL)
Laude, Isabelle (University of Copenhagen)
Lindenstrauss, Ayelet (Indiana University)
Livernet, Muriel (Universite Paris 13)
Merling, Mona (Johns Hopkins University)

Osborne, Christina (University of California Riverside)
Osorno, Angelica (Reed College)
Ozornova, Viktoriya (Universität Bonn)
Ponto, Kate (University of Kentucky)
Richter, Birgit (University of Hamburg)
Riehl, Emily (Johns Hopkins University)
Roitzheim, Constanze (University of Kent)
Rovelli, Martina (EPF Lausanne)
Scheimbauer, Claudia (MPIM Bonn)
Scull, Laura (Fort Lewis College)
Shiple, Brooke (University of Illinois, Chicago)
Stojanoska, Vesna (UIUC)
Tebbe, Amelia (University of Illinois at Urbana Champaign)
Tillmann, Ulrike (Oxford University)
Vidaurre, Elizabeth (Graduate Center of City University of New York)
Whitehouse, Sarah (University of Sheffield)
Yarnall, Carolyn (University of Kentucky)
Yeakel, Sarah (UIUC)
Zakharevich, Inna (University of Chicago)

Complex Analysis and Complex Geometry

May 1 - 6, 2016

Organizers:

Finnur Larusson (University of Adelaide)
Alexandre Sukhov (Universite des Sciences et Technologies de Lille)

Norman Levenberg (Indiana University)
Rasul Shafikov (University of Western Ontario)



We view complex analysis on the one hand and complex geometry on the other as two aspects of the same subject. The two are inseparable, as most work in the area involves inter-play between analysis and geometry. The fundamental objects of the theory are complex manifolds and, more generally, complex spaces, holomorphic functions on them, and holomorphic maps between them. Holomorphic functions can be defined in three equivalent ways as complex-differentiable functions, as sums of complex power series, and as solutions of the homogeneous Cauchy-Riemann equation. The threefold nature of differentiability over the complex numbers gives complex analysis its distinctive character and is the ultimate reason why it is linked to so many areas of mathematics.

For details, please refer to the workshop webpage
<http://www.birs.ca/events/2016/5-day-workshops/16w5080>

Participants:

Andrist, Rafael (Bergische Universität Wuppertal)
Arosio, Leandro (Università di Roma 2)
Bayraktar, Turgay (Syracuse University)
Bedford, Eric (Stony Brook)
Berteloot, Francois (Universite de Toulouse)
Bertrand, Florian (American University of Beirut)
Blocki, Zbigniew (Jagiellonian University)
Bloom, Tom (University of Toronto)
Brudnyi, Alex (University of Calgary)
Chakrabarti, Debraj (Central Michigan University)
Drinovec Drnovšek, Barbara (University of Ljubljana)
Ebenfelt, Peter (University of California at San Diego)
Edigarian, Armen (Jagiellonian University)
Forstneric, Franc (University of Ljubljana)
Gaussier, Herve (Université Grenoble Alpes)
Gupta, Purvi (University of Western Ontario)
Kaliman, Shulim (University of Miami, USA)
Kinzebulatov, Damir (University of Toronto)
Kossovskiy, Ilya (University of Vienna)
Larkang, Richard (University of Wuppertal)
Larusson, Finnur (University of Adelaide)

Levenberg, Norman (Indiana University)
Magnússon, Benedikt (University of Iceland)
Merker, Joel (Université Paris-Sud)
Mitrea, Octavian (University of Western Ontario)
Poletsky, Evgeny (Syracuse University)
Prezelj, Jasna (University of Ljubljana and University of Primorska)
Ramos-Peon, Alexandre (University of Bern)
Rashkovskii, Alexander (Stavanger University)
Ritter, Tyson (University of Oslo)
Shafikov, Rasul (University of Western Ontario)
Shcherbina, Nikolay (University of Wuppertal)
Sukhov, Alexandre (Universite des Sciences et Technologies de Lille)
Tumanov, Alexander (University of Illinois at Urbana-Champaign)
Vivas, Liz (Ohio State)
Winkelmann, Jörg (Ruhr-Universität Bochum)
Wulcan, Elizabeth (Chalmers University of Technology)
Zeriahi, Ahmed (Universite Paul Sabatier (Toulouse))
Zimmer, Andrew (University of Chicago)

Variational Models of Fracture

May 8 - 13, 2016

Organizers:

Blaise Bourdin (Louisiana State University)
Gilles Francfort (Université Paris Nord)

Christopher Larsen (Worcester Polytechnic Institute)
Corrado Maurini (Université Pierre et Maris Curie)



The goal of this workshop was to bring together a group of mathematicians, mechanics, engineers and computational scientist sharing an interest in variational models of fracture mechanics in order to achieve a breakthrough in the mathematical understanding of current topics, tools and issues, and in the scope of the numerical applications of the current theories.

For details, please refer to the workshop webpage
<http://www.birs.ca/events/2016/5-day-workshops/16w5090>

Participants:

Allaire, Grégoire (Centre de Mathématiques Appliquées - Ecole Polytechnique)
Arroyo, Marino (Universitat Politècnica de Catalunya)
Babadjian, Jean-François (Laboratoire Jacques Louis Lions - Université Paris 6)
Bourdin, Blaise (Louisiana State University)
Chambolle, Antonin (Ecole Polytechnique and CNRS)
Dal Maso, Gianni (SISSA)
Francfort, Gilles (Université Paris Nord)
Haber, Robert (University of Illinois at Urbana-Champaign)
Hale, Jack S. (University of Luxembourg)
Haris, Jason (Corning Inc.)
Karma, Alain (Northeastern University)
Kimura, Masato (Kanazawa University)
Lancioni, Giovanni (Polytechnic University of Marche)
Landis, Chad (University of Texas in Austin)
Larsen, Christopher (Worcester Polytechnic Institute)
Lehoucq, Richard (Sandia National Laboratories)
Lew, Adrian (Stanford University)

Luskin, Mitchell (University of Minnesota)
Marigo, Jean-Jacques (École Polytechnique)
Maurini, Corrado (Université Pierre et Maris Curie)
Muddamallappa, Mallikarjuna (Worcester Polytechnic Institute)
Negri, Matteo (University of Pavia)
Ortiz, Michael (California Institute of Technology)
Pandolfi, Anna (Dipartimento di Ingegneria Civile ed Ambientale - Politecnico di Milano)
Pham, Kim (ENSTA-ParisTech)
Ravi-Chandar, Krishnaswamy (Department of Aerospace Engineering and Engineering Mechanics - University of Texas at Austin)
Roman, Benoît (Laboratoire de Physique et Mécanique des Milieux Hétérogènes - École Supérieure de Physique et de Chimie Industrielles)
Sarkis, Marcus (Mathematical Sciences Department - Worcester Polytechnic Institute)
Schmidt, Bernd (Institut fuer Mathematik - University of Augsburg)
Subramanian, Vijay (Corning Incorporated)
Wheeler, Mary F. (University of Texas at Austin)
Yoshioka, Keita (Chevron ETC)
Zehnder, Alan (Cornell University)

Computational Modeling in Games

May 15 - 20, 2016

Organizers:

Michael Mateas (University of California, Santa Cruz)

Andrew Nealen (New York University)



Our goal was to provide computational models of game systems and players, such that we can better explain and predict the effect of a design decision, both on the dynamical behavior of the game, as well as the way this change will affect how a human player will perceive and process the information conveyed by the game. This approach is twofold: finding abstractions/simplifications of complex game systems and their significant feedback loops will help us build design tools that allow designers to ask “what if?” questions, such that the effect of a design choice on the dynamical behavior of the system can be easily visualized and analyzed (systems modeling).

For details, please refer to the workshop webpage
<http://www.birs.ca/events/2016/5-day-workshops/16w5160>

Participants:

Boxerman, Eddy (Hemisphere Games)
Compton, Kate (UC Santa Cruz)
Cook, Michael (University of Falmouth)
Cooper, Seth (Northeastern University)
Dormans, Joris (Ludomotion)
Eladhari, Mirjam (Otter Play)
Hart, Vi (eleVR)
Holmgård, Christoffer (New York University
Tandon School of Engineering)
Hoover, Amy (Northeastern University)
Hunicke, Robin (University of California, Santa
Cruz)
Isaksen, Aaron (NYU)
Isbister, Katherine (UCSC)
Jaffe, Alexander (Spry Fox)
Jhala, Arnav (UCSC)
Khandaker-Kokoris, Mitu (NYU)
Koster, Raph (Independent)
Lantz, Frank (New York University)
Martens, Chris (UC Santa Cruz)
Mateas, Michael (University of California, Santa
Cruz)

McCoy, Josh (American University)
Medler, Ben (Electronic Arts)
Nealen, Andrew (New York University)
Nelson, Mark (Falmouth University)
Osborn, Joseph (University of California at Santa
Cruz)
Shaker, Noor (Aalborg University Copenhagen)
Smith, Gillian (Northeastern University)
Sottosanti, Paul (Riot Games)
Stanley, Kenneth (University of Central Florida)
Sullivan, Anne (American University)
Summerville, Adam (UCSC)
Swink, Erin (UCSC)
Swink, Steve (Independent)
ten Bosch, Marc (Independent)
Togelius, Julian (NYU)
Treanor, Mike (American University)
Treuille, Adrien (CMU)
van Rozen, Riemer (CWI)
Weber, Ben (Electronic Arts)
Whitehead, Jim (Univ. of California Santa Cruz)
Yannakakis, Georgios (University of Malta)

Operations in Highly Structured Homology Theories

May 22 - 27, 2016

Organizers:

Charles Rezk (University of Illinois, Urbana-Champaign)

Andrew Baker (University of Glasgow)



Our programme was primarily intended to bring together algebraic topologists actively developing or using techniques associated with highly structured ring spectra and their associated (co)homology theories. Given the wide range of rapidly developing activity across the subject, a specialist meeting of this type in the near future is desirable and likely to have a significant impact through cross-fertilization between different parts of the subject.

For details, please refer to the workshop webpage
<http://www.birs.ca/events/2016/5-day-workshops/16w5108>

Participants:

Antolín Camarena, Omar (University of British Columbia)
Ausoni, Christian (Université de Paris 13)
Baker, Andrew (University of Glasgow)
Bauer, Kristine (University of Calgary)
Beardsley, Jonathan (Johns Hopkins University)
Bohmann, Anna Marie (Vanderbilt University)
Bonventre, Peter (University of Virginia)
Brantner, Lukas (Harvard University)
Frankland, Martin (University of Western Ontario)
Gheorghe, Bogdan (Wayne State University)
Henn, Hans-Werner (Université de Strasbourg)
Hill, Michael (University of California Los Angeles)
Huan, Zhen (University of Illinois)
Johnson, Niles (Ohio State University Newark)
Khan, Adeel (Universitaet Duisburg-Essen)
Konter, Johan (Northwestern University)
Kuhn, Nick (University of Virginia)
Laures, Gerd (University of Bochum)
Lazarev, Andrey (University of Lancaster)
Mantovani, Lorenzo (Universität Duisburg-Essen)
Mathew, Akhil (Harvard University)
Mazel-Gee, Aaron (University of California Berkeley)

Meier, Lennart (University of Bonn)
Merling, Mona (Johns Hopkins University)
Muro, Fernando (Universidad de Sevilla)
Mycroft, Will (University of Sheffield)
Nelson, Peter (University of Illinois)
Noel, Justin (University of Regensburg)
Peterson, Eric (Harvard University)
Powell, Geoffrey (Université d'Angers)
Rezk, Charles (University of Illinois, Urbana-Champaign)
Sagave, Steffen (Radboud University Nijmegen)
Sarkar, Soumen (University of Calgary)
Schlichtkrull, Christian (University of Bergen)
Sia, Charmaine (Indiana University at Bloomington)
Stojanoska, Vesna (University of Illinois)
Szymik, Markus (NTNU Norwegian University of Science and Technology)
Tilson, Sean (University of Osnabrück)
van Koughnett, Paul (Northwestern University)
Westerland, Craig (University of Minnesota)
Whitehouse, Sarah (University of Sheffield)
Wilson, Dylan (Northwestern University)
Zhu, Yifei (Northwestern University)

Ion Transport: Electrodiffusion, Electrohydrodynamics and Homogenization

May 29 - June 3, 2016

Organizers:

Chun Liu (Pennsylvania State University)
Timothy David (University of Canterbury)

Huaxiong Huang (York University)



The main goal of the workshop focused on mathematical models of realistic biological and engineering systems, methodologies (analytical and numerical methods), experimental validation and verifications, and relationships between mathematical results and practical consequences. The majority of models developed within the biological sphere are highly non-linear and do not easily bend to mathematical analysis. Even for Poisson-Nernst-Planck (PNP) equation, one of the simplest model, the analysis for the cases of three or more ion species is non-trivial. Fundamental questions such as the uniqueness of solution remained unanswered for a system without any permanent charges. On the other hand, there have been extensive work on incorporate the effects of finite size of ions into the PNP model. In general, these models are significantly more difficult to analyze. Thus there is a requirement for numerical models which have to cover the large variation in scales.

For details, please refer to the workshop webpage
<http://www.birs.ca/events/2016/5-day-workshops/16w5118>

Participants:

Berg, Peter (University of Alberta)
Brannick, James (Peen State University)
Brown, Richard (Massey University)
Chang, Josh (National Institutes of Health)
Chen, Wen-bin (Fudan University)
Cheng, Jin (Fudan University)
David, Timothy (University of Canterbury)
Eisenberg, Bob (Rush Medical Center)
Gavish, Nir (Technion)
Hornig, Tzyy-Leng (Feng Chia University)
HUA, Cheng (Fudan University)
Huang, Huaxiong (York University)
Kirshtein, Arkadz (Pennsylvania State University)
Liang, Jie (University of Illinois at Chicago)
Lin, Taichia (National Taiwan University)
Liu, Chun (Penn State University)

Liu, Jinn-Liang (National Hsinchu University of Education)
Liu, Pei (Shanghai Jiao Tong University)
Plank, Michael (University of Canterbury)
Ryham, Rolf (Fordham University)
Takagi, Shu (The University of Tokyo)
Thiriet, Marc (team INRIA-UPMC-CNRS REO)
Tseng, Yu-Hau (National University of Kaohsiung)
Wang, Qiming (Fields Institute)
WEI, GUOWEI (Michigan State University)
Wilson, Phil (University of Canterbury)
Wylie, Jonathan (City University of Hong Kong)
Xu, Zhenli (Shanghai Jiao Tong University)
Xu, Zhiliang (University of Notre Dame)
Young, Yuan-Nan (NJIT)
Yue, Xingye (Soochow University)

Recent Advances in Hydrodynamics

June 5-10, 2016

Organizers:

John Bowman (University of Alberta)
James Kelliher (University of California, Riverside)
Anna Mazzucato (Pennsylvania State University)

Magdalena Czubak (State University of New York at Binghamton)
Slim Ibrahim (University of Victoria)



The main objective of the workshop was to provide a forum for an international mix of senior and young researchers, including advanced graduate students, in the field of incompressible fluid mechanics to share their research. The second objective is to bring together participants with complementary scientific background so as to facilitate an exchange of ideas and techniques between groups that might not otherwise have opportunities to interact. The third objective is to survey the recent progress in the field, and identify new directions of research.

For details, please refer to the workshop webpage
<http://www.birs.ca/events/2016/5-day-workshops/16w5102>

Participants:

Bae, Hantaek (Ulsan National Institute of Science and Technology)
Bowman, John (University of Alberta)
Chan, Chi Hin (National Chiao Tung University)
Cozzi, Elaine (Oregon State University)
Czubak, Magdalena (State University of New York at Binghamton)
Disconzi, Marcelo (Vanderbilt University)
Emami, Pedram (University of Alberta)
Friedlander, Susan (USC)
Ghaemi, Sina (University of Alberta)
Hamouda, Makram (Indiana University)
Hieber, Matthias (Technical University Darmstadt)
Hoefl, Alexi (Rutgers University)
Ibrahim, Slim (University of Victoria)
Iftimie, Dragos (Universite Lyon 1)
Kelliher, James (University of California, Riverside)
Kevlahan, Nicholas (McMaster University)
Kirshtein, Arkadz (Pennsylvania State University)
Kukavica, Igor (University of Southern California)
Kwon, Hyunju (University of British Columbia)

Larios, Adam (University of California Irvine)
Lazar, Omar (Instituto de Ciencias Matematicas)
Lunasin, Evelyn (United States Naval Academy)
Maekawa, Yasunori (Tohoku University)
Mazzucato, Anna (Pennsylvania State University)
Monniaux, Sylvie (Aix-Marseille University)
Nave, Jean-Christophe (McGill University)
Roberts, Malcolm (Institut de Recherche Mathematique Avancee)
Schneider, Kai (Aix Marseille Université)
Shen, Shengyi (University of Victoria)
Shvydkoy, Roman (University of Illinois at Chicago)
Sueur, Franck (University of Bordeaux)
Titi, Edriss (Texas A&M University)
Tran, Chuong Van (University of St. Andrews)
Wang, Xiaoming (Florida State University)
Washabaugh, Pearce (University of Colorado Boulder)
Wiedemann, Emil (University of Bonn)
Yu, Xinwei (University of Alberta)

Uncertainty Modeling in the Analysis of Weather, Climate and Hydrological Extremes

June 12 - 17, 2016

Organizers:

Peter Guttorp (University of Washington)
Francis Zwiers (University of Victoria)

Phillippe Naveau (Centre National de la Recherche Scientifique)



In this workshop, we mainly focused on climate variables, such as surface air temperature or precipitation. Here the notion of an extreme is reasonably well defined and refers to values in the tails of the variable's distribution that would be expected to occur relatively infrequently. The notion of 'extremes' in that context is defined as very high quantiles, such as the 95th, 99th or 99.9th percentiles of annual maximum values. An important aspect of this theory is to quantify the uncertainty of such extrapolations through the computation of suitably constructed confidence intervals. Increasingly, these mathematical advances are being used in the evaluation of extreme events simulated in climate models (e.g., Kharin et al. 2007, 2013; Wehner et al. 2010; Zwiers et al. 2011; Wehner 2012; Craigmile and Guttorp, 2013).

For details, please refer to the workshop webpage
<http://www.birs.ca/events/2016/5-day-workshops/16w5092>

Participants:

Ben Alaya, Mohamed Ali (PCIC)
Berrocal, Veronica (University of Michigan)
Cannon, Alex (Environment and Climate Change Canada)
Cattiaux, Julien (Météo France - CNRS)
Davison, Anthony (Ecole Polytechnique Fédérale de Lausanne (EPFL))
Emeric, Thibaud (Colorado State University)
Engelke, Sebastian (École Polytechnique Fédérale de Lausanne)
Faranda, Davide (Institute Pierre Simon Laplace)
Fischer, Erich (ETH Zurich)
Fowler, Hayley (Newcastle University)
Hannart, Alexis (CNRS)
Huser, Raphael (King Abdullah University of Science and Technology)
Imielska, Agata (Australian Bureau of Meteorology)
Kleiber, William (University of Colorado Boulder)
Kriesche, Bjoern (Ulm University)
Naveau, Philippe (Commissariat à l'énergie atomique et aux énergies alternatives)

Nychka, Douglas (National Center for Atmospheric Research)
Polson, Debbie (University of Edinburgh)
Reich, Brian (North Carolina State University)
Ribes, Aurélien (Météo France - CNRS)
Scheuerer, Michael (University of Colorado Boulder)
Sillmann, Jana (CICERO)
Smith, Richard (University of North Carolina Chapel Hill)
Toreti, Andrea (European Commission Joint Research Centre)
Wan, Phyllis (Columbia University)
Wehner, Michael (Lawrence Berkeley Lab-Scientific Computing Group)
Westra, Seth (University of Adelaide)
Yan, Jun (University of Connecticut)
Yuen, Robert (Liberty Mutual Insurance)
Zhang, Xuebin (Environment Canada)
Zwiers, Francis (University of Victoria)

Triangulated Categories and Applications

June 19 - 24, 2016

Organizers:

Paul Balmer (University of California Los Angeles)
J. Daniel Christensen (University of Western Ontario)

Amnon Neeman (Australian National University)
Ivo Dell'Ambrogio (Universite de Lille)



The goal of this workshop was to gather researchers of various backgrounds who use triangulated categories in their respective domains. By encouraging them to exchange their different methods, points of view, and conjectures, we hoped to stimulate new avenues of research and collaboration. PhD students and postdocs, in particular, were able to use triangulated categories as a bridge towards new territories.

For details, please refer to the workshop webpage
<http://www.birs.ca/events/2016/5-day-workshops/16w5040>

Participants:

Balmer, Paul (UCLA)
Barthel, Tobias (Max Planck Institute)
Belmans, Pieter (University of Antwerp)
Benson, David (University of Aberdeen)
Bodzenta, Agnieszka (University of Edinburgh)
Buchweitz, Ragnar-Olaf (University of Toronto Scarborough)
Carlson, Jon (University of Georgia)
Carlson, Kevin (UCLA)
Christensen, J. Daniel (University of Western Ontario)
Coley, Ian (UCLA)
Dell'Ambrogio, Ivo (Universite de Lille)
Gallauer, Martin (UCLA)
Greenlees, John (University of Sheffield)
Groth, Moritz (U. Bonn)
Hall, Jack (The Australian National University)
Hill, Michael (UCLA)
Iyengar, Srikanth (University of Utah)
Jardine, Rick (University of Western Ontario)
Klein, Sebastian (University of Antwerp)
Krause, Henning (Faculty of Mathematics, Bielefeld University, 33501 Bielefeld, Germany)

Lagkas, Ioannis (UCLA)
Lieblisch, Max (University of Washington)
Linckelmann, Markus (City University of London)
Liu, Yong (University of Regina)
Murfet, Daniel (University of Melbourne)
Muro, Fernando (Universidad de Sevilla)
Nakano, Daniel K. (University of Georgia)
Nakaoka, Hiroyuki (Kagoshima University)
Neeman, Amnon (Australian National University)
Pauwels, Bregje (The Australian National University)
Pevtsova, Julia (University of Washington)
Richardson, James (University of Western Ontario)
Rydh, David (Royal Institute of Technology (KTH))
Sanders, Beren (University of Copenhagen)
Scherotzke, Sarah (U. Bonn)
Schwede, Stefan (Universitaet Bonn)
Stanley, Don (University of Regina)
Stevenson, Greg (University of Bielefeld)
Stovicek, Jan (Charles University in Prague)
Strickland, Neil (University of Sheffield)
Zhang, James (University of Washington)
Zhang, John (UCLA)

New Directions in Iwasawa Theory

June 26 - July 1, 2016

Organizers:

Ted Chinburg (University of Pennsylvania)
Frauke Bleher (University of Iowa)
Georgios Pappas (Michigan State University)

Romyar Sharifi (University of Arizona)
Ralph Greenberg (University of Washington)



This workshop brought together researchers and advanced Ph.D. students working on Iwasawa theory and related topics in K-theory, commutative algebra and modular forms in order to further advance these fields. A specific objective of the workshop was to discuss recent advances in Iwasawa theory. Another objective was the development of deeper ties between Iwasawa theory and algebraic K-theory.

For details, please refer to the workshop webpage
<http://www.birs.ca/events/2016/5-day-workshops/16w5043>

Participants:

Agboola, Adebisi (University of California Santa Barbara)
Bleher, Frauke (University of Iowa)
Bouganis, Athanasios (Durham University)
Burungale, Ashay (University of Arizona)
Büyükboduk, Kazım (Koc University of Istanbul)
Castella, Francesc (University of California, Los Angeles)
Chinburg, Ted (University of Pennsylvania)
Ciperiani, Mirela (The University of Texas at Austin)
Dasgupta, Samit (University of California, Santa Cruz)
Fouquet, Olivier (Université Paris-Sud)
Greenberg, Ralph (University of Washington)
Harron, Robert (University of Hawaii at Manoa)
Hida, Haruzo (University of California, Los Angeles)
Hsieh, Ming-Lun (National Taiwan University)
Johnson-Leung, Jennifer (University of Idaho)
Kakde, Mahesh (King's College London)
Kim, Chan-Ho (Korea Institute for Advanced Study)
Kolster, Manfred (McMaster University)
Kurihara, Masato (Keio University)
Lamplugh, Jack (University College London)
Lei, Antonio (Université Laval)

Palvannan, Bharathwaj (University of Washington)
Ponsinet, Gautier (Université Laval)
Popescu, Cristian D. (University of California, San Diego)
Ramdorai, Sujatha (University of British Columbia)
Rubin, Karl (University of California, Irvine)
Sano, Takamichi (Osaka University)
Schneider, Peter (Mathematisches Institut Muenster)
Sharifi, Romyar (University of Arizona)
Sprung, Florian (Princeton University)
Taylor, Martin (Merton College - Oxford University)
Tomaskovic-Moore, Sebastian (University of Pennsylvania)
Trihan, Fabien (Sophia University in Tokyo)
Valentino, Maria (King's College London)
Vatsal, Vinayak (Mathematics Department, University of British Columbia)
Venjakob, Otmar (Heidelberg University)
Wake, Preston (UC Los Angeles)
Wang, Jun (University of Arizona)
Wang Erickson, Carl (Brandeis University)
Witte, Malte (Universität Heidelberg)
Zaehring, Yasin (King's College London)

Developing a Comprehensive, Integrated Framework for Advanced Statistical Analyses of Observational Studies

July 3 - 8, 2016

Organizers:

Saskia le Cessie (Leiden University Medical Center)
James Carpenter (London School of Hygiene &
Tropical Medicine (UK))
Stephen Walter (McMaster University)

Michal Abrahamowicz (Royal Victoria Hospital)
Erica Moodie (McGill University)
Willi Sauerbrei (Medical Center - University of
Freiburg)



The long-term overall goal of this inter-disciplinary international workshop was to stimulate an integrated effort of statistical research community aimed at developing a comprehensive, state-of-the-art approach to deal simultaneously with several statistical challenges common to most observational analyses. The workshop brought together international experts from several, highly relevant fields of statistical research and created an unique opportunity for direct interactions between leading researchers working on different but related analytical challenges.

For details, please refer to the workshop webpage
<http://www.birs.ca/events/2016/5-day-workshops/16w5091>

Participants:

Abrahamowicz, Michal (Royal Victoria Hospital)
Andersen, Per Kragh (University of Copenhagen)
Becher, Heiko (University Medical Center
Heidelberg)
Burne, Rebecca (McGill University)
Cadarette, Suzanne (University of Toronto)
Carpenter, James (London School of Hygiene &
Tropical Medicine (UK))
Collins, Gary (University of Oxford)
Cook, Richard (University of Waterloo)
Day, Simon (Clinical Trials Consulting & Training
Limited)
Deffner, Veronika (Ludwig-Maximilians-Universität
München)
Freedman, Laurence (Gertner Institute for
Epidemiology)
Gail, Mitchell (National Institutes of Health)
Goetghebeur, Els (University of Ghent)
Groenwold, Rolf (UMC Utrecht)
Harrell, Frank (Vanderbilt University)
Hofmann, Heike (Iowa State University)
Huebner, Marianne (Michigan State University)
Joly, Pierre (Bordeaux University)
Keiding, Niels (University of Copenhagen)
Keogh, Ruth (London School of Hygiene and
Tropical Medicine)

Kipnis, Victor (National Cancer Institute)
Lee, Katherine (Murdoch Childrens Research
Institute)
Little, Roderick (University of Michigan)
Lusa, Lara (University of Ljubljana)
McShane, Lisa (U.S. National Cancer Institute)
Moon, Nathalie (University of Waterloo)
Perperoglou, Aris (University of Essex)
Rahnenführer, Jörg (TU Dortmund University)
Rotnitzky, Andrea (Harvard University and Di Tella
University)
Sauerbrei, Willi (University of Freiburg)
Schmid, Matthias (Universität Bonn)
Shaw, Pamela (University of Pennsylvania)
Steyerberg, Ewout (Erasmus MC)
Taylor, Jeremy (University of Michigan)
Therneau, Terry (Mayo Clinic)
Tilling, Kate (University of Bristol)
Vach, Werner (University of Freiburg)
Van Calster, Ben (KU Leuven)
Wallace, Michael (McGill University)
Walter, Stephen (McMaster University)
Wang, Yishu (McGill University)
Williamson, Elizabeth (London School of Hygiene
and Tropical Medicine)
Wu, Ying (University of Waterloo)

Geometric and Analytic Inequalities

July 10-15, 2016

Organizers:

Cristina Trombetti (Università di Napoli)
Paolo Salani (Università di Firenze)

Pengfei Guan (McGill University)
Carlo Nitsch (Università di Napoli Federico II)



This workshop aimed to present the most recent results, in order especially to advance the mathematical understanding of the deep interplay between analysis (especially PDEs and Calculus of Variations), geometry and probability. Given the rapid development of the subject, 2016 is an ideal time to organize such a conference.

For details, please refer to the workshop webpage
<http://www.birs.ca/events/2016/5-day-workshops/16w5047>

Participants:

Bianchini, Chiara (Università degli studi di Firenze)
Brasco, Lorenzo (Università di Ferrara)
Bucur, Dorin (Université de Savoie, France)
Buttazzo, Giuseppe (Università di Pisa)
Chiacchio, Francesco (Università di Napoli Federico II)
Cianchi, Andrea (Università degli Studi di Firenze)
Ferone, Vincenzo (Università di Napoli Federico II)
Gavitone, Nunzia (Università Federico II)
Ge, Yuxin (Université Toulouse 3)
Guan, Pengfei (McGill University)
Henrot, Antoine (Institut Elie Cartan (France))
Kawohl, Bernd (University of Cologne)
Li, Junfang (University of Alabama at Birmingham)
Lu, Siyuan (McGill University)
Ma, Xinan (University of Science and Technology of China)
Marini, Michele (SNS Pisa and Università di Firenze)
Mazzoleni, Dario (University of Torino)
Mercaldo, Anna (Università di Napoli Federico II)
Nitsch, Carlo (University of Naples)
Pick, Lubos (Faculty of Mathematics and Physics of the Charles University in Prague)
Pratelli, Aldo (University of Erlangen)
Qiu, Guohuan (Department of Mathematics and Statistics McGill University)
Salani, Paolo (Università di Firenze)
Seo, Keomkyo (Sookmyung Women's University)
Slavikova, Lenka (Faculty of Mathematics and Physics, Charles University in Prague)
Trombetti, Cristina (Università di Napoli)
Vernicos, Constantin (University of Montpellier)
Vétois, Jérôme (McGill University)
Wang, Yi (Johns Hopkins University)
Wang, Guofang (Freiburg University)
Weth, Tobias (Goethe-University Frankfurt am Main)
Wu, Jie (Zhejiang University)
Xia, Chao (Xiamen University & McGill University)
Zhang, Gaoyong (New York University)

Geometric Analysis and General Relativity

July 17 - 22, 2016

Organizers:

Greg Galloway (University of Miami)
David Maxwell (University of Alaska Fairbanks)

Daniel Pollack (University of Washington)
Richard Schoen (University of California Irvine)



This workshop brought together a wide variety of researchers from around the world whose expertise and interests lie within the realms of geometric analysis and general relativity. Over the past few years there have been remarkable advances on the mathematical problems of general relativity and this workshop built on this by bringing together the primary participants in this recent progress as well as young researchers, including post-docs and advanced graduate students, working in this area.

For details, please refer to the workshop webpage
<http://www.birs.ca/events/2016/5-day-workshops/16w5054>

Participants:

Alaee, Aghil (University of Alberta)
Allen, Paul T (Lewis & Clark College)
Bray, Hubert (Duke University)
Carlotto, Alessandro (ETH Zurich)
Cortier, Julien (Institut Fourier, Université Grenoble-Alpes)
Corvino, Justin (Lafayette College)
Dahl, Mattias (KTH Royal Institute of Technology)
Dilts, James (UC: San Diego)
Gabach Clement, María Eugenia (Universidad Nacional de Córdoba)
Galloway, Greg (University of Miami)
Holst, Michael (University of California San Diego)
Isenberg, Jim (University of Oregon)
Jahns, Sophia (Universitat Tubingen)
Jauregui, Jeff (Union College)
Khuri, Marcus (Stony Brook University)
Lee, Dan (Queens College & CUNY Graduate Center)
Lee, John M (University of Washington)
LeFloch, Philippe (University of Paris 6)
Mantoulidis, Christos (Stanford University)
Mars, Marc (Universidad de Salamanca)
Maxwell, David (University of Alaska Fairbanks)

Metzger, Jan (Universitaet Potsdam)
Miao, Pengzi (University of Miami)
Nerz, Christopher (KTH Stockholm)
Nguyen, The-Cang (Universite Francois-Rabelais de Tours)
Pollack, Daniel (University of Washington)
Premoselli, Bruno (Université Libre de Bruxelles (ULB))
Radermacher, Katharina (KTH Royal Institute of Technology)
Roesch, Henri (Duke University)
Sakovich, Anna (Uppsala University)
Sbierski, Jan (University of Cambridge)
Schoen, Richard (University of California Irvine)
Shi, Yuguang (Peking University)
Smillie, Peter (Harvard University)
Sormani, Christina (City University of New York)
Stavrov, Iva (Lewis & Clark College)
Vega, Carlos (St Louis University)
Woolgar, Eric (University of Alberta)
Xie, Naqing (Fudan University)
Yamada, Sumio (Gakushuin University)
Zhou, Xin (UC Santa Barbara)

Whittaker Functions: Number Theory, Geometry and Physics

July 24-29, 2016

Organizers:

Daniel Bump (Stanford University)
Gautam Chinta (City University of New York)
Benjamin Brubaker (University of Minnesota)

Solomon Friedberg (Boston College)
Paul Gunnells (University of Massachusetts Amherst)



Whittaker functions appear in a wide variety of different contexts. The goals of the proposed workshop were to report on the latest results in these interrelated fields, to identify the main obstructions to progress and to chart a course for future developments. Due to the interdisciplinary nature of the proposed topics, we will supplement the research talks with more introductory lectures explaining the motivations coming from automorphic forms, combinatorial representation theory and mathematical physics.

For details, please refer to the workshop webpage
<http://www.birs.ca/events/2016/5-day-workshops/16w5039>

Participants:

Brubaker, Benjamin (University of Minnesota)
Bump, Daniel (Stanford University)
Cai, Yuanqing (Boston College)
Chhaibi, Reda (Institut de Mathématiques de Toulouse)
Chinta, Gautam (City University of New York)
Choie, YoungJu (POSTECH)
Friedberg, Solomon (Boston College)
Friedlander, Holley (Dickinson College)
Grodzicki, Will (University of Minnesota)
Gunnells, Paul (University of Massachusetts Amherst)
Gurevich, Nadya (Ben-Gurion University of the Negev)
Hamel, Angele (Wilfrid Laurier University)
Hoffstein, Jeffrey (Brown)
Karasiewicz, Edmund (Rutgers)
Kleinschmidt, Axel (Max Planck Institute for Gravitational Physics)
Lee, Kyu-Hwan (University of Connecticut)
Lenart, Cristian (SUNY Albany)
Leslie, Spencer (Boston College)

Licata, Anthony (Australian National University)
Liu, Dongwen (Zhejiang University)
McNamara, Peter (University of Queensland)
Muthiah, Dinakar (University of Alberta)
Nakasuji, Maki (Sophia)
Offen, Omer (Technion)
Patnaik, Manish (University of Alberta)
Patterson, Samuel (Universitaet Goettingen)
Persson, Daniel (Chalmers University of Technology)
Puskás, Anna (University of Alberta)
Ram, Arun (University of Melbourne)
Schilling, Anne (University of California Davis)
Scrimshaw, Travis (Univ. of Minnesota)
Strasser, Ben (University of Minnesota)
Takeda, Shuichiro (University of Missouri)
Taniguchi, Takashi (Kobe University)
Templier, Nicolas (Cornell University)
Tingley, Peter (Loyola University Chicago)
Wen, Jun (Univ of Massachusetts)
Whitehead, Ian (University of Minnesota)
Zhang, Lei (National University of Singapore)

Algebraic and Spectral Graph Theory

July 31 - August 5, 2016

Organizers:

James Lee (University of Washington)
Joseph Cheriyan (University of Waterloo)

Nicholas Harvey (University of British Columbia)
Nikhil Srivastava (University of California, Berkeley)



Graphs are among the most ubiquitous combinatorial objects: They can be used to model an array of diverse phenomena, and arise naturally in almost every area of mathematics and the sciences. Algebraic and Spectral Graph Theory are two closely related research traditions whose goal is roughly to understand and manipulate graphs by associating with them more classically “structured” objects like matrices, vector spaces, polynomials, and groups. While the former is more likely to be concerned with exact algebraic concepts, often producing identities and recurrences, the latter tends to focus on softer, analytic concepts. Part of the impetus for this workshop is the significant and rapidly growing interaction between the two.

For details, please refer to the workshop webpage
<http://www.birs.ca/events/2016/5-day-workshops/16w5111>

Participants:

Alev, Vedat Levi (University of Waterloo)
Cheriyan, Joseph (University of Waterloo)
Chung Graham, Fan (University of California at San Diego)
Cohen, Michael (MIT)
Friedman, Joel (University of British Columbia)
Gilbert, Anna (University of Michigan)
Godsil, Chris (University of Waterloo)
Guo, Krystal (University of Waterloo)
Harvey, Nicholas (University of British Columbia)
Koutis, Yiannis (University of Puerto Rico)
Kwok, Tsz Chiu (U.Waterloo)
Kyng, Rasmus (Yale)
Lau, Lap Chi (University of Waterloo)
Lee, James (University of Washington)
Lee, Yin Tat (MIT)
Liaw, Christopher (University of British Columbia)
Linial, Nathan (Hebrew University of Jerusalem)
Liu, Shiping (Durham University)
Madry, Aleksander (MIT)
Marcus, Adam (Princeton University)
Mehrabian, Abbas (University of British Columbia)
Miller, Gary (Carnegie Mellon University)

Mohar, Bojan (Simon Fraser University)
Mossel, Elchanan (MIT)
Orecchia, Lorenzo (Boston University)
Oveis Gharan, Shayan (University of Washington)
Pachocki, Jakub (Harvard)
Peng, Richard (Georgia Institute of Technology)
Peres, Yuval (Microsoft Research)
Raghavendra, Prasad (University of California, Berkeley)
Rao, Satish B. (U.California Berkeley)
Ryder, Nick (UC Berkeley)
Saberi, Amin (Stanford University, USA)
Schild, Aaron (UC Berkeley)
Schramm, Tselil (University of California, Berkeley)
Sidford, Aaron (Microsoft Research New England)
Srivastava, Nikhil (University of California, Berkeley)
Steurer, David (Cornell University)
Sun, He (U.Bristol)
Trevisan, Luca (U.C. Berkeley)
Vishnoi, Nisheeth (École Polytechnique Fédérale de Lausanne)

EPIC - Enabling Process Innovation through Computation

August 7 - 12, 2016

Organizers:

Krishnaswamy Nandakumar (Louisiana State University & Agricultural and Mechanical College)
Omar Matar (Imperial College London)

François Bertrand (Ecole Polytechnique de Montréal)
Sankaran Sundaresan (Princeton University)
Jos Derksen (Delft University of Technology)



The workshop focused on assessing the current status of the fundamental science of multiphase flows that governs many of the engineered process systems used in chemical, materials, mineral, agrochemical, pharmaceutical and energy processing industries. It assembled a group of mathematicians, applied numerical analysts, researchers from advanced scientific computing and high resolution experimentalists to work together with industrial researchers to produce a strategy for increasing the confidence levels in the fidelity of simulation tools. In addition, it also involved discussions on the relevant computational techniques needed for advanced simulations of such systems.

For details, please refer to the workshop webpage
<http://www.birs.ca/events/2016/5-day-workshops/16w5074>

Participants:

Berrouk, Abdallah Sofiane (Petroleum Institute)
Bertrand, François (Ecole Polytechnique de Montréal)
Chen, Chau-Chyun (Texas Tech University)
de Oliveira, Daniel (LSU)
Derksen, Jos (Delft University of Technology)
Desjardins, Olivier (Cornell university)
Evans, Geoffrey (The University of Newcastle)
Fan, L.S. (Ohio State University)
Frolov, Roman (University of Alberta)
Hayes, Bob (U Alberta)
Hrenya, Christine (University of Colorado)
Jaffer, Shaffiq (TOTAL SA)
Joshi, J.B. (Hoim Bhabha National Institute)
Juric, Damir (CNRS)
Larachi, Faical (Laval)
Matar, Omar (Imperial College London)
Mills, Patrick (Texas A&M University-Kingsville)
Minev, Peter (University of Alberta)
Nandakumar, Krishnaswamy (Louisiana State

University & Agricultural and Mechanical College)
Narayanan, Ranga (University of Florida)
Pannala, Sreekanth (Sabic)
Prosperetti, Andrea (University of Houston)
Rahmani, Mona (UBC)
Ranade, Vivek V. (National Chemical Laboratory)
Sommerfield, Martin (Martin-Luther-University Halle-Wittenberg)
Sundaresan, Sankaran (Princeton University)
Syamlal, Madhava (NETL)
Tryggvason, Gretar (University of Notre Dame)
Tyagi, Mayank (Louisiana State University)
Vidal, David (PolyTec)
Vigil, Dennis (Iowa State University)
Wachs, Anthony (University of British Columbia)
Wray, Alex (Imperial College)
Wu, Chunliang (SABIC Americas Inc)
Xie, Zhihua (Imperial College London)
Zoric, Josip (SINTEF)

Newest Developments and Urgent Issues in Measurement Error and Latent Variable Problems

August 14 - 19, 2016

Organizers:

Liqun Wang (University of Manitoba)
Paul Gustafson (University of British Columbia)

Yanyuan Ma (University of South Carolina)
Grace Yi (University of Waterloo)



As a long standing problem in many scientific fields, measurement error has been studied in various application areas as well as in statistics. The workshop aimed to strengthen collaboration and communication among different research groups from mathematical statistics, biostatistics, econometrics and other applied areas. The workshop participants included leading researchers in the measurement error area as well as graduate students and young researchers across Canada who are interested in these problems. This workshop was an important opportunity for leading and young researchers in the field to exchange ideas, problems and to work together. To achieve these objectives and facilitate interactions, besides formal sessions sufficient informal discussions were organized and encouraged.

For details, please refer to the workshop webpage
<http://www.birs.ca/events/2016/5-day-workshops/16w5063>

Participants:

Basulto-Elias, Guillermo (Iowa State University)
Carrquiry, Alicia (Iowa State University)
Carroll, Raymond (Texas A&M University)
Delaigle, Aureore (University of Melbourne)
Garcia, Tanya (Texas A&M University)
Goldberg, Yair (University of Haifa)
Gorfine, Malka (Tel Aviv University)
Gustafson, Paul (University of British Columbia)
He, Wenqing (University of Western Ontario)
Hoegg, Tanja (University of British Columbia)
Hu, Joan (Simon Fraser University)
Huang, Xianzheng (University of South Carolina)
Huang, Yijian (Emory University)
Huang, Jialin (Amazon.com)
Jiang, Fei (University of South Carolina)
Kipnis, Victor (National Cancer Institute)
Kong, Linglong (University of Alberta)
Lewbel, Arthur (Boston College)
Liang, Hua (University of George Washington)
Ma, Yanyuan (Pennsylvania State University -
Department of Statistics)

Shu, Di (University of Waterloo)
Sinha, Samiran (Texas A&M University)
Song, Weixing (Kansas State University)
Spiegelman, Donna (Harvard School of Public
Health- Epidemiology)
Staudenmayer, John (University of Massachusetts)
Stefanski, Len (North Carolina State University)
Thompson, Mary (University of Waterloo)
Thoresen, Magne (Univ of Oslo)
Van Keilegom, Ingrid (Université catholique de
Louvain)
Wang, Liqun (University of Manitoba)
Wang, Qihua (Chinese Academy of Sciences)
Wang, Yuanjia (Columbia University)
Wang, Haiying (University of New Hampshire)
Xue, Lin (University of Manitoba)
Yan, Ying (University of Calgary)
Yi, Grace (University of Waterloo)
Zeng, Donglin (University of North Carolina)
Zhang, Xinyu (Chinese Academy of Sciences)
Zhu, Zhongyi (Fudan University)

Geometrical Degrees of Freedom in Topological Phases

August 21 - 26, 2016

Organizers:

Joseph Maciejko (University of Alberta)
Eduardo Fradkin (University of Illinois at Urbana-Champaign)

Siddharth Parameswaran (University of California, Irvine)



The past few years have witnessed the emergence of a new direction in the field of topological phases of matter: the interplay between geometry and topology. Thanks to powerful mathematical frameworks such as topological field theory, tensor category theory, and K-theory, much is now known about the properties of topological phases in the topological or strict long-wavelength/low-energy limit, where only the topology of space matters. An outstanding challenge in the field of topological phases is to describe them beyond this limit. A number of recent developments stemming from diverse parts of the scientific community have prompted increased attention to those properties of topological phases for which geometry matters.

For details, please refer to the workshop webpage
<http://www.birs.ca/events/2016/5-day-workshops/16w5124>

Participants:

Barkeshli, Maissam (Microsoft Station Q)
Bauer, Bela (Microsoft Station Q)
Bradlyn, Barry (Princeton University)
Burnell, Fiona (University of Minnesota)
Can, Tankut (Simons Center for Geometry and Physics)
Chen, Xie (Caltech)
Cho, Gil Young (Korea Advanced Institute of Science and Technology)
Fradkin, Eduardo (University of Illinois at Urbana-Champaign)
Franz, Marcel (University of British Columbia)
Fu, Liang (Massachusetts Institute of Technology)
Gromov, Andrey (University of Chicago)
Gu, Zhengcheng (Perimeter Institute)
Gurarie, Victor (University of Colorado)
Haldane, F Duncan M (Princeton University)
Hermele, Michael (University of Colorado Boulder)
Hsieh, Tim (Kavli Institute for Theoretical Physics)
Kimchi, Itamar (Massachusetts Institute of Technology)
Maciejko, Joseph (University of Alberta)
Metlitski, Max (Perimeter Institute)
Moroz, Sergej (TU Munich)

Neupert, Titus (University of Zurich)
Oshikawa, Masaki (University of Tokyo)
Papic, Zlatko (University of Leeds)
Parameswaran, Sid (University of California Irvine)
Pereg Barnea, Tami (McGill University)
Ran, Ying (Boston College)
Regnault, Nicolas (École Normale Supérieure)
Roberts, Matthew (University of Chicago)
Roy, Rahul (University of California Los Angeles)
Sau, Jay (University of Maryland)
Shtengel, Kirill (University of California Riverside)
Sodemann, Inti (Massachusetts Institute of Technology)
Sun, Kai (University of Michigan Ann Arbor)
Vaezi, Abolhassan (Stanford University)
Vijay, Sagar (Massachusetts Institute of Technology)
Wang, Chong (Harvard University)
Witczak-Krempa, William (Harvard University)
Ye, Peng (University of Illinois at Urbana-Champaign)
You, Yizhi (University of Illinois at Urbana-Champaign)
Zaletel, Mike (Microsoft Station Q)

Coupled Mathematical Models for Physical and Biological Nanoscale Systems and Their Applications

August 28 - September 2, 2016

Organizers:

Roderick Melnik (Wilfrid Laurier University)
Luis Bonilla (Universidad Carlos III de Madrid)

Efthimios Kaxiras (Harvard University)



Due to the vastness, novelty and complexity of the interface between mathematical modelling and nanoscience and nanotechnology, many important areas in these disciplines remain barely explored. In progressing further, multidisciplinary research communities have come to a clear understanding that, along with experimental techniques, mathematical modelling and analysis have become crucial in the study, development, and applications of systems at the nanoscale. This workshop was aimed at bringing together researchers from these communities, experts who are working on different aspects of the analysis, modeling, and applications of nanoscale systems, with particular focus on low dimensional nanostructures and coupled mathematical models for their description.

For details, please refer to the workshop webpage
<http://www.birs.ca/events/2016/5-day-workshops/16w5069>

Participants:

Birner, Bjorn (Univ. of California, Santa Barbara)
Bonilla, Luis (Universidad Carlos III de Madrid)
Caflich, Russel (University of California at Los Angeles)
Cances, Eric (Ecole des Ponts and INRIA)
Carpio, Ana (Universidad Complutense de Madrid)
Carr, Stephen (Harvard University)
Carretero, Manuel (Universidad Carlos III de Madrid)
Cazeaux, Paul (University of Minnesota)
Fang, Shiang (Harvard University)
Grahn, Holger (Paul Drude Institute for Solid State Electronics)
Gusarov, Sergey (National Institute for Nanotechnology)
Hoiles, William (University of British Columbia)
Kaupuzs, Jevgenijs (IMSIT at Liepaja University)
Kaxiras, Efthimios (Harvard University)
Krishnamurthy, Vikram (University of British Columbia)
Li, Shaofan (University of California at Berkeley)
Luskin, Mitchell (University of Minnesota)
Marquina, Antonio (Universidad de Valencia)
Massatt, Daniel (University of Minnesota)
Melnik, Roderick (Wilfrid Laurier University)

Miedlar, Agnieszka (University of Kansas)
Nelson, David (Harvard University)
Neu, John (Duke University)
Ortner, Christoph (University of Warwick)
Platero, Gloria (Instituto de Ciencia de Materiales de Madrid)
Plecháč, Petr (University of Delaware)
Prabhakar, Sanjay (Wilfrid Laurier University)
Prados, Antonio (Universidad de Sevilla)
Preto, Jordane (University of Alberta)
Privman, Vladimir (Clarkson University)
Rubi, Miguel (Universitat de Barcelona)
Ruiz-Garcia, Miguel (Universidad Carlos III de Madrid)
Sachrajda, Andrew (National Research Council Canada)
Sanchez, Rafael (Universidad Carlos III de Madrid)
Serna, Susana (Universitat Autònoma de Barcelona)
Shirodkar, Sharmila (Harvard University)
Tuszynski, Jack (University of Alberta)
Willatzen, Morten (Technical University of Denmark)
Yatsyshin, Peter (Imperial College London)
Zabaras, Nicholas (University of Warwick)

Computational Complexity

September 4 - 9, 2016

Organizers:

Toni Pitassi (University of Toronto)
Paul Beame (University of Washington)
Russell Impagliazzo (University of California, San Diego)

Avi Wigderson (Institute for Advanced Study)
Valentine Kabanets (Simon Fraser University)



Computational complexity is a field of research whose main objective is to understand the power and limitation of efficient computation. The area was born in the 1960's, when it was realized that some problems solvable in principle on a computer may not be solvable in practice, as they may not have any efficient algorithmic solution. The workshop brought together the top experts on computational complexity from around the world to examine some recent methods and tools developed in complexity theory, and propose new directions of research.

For details, please refer to the workshop webpage
<http://www.birs.ca/events/2016/5-day-workshops/16w5044>

Participants:

Aaronson, Scott (Massachusetts Institute of Technology)
Barak, Boaz (Harvard)
Beame, Paul (University of Washington)
Bun, Mark (Harvard)
Carmosino, Marco (UCSD)
Chattopadhyay, Eshan (UT Austin)
Cohen, Gil (CalTech)
De, Anindya (Northwestern University)
Drucker, Andy (University of Chicago)
Fleming, Noah (U of Toronto)
Garg, Ankit (Microsoft Research New England)
Göös, Mika (Harvard University)
Grochow, Joshua (University of Colorado - Boulder)
Guruswami, Venkatesan (Carnegie Mellon University)
Impagliazzo, Russell (University of California, San Diego)
Kabanets, Valentine (Simon Fraser University)
Kane, Daniel (UCSD)
Kol, Gillat (Princeton University)
Kolokolova, Antonina (Memorial University of Newfoundland)
Kopparty, Swastik (Rutgers)
Lovett, Shachar (University of California, San Diego)
Lu, Zhenjian (Simon Fraser University)
Meka, Raghu (UCLA)
Moshkovitz, Dana (MIT)
Pitassi, Toniann (University of Toronto)
Raghavendra, Prasad (University of California Berkeley)
Raz, Ran (Weizmann & IAS)
Regev, Oded (New York University)
Robere, Robert (University of Toronto)
Romani, Shadi (SFU)
Rossman, Benjamin (University of Toronto)
Santhanam, Rahul (University of Oxford)
Saraf, Shubhangi (Rutgers)
Schramm, Tselil (University of California, Berkeley)
Shpilka, Amir (Tel Aviv University)
Steinke, Thomas (IBM Research - Almaden)
Steurer, David (Cornell University)
Tal, Avishay (IAS)
Tan, Li-Yang (TTI Chicago)
Wigderson, Avi (Institute for Advanced Study)
Williams, Ryan (Stanford University)
Zuckerman, David (University of Texas, Austin)

Bridges between Noncommutative Algebra and Algebraic Geometry

September 11 - 16, 2016

Organizers:

Colin Ingalls (University of New Brunswick)
Jason Bell (University of Waterloo)
James Zhang (University of Washington)

Lance Small (University of California, San Diego)
Michael Artin (MIT)



Algebraic geometry is the study of solution spaces of polynomials in several variables. This includes the geometry of familiar shapes like parabolas, spheres, and curves in the plane defined by a polynomial. One tries to study the solutions by relating them to other spaces via mappings or parametrizations. This subject is highly controlled by the algebra of polynomials. Geometric statements about the space of solutions correspond directly to algebraic statements about the polynomial equations one is solving. The theme of this workshop was the interplay between noncommutative algebra, algebraic geometry, and representation theory. Our objectives were to bring together researchers who apply geometric and homological methods in different areas of algebra; to identify new research directions; and to encourage interaction and collaborations.

For details, please refer to the workshop webpage
<http://www.birs.ca/events/2016/5-day-workshops/16w5088>

Participants:

Ardakov, Konstantin (University of Oxford)
Bell, Jason (University of Waterloo)
Belmans, Pieter (University of Antwerp)
Brown, Ken (University of Glasgow)
Buchweitz, Ragnar-Olaf (University of Toronto Scarborough)
Chirvasitu, Alexandru (University of Washington)
De Laet, Kevin (University of Antwerp)
Faber, Eleonore (University of Michigan)
Goodearl, Kenneth (University of California, Santa Barbara)
Hille, Lutz (University of Münster)
Hodges, Timothy (NSF)
Ingalls, Colin (University of New Brunswick)
Kirkman, Ellen (Wake Forest University)
Krashen, Daniel (University of Georgia)
Kulkarni, Rajesh (Michigan State University)
Launois, Stéphane (University of Kent)
Lenagan, Tom (University of Edinburgh)
Liebl, Max (University of Washington)
Lorenz, Martin (Temple University)
Lu, Di-Ming (Zhejiang University)
McKinnie, Kelly (University of Montana)
Mori, Izuru (Shizuoka University)

Nasr, Amir (University of New Brunswick)
Negron, Cris (Massachusetts Institute of Technology)
Ng, Siu-Hung (Louisiana State University)
Reyes, Manuel (Bowdoin College)
Rogalski, Daniel (University of California at San Diego)
Rowen, Louis (Bar Ilan University)
Saltman, David J (Center for Communications Research)
Satriano, Matt (University of Waterloo)
Sierra, Susan (University of Edinburgh)
Small, Lance (University of California, San Diego)
Smith, Paul (University of Washington)
Stafford, J. Toby (University of Manchester)
Walt, Chelsea (Temple University)
Wicks, Elizabeth (University of Washington)
Witherspoon, Sarah (Texas A&M University)
Woods, Billy (University of Oxford)
Wu, Quanshui (Fudan University)
Yakimov, Milen (Louisiana State University)
Yekutieli, Amnon (Ben Gurion University)
Zhang, James (University of Washington)

Integrodifference Equations in Ecology: 30 years and counting

September 18 - 23, 2016

Organizers:

Mark Kot (University of Washington)
Frithjof Lutscher (University of Ottawa)

Christina Cobbold (University of Glasgow)
Mark Lewis (University of Alberta)



The main purpose of this BIRS workshop was to instigate the development of novel theory and tools related to the mathematical analysis of IDEs and their applicability to pressing ecological and environmental challenges of our times. The workshop fostered a synergistic research environment where researchers from different areas of dynamical systems, stochastic processes, non-local operators, invasion and conservation biology who do not usually interact exchanged ideas and results and developed joint ideas and projects for the future. The workshop included experienced scientists as well as young researchers worldwide.

For details, please refer to the workshop webpage
<http://www.birs.ca/events/2016/5-day-workshops/16w5121>

Participants:

Agusto, Folashade (University of Kansas)
Baskett, Marissa (University of California, Davis)
Beckman, Noelle (University of Maryland)
Bewick, Sharon (University of Maryland)
Bouhours, Juliette (University of Alberta)
Brasseur, Julien (CNRS)
Bullock, James (NERC Centre for Ecology and Hydrology)
Cobbold, Christina (University of Glasgow)
Coville, Jerome (INRA Avignon)
Crone, Elizabeth (Tufts University)
D'Aloia, Cassidy (Woods Hole Oceanographic Institution)
Dwyer, Greg (University of Chicago)
Ellner, Stephen (Cornell University)
Fagan, William (University of Maryland)
Fang, Jian (Harbin Institute of Technology)
Gharouni, Ali (University of New Brunswick)
Guichard, Fred (McGill University)
Hastings, Alan (University of California, Davis)
Hughes, Josie (York University)
Hurford, Amy (Memorial University of Newfoundland)

Jacobsen, Jon (Harvey Mudd College)
Kot, Mark (University of Washington)
Lenhart, Suzanne (University of Tennessee)
Lewis, Mark (University of Alberta, Canada)
Li, Bingtuan (University of Louisville)
Lui, Roger (Worcester Polytechnic Institute)
Lutscher, Frithjof (University of Ottawa)
Maciel, Gabriel (University of Ottawa)
Marculis, Nathan (University of Alberta)
Miller, Tom (Rice University)
Neubert, Michael (Woods Hole Oceanographic Institution)
Phillips, Austin (University of Washington)
Powell, Jim (Utah State University)
Rinnan, D. Scott (University of Washington)
Robertson, Suzanne (Virginia Commonwealth University)
White, Steven (Centre for Ecology & Hydrology)
Zhao, Xiaoqiang (Memorial University of Newfoundland)
Zhou, Joy (Ohio State University)

Modular Forms in String Theory

September 25 - 30, 2016

Organizers:

Charles Doran (University of Alberta, Canada)
Ling Long (Louisiana State University)

Yasuhiro Goto (Hokkaido University of Education at Hakodate, Japan)
Noriko Yui (Queen's University, Canada)



One of the principal goals of this workshop was to compare new developments since the last one, and give directions to future researches in the interface of number theory and string theory. We continue to look at various modular forms, zeta-functions, L-series, Galois representations, arising from Calabi--Yau manifolds, conformal field theory, quantum field theory, 4D gauge theory, and Feynman diagrams and integrals.

For details, please refer to the workshop webpage
<http://www.birs.ca/events/2016/5-day-workshops/16w5009>

Participants:

Bouchard, Vincent (University of Alberta)
Candelori, Luca (Louisiana State University)
Carnahan, Scott (Tsukuba University)
Chidambaram, Nitin Kumar (University of Alberta)
Chinen, Minako (University of Alberta)
Clingher, Adrian (University of Missouri-St.Louis)
Creutzig, Thomas (University of Alberta)
Dauphinee, Tyler (University of Alberta)
Doran, Charles (University of Alberta, Canada)
Gannon, Terry (University of Alberta)
Goto, Yasuhiro (Hokkaido University of Education at Hakodate, Japan)
Hosono, Shinobu (Gakushuin University)
Ito, Hiroyuki (Tokyo University of Science)
Joshi, Aniket (University of Alberta)
Kanazawa, Atsushi (Harvard University)
Kerr, Matt (Washington University in St. Louis)
Kiming, Ian (University of Copenhagen)
Kloosterman, Remke (Humboldt Universitaet zu Berlin)
Kudla, Stephen (University of Toronto)
Lewis, James (University of Alberta)

Long, Ling (Louisiana State University)
Mahlburg, Karl (Louisiana State University)
Malmendier, Andreas (Utah State University)
Monien, Hartmut (University Bonn)
Ono, Ken (Emory University)
Osburn, Robert (University College Dublin)
Osuga, Kento (University of Alberta)
Rose, Simon
Scheidegger, Emanuel (Albert-Ludwigs-Universität Freiburg)
Sebbar, Abdellah (University of Ottawa)
Top, Jaap (University of Groningen, Johann Bernoulli Institute)
Tu, Fang-Ting (Louisiana State University)
Westerholt-Raum, Martin (Chalmers University of Technology)
Whang, Jun Ho (Peter) (Princeton University)
Yang, Yifan (National Chiao Tung University)
Yui, Noriko (Queen's University, Canada)
Zhou, Jie (Perimeter Institute Waterloo)
Zudilin, Wadim (The University of Newcastle)

Painleve Equations and Discrete Dynamics

October 2 - 7, 2016

Organizers:

Nalini Joshi (University of Sydney)

Vladimir Dragovic (The University of Texas at Dallas)



Interest in non-linear models has grown dramatically over the last decades, since, on the one hand, chaos was discovered in simple models of the atmospheric circulation, and on the other hand astonishingly well-ordered and predictable behaviour was found in certain models of non-linear lattices used to describe thermal properties of metals. The latter observations led to the theory of solitons and completely integrable systems, one of the most profound advances of twentieth century mathematics. Reductions of soliton equations led to the Painlevé equations, which are canonical representations of integrable models in one dimension. Integrable systems have now been recognized as widely applicable models of science, occurring in fluid dynamics, particle physics, solid state physics, optics and many other fields. The main objective of the event was to bring together researchers from several centers and schools, who work in topics related to Painlevé equations and discrete dynamics.

For details, please refer to the workshop webpage
<http://www.birs.ca/events/2016/5-day-workshops/16w5027>

Participants:

Alexandrov, Alexander (Université de Montréal)

Bertola, Marco (Concordia University and SISSA)

Bilman, Deniz (University of Michigan)

Clarkson, Peter (University of Kent)

Dragovic, Vladimir (The University of Texas at Dallas)

Dullin, Holger (University of Sydney)

Girotti, Manuela (Université Catholique de Louvain (UCL))

Harnad, John (Centre de recherches mathématiques, Université de Montréal, and Concordia University)

Horrobin, Calum (Loughborough University)

Izosimov, Anton (University of Toronto)

Joshi, Nalini (University of Sydney)

Julia, Bernard (École Normale Supérieure)

Khoshnasib-Zeinabad, Fariba (University of Texas at Dallas)

Knizel, Alisa (Massachusetts Institute of Technology)

Korotkin, Dmitry (Concordia University)

Kostiuk, Jordan (University of Alberta)

Lisovyi, Oleg (Université François Rabelais de Tours)

Luu, Steven (The University of Sydney)

Mazzocco, Marta (University of Loughborough)

Mulase, Motohico (University of California, Davis)

Nakamura, Akane (University of Sydney)

Nakazono, Nobutaka (The University of Sydney)

Nijhoff, Frank (University of Leeds)

Nolan, Matthew (University of Sydney)

Noumi, Masatoshi (Kobe University)

Ohta, Yasuhiro (Kobe University)

Ormerod, Christopher (University of Maine)

Previato, Emma (Boston University)

Rains, Eric (California Institute of Technology)

Roffelsen, Pieter (The University of Sydney)

Sakai, Hidetaka (University of Tokyo)

Shramchenko, Vasilisa (Université de Sherbrooke)

Suris, Yuri (Technical University of Berlin)

Tsuda, Teruhisa (Hitotsubashi University)

Viallet, Claude (CNRS / Université de Pierre et Marie Curie)

Modeling and Quantifying Cell Function: 25 years of Cell Mechanobiology October 9 - 14, 2016

Organizers:

Paul Janmey (University of Pennsylvania)
Taher Saif (University of Illinois at Urbana-Champaign)

Craig Simmons (University of Toronto)



The primary objective and vision of the workshop were to (1) Reflect on the most critical and fundamental findings and concepts in quantitative cell mechanics to date, (2) Identify the challenges in the field, (3) Identify critical areas of its potential societal impact, e.g., health care, new paradigms in biohybrid devices, sensors and machines, and (4) propose potential roadmaps for the field to realize the potentials. The workshop brought together 30-50 scientists in the field. There were short lectures, Q&A sessions, panel discussions, and working group meetings. The invitees included researchers with expertise in cellular biomechanics and biophysics, experimentalists and theorists, as well as a few clinicians who have experience and interest in applying quantitative concepts of novel analyses to biomedicine.

For details, please refer to the workshop webpage
<http://www.birs.ca/events/2016/5-day-workshops/16w5141>

Participants:

Angelini, Thomas (University of Florida)
Charrier, Elisabeth (University of Pennsylvania)
Chaudhuri, Ovijit (Stanford University)
Clyne, Alisa (Drexel University)
Condeelis, John (Albert Einstein College of Medicine)
Discher, Dennis (University of Pennsylvania)
Dunn, Alex (Stanford University)
Edelstein-Keshet, Leah (University of British Columbia)
Fletcher, Dan (University of California Berkeley)
Fu, Jianping (University of Michigan, Ann Arbor)
Henon, Sylvie (University Paris Diderot)
Hinz, Boris (University of Toronto)
Jacobs, Christopher (Columbia University)
Janmey, Paul (University of Pennsylvania)
Kaufman, Laura (Columbia University)
Kumar, Sanjay (University of California, Berkeley)
Lakins, Jon (University of California, San Francisco)
MacKintosh, Fred (Rice University)
Oakes, Patrick (University of Rochester)

Odde, David (University of Minnesota)
Pakshir, Pardis (University Toronto)
Park, Chan Young (Harvard T.H. Chan School of Public Health)
Pogoda, Katarzyna (Institute of Nuclear Physics, PAN)
Reinhart-King, Cynthia (Cornell University)
Roca-Cusachs, Pere (Institute for Bioengineering of Catalonia - Universitat de Barcelona)
Schmidt, Christoph (Georg August University of Göttingen)
Schwarz, Jennifer (Syracuse University)
Sept, David (University of Michigan)
Shah, Jagesh (Harvard Medical School)
Simmons, Craig (University of Toronto)
Wang, Yu-Li (Carnegie Mellon University)
Weaver, Valerie (University of California San Francisco)
Weitz, David (Harvard University)
Wong, Ian (Brown University)
Zemel, Assaf (Hebrew University)
Zmurchok, Cole (University of British Columbia)

New Trends in Graph Coloring

October 16 - 21, 2016

Organizers:

Zdenek Dvorak (Charles University)
Robin Thomas (Georgia Institute of Technology)

Luke Postle (University of Waterloo)
Bojan Mohar (Simon Fraser University)



Earlier workshops on Viscoplastic Fluids from Theory to Application have been held biannually since 2005, at Graph coloring is one of the oldest studied topics in graph theory. Its roots date back to 1852 with the first statement of the celebrated Four Color Conjecture: can the countries of any map on a globe be colored with at most four colors so that no two countries that share a common boundary have the same color? It took over 100 years to prove this conjecture, and the attempts to do so gave rise to many other important concepts in graph theory and motivated the study of graph colorings in greater generality. Further motivation for the concept comes from wide-ranging applications of many variants of graph coloring in algorithm design, scheduling and resource allocation.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/5-day-workshops/16w5120>

Participants:

Aksenovich, Maria (Karlsruhe Institute of Technology)
Bernshteyn, Anton (University of Illinois at Urbana-Champaign)
Bonamy, Marthe (LaBRI - Université Bordeaux)
Choi, Ilkyoo (KAIST)
Churchley, Ross (Simon Fraser University)
Cranston, Daniel (Virginia Commonwealth University)
Dvorak, Zdenek (Charles University)
Edwards, Katherine (Princeton University)
Esperet, Louis (CNRS)
Gauthier, Gregory (Princeton University)
Haxell, Penny (University of Waterloo)
Hell, Pavol (Simon Fraser University)
Hosseini, Seyyed Aliasghar (Simon Fraser University)
Joos, Felix (University of Birmingham)
Kelly, Tom (University of Waterloo)
Kim, Jaehoon (University of Birmingham)
Knox, Fiachra (Simon Fraser University)
Kostochka, Alexander (University of Illinois at Urbana-Champaign)
Kral, Dan (University of Warwick)

Le, Ngoc Khang (ENS de Lyon)
Lidicky, Bernard (Iowa State University)
Liu, Chun-Hung (Princeton University)
Lukotka, Robert (Comenius University)
Mohar, Bojan (Simon Fraser University)
Norin, Sergey (McGill University)
Postle, Luke (University of Waterloo)
Samal, Robert (Charles University)
Schiermeyer, Ingo (TU Bergakademie Freiberg)
Scott, Alex (University of Oxford)
Seymour, Paul (Princeton University)
Shantanam, Abhinav (Simon Fraser University)
Singer, Nathan (Simon Fraser University)
Smith-Roberge, Evelyne (University of Waterloo)
Spirkl, Sophie (Princeton University)
Stehlik, Matej (Laboratoire G-SCOP)
Trotignon, Nicolas (CNRS - École Normale Supérieure de Lyon)
Wollan, Paul (University of Rome)
Wood, David (Monash University)
Wu, Hehui (University of Mississippi)
Yancey, Matthew (Institute for Defense Analyses)
Yuditsky, Lena (McGill University)

Workshop in Analytic and Probabilistic Combinatorics

October 23 - 28, 2016

Organizers:

Miklos Bona (University of Florida)
Mark Daniel Ward (Purdue University)

Ricardo Gomez (Universidad Nacional Autonoma de Mexico)



Combinatorics is a young area in mathematics that has connections to almost all older fields, such as probability theory, analysis, algebra, number theory and geometry. Therefore, combinatorialists try to apply the existing strong theorems of these other fields in their research. However, no combinatorialist can master all the tools of all of these other fields. Our workshop aimed to facilitate the learning of these tools by bringing together two separate groups of researchers, those who call themselves Analytic Combinatorialists, and those who call themselves Probabilistic Combinatorialists. Each of these groups have their own annual workshops and conferences, which are usually not attended by many members of the other group. There is a substantial potential to increase collaboration between these two circles of researchers, and our workshop aimed to initiate such synergy.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/5-day-workshops/16w5048>

Participants:

Banderier, Cyril (Paris 13 University)
Bevan, David (University of Strathclyde)
Bona, Miklos (University of Florida)
Boyle, Mike (University of Maryland)
Courtial, Julien (University of British Columbia)
de Panafieu, Élie (Université Pierre et Marie Curie)
Drmota, Michael (TU Vienna)
Eslava, Laura (McGill University)
Fill, James Allen (The Johns Hopkins University)
Gaither, Jeff (Mathematical Biosciences Institute)
Galvin, David (Notre Dame)
Gomez, Ricardo (Universidad Nacional Autonoma de Mexico)
Greenwood, Torin (Georgia Institute of Technology)
Heuberger, Clemens (Alpen-Adria-Universität Klagenfurt)
Hitczenko, Pawel (Drexel University)
Holmgren, Cecilia (Uppsala University)
Homberger, Cheyne (University of Maryland, Baltimore County)
Hwang, Hsien-Kuei (Academia Sinica)
Krenn, Daniel (Alpen-Adria Universität Klagenfurt)
Kropf, Sara (Insitute of Statistical Science)
Lohss, Amanda (Drexel University)
Lumbroso, Jérémie (Princeton University)

Magner, Abram (University of Illinois at Urbana-Champaign)
Mailler, Cécile (University of Bath)
McGoff, Kevin (UNC Charlotte)
Melczer, Stephen (University of Waterloo & ENS Lyon)
Mezo, Istvan (Nanjing University of Information Science and Technology)
Michelen, Marcus (University of Pennsylvania)
Mishna, Marni (Mathematics, Simon Fraser University)
Morales, Alejandro (UCLA)
Panario, Daniel (Carleton University)
Panholzer, Alois (Vienna University of Technology)
Pantone, Jay (Dartmouth College)
Pavlov, Ronald (University of Denver)
Petersen, Karl (University of North Carolina)
Prodinger, Helmut (Stellenbosch University)
Simon, Samuel (Simon Fraser University)
Uribe Bravo, Geronimo (Instituto de Matematicas, UNAM)
Vatter, Vincent (University of Florida)
Wagner, Stephan (Stellenbosch University)
Ward, Mark Daniel (Purdue University)

Theoretical and Computational Aspects of Nonlinear Surface Waves

October 30 - November 4, 2016

Organizers:

Mark Groves (Saarland University)
Guyenne Philippe (University of Delaware)

Emilian Parau (University of East Anglia, UK)
Erik Wahlen (Lund University)



This workshop was organised around five main themes related to important mathematical and numerical issues about nonlinear waves arising in a variety of free-surface problems. These issues are among the list of open problems that were highlighted during the concluding session of the 2014 'Theory of Water Waves' program at the Isaac Newton Institute. Because the problems under consideration are similar in nature, they use similar formulations and thus can be addressed by closely related methods. The participants reflected the multidisciplinary nature of these problems, including mathematical analysts, applied mathematicians, numerical analysts as well as fluid dynamicists, oceanographers and engineers. The main objective was to promote the direct interaction between experts from different communities and the cross-fertilization of ideas among them with a focus on the five themes to be described next. We believe this will pave the way for further significant progress and breakthroughs in the theory, numerics and applications of these problems.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/5-day-workshops/16w5112>

Participants:

Ambrose, David (Drexel University)
Arnesen, Mathias (NTNU Trondheim)
Bingham, Harry (Technical University of Denmark)
Bokhove, Onno (University of Leeds)
Bona, Jerry (University of Illinois at Chicago)
Bruell, Gabriele (NTNU)
Carter, John (Seattle University)
Craig, Walter (McMaster University)
Curtis, Christopher (SDSU)
Ehrnstrom, Mats (NTNU Trondheim)
Geyer, Anna (University of Vienna)
Groves, Mark (Saarland University)
Grue, John (University of Oslo)
Haragus, Mariana (Université de Franche-Comté)
Henry, David (University College Cork)
Hristov, Nikolay (McMaster University)
Hur, Vera Mikyong (University of Illinois at Urbana-Champaign)
Ifrim, Mihaela (UC Berkeley)
Kalisch, Henrik (University of Bergen)
Klein, Christian (Institut de Mathématiques de Bourgogne)
Korotkevich, Alexander (University of New Mexico)

Lannes, David (Université de Bordeaux et CNRS)
Marche, Fabien (Université de Montpellier)
Milewski, Paul (University of Bath)
Nilsson, Dag (Lund University)
Oliveras, Katie (Seattle University)
Parau, Emilian (University of East Anglia, UK)
Philippe, Guyenne (University of Delaware)
Ratliff, Daniel (University of Surrey)
Shkoller, Steve (UC Davis)
Tataru, Daniel (University of California, Berkeley)
Trichtchenko, Olga (UCL)
Upsal, Jeremy (University of Washington)
Van-den-Broeck, Jean-Marc (University College London)
Vargas-Magana, Rosa (Universidad Nacional Autónoma de México)
Varholm, Kristoffer (NTNU Trondheim)
Wahlen, Erik (Lund University)
Walsh, Samuel (University of Missouri)
Wang, Zhan (Chinese Academy of Sciences)
Wheeler, Miles (Courant Institute of Mathematical Sciences)
Wu, Sijue (University of Michigan)

Random Geometric Graphs and Their Applications to Complex Networks

November 6 - 11, 2016

Organizers:

Pawel Pralat (Ryerson University)
Josep Diaz (Universitat Politècnica de Catalunya)
Alan Frieze (Carnegie Mellon University, USA)

Tobias Muller (Utrecht University)
Xavier Perez-Gimenez (Ryerson University)
Nick Wormald (Monash University, Australia)



Random geometric graphs are mathematical network models whereby a network is formed on a set of randomly generated points in the plane (or some higher dimensional space) by connecting pairs of points according to some geometric rule. For example, two points are connected if their distance is less than some parameter r . The topic is currently receiving considerable attention from the mathematics, computer science and engineering communities because of its relevance to real-world networks such as ad-hoc wireless networks. In particular, hyperbolic versions of continuum percolation/random geometric graphs have amongst other things been suggested as good models for social networks, and are also being studied in connection with the routing of messages on a network. The main goals of the workshop were to facilitate the exchange of tools, techniques, questions, and ideas that will lead to a better understanding of (hyperbolic) continuum percolation/random geometric graphs; and to form new (international) collaborations for the exploration of this exciting research frontier.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/5-day-workshops/16w5095>

Participants:

Addario-Berry, Luigi (McGill University, Canada)
Angel, Omer (University of British Columbia)
Balister, Paul (University of Memphis)
Balogh, Jozsef (University of Illinois)
Bonato, Anthony (Ryerson University)
Bradonjic, Milan (Bell Labs)
Broman, Erik (Uppsala)
Candellero, Elisabetta (University of Warwick)
Conijn, René (Utrecht University)
Coupier, David (Université Lille 1)
Dettmann, Carl (The University of Bristol)
Devroye, Luc (McGill University)
Diaz, Josep (Universitat Politècnica de Catalunya)
Dudek, Andrzej (Western Michigan University)
Fountoulakis, Nikolaos (University of Birmingham)
Fraiman, Nicolas (Harvard University)
Frieze, Alan (Carnegie Mellon University, USA)
Gao, Jane (Monash University)
Gunderson, Karen (University of Manitoba)
Hansen, Ben (Utrecht University)
Infeld, Ewa (Ryerson University)
Janssen, Jeannette (Dalhousie University)
Kang, Ross (Radboud University Nijmegen)

Kiwi, Marcos (University of Chile)
Krioukov, Dmitri (Northeastern University)
Last, Guenter (Karlsruhe Institute of Technology)
Luczak, Tomasz (Adam Mickiewicz University)
Mehrabian, Abbas (University of British Columbia)
Menard, Laurent (Université Paris Ouest)
Mitsche, Dieter (Universite de Nice Sophia-Antipolis)
Morin, Pat (Carleton University)
Muller, Tobias (Utrecht University)
Penrose, Mathew (University of Bath)
Perarnau, Guillem (Birmingham University)
Peres, Yuval (Microsoft Research)
Perez-Gimenez, Xavier (Ryerson University)
Pralat, Pawel (Ryerson University)
Schepers, Markus (Utrecht University)
Schulte, Matthias (University of Bern)
Solovey, Kiril (Tel Aviv University)
Tykesson, Johan (Gothenburg)
van der Hoorn, Pim (Northeastern University)
Walters, Mark (Queen Mary University of London)
Yukich, Joseph (Lehigh University)

Permutation Groups

November 13 - 18, 2016

Organizers:

Donna Testerman (Ecole Polytechnique Federale de Lausanne)
Cheryl Praeger (The University of Western Australia)

Katrin Tent (Universitaet Muenster)
George Willis (The University of Newcastle)
Luc Vinet (University of Montreal)



Permutation groups are a mathematical approach to analysing structures by studying the rearrangements of the elements of the structure that preserve it. Finite permutation groups are primarily understood through combinatorial methods, while concepts from logic and topology come to the fore when studying infinite permutation groups. These two branches of permutation group theory are not completely independent however because techniques from algebra and geometry may be applied to both, and ideas transfer from one branch to the other. This workshop brought together researchers on both finite and infinite permutation groups to share techniques and recent advances.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/5-day-workshops/16w5087>

Participants:

Aschbacher, Michael (California Institute of Technology)
Bors, Alexander (University of Salzburg)
Burness, Tim (University of Bristol)
Capdeboscq, Inna (University of Warwick, UK)
Caprace, Pierre-Emmanuel (Université catholique de Louvain)
Castellano, Ilaria (University of Southampton)
Chatzidakis, Zoé (CNRS - Ecole Normale Supérieure)
Cherlin, Gregory (Rutgers, The State University of New Jersey)
Craven, David (University of Birmingham)
De Medts, Tom (Ghent University)
Fawcett, Joanna (University of Western Australia)
Garrido, Alejandra (Heinrich Heine Universität Düsseldorf)
Gillespie, Neil (University of Bristol)
Giudici, Michael (The University of Western Australia)
Kaplan, Itay (Hebrew University of Jerusalem)
Litterick, Alastair (Bielefeld University)
MacPherson, Dugald (University of Leeds)
Magaard, Kay (University Birmingham)
Malle, Gunter (Technische Universität Kaiserslautern)
Moller, Rognvaldur (University of Iceland)

Morgan, Luke (The University of Western Australia)
Morris, Joy (University of Lethbridge)
Neumann, Peter M (The Queen's College)
Nies, Andre (The University of Auckland)
Praeger, Cheryl (The University of Western Australia)
Radu, Nicolas (Université Catholique de Louvain)
Ramagge, Jacqui (University of Sydney)
Reid, Colin (University of Newcastle)
Schneider, Csaba (Universidade Federal de Minas Gerais)
Segev, Yoav (Ben Gurion University)
Seitz, Gary (University of Oregon)
Simon, Pierre (Université Lyon 1)
Smith, Simon (New York City College of Technology, City University of New York)
Tent, Katrin (Universitaet Muenster)
Testerman, Donna (Ecole Polytechnique Federale de Lausanne)
Thomas, Adam (Bristol University)
Tiep, Pham (University of Arizona)
Tornier, Stephan (Swiss Federal Institute of Technology Zurich)
Verret, Gabriel (University of Western Australia)
Weiss, Richard (Tufts University)
Wesolek, Phillip (Binghamton University)
Willis, George (The University of Newcastle)

Mathematical Biology for Understanding Emerging Infectious Diseases at the Human-Animal-Environment Interface: a “One Health” Approach

November 20 - 25, 2016

Organizers:

Amy Greer (University of Guelph)
David Fisman (University of Toronto)

Jianhong Wu (York Institute for Health Research, York University)



This workshop brought together methodological experts in mathematics, statistics, computational biology, and computer science with human and veterinary medicine practitioners, industry partners and government officials to begin to develop a computational framework for modeling pathogens at the human-animal-environment interface in a meaningful way. There are three main themes related to infectious diseases that this workshop will address. Each of the theme areas yield a variety of control challenges for human and veterinary health as a result of the complex host-pathogen-environment interactions responsible for the emergence and spread of these pathogens and therefore pose a particular challenge to public health, veterinary, and regulatory decision-makers. These systems involve the presence of alternate hosts, and/or have an environmental reservoir that allows the pathogen to exist independent of the host. As a result, these systems demonstrate non-linear behaviour that makes many aspects of their dynamics difficult to predict and makes optimal decisions regarding interventions and control measures difficult. Mathematical biology, specifically, disease transmission models allow researchers to test hypotheses that are difficult to test in the field.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/5-day-workshops/16w5041>

Participants:

Agusto, Folashade (University of Kansas)
Ajayi, Toluwalope (University of Guelph)
Arino, Julien (University of Manitoba)
Arsenault, Julie (University of Montreal)
Aubry, Pascale (Canadian Food Inspection Agency)
Belair, Jacques (CDM & Mathematics and Statistics, Université de Montréal)
Caffrey, Niamh (U. of Calgary)
Cattuto, Ciro (ISI Foundation)
Champredon, David (McMaster University)
Cousins, Melanie (University of Guelph)
Deardon, Rob (Guelph)
Delgado, Amy (US Department of Agriculture)
Eng, Ken (Public Health Agency of Canada)
Engblom, Stefan (Uppsala University)
Fisman, David (University of Toronto)
Fitzpatrick, Meagan (Yale University)
Gardner, Emma (FAO/University of Guelph)

Greer, Amy (University of Guelph)
Heffernan, Jane (CDM & Mathematics and Statistics, York University)
Hill, Edward (University of Warwick)
Huo, Xi (York University)
Khan, Salah Uddin (University of Guelph)
Munoz-Zanzi, Claudia (University of Minnesota)
Rahman, Ashrafur (York University)
Rönn, Minttu (Harvard T.H. Chan School of Public Health)
Sargeant, Jan (University of Guelph)
Spence, Kelsey (University of Guelph)
Tizzoni, Michele (ISI Foundation)
Tuite, Ashleigh (Harvard)
Von Dobschuetz, Sophie (FAO)
Waldner, Cheryl (University of Saskatchewan)
Wu, Jianhong (York Institute for Health Research, York University)

Fifth Parallel-in-time Integration Workshop

November 27 - December 2, 2016

Organizers:

Matthew Emmett (Computer Modelling Group Ltd)
Ronald Haynes (Memorial University of Newfoundland)

Michael Minion (Lawrence Berkeley National Lab)
Martin Gander (Université de Genève)
Rolf Krause (Università della Svizzera italiana)



Scientific computing is an increasingly important tool in many areas of science and engineering. By simulating models of physical phenomena we can, for example, gain insight into processes that are difficult or impossible to measure experimentally. This workshop brought together scientists from the fields of parallel-in-time integration, multigrid methods, and domain decomposition to discuss similarities between their respective approaches to space/time algorithms, their applications and, ultimately, their combination. Questions arising in this context range from possible coarsening strategies to suitable inter-level transfer operators in space and time, and how other features of time-parallel methods can be exploited to further enhance their applicability to complex systems.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/5-day-workshops/16w5030>

Participants:

Bae, Jane (Stanford University)
Bolten, Matthias (Universität Kassel)
Emmett, Matthew (Computer Modelling Group Ltd)
Enright, Wayne (University of Toronto)
Falgout, Robert (Lawrence Livermore National Laboratory)
Friedhoff, Stephanie (Universität zu Köln)
Gander, Martin (Université de Genève)
Günther, Stefanie (TU Kaiserslautern)
Haynes, Ronald (Memorial University of Newfoundland)
Howse, Alexander (University of Waterloo)
Iizuka, Mikio (RIKEN)
Krause, Rolf (Università della Svizzera italiana)
Kreienbuehl, Andreas (Lawrence Berkeley National Laboratory)
Kwok, Felix (Hong Kong Baptist University)
Lui, Shaun (University of Manitoba)
Lunet, Thibaut (ISAE-Supaero)
May, Ian (Simon Fraser University)
Minion, Michael (Lawrence Berkeley National Lab)
Moser, Dieter (Jülich Supercomputing Centre)
Muir, Paul (Saint Mary's University)
Mula, Olga (Paris Dauphine University)

Nataj, Sarah (University of Manitoba)
Neumüller, Martin (Johannes Kepler University Linz)
Ong, Benjamin (Michigan Technological University)
Peng, Zhen (University of New Mexico)
Ruprecht, Daniel (University of Leeds)
Salomon, Julien (Université Paris-Dauphine)
Samaddar, Debasmita (Culham Centre for Fusion Energy)
Schmitt, Andreas (Technische Universität Darmstadt)
Schöbel, Ruth (Jülich Supercomputing Centre)
Schreiber, Martin (University of Exeter)
Schroder, Jacob (Lawrence Livermore National Laboratory)
Shipton, Jemma (Imperial College London)
Speck, Robert (Forschungszentrum Jülich GmbH)
Spiteri, Ray (University of Saskatchewan)
Steinbach, Olaf (Technische Universität Graz)
Vandewalle, Stefan (University of Leuven)
Weiser, Martin (Zuse Institute Berlin)
Wensch, Joerg (Technische Universität Dresden)
Wingate, Beth (University of Exeter)
Zhang, Hui (Zhejiang Ocean University)

Analytic versus Combinatorial in Free Probability

December 4 - 9, 2016

Organizers:

James Mingo (Queen's University)
Roland Speicher (Saarland University)

Alexandru Nica (University of Waterloo)
Dan Voiculescu (University of California, Berkeley)



Free Probability is a recent mathematical theory which tries to understand non-commutative algebras (which are generated, for example, by operators on Hilbert spaces or by random matrices) inspired by classical probability theory. Free probability is certainly a very active area, with many unsolved problems ahead, as well as various recent new exciting developments. A meeting bringing together various mathematical backgrounds -- in particular, analytic and combinatorial -- with an emphasis on the connections is very timely and useful, with a potentially great impact on the further developments of free probability and related subjects.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/5-day-workshops/16w5025>

Participants:

Anshelevich, Michael (Texas A & M University)
Arizmendi, Octavio (Centro de Investigacion en Matematicas (Guanajuato-Mexico))
Au, Benson (University of California, Berkeley)
Banna, Marwa (Saarland University)
Belinschi, Serban Teodor (Université Paul Sabatier Toulouse)
Bercovici, Hari (Indiana University)
Biane, Philippe (Institut Gaspard Monge UMR CNRS - 8049 Université Paris-Est)
Brannan, Michael (Texas A&M University)
Capitaine, Mireille (CNRS, Université Paul Sabatier Toulouse)
Cebon, Guillaume (Saarland University)
Charlesworth, Ian (University of California, Los Angeles)
Diaz, Mario (Queen's University)
Dykema, Ken (Texas A & M University)
Ebrahimi-Fard, Kurusch (Norwegian University of Science and Technology in Trondheim)
Friedrich, Roland (Saarland University)
Germain, Emmanuel (Université de Caen)
Goetze, Friedrich (University of Bielefeld)
Gu, Yinzheng (Queen's University)
Gudowska-Nowak, Ewa (Jagiellonian University)
Hasebe, Takahiro (Hokkaido University)
Hsueh, Kun-Hung (University of Waterloo)

Kemp, Todd (University of California, San Diego)
Koestler, Claus (University College Cork)
Krishnaswamy-Usha, Amudhan (Texas A&M University)
Lehner, Franz (TU Graz)
Liu, Weihua (UC Berkeley)
Male, Camille (Université Bordeaux & CNRS)
Marcus, Adam (Princeton University)
Mingo, James (Queen's University)
Nelson, Brent (UC Berkeley)
Nica, Alexandru (University of Waterloo)
Novak, Jonathan (University of California, San Diego)
Nowak, Maciej (Jagiellonian University)
Patras, Frederic (Université de Nice Sophia-Antipolis)
Sakuma, Noriyoshi (Aichi University of Education)
Shlyakhtenko, Dimitri (University of California, Los Angeles)
Skoufranis, Paul (Texas A&M University)
Speicher, Roland (Saarland University)
Szpojankowski, Kamil (University of Waterloo)
Vázquez Becerra, Josué (Queen's University)
Voiculescu, Dan (University of California, Berkeley)
Wang, Jiun-Chau (University of Saskatchewan)
Weber, Moritz (Saarland University)

Banff International Research Station

2016

2-Day Workshops

Big Data Tsunami at the Interface of Statistics, Environmental Sciences and Beyond

March 11 - 13, 2016

Organizers:

Yulia Gel (University of Texas at Dallas)
Lilia Leticia Ramirez Ramirez (Instituto Tecnológico
Autonómico de México)

Viacheslav Lyubchich (University of Maryland
Center for Environmental Science)



The rampant growth of digital technologies and information storage have revolutionized the volume, velocity and variety of collected information, leading to the so-called “Big Data” paradigm. In turn, this alters the way in which scientists sense and analyze the available information dramatically, and ignites the interest in Big Data phenomenon virtually everywhere, from climate research to omics studies to business analytics. The goal of this workshop was to bring together a productive combination of various modern and yet relatively scarcely investigated perspectives on modeling and fusing massive multi-source multi-scale data and to encourage debate, which will lead to cross-fertilization of ideas and enhancing cohesion between experts from statistics, applied mathematics, computer science, social sciences, geography, ecology, hydrology and other environmental disciplines.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/2-day-workshops/16w2669>

Participants:

Ebert-Uphoff, Imme (Colorado State University)
Esterby, Sylvia (University of British Columbia
Okanagan)
Finley, Andrew (Michigan State University)
Gel, Yulia (University of Texas at Dallas)
Griffith, Daniel (University of Texas at Dallas)
Guinness, Joe (North Carolina State University)
Hammerling, Dorit (National Center for Atmospheric
Research)
Haug, Ola (Norwegian Computing Center)
Heaney, Dan (Farmers Edge)

Lund, Robert (Clemson University (United States))
Martinez-Gomez, Elizabeth (Instituto Tecnológico
Autonómico de México)
McMahan, Chris (Clemson University)
McMahan, Jonathan (Environmental Protection
Agency)
Mena, Ramsés (Universidad Nacional Autónoma de
México)
Ramirez Ramirez, Lilia Leticia (Instituto
Tecnológico Autonomo de México)
Yamana, Teresa (Columbia University)

Continuing to Connect: Computational Thinking, Design Thinking, Critical Thinking in the Elementary Classroom

April 1 - 3, 2016

Organizers:

Geri Lorway (Thinking 101)
Crichton Susan (University of British Columbia)

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 until later, or the other way round? This follow-up workshop was 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
<https://www.birs.ca/events/2016/2-day-workshops/16w2686>

Participants:

Berg, Sandi (Central Alberta Regional Consortium)
Bieraugle, Vance (Teacher Edmonton Public School District)
Brown, April (Peace Wapiti School Division 76)
Bruised Head, Annette (Kainai High School)
Bruised Head, Clark (Red Crow College)
Cherkowski, Gina (STEM Learning Lab Calgary)
Currie, Tom (Teacher Westmount Charter School)
Egge, Karen (Northwest Regional Learning Consortium)
Graves, Sean (University of Alberta)
Hall, Kathy (James Short Memorial School)
Layton, Ryan (ATA Ed Technology Council)
Lewis, Omari (Edmonton Public School District)
Lore, Pat (Alberta Assessment Consortium)

Lorway, Geri (Thinking 101)
McNutt, Kathy (Wildrose School District AB)
Preciado Babb, Paulino (University of Calgary)
Rosko, Suzanne (Teacher Edmonton Catholic)
Sauerborn, Mardelle (Scool District 5)
Sengupta, Pratim (University of Calgary)
Simmons, Brian (Calgary Board of Education)
Spencer, Danielle (Wild Rose School Division)
Susan, Crichton (University of British Columbia)
Wright, Kristin (Teacher)
Yamada, Karen (C21 Canada)

Alberta Number Theory Days VIII

April 15 - 17, 2016

Organizers:

Anna Puskás (University of Alberta)

Habiba Kadiri (University of Lethbridge)



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 allowed for the exchange of knowledge, which will improve the progress of current projects.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/2-day-workshops/16w2687>

Participants:

Akbary, Amir (University of Lethbridge)
Ali, Abid (University of Alberta)
Auger, Jean (University of Alberta)
Bose, Arnab (University of Lethbridge)
Creutzig, Thomas (University of Alberta)
Das, Parthasarathi (University of Calgary)
Duffy, Dakota (University of Lethbridge)
Eischen, Ellen (University of Oregon)
Feaver, Amy (The King's University)
Fiori, Andrew (University of Calgary)
Francis, Forrest (University of Lethbridge)
Gannon, Terry (University of Alberta)
Guy, Richard (The University of Calgary)
Hamieh, Alia (University of Lethbridge)
Jacobson, Mike (University of Calgary)

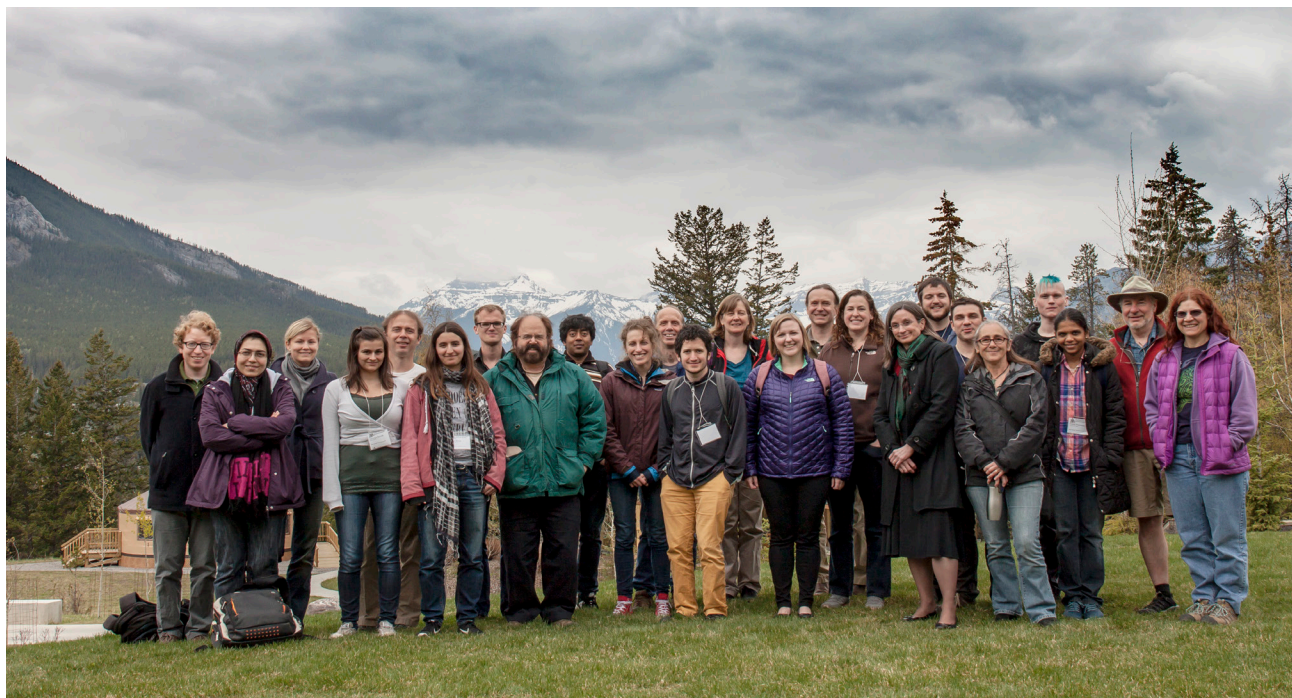
Kadiri, Habiba (University of Lethbridge)
Kanade, Shashank (University of Alberta)
Lamzouri, Youness (York University)
Lindner, Sebastian (University of Calgary)
Moussaoui, Ahmed (University of Calgary)
Ng, Nathan (University of Lethbridge)
Puskás, Anna (University of Alberta)
Rezai Rad, Monireh (University of Calgary)
Sarkar, Soumen (University of Calgary)
Scheidler, Renate (University of Calgary)
Shahabi, Majid (University of Calgary)
Siavashi, Sahar (University of Lethbridge)
Xu, Bin (University of Calgary)
Zvengrowski, Peter (University of Calgary)

56th Cascade Topology Seminar

April 29 - May 1, 2016

Organizers:

Kristine Bauer (University of Calgary)



The Cascade Topology Seminar was designed to foster contacts between researchers, including graduate students, in similar fields across Western Canada and the Pacific Northwestern United States. This seminar has met twice per year for over 25 years, and has helped to establish contact between many researchers who are very broadly interested in topology. This particular meeting of the Cascade Topology Seminar came at the nexus of several other activities in topology within this geographic area: this 2-day seminar came in the middle of many activities related to a PIMS collaborative research group in Applied, Algebraic and Geometric topology, and followed the BIRS workshop Women in Topology II. Both of these activities provided a unique opportunity to bring a more global community of topologists in contact with topologists in the Cascade region. The goal of this workshop was to foster interaction between these diverse groups of topologists.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/2-day-workshops/16w2679>

Participants:

Basterra, Maria (University of New Hampshire)
Bauer, Kristine (University of Calgary)
Bayeh, Marzieh (University of Regina)
Beaudry, Agnes (University of Chicago)
Bleiler, Steven (Portland State University)
Budney, Ryan (University of Victoria)
Cockett, Robin (University of Calgary)
Davis, James (Indiana University)
Gallagher, Jonathan (University of Calgary)
Henrich, Allison (Seattle University)
Hess, Kathryn (Ecole Polytechnique Federale de Lausanne)
Johnson, Brenda (Union College)

Kedziorek, Magdalena (EPFL)
Klang, Inbar (Stanford University)
MacAdam, Ben (University of Calgary)
Pronk, Dorette (Dalhousie University)
Rovelli, Martina (EPF Lausanne)
Sarkar, Soumen (University of Calgary)
Scull, Laura (Fort Lewis College)
Srinivasan, Priyaa (University of Calgary)
Stanley, Donald (University of Regina)
Vela, Diego (University of Victoria)
Wierstra, Felix (University of Oregon)
Williams, Ben (University of British Columbia)

Ted Lewis Math Fair Workshop 2016

May 6 - 8, 2016

Organizers:

Ted Lewis (SNAP Mathematics Foundation)
Sean Graves (University of Alberta)

Tiina Hohn (MacEwan University)

This was the fourteenth annual Math Fair workshop at BIRS. The workshop is extremely popular with teachers in elementary and secondary schools, provides them with resources for their lesson plans, and it is helping to reshape the way mathematics is being approached in the schools. Problem solving and puzzles in the classroom is now a specific area of the new curriculum and in-service teachers have had very little training in using these tools effectively. This is not limited to Alberta Schools and the SNAP Math Fair idea is now spreading around the world. This type of 2-day workshop is considered front line approach in the collaborative effort between mathematicians, more experienced teachers and all teachers interested in professional development to improve the mathematics teaching in the elementary level and beyond. To have teachers share their valuable experiences with math fair in their own schools is the best and most useful information to others. Teachers in Alberta and participants from outside view the Ted Lewis Workshop as one of the PIMS and BIRS most valuable education initiatives.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/2-day-workshops/16w2681>

Participants:

Conner, Patrick (Red Deer College)
Espinoza, Richard (Edmonton Public Schools)
Forster, Amanda (Edmonton Public Schools)
Graves, Sean (University of Alberta)
Greco, Silvia (Edmonton Public Schools)
Hildebrandt, Maxine (Mother Earth Charter School)
Hoffman, Janice (Edmonton Public Schools)
Hohn, Tiina (MacEwan University)
Hrycaj, Andrea (Evergreen Catholic Schools)
Hrycaj, Julia (Elk Island Catholic Schools)
Jones, Carolyn (Centre for Education)

Kotyk, Nicole (Evergreen Elementary School)
Lenuik, Tania (Edmonton Public Schools)
Lewis, Ted (SNAP Mathematics Foundation)
Lorway, Geri (Thinking 101)
McLeod, Vanessa (Edmonton Public Schools)
Nichols, Ryan (Edmonton Schools)
Pasanen, Trevor (University of Alberta)
Sartorelli, Toni (Johnny Bright School)
Shaw, Dolph (Edmonton Public Schools)
Thompson, Tanya (Mastermind Toys)
Vigfusson, Lori (New Horizons School)

Surgery and Geometry

July 22 - 24, 2016

Organizers:

Diarmuid Crowley (University of Aberdeen)
Guoliang Yu (Texas A&M University)

James Davis (Indiana University)



This 2-day workshop was intended as the capstone event for the Summer School on the Classification of Manifolds held at the University of Calgary July 18-22, 2016. There have been several summer schools on this central area of geometric topology in Europe and one in India, but none in North America. This workshop focused on current research in surgery theory and with a focus on applications to and connections with geometry. This workshop followed the week-long summer school “Classification of Manifolds” held at University of Calgary and aimed at future and recent Ph.D.’s. The workshop facilitated the interaction between summer school participants and research mathematicians.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/2-day-workshops/16w2689>

Participants:

Buggish, Lukas (University of Muenster)
Burdick, Bradley (University of Oregon)
Bustamante, Mauricio (Binghamton University)
Crowley, Diarmuid (University of Aberdeen)
Davis, James (Indiana University)
Frenck, Georg (University of Muenster)
Hambleton, Ian (McMaster University)
Hu, Hailiang (Indiana University)
Hu, Yang (University of Regina)
kasilingam, ramesh (Indian Statistical Institute, Bangalore)
Kazaras, Demetre (University of Oregon)
Khan, Qayum (Saint Louis University)
Kudryashov, Alexei (University of Augsburg)
Miller, Maggie (Princeton University)
Miller, Allison (University of Texas Austin)

Nagy, Csaba (University of Aberdeen)
Pederzani, Niccolò (Max Planck Institute for Mathematics in the Sciences)
Perlmutter, Nathan (Stanford University)
Reinauer, Raphael (Auswählen)
Reinhold, Jens (Stanford University)
Sanford, Sean (University of Hawaii)
Schick, Thomas (University of Göttingen)
Smith, Gerrit (Saint Louis University)
Sorcar, Gangotryi (Ohio State University)
Stanley, Donald (University of Regina)
Su, Zhixu (Indiana University)
Tanaka, Hiro (Harvard University)
Tshishiku, Bena (Stanford University)
Xie, Zhizhang (Texas A&M University)
Yu, Guoliang (Texas A&M University)

Geophysical Simulation and Inversion

August 19 - 21, 2016

Organizers:

Adam Pidlisecky (University of Calgary)

Douglas Oldenburg (University of British Columbia)



The objective of this meeting was to refine a framework that enables and encourages sustained cross-disciplinary communication, which is a necessary first step in integrated geophysical simulation research. This meeting presented a unique opportunity to bring together a diverse group of geophysical experts to summarize and synthesize several sub-fields of geophysical simulation and inversion research. The integration of geophysical sub-disciplines, supported by this framework, will enhance communication between disciplines and support the next-generation of integrated geophysical research.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/2-day-workshops/16w2695>

Participants:

Capriotti, Joseph (Colorado School of Mines)
Cockett, Rowan (University of British Columbia)
Cordell, Darcy (University of Alberta)
Fournier, Dominique (University of British Columbia)
Gao, Wenlei (University of Alberta)
Gibson, Peter (York University)
Hardeman, Heather (University of Calgary)
Heagy, Lindsey (University of British Columbia)
Herring, Teddi (University of Calgary)
Kang, Seogi (University of British Columbia)
Karchewski, Brandon (University of Calgary)

Kent-O'Donnell, Daniel (University of Calgary)
Lamoureux, Michael (University of Calgary)
Lee, Ben (University of Alberta)
McAliley, Wallace (Colorado School of Mines)
Oldenburg, Douglas (University of British Columbia)
Pare, Andrew (Colorado School of Mines)
Pidlisecky, Adam (University of Calgary)
Rosenkjar, Gudni (University of British Columbia)
Singha, Kamini (Colorado School of Mines)
Stanton, Aaron (University of Alberta)
Trad, Daniel (University of Calgary)

Robustness Theory and Methodology: Recent Advances and Future Directions September 2 - 4, 2016

Organizers:

Giseon Heo (University of Alberta)

Julie Zhou (University of Victoria)



The primary objective of this BIRS workshop was to bring together researchers active in the field of robustness theory and its methodology, to which Professor Douglas Wiens has made a notably strong contribution over the last thirty years. Participants discussed the history of robustness and focused on prospective future developments; speakers highlighted recent advances and proposed new techniques for incorporation into other areas of research, such as high-dimensional data analysis. The second objective of this workshop was to provide graduate and senior undergraduate students the opportunity to advance robustness theory and its applications to currently-active research areas such as statistical machine learning.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/2-day-workshops/16w2693>

Participants:

Carriere, Keumhee (University of Alberta)
Collins, John (University of Calgary)
Cribben, Ivor (Alberta School of Business)
Fang, Zhide (Louisiana State University Health Sciences Center)
Frolova, Nadezda (University of Alberta)
Gao, Lucy (University of Washington)
Hart, Trevor (Government of Alberta)
Heo, Giseon (University of Alberta)
Hu, Rui (MacEwan University)
Jiang, Bei (University of Alberta)
Karunamuni, Rohan (University of Alberta)
Kong, Linglong (University of Alberta)
Li, Pengfei (University of Waterloo)
Maciak, Matus (Charles University)

Mizera, Ivan (University of Alberta)
Oyet, Alwell (Memorial University of Newfoundland)
Pietrosanu, Matthew (University of Alberta)
Schmuland, Byron (University of Alberta)
Sinha, Sanjoy (Carleton University)
Tu, Wei (University of Alberta)
Wang, Quanli (Duke University)
Wiens, Douglas (University of Alberta)
Wubie, Berhanu (University of Alberta)
Xu, Xiaojian (Brock University)
Yin, Yue (University of Victoria)
Yu, Dengdeng (University of Alberta)
Zhai, Zhichun (University of Alberta)
Zhou, Julie (University of Victoria)
Zhou, Yi (University of Alberta)

Retreat for Young Researchers in Stochastics

September 23 - 25, 2016

Organizers:

Michael Kouritzin (University of Alberta)
Christopher Hoffman (University of Washington)

Ed Perkins (University of British Columbia)



The workshop allowed some outstanding young postdoctoral fellows to describe their recent research results and the open problems on which they are currently working. The range of topics from pure to the very applied was a distinctive feature of the workshop. This gives those whose interests are on the fundamental side an opportunity to see what is going on in applications in areas such as filtering and mathematical finance and gives those on the more applied side an opportunity to learn some of the more recent fundamental advances in theory. Several senior faculty presented open problems.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/2-day-workshops/16w2696>

Participants:

Adcock, Ben (Simon Fraser University)
Angel, Omer (University of British Columbia)
Balka, Richard (University of British Columbia)
Barlow, Martin (University of British Columbia)
Barnes, Clayton (University of Washington)
Beaton, Nicholas (University of Saskatchewan)
Bitto, Gerandy (University of Washington)
Brugiapaglia, Simone (Simon Fraser University)
Cera, Katharina (U. Calgary)
Chavez Casillas, Jonathan (University of Calgary)
Chetrite, Raphael (CNRS- PIMS-SFU)
Dinan, Emily (University of Washington)
Forman, Noah (U. Oxford)
Hoffman, Christopher (University of Washington)

Kouritzin, Michael (University of Alberta)
Le, Khoa (U. Calgary/U. Alberta)
Lo, Gane Samb (visiting U. Calgary from Senegal)
Murugan, Mathav (University of British Columbia)
Perkins, Ed (University of British Columbia)
Racz, Miklos (Microsoft Research)
Schmidt, Julia (U. Calgary)
Sezer, Deniz (University of Calgary)
Slade, Gordon (University of British Columbia)
Swishchuk, Anatoliy (University of Calgary)
Wang, Zhenan (U. Washington)
Ware, Tony (University of Calgary)

Banff International Research Station

2016

**Summer Schools
Research in Teams
Focused Research Groups**

Summer Schools

2016 Summer IMO Training Camp June 26 - July 8, 2016

Organizers:

Dorette Pronk (Dalhousie University)
Johan Rudnick (Canadian Mathematical Society)
Bill Sands (University of Calgary)

Jacob Tsimmerman (Princeton)
Rogelio Valdez (Universidad Autónoma del Estado de México)



The purpose of the IMO Training Camp is to be an intensive preparation for the Canadian students attending the upcoming IMO, and also to allow these students to get to know each other well. In the last ten years, most of the Summer IMO Training Camps have been held at BIRS, and each was a complete success for all concerned, from the point of view of contest preparation, but also because of the chance our Team had to experience the natural beauty of the surroundings. Incidentally our Canadian IMO Teams in these years all performed extremely well and it is certain that some of the credit for the team's excellent results can be attributed to the students' time spent at BIRS.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/summer-schools/16ss031/press>

Participants:

Arthur, David (Google)
Lin, Andrew (IMO)
Lopatto, Patrick (IMO)
Morewood, Robert (YWorld.com)
Opie, Morgan (IMO)
Qi, Qi (IMO)
Spink, Hunter (Western Canada H.S. Calgary)

Spink, Grant (IMO)
Sun, Kevin (IMO)
Sun, Kai (A.B. Lucas S.S. London Ont.)
Xiong, Ruiming (IMO)
Xu, Jinhao (IMO)
Yang, Ruizhou (IMO)
Zhao, William (IMO)

Research in Teams

Multi-Banach Algebras and Fourier Algebras February 14 - 21, 2016

Organizers:

H. Garth Dales (University of Lancaster)

Anthony Lau (University of Alberta)

For many decades mathematicians have studied the theory of operators on Banach spaces: this generalises the theory of matrices to infinite-dimensional spaces, and has huge applications in mathematical physics; these applications have often driven the subject. The original idea involved a 'norm' on a linear space. The proposers and others have developed a more general notion, that of a 'multi-norm', which is a sequence of norms defined on successive powers of the space. They wish to explore the geometric and analytical implications of these new notions.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/research-in-teams/16rit672>

Participants:

Dales, H. Garth (University of Lancaster)

Lau, Anthony To-Ming (University of Alberta)

Troitsky, Vladimir (University of Alberta)

Metastring Theory and Generalized Geometries March 20 -27, 2016

Organizers:

Rob Leigh (University of Illinois at Urbana-Champaign)

Djordje Minic (Virginia Polytechnic Institute and State University)

Laurent Freidel (Perimeter Institute)

Our objective for meeting in Banff was to continue our collaborative work on the development of metastring theory. BIRS will provided an environment that enabled us to push forward many aspects of this development and to enable the completion of several research papers on the subject. Because we are at three separate institutions, we rarely are able to meet together for extensive discussions, and Banff provided an ideal environment for that. There are three major accomplishments that this meeting helped with: the development of the quantization and consistency of metastrings at the level of the string functional integral, a deepening of our understanding of quantum space-time, and further developing an understanding of consistent backgrounds for metastrings and how they are related by string dualities.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/research-in-teams/16rit683>

Participants:

Freidel, Laurent (Perimeter Institute)

Leigh, Rob (University of Illinois at Urbana-Champaign)

Minic, Djordje (Virginia Polytechnic Institute and State University)

Random Partitions and Bayesian Nonparametrics

April 17 - 24, 2016

Organizers:

Shui Feng (McMaster University)
Stefano Favaro (University of Torino)

Measuring abundance and random sampling are important issues for resource management in ecology and many other subjects. The study on rare or elusive species has led to the development of new tools and models in probability theory and Bayesian statistics. Exchangeable random partitions have proved to be a fundamental structure for a wide range of statistical problems in Bayesian nonparametrics. The objective of our project was threefold: i) to investigate conditional, or posterior, asymptotic properties of exchangeable random partitions arising by sampling from certain classes of discrete random probability measures in Bayesian nonparametrics; ii) to introduce a comprehensive methodology for making Bayesian nonparametric (predictive) inference for the genealogical structure of the Kingman's coalescent; iii) to develop algorithms in the estimation of rare species.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/research-in-teams/16rit674>

Participants:

Favaro, Stefano (University of Torino and Collegio Carlo Alberto) **Feng, Shui** (McMaster University)

Gorenstein Homological Algebra

May 22 - 29, 2016

Organizers:

Alina Iacob (Georgia Southern University) **Sergio Estrada** (University of Murcia)

The Gorenstein injective precovers (covers, special precovers) are defined in a similar manner with the Gorenstein projective precovers (covers, special precovers) - simply replace the class of Gorenstein projective modules, $\{GP\}$, with that of Gorenstein injectives, $\{GI\}$, in the definition. Since a precovering class of modules that is closed under direct summands is also closed under direct sums, it follows (by [christensen:06:ongorenstein]) that the ring R must be noetherian if the class of Gorenstein injective R -modules is precovering. But whether or not the converse holds, this is an open question.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/research-in-teams/16rit690>

Participants:

Bravo, Daniel (Universidad Austral de Chile) **Iacob, Alina** (Georgia Southern University)
Estrada, Sergio (Universidad de Murcia, Spain)

New Applications of Menger Curvature to Complex Analysis

July 10 - 17, 2016

Organizers:

Loredana Lanzani (Syracuse University)

Malabika Pramanik (University of British Columbia)

This Research in Team Mathematics research project focused on the area known as “Mathematical Analysis”, in particular on the problem of finding new applications of the notion of Menger Curvature (that is, the reciprocal of the radius of the circle joining any three given, distinct points A, B and C). A leading theme in our team’s work are the so-called “integral formulas”. Integral formulas are important tools for recovering information on large data sets that are located in hard-to-reach places by collecting very small samples that are within easy reach. For instance, integral formulas can be used to recover the temperature in the interior of a solid body (say a tree, or even a planet) without having to probe holes in the body (that is, in the tree example, without having to drill holes in the trunk). Instead, one measures the temperature at surface level (say on the tree’s bark) and plots these values in the integral formula: the output will be the value of the temperature inside. One of the novelties in our approach to these problems is that it allows to deal with objects whose outer surface is very rough (as opposed to very smooth).

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/research-in-teams/16rit691>

Participants:

Lanzani, Loredana (Syracuse University)

Pramanik, Malabika (University of British Columbia, Vancouver)

Dynamics in Applied Functional Differential Equations

July 24 - 31, 2016

Organizers:

Anatoli Ivanov (Pennsylvania State University)

The workshop was aimed at development of long term collaborative plans between researchers at four universities in Canada, Czech Republic, USA, and Chile. The team tackled problems of qualitative analysis of dynamical behaviors in mathematical models describing several real world phenomena with time delay.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/research-in-teams/16rit675>

Participants:

Braverman, Elena (University of Calgary)
Hasik, Karel (Silesian University in Opava)

Ivanov, Anatoli (Pennsylvania State University)
Trofimchuk, Sergei (University of Talca)

New Examples of Almost Non-Negative Curvature

July 31 - August 7, 2016

Organizers:

Pedro Solorzano (Universidad Nacional Autónoma de México)

Frederick Wilhelm (University of California at Riverside)

Catherine Searle (Wichita State University)

The overarching goal of this Research in Teams proposal was to show that there are exotic spheres with almost non-negative curvature in all dimensions congruent to 3 mod 4. Exotic spheres were discovered by Milnor in 1956, but their geometry continues to remain largely a mystery. The class of almost non-negatively curved manifolds are those that collapse to a point with a lower curvature bound and these exotic spheres are natural candidates to admit almost non-negative curvature.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/research-in-teams/16rit692>

Participants:

Searle, Catherine (Wichita State University)
Solorzano, Pedro (CONACYT-UNAM)

Wilhelm, Frederick (University of California at Riverside)

Bivariate Orthogonal Polynomials and Eigenvalues of Hankel Matrices

August 28 - September 4, 2016

Organizers:

Zeinab Mansour (King Saud University)
Ruiming Zhang (Northwest A&F University)

Mourad Ismail (University of Central Florida)

In the 1920's the noble laureate F. Zernike discovered the Zernike or disc polynomials which was used to expand light waves in large telescopes and powerful microscopes. These polynomials are well studied in the field of optics and physics in general. This team studied a general class of polynomials which contains the Zernike polynomials as a model. We expect the new polynomials to be very useful.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/research-in-teams/16rit684>

Participants:

Ismail, Mourad (University of Central Florida)
Mansour, Zeinab (King Saud University)

Zhang, Ruiming (Northwest A&F University)

Ergodicity in Nonlinear Stochastic Partial Differential Equations with Applications in Turbulent Geophysical Flows

October 15 - 22, 2016

Organizers:

Jared Whitehead (Brigham Young University)

Nathan Glatt-Holtz (Tulane University)

Juraj Foldes (Université libre de Bruxelles)

Geordie Richards (University of Rochester)

This Research in Teams workshop focused on the development of theory and technique in the analysis of stochastic partial differential equations (SPDEs) appearing in fluid mechanics, particularly in turbulent geophysical flows. Classical theories of turbulence rest on mathematical assumptions (such as ergodic hypotheses) which can be difficult to justify at the level of deterministic model equations. However, there is emerging theory in SPDEs which provides a rigorous foundation for some of these assumptions.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/research-in-teams/16rit688>

Participants:

Foldes, Juraj (Université libre de Bruxelles)

Glatt-Holtz, Nathan (Tulane University)

Richards, Geordie (University of Rochester)

Whitehead, Jared (Brigham Young University)

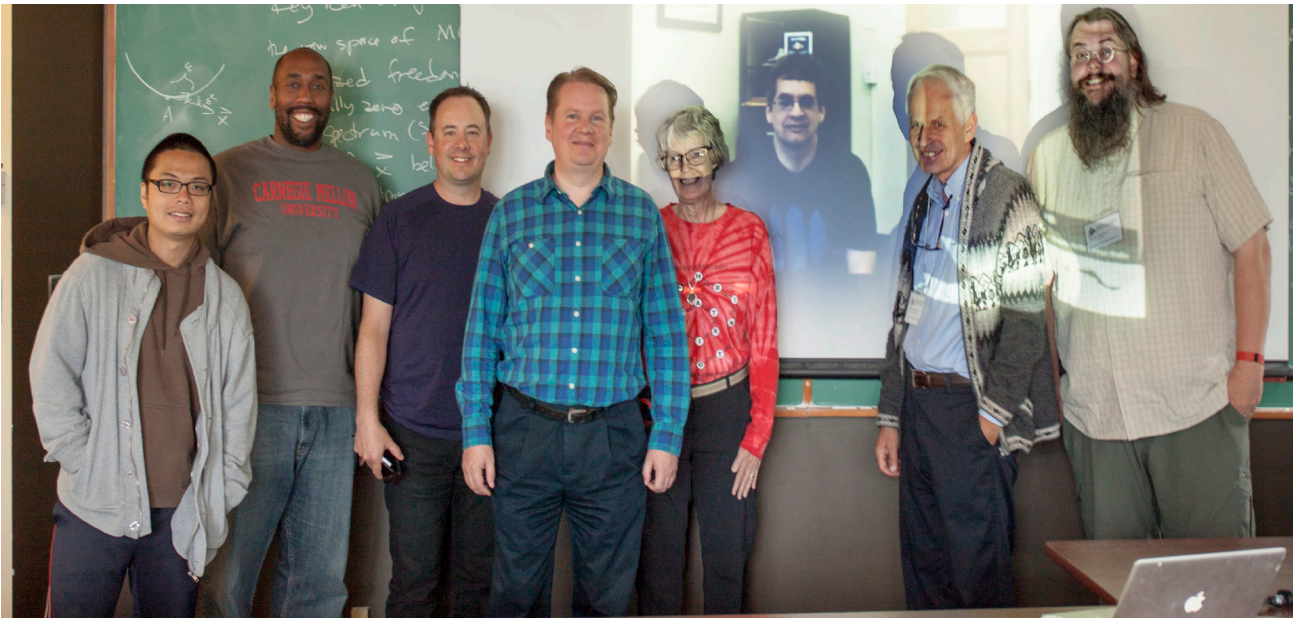
Focused Research Groups

The Inverse Eigenvalue Problem of a Graph June 5 - 12, 2016

Organizers:

Leslie Hogben (Iowa State University)
Shaun Fallat (University of Regina)

Bryan Shader (University of Wyoming)



This FRG applied recently developed tools to advance the current study on the inverse eigenvalue problem of a graph, including the minimum number of distinct eigenvalues of a graph. Finding mathematical solutions to inverse eigenvalue problems can be difficult, as the solutions are often very intricate and specific to the given problem. Recently, mathematical tools have been developed that allow one to conclude the solvability of a given inverse eigenvalue problem from a special type of solution to a nearby inverse eigenvalue problem. This Focused Research Group more fully developed and utilized these tools to obtain significant new results on the inverse eigenvalue problem.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/focussed-research-groups/16frg677>

Participants:

Barrett, Wayne (Brigham Young University)
Butler, Steve (Iowa State University)
Fallat, Shaun (University of Regina)
Hall, Tracy (Brigham Young University)

Hogben, Leslie (Iowa State University)
Lin, Jephian Chin-Hung (Iowa State University)
Young, Michael (Iowa State University)

Topological Methods in Model Theory

June 12 - 19, 2016

Organizers:

Jose Iovino (The University of Texas)

Franklin Tall (University of Toronto)

Xavier Caicedo (Universidad de los Andes)

Eduardo Duenez (University of Texas at San Antonio)

Christopher Eagle (University of Victoria)

This project focused on several problems on the interface between logic and topology (specifically between model theory and set-theoretic topology), and it brought together researchers who work at the intersection of these fields. This is a research direction that has been expanding rapidly in recent years due to its applicability in different areas of mathematics, and where the participants of this research group have made significant contributions.

For details, please refer to the workshop webpage

<https://www.birs.ca/events/2016/focussed-research-groups/16frg676>

Participants:

Caicedo, Xavier (Universidad de los Andes)

Duenez, Eduardo (University of Texas at San Antonio)

Eagle, Christopher (University of Victoria)

Iovino, Jose (The University of Texas)

Tall, Franklin (University of Toronto)

SYZ Mirror Symmetry

June 19 - 26, 2016

Organizers:

Siu Cheong Lau (Boston University)

Naichung Conan Leung (The Chinese University of Hong Kong)

Mirror symmetry is a deep duality between two types of geometries of totally different nature. Since its discovery by string theorists it astonished many mathematicians again and again by its powerful predictions in enumerative geometry. SYZ and homological mirror symmetry are two major unsolved problems in the field. The aim of this Focused Research Group was to study the various related topics in geometry, including Lagrangian torus fibrations, semi-classical analysis, non-commutative geometry and moduli theory.

For details, please refer to the workshop webpage

<https://www.birs.ca/events/2016/focussed-research-groups/16frg673>

Participants:

Alston, Garrett (University of Oklahoma)

Chan, Kwok Wai (The Chinese University of Hong Kong)

Cho, Cheol-Hyun (Seoul National University)

Hong, Hansol (Chinese University of Hong Kong)

Lau, Siu Cheong (Boston University)

Leung, Naichung Conan (The Chinese University of Hong Kong)

Ma, Ziming Nikolas (National Taiwan university)

Entropy Theory in Dynamics

August 7 - 14, 2016

Organizers:

Ben Hayes (Vanderbilt)

Balazs Szegedy (Alfred Renyi Institute)

Brandon Seward (Hebrew University)

Tim Austin (New York University)

Miklos Abert (Renyi Institute)

Lewis Bowen (University of Texas)

The proposed Focussed Research Group brought together eight active researchers studying different fields in mathematics, namely, group theory, geometry, discrete mathematics, dynamics, ergodic theory and probability theory. These researchers all investigate the same object, entropy, but from very different perspectives. Entropy is a measurement of the amount of randomness inherent in a system; it can also be interpreted as an expression of the number of possible states that a system can be in. Because of its generality, entropy appears in many subjects. The main aim of the workshop was to provide an opportunity for the participants to get to know each other's work in depth. The meeting resulted in unifying concepts and finding strong directions for further research.

For details, please refer to the workshop webpage

<https://www.birs.ca/events/2016/focussed-research-groups/16frg685>

Participants:

Austin, Tim (New York University)

Bowen, Lewis (University of Texas)

Burton, Peter (Caltech)

Hayes, Ben (Vanderbilt)

Lyons, Russell (Indiana University)

Mossel, Elchanan (MIT)

Seward, Brandon (Courant Institute of Mathematical Sciences)

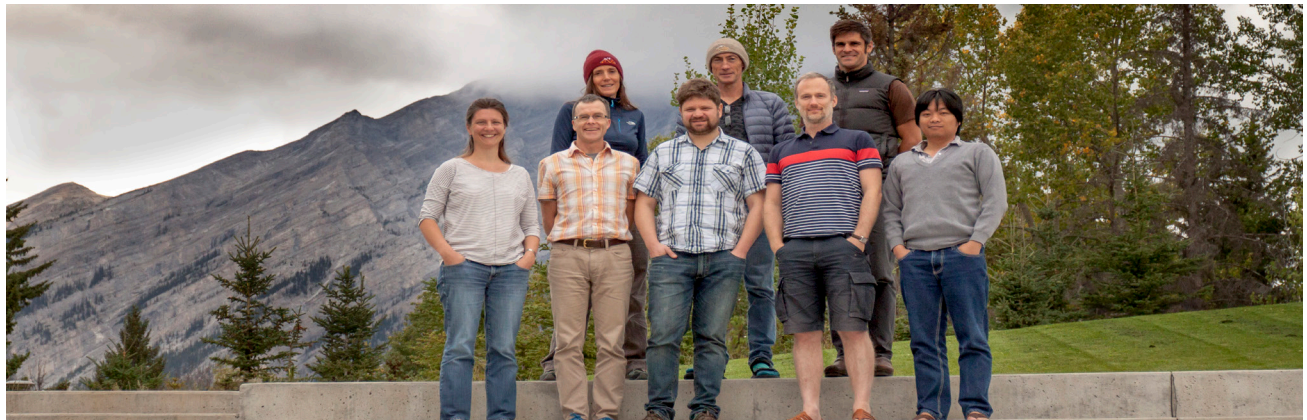
Random Graph Models in Phylogenetics

August 21 - 28, 2016

Organizers:

Tanja Stadler (ETH(Swiss Federal Institute of Technology)-Zurich)

Mike Steel (University of Canterbury)



The workshop brought together some of the leading experts in the mathematics of evolutionary trees and networks (phylogenetics). It focused on three particular questions: How can one best model and analyse reticulate evolution (such as lateral gene transfer)? Which models of speciation and extinction are both tractable and realistic? and, When species are sampled randomly how one best predict the total phylogenetic diversity at the present, and in the future. The workshop aimed to settle some important theoretical questions and while the group were primarily mathematicians there was also some input from biology.

For details, please refer to the workshop webpage

<https://www.birs.ca/events/2016/focussed-research-groups/16frg670>

Participants:

Ane, Cecile (University of Wisconsin-Madison)

Bryant, David (University of Otago)

Dinh, Vu (Fred Hutchinson Cancer Research Center)

Lambert, Amaury (UPMC Univ Paris 06)

Matsen, Frederick (Fred Hutchinson Cancer

Research Centre)

Mooers, Arne (Simon Fraser University)

Stadler, Tanja (ETH(Swiss Federal Institute of Technology)-Zurich)

Steel, Mike (University of Canterbury)

Ion Channels: Mathematical Modeling and Analysis

September 25 - October 2, 2016

Organizers:

Chun Liu (Pennsylvania State University)
Bob Eisenberg (Rush Medical Center)

Huaxiong Huang (York University)

Life occurs in electrolyte solutions made of mixtures of 'bio-ions' (sodium Na^+ , potassium K^+ , calcium Ca^{2+} , and chloride Cl^-), along with many other charged components. The ions in biological mixtures (called 'Ringer solutions' in general) carry information that controls biological systems. The selective flow of some of these ions are the signals of the nervous system, coordinate contraction of muscle and allow the heart to function as a pump. One of the key components of many complex biological systems is the ion channels, proteins that embedded in cell membranes. Developing new mathematical and computational tools for ion channels was the main focus of this Focused Research Group.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/focussed-research-groups/16frg212>

Participants:

Eisenberg, Bob (Rush Medical Center)
Huang, Huaxiong (York University)
Liang, Jie (University of Illinois at Chicago)
Liu, Chun (Penn State University)

Perez-Rathke, Alan (University of Illinois, Chicago)
Song, Zilong (York University)
WU, Simo (Penn State University)
Wylie, Jonathan (City University of Hong Kong)

The Classification Problem for Quantum Groups

November 20 - 27, 2016

Organizers:

Martin Argerami (University of Regina)

The study of quantum groups is an important component of the field of non-commutative geometry, which has been developed in the last 20 years to understand and describe physical phenomena observed at a subatomic level. Despite the development of the theory and the rich variety of examples, classification results of quantum groups are rare. The goal of our Focused Research Group was to initiate a classification program for well-behaved classes of quantum groups.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/focussed-research-groups/16frg210>

Participants:

Argerami, Martin (University of Regina)
Kennedy, Matthew (University of Waterloo)
Lupini, Martino (California Institute of Technology)

Sabok, Marcin (McGill University)
Stark, Jalex (California Institute of Technology)



Photo credit: Jim Oliver

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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Web: <http://www.birs.ca>

Twitter: [@BIRS_Math](https://twitter.com/BIRS_Math)

CMO 2016 Program

5-Day Workshops 2016

| | | |
|--------|--------|---|
| May 1 | May 6 | Algebraic, Tropical, and Nonarchimedean Analytic Geometry of Moduli Spaces |
| May 8 | May 13 | Flat Surfaces and Dynamics of Moduli Space |
| May 15 | May 20 | Black Holes' New Horizons |
| May 22 | May 27 | Stochastic Analysis and Mathematical Finance - A Fruitful Partnership |
| May 29 | Jun 3 | Dirichlet-to-Neumann Maps: Spectral Theory, Inverse Problems and Applications |
| Jun 5 | Jun 10 | Computing the Universe: At the Intersection of Computer Science and Cosmology |
| Jun 12 | Jun 17 | Integrability and Near-Integrability in Mechanics and Geometry |
| Jun 19 | Jun 24 | Coherent Structures in PDEs and Their Applications |
| Jun 26 | Jul 1 | Random Structures in High Dimensions |
| Jul 31 | Aug 5 | Stochastic and Deterministic Models for Evolutionary Biology |
| Aug 7 | Aug 12 | Computational Algebra and Geometric Modeling |
| Aug 14 | Aug 19 | Modular Categories--Their Representations, Classification, and Applications |
| Aug 21 | Aug 26 | Women in Mathematics in Latin America: Barriers, Advancements and New Perspectives |
| Aug 28 | Sep 2 | Models and Algorithms for Crowds and Networks |
| Sep 4 | Sep 9 | Mathematical Problems of Orientationally Ordered Soft Solids |
| Sep 11 | Sep 16 | Set Theory and its Applications in Topology |
| Sep 18 | Sep 23 | Analysis and Dynamics |
| Sep 25 | Sep 30 | Asymptotic Patterns in Variational Problems: PDE and Geometric Aspects |
| Oct 16 | Oct 21 | Applied Harmonic Analysis, Massive Data Sets, Machine Learning, and Signal Processing |
| Oct 23 | Oct 28 | Transversal, Helly and Tverberg type Theorems in Geometry, Combinatorics and Topology III |
| Oct 30 | Nov 4 | Sparse Interpolation, Rational Approximation and Exponential Analysis |
| Nov 6 | Nov 11 | Stable Processes |
| Nov 13 | Nov 18 | Interval Analysis and Constructive Mathematics |
| Nov 27 | Dec 2 | Complexity and Analysis of Distributed Algorithms |
| Dec 4 | Dec 9 | Algorithmic Randomness Interacts with Analysis and Ergodic Theory |
| Dec 11 | Dec 16 | Geometric and Spectral Methods in Partial Differential Equations |

Algebraic, Tropical, and Nonarchimedean Analytic Geometry of Moduli Spaces

May 1 - 6, 2016

Organizers:

Sam Payne (Yale University)
Matthew Baker (Georgia Institute of Technology)

David Jensen (University of Kentucky)
Melody Chan (Brown University)



This workshop brought together leading researchers from three fields that rarely have overlapping conferences: tropical geometry, classical algebraic geometry of moduli spaces, and nonarchimedean analytic geometry. Recent breakthroughs have come from teams of mathematicians with a range of backgrounds spanning these disciplines. Our list of participants also included a few carefully chosen geometric group theorists and topologists who have studied the topology of Outer Space and Teichmüller space (closely related to moduli spaces of tropical and algebraic curves, and have also indicated an interest in learning about the algebraic and tropical perspectives.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/5-day-workshops/16w5153>

Participants:

Abramovich, Dan (Brown University)
Alexeev, Valery (University of Georgia)
Baker, Matthew (Georgia Institute of Technology)
Bernal Guillén, Martha María (Universidad de Zacatecas)
Brown, Morgan (University of Miami)
Cavaliere, Renzo (Colorado State University)
Chan, Melody (Brown University)
Corey, Daniel (Yale University)
Cotterill, Ethan (Universidade Federal Fluminense)
Cueto, Maria Angelica (The Ohio State University)
Deopurkar, Ashwin (Columbia University)
Foster, Tyler (University of Michigan)
Galatius, Soren (Stanford University)
Garay, Cristhian (Universidade Federal Fluminense (UFF))
Giansiracusa, Jeffrey (Swansea University)
Giansiracusa, Noah (University of Georgia)
Gómez-Morales, Mirna Lissette (Universidad Nacional Autónoma de México)
Gross, Andreas (TU Kaiserslautern)
Jensen, David (University of Kentucky)
Jiménez Rolland, Rita (Universidad Nacional Autónoma de México)
Karp, Dagan (Harvey Mudd College)

Katz, Eric (Ohio State University)
Len, Yoav (Saarbrücken University)
Lopez de Medrano, Lucia (Universidad Nacional Autónoma de México)
Lorscheid, Oliver (IMPA)
Lozano Huerta, Cesar (UNAM Oaxaca)
Maclagan, Diane (University of Warwick)
Manon, Christopher (George Mason University)
Markwig, Hannah (University of Saarland)
Nicaise, Johannes (Imperial College)
Odaka, Yuji (Kyoto university)
Payne, Sam (Yale University)
Pflueger, Nathan (Brown University)
Ranganathan, Dhruv (Yale University)
Schroeter, Franziska (Universitaet Hamburg)
Shaw, Kristin (TU Berlin)
Shen, Tif (Yale University)
Shende, Vivek (UC Berkeley)
Shokrieh, Farbod (Cornell University)
Talpo, Mattia (University of British Columbia)
Tevelev, Jenia (University of Massachusetts)
Ulirsch, Martin (University of Bonn)
Usatine, Jeremy (Yale University)
Vakil, Ravi (Stanford University)
Viviani, Filippo (Universita Roma Tre)

Flat Surfaces and Dynamics of Moduli Space

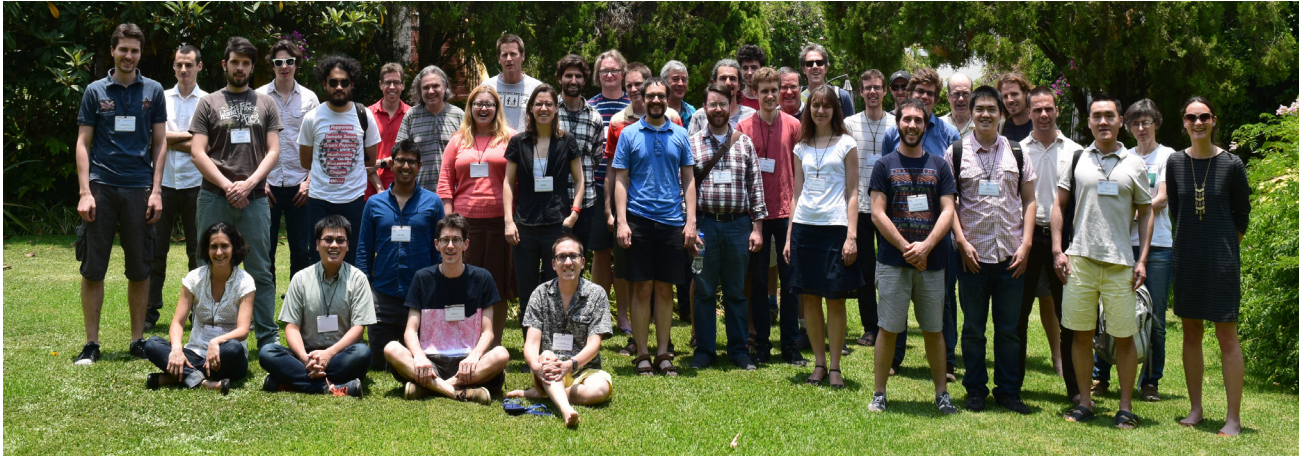
May 8 - 13, 2016

Organizers:

Ferran Valdez (Universidad Nacional Autonoma de Mexico)

Jayadev Athreya (University of Washington)

Martin Möller (Goethe Universität Frankfurt Am Main)



The purpose of this workshop was to push further the fruitful concept of adapting methods from dynamics on homogeneous spaces to dynamics on the moduli space of flat Riemann surfaces, although this is not a homogeneous space. Recently, major progress has been made on orbit closures, but the classification problem is far from solved and steps in this direction will be discussed at the workshop. Deeper understanding of flat surfaces, and in particular infinite area flat surfaces are making it possible to also tackle problems on billiard tables without rationality conditions.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/5-day-workshops/16w5010>

Participants:

Apisa, Paul (University of Chicago)

Athreya, Jayadev (University of Washington)

Aulicino, David (University of Chicago)

Bainbridge, Matt (Indiana University)

Chaika, Jon (University of Utah)

Chen, Dawei (Boston College - Mathematics)

Cheung, Yitwah (San Francisco State University)

Costantini, Matteo (Goethe Universität Frankfurt Am Main)

Davis, Diana (Northwestern University)

Delecroix, Vincent (CNRS, Université de Bordeaux)

Eskin, Alex (University of Chicago)

Filip, Simion (University of Chicago)

Fortier Bourque, Maxime (University of Toronto)

Fougeron, Charles (Université Paris Diderot-Paris 7)

Fraczek, Krzysztof (Nicolaus Copernicus University)

Gendron, Quentin (Hannover University)

Hamenstaedt, Ursula (Universität Bonn)

Hernández Serda, José de Jesús (UCIM - UNAM)

Hooper, Patrick (City College of New York)

Hu, Xuntao (Stony Brook University)

Jimenez Rolland, Rita (Universidad Nacional Autónoma de México)

Johnson, Charles (Wake Forest University)

Lanneau, Erwan (Université Joseph Fourier)

Lelievre, Samuel (Université Paris-Sud)

Lindsey, Kathryn (University of Chicago)

Marchese, Luca (Université Paris 13)

Marcinek, Jake (Harvard University)

Masur, Howard (University of Illinois)

Möller, Martin (Goethe Universität Frankfurt Am Main)

Mukamel, Ronen (Rice University)

Pardo, Angel (Aix-Marseille Université)

Rafi, Kasra (University of Toronto)

Randecker, Anja (Karlsruhe Institute of Technology)

Smillie, John (University of Warwick)

Torres-Teigell, David (Universidad Autónoma de Madrid)

Valdez, Ferran (Universidad Nacional Autónoma de México)

Weiss, Barak (Tel Aviv University)

Work, Grace (University of Illinois)

Zachhuber, Jonathan (Goethe Universität Frankfurt am Main)

Zorich, Anton (Université Paris Diderot-Paris 7)

Black Holes' New Horizons

May 15 - 20, 2016

Organizers:

Valeri Frolov (University of Alberta)

Don Page (University of Alberta)



Black hole theory is one of the most interesting and intriguing topics of the modern science. It is in the focus of interests of astrophysics as well as of theoretical and mathematical physics. Black holes are solutions of the Einstein equations, which possess a number of remarkable properties. Recently the status of black holes has dramatically changed. There exist more and more observational evidence that stellar mass and supermassive black holes do exist in our Universe. Theoretical and mathematical interest in black holes has greatly increased after understanding that black holes allow one to test new fundamental ideas such as string theory and extra dimensions. Study of higher-dimensional black holes requires contemporary results from topology, differential and Riemannian geometry and the global theory of partial differential equations. Recent wide discussion of the information puzzle in black holes (e.g., concerning a possible firewall at the horizon) has attracted new attention to longstanding problems of the foundations of quantum theory and quantum gravity.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/5-day-workshops/16w5008>

Participants:

Aliev, Alikram (Yeni Y'üzyl University)
Blazquez, Jose (Oldenburg University)
Boos, Jens (Perimeter Institute)
Booth, Ivan (Memorial University)
Cariglia, Marco (Federal University of Ouro Preto)
Cavaglia, Marco (University of Mississippi)
Cvetic, Mirjam (University of Pennsylvania)
Frolov, Valeri (University of Alberta)
Frolov, Andrei (Simon Fraser University)
García Ariza, Miguel Ángel (Benemérita Universidad Autónoma de Puebla)
Gregory, Ruth (University of Durham)
Gruber, Christine (UNAM)
Hennigar, Robie (University of Waterloo)
Holguín Cardona, Sergio Andrés (UNAM)
Kim, Sang Pyo (Kunsan National University)
Kol, Barak (Hebrew University of Jerusalem)
Kolar, Ivan (Charles University in Prague)
Krtous, Pavel (Charles University)
Kubizňák, David (Perimeter Institute)
Kunstatter, Gabor (University of Winnipeg)
Lemos, Jose P. S. (University of Lisbon)

Maeda, Kei-ichi (Waseda University)
Manko, Vladimir (CINVESTAV)
Mann, Robert (University of Waterloo)
Mathur, Samir D. (Ohio State U.)
Mazumdar, Anupam (Lancaster University)
McClintock, Jeffrey (Harvard-Smithsonian Center for Astrophysics)
Modesto, Leonardo (Fudan University)
Moreno Gonzalez, Claudia (University of Guadalajara)
Okon, Elias (UNAM)
Page, Don (University of Alberta)
Parikh, Maulik (Arizona State University)
Poisson, Eric (University of Guelph)
Salgado, Marcelo (Instituto de Ciencias Nucleares)
Shoom, Andrey (Memorial University)
Solorzano, Pedro (UNAM)
Sudarsky, Daniel (UNAM)
Tomboulis, Terry E. (UCLA)
Unruh, Bill (University of British Columbia)
Volkov, Michael (University of Tours)
Zelnikov, Andrei (University of Alberta)

Stochastic Analysis and Mathematical Finance - A Fruitful Partnership

May 22 - 27, 2016

Organizers:

Gordan Zitkovic (The University of Texas at Austin) **Walter Schachermayer** (University of Vienna)
Constantinos Kardaras (London School of Economics)



The workshop focused on new developments in mathematical finance with a special focus on its interaction with stochastic analysis, optimal stochastic control and their applications. A wide spectrum of topics, including foundational ones (like arbitrage theory and portfolio optimization) as well as ones inspired by financial questions, but with potentiality of application in a multitude of other research areas (rough paths, Skorokhod embeddings, martingale optimal transport, stochastic partial differential equations e.g.).

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/5-day-workshops/16w5134>

Participants:

Acciaio, Beatrice (London School of Economics)
Bayer, Christian (Weierstrass Institute Berlin)
Beiglböck, Mathias (University of Vienna)
Bouchard, Bruno (University Paris-Dauphine)
Campi, Luciano (London School of Economics)
Četin, Umut (London School of Economics)
Choi, Jin Hyuk (University of Texas at Austin)
Cont, Rama (Imperial College London)
Cuchiero, Christa (University of Vienna)
Cvitanić, Jakša (California Institute of Technology)
Czichowsky, Christoph (London School of Economics)
Fontana, Claudio (Université Paris-Diderot (Paris VII))
Hernandez-Hernandez, Daniel (CIMAT)
Källblad, Sigrid (École Polytechnique)
Kallsen, Jan (University of Kiel)
Kardaras, Constantinos (London School of Economics)
Kramkov, Dmitry (Carnegie Mellon University)
Kupper, Michael (University of Konstanz)
Lacker, Daniel (Brown University)
Larsen, Kasper (Carnegie Mellon University)
Larsson, Martin (ETH Zurich)

Muhle-Karbe, Johannes (ETH Zürich)
Nutz, Marcel (Columbia University)
Oblój, Jan (University of Oxford)
Pal, Soumik (University of Washington)
Possamai, Dylan (Université Paris Dauphine)
Pulido, Sergio (ENSIIE ÉVRY)
Ramanan, Kavita (Brown University)
Robertson, Scott (Carnegie Mellon University)
Rosenbaum, Mathieu (Université Pierre et Marie Curie (Paris 6))
Ruf, Johannes (UCL)
Schachermayer, Walter (University of Vienna)
Schweizer, Martin (ETH Zurich)
Sirbu, Mihai (The University Of Texas at Austin)
Tankov, Peter (Université Paris Diderot - Paris 7)
Teichman, Josef (ETH Zurich)
Touzi, Nizar (Ecole Polytechnique)
Treviño Aguilar, Erick (Universidad de Guanajuato)
Wong, Leonard (University of Washington)
Xing, Hao (London School of Economics)
Zariphopoulou, Thaleia (University of Texas at Austin)
Zitkovic, Gordan (The University of Texas at Austin)

Dirichlet-to-Neumann Maps: Spectral Theory, Inverse Problems and Applications

May 29 - June 3, 2016

Organizers:

Michael Levitin (University of Reading)
Lauri Oksanen (University College London)

Iosif Polterovich (Université de Montréal)
Adrian Nachman (University of Toronto)



The Dirichlet-to-Neumann map is a fundamental object appearing widely in many branches of mathematics, physics and engineering. The main purpose of the workshop was to bring together and foster novel interactions between diverse groups of people who are studying and using these maps in different (though interrelated) settings, such as the spectral geometry, inverse problems, and applications ranging from medical imaging to earth sciences.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/5-day-workshops/16w5083>

Participants:

Canzani, Yaiza (Harvard University)
Caro, Pedro (Basque Center for Applied Mathematics)
Choque Rivero, Abdon Eddy (Universidad Michoacana de San Nicolás de Hidalgo)
Colbois, Bruno (Universite de Neuchatel)
de Hoop, Maarten (Rice University)
Dos Santos Ferreira, David (Université de Lorraine)
Friedlander, Leonid (University of Arizona)
Gaburro, Romina (University of Limerick, Ireland)
Galkowski, Jeffrey (Stanford University)
Gesztesy, Fritz (University of Missouri)
Girouard, Alexander (Universite Laval)
Hassannezhad, Asma (Max Planck Institute Bonn)
Isakov, Victor (Wichita State University)
Karpukhin, Mikhail (McGill)
Kian, Yavar (Université d'Aix-Marseille)
Kinzebulatov, Damir (Indiana University, Bloomington)
Krupchyk, Katya (University of California, Irvine)
Lagacé, Jean (Université de Montréal)
Lassas, Matti (University of Helsinki)
Levitin, Michael (University of Reading)

Macia, Fabricio (Universidad Politecnica de Madrid)
Marletta, Marco (Cardiff University)
Nicoleau, Francois (Université de Nantes)
Nigam, Nilima (Simon Fraser University)
Oksanen, Lauri (University College London)
Paternain, Gabriel (University of Cambridge)
Polterovich, Iosif (Université de Montréal)
Rondi, Luca (Università degli Studi di Trieste)
Roy-Fortin, Guillaume (Northwestern University)
Ruland, Angkana (Oxford)
Saksala, Teemu (University of Helsinki)
Salo, Mikko (University of Jyväskylä)
Schoen, Richard (University of California Irvine)
Sher, David (University of Michigan)
Sincich, Eva (Università di Trieste)
Stefanov, Plamen (Purdue University)
Strohmaier, Alex (University of Loughborough)
Sylvester, John (University of Washington)
Toth, John (McGill)
Uhlmann, Gunther (University of Washington)
Villegas-Blas, Carlos (Universidad Nacional Autónoma de México)
Yang, Yang (Purdue University)
Zhou, Hanming (University of Cambridge)

Computing the Universe: At the Intersection of Computer Science and Cosmology

June 5 - 10, 2016

Organizers:

George Lake (University of Zurich)
Norman Murray (University of Toronto)
Arif Babul (University of Victoria)
James Wadsley (McMaster University)

Fabrice Durier (University of Arizona)
Andrew Benson (Carnegie Institution for Science)
Thomas Quinn (University of Washington)



Some of the key issues that the workshop addressed included: How do the current simulations stack up against each other and against the mirror of reality? What are the main deficits and how can these be overcome? What is the minimum set of physical processes that cosmological simulations must incorporate? How does one decide which of the large number of known processes can be safely neglected? How does one gauge the sensitivity of the end product to such decisions? What is the best way to treat sub-grid processes? Do the aforementioned algorithmic, coding and technological development make it possible to implement more physical, more realistic prescriptions (or for that matter, do away with the prescriptions altogether in some cases)? Is it possible to design prescriptions that can adapt as the simulation resolution is increased or decreased, even if only over a finite range?

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/5-day-workshops/16w5163>

Participants:

Agertz, Oscar (University of Surrey)
Angles-Alcazar, Daniel (Northwestern University)
Babul, Arif (University of Victoria)
Bahe, Yannick (MPA Garching)
Bellovary, Jillian (American Museum of Natural History)
Biernacki, Pawel (Universität Zürich)
Chapman, Scott (Dalhousie)
Costa, Tiago (University of Leiden)
Dalla Vecchia, Claudio (Instituto de Astrofísica de Canarias)
Devriendt, Julien (University of Oxford)
Durier, Fabrice (University of Arizona)
Faucher-Giguere, Claude-Andre (Northwestern University)
Genel, Shy (Columbia University)
Hayward, Chris (California Institute of Technology)
Hlavacek-Larrondo, Julie (Université de Montréal)
Katz, Neal (University of Massachusetts)

Keller, Ben (McMaster University)
Kravtsov, Andrey (University of Chicago)
Lehner, Nicolas (University of Notre Dame)
Li, Yuan (University of Michigan)
Liang, Lichen (University of Victoria)
López-Cruz, Omar (University of North Dakota)
Martizzi, Davide (University of California Berkeley)
Muratov, Alexander (UC San Diego)
Murray, Norman (University of Toronto)
Ostriker, Jeremiah (Princeton University)
Quinn, Thomas (University of Washington)
Rahmati, Alireza (University of Zurich)
Rennehan, Douglas (University of Victoria)
Rosdahl, Joakim (Leiden Observatory)
Sokolowska, Aleksandra (University of Zurich)
Torrey, Paul (Massachusetts Institute of Technology)
Trakhtenbrot, Benny (ETH Zurich)
Wadsley, James (McMaster University)
Wu, Hao-Yi (California Institute of Technology)

Integrability and Near - Integrability in Mechanics and Geometry

June 12 - 17, 2016

Organizers:

Vadim Zharnitsky (University of Illinois at Urbana-Champaign)

Boris Khesin (University of Toronto)

Sergei Tabachnikov (Pennsylvania State University)



The main goal of the workshop was to bring together mathematicians, physicists, and engineers working on various aspects of mechanics and geometry: on the one hand, researchers working on more applied problems - control theory, robotics, motion planning, etc., and on the other hand, researchers working on basic problems in dynamics (integrability, Arnold's diffusion, KAM, nonholonomic problems, etc.) Topics of the workshop include studies on bicycle stability, integrability of pentagram maps, non-holonomic methods in the study of billiards, geometry of cluster algebras, and infinite-dimensional non-holonomic systems in mechanics and fluid dynamics.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/5-day-workshops/16w5017>

Participants:

Arnold, Maxim (University of Texas at Dallas)

Azpeitia, Carlos García (UNAM)

Bialy, Michael (Tel Aviv University)

Bor, Gil (CIMAT)

Dragovic, Vladimir (The University of Texas at Dallas)

Dunajski, Maciej (Cambridge University)

Fedorov, Yuri (Universitat Politècnica de Catalunya)

Fuchs, Dmitry (University of California at Davis)

Hernandez-Lamoneda, Luis (CIMAT)

Izmestiev, Ivan (University of Fribourg)

Izosimov, Anton (University of Toronto)

Kaloshin, Vadim (University of Maryland)

Kasman, Alex (College of Charleston)

Kenyon, Richard (Brown University)

Khesin, Boris (University of Toronto)

Landsberg, Joseph (Texas A&M University)

Langer, Joel (Case Western Reserve University)

Levi, Mark (PennState University)

Mari-Beffa, Gloria (University of Wisconsin)

Montgomery, Richard (University of California, Santa Cruz)

Morier-Genoud, Sophie (IMJ-PRG, Université Pierre et Marie Curie)

Olver, Peter (University of Minnesota)

Ovsienko, Valentin (University of Reims)

Pedroza, Andrés (Universidad de Colima)

Perline, Ron (Drexel University)

Pinkall, Ulrich (Technical University of Berlin)

Ramassamy, Sanjay (Brown University)

Roger, Claude (Université Claude Bernard (Lyon 1))

Schwartz, Richard (Brown University)

Shapiro, Michael (Michigan State University)

Stephenson, Ken (University of Tennessee)

Tabachnikov, Sergei (Pennsylvania State University)

Zharnitsky, Vadim (University of Illinois at Urbana-Champaign)

Coherent Structures in PDEs and Their Applications

June 19 - 24, 2016

Organizers:

Andrea Bertozzi (University of California Los Angeles)
Theodore Kolokolnikov (Dalhousie University)
Panayotis Kevrekidis (University of Massachusetts Amherst)

Ricardo Carretero (San Diego State University)
Paul Newton (University of Southern California)
David Uminsky (University of San Francisco)



This workshop explored what is understood and understandable theoretically with what is feasible experimentally. It brought together leading experimentalists and theoreticians to identify focus questions that can be jointly addressed. Specifically, some of the topics will included: techniques to derive the reduced dynamical systems; the analysis of the resulting effective dynamics; numerical computations; comparison with experiments, and identification of important challenges stemming from the general theory and the concrete applications. This workshop provided a fertile ground for cross-pollination between applied mathematicians, experimental and theoretical physicists. To ensure the strongest opportunity of developing new collaborations, this workshop included a very diverse set of researchers at various stages of their careers.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/5-day-workshops/16w5050>

Participants:

Kevrekidis, Panos (University of Massachusetts Amherst)
Anderson, Brian (University of Arizona)
Bernoff, Andrew (Harvey Mudd College)
Bradley, Ashton (University of Otago)
Calleja, Renato (IIMAS-UNAM)
Carretero, Ricardo (San Diego State University)
Contreras, Andres (New Mexico State University)
Cruz-García, Salvador (IIMAS)
Curtis, Christopher (SDSU)
D'Orsogna, Maria Rita (California State University Northridge)
Dimitri, Frantzeskakis (U. of Athens)
Edwards, Mark (Georgia Southern University)
Espínola-Rocha, Jesús Adrián (Universidad Autonoma de Metropolitana -Azcapotzalco)
Evers, Joep (Simon Fraser University and Dalhousie University)
Fetecau, Razvan (Simon Fraser University)
Gai, Chunyi (Dalhousie)
García-Azpeitia, Carlos (Universidad Nacional Autónoma de México)
Goodman, Roy (New Jersey Institute of Technology)

Higdon-Topaz, Chad (Macalester College)
Holm, Darryl (Imperial College)
Iron, David (Dalhousie)
Kolokolnikov, Theodore (Dalhousie University)
Lindsay, Alan (University of Notre Dame)
Martínez Farías, Francisco Javier (IIMAS UNAM)
Moscoso, Jordyn (San Diego State University)
Panayotaros, Panayotis (Instituto de Investigaciones en Matematicas Aplicadas y en Sistemas, Universidad Nacional Autonoma de Mexico)
Pelinovsky, Dmitry (McMaster University)
Rodriguez, Nancy (UNC Chapel Hill)
Sandoval Torres, Sadoth (Instituto Politécnico Nacional - CIIDIR Oaxaca)
Short, Martin (Georgia Institute of Technology)
Torres, Pedro J. (U. Granada)
Tsatsos, Marios (Institute of Physics Sao Carlos)
Tzou, Justin (University of British Columbia)
Uminsky, David (University of San Francisco)
Ward, Michael (University of British Columbia)
Whitaker, Nathaniel (University of Massachusetts)
Xie, Shuangquan (Dalhousie)

Random Structures in High Dimensions

June 26 - July 1, 2016

Organizers:

Frank den Hollander (University of Leiden)

David Brydges (University of British Columbia)



Some of the most interesting structures in our world come in random sizes and shapes, for example, long polymer chains, the network of links making up Internet, the tree-like structures in computer science and evolution. These random geometries provide interesting challenges to researchers working in probability and combinatorics, because essential concepts are realised in new ways. The purpose of the workshop is to learn more about each other's recent progress. The main objective is to communicate the different methods and mathematical traditions that are currently being used and explored to solve the problems. These problems have two levels: (i) interactions are strong (focus on phase diagrams); (ii) interactions are weak (focus on critical exponents).

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/5-day-workshops/16w5085>

Participants:

Angel, Omer (University of British Columbia)

Barlow, Martin (University of British Columbia)

Bauerschmidt, Roland (Harvard University)

Beaton, Nicholas (University of Saskatchewan)

Biskup, Marek (University of California at Los Angeles)

Brydges, David (University of British Columbia)

Caballero, Maria Emilia (Universidad Nacional Autónoma de México (UNAM))

Camia, Federico (New York University Abu Dhabi)

Chandra, Ajay (University of Warwick)

den Hollander, Frank (University of Leiden)

Goodman, Jesse (University of Auckland)

Gorostiza, Luis (CINVESTAV)

Grimmett, Geoffrey (Centre for Mathematical Sciences)

Guttmann, Tony (University of Melbourne)

Hara, Takashi (Kyushu University)

Helmuth, Tyler (Berkeley)

Heydenreich, Markus (University of Munich)

Holmes, Mark (University of Auckland)

Jarai, Antal (University of Bath)

Kennedy, Tom (University of Arizona)

Kotecky, Roman (University of Warwick and Charles University)

Kumagai, Takashi (RIMS Kyoto)

Lawler, Greg (University of Chicago)

López Ortega, Sergio Ivan (Universidad Autónoma de México)

Munoz-Maya, Ismael (Instituto Tecnológico de Pachuca)

Newman, Charles (New York University)

Perkins, Ed (University of British Columbia)

Rechnitzer, Andrew (University of British Columbia)

Rivero, Victor (CIMAT A.C.)

Sakai, Akira (Hokkaido University)

Shen, Hao (Columbia University)

Slade, Gordon (University of British Columbia)

Soteros, Christine (University of Saskatchewan)

Toth, Balint (University of Bristol)

Uribe Bravo, Geronimo (Instituto de Matematicas, UNAM)

Van der Hofstad, Remco (TU Eindhoven)

Wallace, Ben (University of British Columbia)

Whiteley, Chris (University of Auckland)

Stochastic and Deterministic Models for Evolutionary Biology

July 31 - August 5, 2016

Organizers:

Gaël Raoul (Ecole polytechnique)
Vincent Calvez (École normale supérieure de Lyon)
Mark Kirkpatrick (University of Texas)

Sylvie Méléard (Ecole Polytechnique)
Sarah Otto (University of British Columbia)



The world is confronted to new environmental challenges: global warming, emerging epidemics, antibiotic resistant bacteria... Those problems are very complex, involving many aspects of our societies (from public health management to transportation). The stakes are high, and the available theoretical or experimental tools remain unable to embrace this level of complexity. This workshop focused on the spatial and evolutionary dynamics of organisms submitted to a changing environment. It is a key element common to many societal problems, on which an interdisciplinary approach can shade a new light. By bringing together biologists and mathematicians working on those problems, this meeting led to the development of new ideas, and new tools to understand the ecology of organisms in a changing world.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/5-day-workshops/16w5113>

Participants:

Alfaro, Matthieu (University Montpellier)
Blancas Benítez, Airam Aseret (Centro de Investigación en Matemáticas)
Bouin, Emeric (University Paris-Dauphine)
Bourgeron, Thibault (Ecole Normale Supérieure de Lyon)
Caballero, Maria Emilia (Universidad Nacional Autónoma de México (UNAM))
Calvez, Vincent (École normale supérieure de Lyon)
Champagnat, Nicolas (INRIA Nancy)
Coville, Jerome (INRA Avignon)
Day, Troy (Queens University)
Deforet, Maxime (Memorial Sloan Kettering Cancer Center)
Diekmann, Odo (Universiteit Utrecht)
Gandon, Sylvain (Centre national de la recherche scientifique)
Garnier, Jimmy (CNRS - University Savoie Mont-Blanc)
Gog, Julia (University of Cambridge)
Hallatschek, Oskar (University of California - Berkeley)
Henderson, Christopher (Ecole Normale Supérieure de Lyon)
Herrera-Valdez, Marco Arieli (UNAM)

Kirkpatrick, Mark (University of Texas)
Lam, King-Yeung (Adrian) (Ohio State University)
Lambert, Amaury (UPMC Univ Paris 06)
Lion, Sébastien (CEFE - CNRS UMR 5175)
Lou, Yuan (Ohio State University)
Méléard, Sylvie (Ecole Polytechnique)
Mirrahimi, Sepideh (Université Paul Sabatier)
Osmond, Matthew (University of British Columbia)
Otto, Sarah (University of British Columbia)
Palau Calderón, Sandra (Centro de Investigación en Matemáticas)
Peischl, Stephan (University of Bern)
Peña-Miller, Rafael (Universidad Nacional Autónoma de Mexico)
Peralta Hernández, Liliana (Universidad Autónoma del Estado de Hidalgo)
Raoul, Gaël (Ecole polytechnique)
Siri-Jégousse, Arno (University of Guanajuato)
Smadi, Charline (IRSTEA)
Tran, Viet Chi (University Lille 1)
Turanova, Olga (UCLA)
Velázquez Castro, Jorge (Benemerita Universidad Autónoma de Puebla)
Wakano, Joe Yuichiro (Meiji University)
Wakolbinger, Anton (Goethe-University Frankfurt)

Computational Algebra and Geometric Modeling

August 7 - 12, 2016

Organizers:

Laurent Buse (Institute for Research in Computer Science and Automation)
Ron Goldman (Rice University)

Hal Schenck (University of Illinois Urbana Champaign)



The visual depiction of complex surfaces and solids via computer graphics is a topic with a broad range of applications; companies ranging from Boeing (design of airplane shape) to Pixar (computer animation) use geometric modeling in their work. The purpose of this workshop is to bring together experts from both computer science and mathematics to work on problems and algorithms in the area. There has been a recent explosion of activity, because for many real world applications, the usual mathematical techniques (which are known technically as Grobner bases and resultants) are slow; a new method (Rees algebras) seems to provide excellent increases in speed. Bringing together experts from both computer science and mathematics will foster interdisciplinary collaboration and lead to potential progress (both theoretical and practical) on a number of problems.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/5-day-workshops/16w5115>

Participants:

Alfeld, Peter (University of Utah)
Bajaj, Chandrajit (University of Texas at Austin)
Botbol, Nicolas (University of Buenos Aires)
Buse, Laurent (Institute for Research in Computer Science and Automation)
Chen, Falai (University of Science and Technology of China)
D'Andrea, Carlos (University of Barcelona)
Dickenstein, Alicia (University of Buenos Aires)
Duarte, Eliana (University of Illinois Urbana-Champaign)
Farouki, Rida (UC Davis)
Galligo, Andre (University of Nice)
Goldman, Ron (Rice University)
Hubert, Evelyne (INRIA Sophia Antipolis France)
Jia, Xiaohong (Chinese Academy of Sciences)
Jüttler, Bert (JKU Linz)
Krasauskas, Rimvydas (Vilnius University)
Liyong, Shen (Chinese Academy of Science)
Lozano, Cesar (Instituto de Matematicas, Oaxaca UNAM)
Martin del Campo, Abraham (CIMAT)

Morin, Geraldine (Universite de Toulouse)
Mourrain, Bernard (INRIA Sophia-Antipolis)
Peters, Jorg (University of Florida)
Peterson, Chris (Colorado State University)
Piene, Ragni (University of Oslo)
Pitones Amaro, Yuriko (Centro de Investigación y de Estudios Avanzados- IPN)
Romani, Lucia (University of Milano-Bicocca)
Ron, Amos (University of Wisconsin - Madison)
Schicho, Josef (Johannes Kepler University of Linz)
Secleanu, Alexandra (University of Nebraska)
Sederberg, Tom (Brigham Young University)
Shi, Xiaoran (Harbin Institute of Technology)
Smith, Gregory G. (Queen's University)
Stillman, Mike (Cornell University)
Villamizar, Nelly (RICAM Austrian Academy of Sciences)
Wang, Haohao (Southeast Missouri University)
Wang, Xuhui (Hefei University of Technology)
Wang, Wenping (Univ. of Hong Kong)
Zheng, Jianmin (Nanyang Technological University)
Zube, Severinas (Vilnius university)

Modular Categories -Their Representations, Classification, and Applications

August 14 - 19, 2016

Organizers:

Zhengan Wang (University of California, Santa Barbara)

Eric Rowell (Texas A&M University)

Siu-Hung Ng (Louisiana State University)

Dmitri Nikshych (University of New Hampshire)



Modular categories are intricate organizing algebraic structures appearing in a variety of mathematical subjects including topological quantum field theory, conformal field theory, and representation theories of quantum groups, von Neumann algebras, and vertex operator algebras. In this workshop, we studied the mathematical structures of modular categories---their classification and representations, and explore their applications to gapped states of quantum matter and quantum computing. The workshop brought applied and theoretical researchers in close contact to establish a cohesive community of researchers working in modular categories and their applications. Exploration of this area can push the boundaries of our understanding of quantum mathematics, new quantum states of matter, and simultaneously generate quantum information technologies with potentially great societal impact.

Participants:

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/5-day-workshops/16w5049>

Bontea, Costel (University of New Hampshire)

Bruguières, Alain (Université de Montpellier)

Bruillard, Paul (Pacific Northwest National Laboratory)

Creamer, Daniel (Texas A&M U.)

Cuadra, Juan (University of Almeria)

Cui, Xingshan (UC Santa Barbara)

Davydov, Alexei (Ohio University)

Dong, Chongying (University of California)

Fuchs, Jurgen (Karlstad University)

Gannon, Terry (University of Alberta)

Gilmer, Patrick (Louisiana State University)

Gonzalez Novelo, Nayeli (CIMAT)

Grossman, Pinhas (University of New South Wales)

Hoehn, Gerald (Kansas State University)

Kawahigashi, Yasuyuki (The University of Tokyo)

Kharchenko, Vladislav (UNAM)

Lan, Tian (Perimeter Institute for Theoretical Physics)

Lanéry, Suzanne (UNAM)

Levin, Alex (U. New Hampshire)

Meir, Ehud (University of Hamburg)

Morrison, Scott (Australian National University)

Mueger, Michael (Radboud Universiteit Nijmegen)

Naidu, Deepak (Northern Illinois University)

Negron, Cris (MIT)

Ng, Siu-Hung (Louisiana State University)

Oeckl, Robert (UNAM)

Ostrik, Victor (University of Oregon)

Pacheco, Edwin (Universidad Nacional de Córdoba)

Peters, Emily (Loyola University Chicago)

Plavnik, Julia (Texas A&M University)

Priel, Jan (Universität Hamburg)

Reza Rahmati, Mohammad (CIMAT)

Rowell, Eric (Texas A&M University)

Runkel, Ingo (U Hamburg)

Schopieray, Andrew (University of Oregon)

Snyder, Noah (Indiana University)

Tener, James (Max Planck Institut fur Mathematik)

Tucker, Henry (University of Southern California)

Walton, Chelsea (Temple University)

Wang, Zhengan (University of California, Santa Barbara)

Wen, Xiao-Gang (Massachusetts Institute of Technology/Perimeter Institute)

Wenzl, Hans (UC San Diego)

Women in Mathematics in Latin America: Barriers, Advancements and New Perspectives

August 21 - 26, 2016

Organizers:

Patricio Felmer (Universidad de Chile)
Lilliam Alvarez Diaz (Cuban Academy of Sciences)
Ann Hibner Koblitz (Arizona State University)

Neal Koblitz (University of Washington)
Gabriela Araujo (UNAM)
Luis Ramiro Piñeira (Universidad de La Habana)



The workshop proposed a Strategic Action Plan to disseminate and promote in Education systems and media calling the attention on the importance to include more Women as scientists and as Mathematicians in particular. It promoted through the National Societies for Mathematics in Latin America, one Association, with Focal points and Groups, for Women in Mathematics.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/5-day-workshops/16w5003>

Participants:

Martín, María Teresa (La Plata University Argentina)
Alvarez Diaz, Lilliam (Cuban Academy of Sciences)
Araujo, Gabriela (UNAM)
Aroca, Fuensanta (UNAM)
Benedetti, Carolina (Fields Institute)
Brech, Christina (University of São Paulo)
Caballero, MEMILIA (UNAM)
Carbajal Licas, Jenny (Universidad Nacional de San Marcos)
Carely Luna, Beatriz (Universidad del Papaloapan)
Cortez, Maria Isabel (Universidad de Santiago de Chile)
de Teresa, Luz (UNAM)
Escalona, Eva (Directora Ciencia y Técnica MINED)
Felmer, Patricio (Universidad de Chile)
García-Colin, Natalia (INFOTEC Centro de Investigación e Innovación en tecnologías de la información y comunicación)
Gomez Pasquali, Gabriela (Organización Multidisciplinaria de Apoyo a Profesores y Alumnos)
Gomez Wulschner, Claudia (ITAM)
Gonzalez Tokman, Cecilia (The University of Queensland)
Guevara, Mucuy-Kak (UNAM)
Hernández Mederos, Victoria (Instituto de Cibernética Matemática y Física)
Hubard, Isabel (UNAM)
Jiménez Rolland, Rita (UNAM)
Koblitz, Ann Hibner (Arizona State University)
Lara, Dolores (Centro de Investigación y de Estudios Avanzados del IPN)
Llivina, Jesus (UNESCO)
López Cruz, Roxana (Universidad Nacional Mayor de San Marcos)
Lopez de Medrano, Lucia (UNAM)
Martínez Avendaño, Ruben (Universidad Autónoma del Estado de Hidalgo)
Martínez Ruíz, Guadalupe (Universidad del Istmo Campus Tehuantepec)
Moctezuma, Daniela (CentroGeo)
Montejano, Amanda (UNAM Juriquilla)
Munguía Villanueva, Eréndira (Universidad del Papaloapan)
Neira, Carolina (Universidad Nacional de Colombia)
Olsen, Mika (Universidad Autónoma Metropolitana - Cuajimalpa)
Ortega Castillo, Sofía (CIMAT)
Pellicer-Covarrubias, Patricia (UNAM)
Rincón, Elizabeth (Universidad Autónoma de Sto Domingo)
Santiago Ayala, Yolanda (Universidad Nacional Mayor de San Marcos)
Santillán Hernández, Alma Sofía (Universidad Autónoma del Estado de Hidalgo)
Takane, Martha (UNAM)
Vampa, Victoria (Universidad Nacional de La Plata)
Vazquez, Mariel (University of California Davis)
Zdimalová, María (Slovak University of Technology in Bratislava)
Zubieta, Judith (Investigadora IIS, UNAM)
Zubieta, Paloma (UNAM)

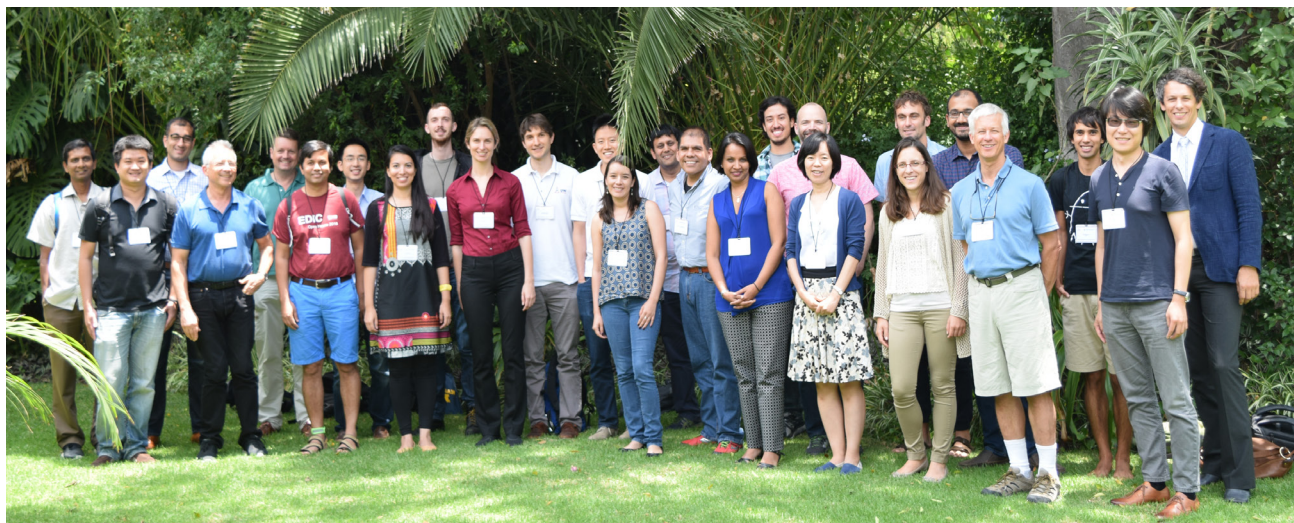
Models and Algorithms for Crowds and Networks

August 28 - September 2, 2016

Organizers:

Dan Weld (University of Washington)
Elisa Celis (École Polytechnique Fédérale de Lausanne)

Yiling Chen (Harvard University)
Panos Ipeirotis (New York University)



The modern world is increasingly being defined by connections, both physical and virtual. This has given rise to many large and heterogeneous networks which sometimes also involve rational agents; from those one thinks about daily such as Facebook, to ones often not thought about explicitly such as the physical structure of the internet, and even some that have been forming for millennia such as phylogenetic trees from biology. One important application which requires insights from many of these fields is crowdsourcing, the practice of outsourcing tasks to a large, often anonymous, crowd. While the behavior of the components shape the networks, the network structure also affects the components, and understanding these complex interactions has been a key focus in many fields including mathematics, computer science, engineering, physics, biology and the social sciences. This workshop will bring together prominent and upcoming researchers from several of these areas in order to stimulate an exchange of ideas, improve the state-of-the art in terms of techniques, and define its future.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/5-day-workshops/16w5140>

Participants:

Bansal, Shweta (Georgetown University)
Barajas Ramírez, Juan Gonzalo (IPICYT)
Ben-David, Shai (University of Waterloo)
Bigham, Jeff (Carnegie Mellon University)
Bragg, Jonathan (University of Washington)
Celis, Elisa (École Polytechnique Fédérale de Lausanne)
Chávez Hernández, María Victoria (Universidad Autónoma Metropolitana - Iztapalapa)
Chen, Yiling (Harvard University)
Chilton, Lydia (Stanford University)
Goel, Ashish (Stanford University)
Hartline, Jason (Northwestern University)
Ho, Chien-Ju (Cornell University)
Ipeirotis, Panos (New York University)
Koutra, Danai (University of Michigan)

Krafft, Peter (MIT)
Kumar, Ravi (Google)
Lasecki, Walter (University of Michigan)
Lease, Matthew (University of Texas - Austin)
Lee, David (UC Santa Cruz)
Lin, Chris (UW)
Liu, Yang (Harvard)
Mausam, (IIT Delhi)
Parameswaran, Aditya (University of Illinois - Urbana-Champaign)
Suri, Siddharth (Microsoft Research)
Thiran, Patrick (EPFL)
Vishnoi, Nisheeth (École Polytechnique Fédérale de Lausanne)
Waggoner, Bo (U Penn)
Weld, Dan (University of Washington)

Mathematical Problems of Orientationally Ordered Soft Solids

September 4 - 9, 2016

Organizers:

Len Pismen (Technion)
Alejandro Rey (McGill University)

Antonio DeSimone (International School for Advanced Studies, Trieste, Italy)



Studies of orientable soft materials pose challenging mathematical problems, in view of the necessity to follow the evolution of several interconnected fields: orientational order parameter, deformation, mechanical stress, and chemical composition. Interactions of these fields lead to various instabilities and self-organization phenomena. The general objective of this workshop was to bring together the leading researchers in the field across several disciplines, including physicists, mathematicians, polymer scientists and engineers, to foster awareness and cross-disciplinary transfer of ideas in this fast evolving field and facilitate conversation among the different communities of scientists. The workshop brought together different, so far disconnected aspects of state-of-art knowledge: elasticity theory, pattern formation, mesoscopic aspects of soft matter physics, and biological or biomimetic morphogenesis.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/5-day-workshops/16w5021>

Participants:

Aguilar Gutiérrez, Oscar Felipe (McGill University)
Bhattacharya, Kaushik (California Institute of Technology)
Calderas, Fausto (CIATEC)
Capella Kort, Antonio (IPICYT)
DeSimone, Antonio (International School for Advanced Studies, Trieste, Italy)
Herrera Valencia, Edtson Emilio (Universidad Nacional Autónoma de México)
Lubensky, Tom (University of Pennsylvania)
Luccioni, Alessandro (Sissa)
Matus Rivas, Oscar Manuel (McGill University)
Morales Montesinos, Lauro (UNAM)
Oates, William (Florida State University)
Plucinsky, Paul (California Institute of Technology)

Rey, Alejandro (McGill University)
Sagues, Francesc (University of Barcelona)
Sandoval Torres, Sadoth (Instituto Politécnico Nacional - CIIDIR Oaxaca)
Santangelo, Chris (University of Massachusetts Amherst)
Schoenke, Johannes (Okinawa Institute of Science and Technology)
Selinger, Jonathan (Kent State University)
Sharon, Eran (The Hebrew University of Jerusalem)
Skacej, Gregor (University of Ljubljana, Faculty of Mathematics and Physics)
Urayama, Kenji (Kyoto Institute of Technology)
Yllanes, David (Syracuse University)

Set Theory and its Applications in Topology

September 11 - 16, 2016

Organizers:

Stevo Todorcevic (University of Toronto)
Michael Hrusak (UNAM)

Justin Tatch Moore (Cornell University)



The workshop was designed to explore the strong connection that exists between set theory, topology, and functional analysis. The set-theoretic methods involved included infinitary Ramsey theory, descriptive set theory and forcing. The focus of the workshop was on applications of these methods to problems in set-theoretic topology, the geometry of Banach spaces, functional analysis, and topological dynamics. The program brought together senior leaders in the field, and students and junior researchers.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/5-day-workshops/16w5053>

Participants:

Bartosova, Dana (University of Sao Paulo)
Bergfalk, Jeffrey (Cornell University)
Blass, Andreas (University of Michigan)
Brech, Christina (University of São Paulo)
Brendle, Joerg (Kobe University)
Choudounsky, David (Czech Academy of Sciences)
Cummings, James (Carnegie Mellon University)
de Rancourt, Noé (Université Paris Diderot)
Di Prisco, Carlos (Universidad de los Andes)
Dobrinen, Natasha (University of Denver)
Dow, Alan (University of North Carolina, Charlotte)
Eisworth, Todd (Ohio University)
Fernández Bretón, David (University of Michigan)
Guzmán, Osvaldo (UNAM)
Hernandez Gutierrez, Rodrigo Jesus (Universidad Autónoma Metropolitana, Iztapalapa)
Hrusak, Michael (UNAM)
Juhász, Isván (Alfred Renyi Institute of Mathematics, Hungarian Academy of Sciences)
Koszmider, Piotr (Polish Academy of Sciences)
Kwiatkowska, Aleksandra (University of Bonn)
Larson, Paul (Miami University)
Martínez, Carlos (University of Concepción)
Martinez Celis Rodriguez, Arturo Antonio (UNAM)
Meza-Alcantara, David (UNAM)
Mildenberger, Heike (University of Freiburg)
Moore, Justin Tatch (Cornell University, Ithaca, NY)

Mota, Miguel Angel (Instituto Tecnológico Autónomo de México)
Neeman, Itay (UCLA)
Ongay Valverde, Ivan (University of Wisconsin)
Peng, Yinhe (University of Toronto)
Pichardo Mendoza, Roberto (UNAM)
Piña, Claribet (Universidad de los Andes)
Raghavan, Dilip (National University of Singapore)
Ramos-García, Ulises Ariet (UNAM)
Rinot, Assaf (Bar-Ilan University)
Sabok, Marcin (McGill University)
Shibakov, Alexander (Tennessee Tech University)
Smythe, Iain (Cornell University)
Solecki, Slawomir (University of Illinois at Urbana-Champaign)
Steprans, Juris (York University)
Todorcevic, Stevo (University of Toronto and Institut de Mathématiques de Jussieu)
Tornquist, Asger (University of Copenhagen)
Torres-Perez, Victor (Vienna University of Technology)
Tserunyan, Anush (University of Illinois at Urbana-Champaign)
Uzcategui, Carlos (Universidad Industrial de Santander)
van Mill, Jan (University of Amsterdam)
Weiss, William (University of Toronto)
Zapletal, Jindrich (University of Florida)

Analysis and Dynamics

September 18 - 23, 2016

Organizers:

Liviana Palmisano (Polish Academy of Sciences)
Neil Dobbs (University of Geneva)

Jacek Graczyk (Université Paris-Sud)



The main purpose of the workshop was to bring researchers together, who may not otherwise meet, to discuss the recent developments of dynamical systems in one complex variable and in one real variable from the analyst's point of view. Through a relaxed and stimulating environment, we hoped to inspire new questions, ideas and collaborative projects. The interplay between dynamics and analysis was highlighted as we renewed and rejuvenated the links between these domains. We brought together a mid-sized, high quality group of younger and more experienced participants from diverse countries and from the various strands of mathematics related to the theme of the workshop. In the workshop spirit, we focussed on presenting ideas and tools that may lead to further progress and collaboration.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/5-day-workshops/16w5129>

Participants:

Astala, Kari (University of Helsinki)
Baranski, Krzysztof (University of Warsaw)
Benedicks, Michael (Royal Institute of Technology - Sweden)
Berteloot, François (Université Paul Sabatier)
Cheraghi, Davoud (Imperial College London)
Dobbs, Neil (University of Geneva)
Ernesto, Rosales (UNAM)
Graczyk, Jacek (Université Paris-Sud)
Haïssinsky, Peter (Université d'Aix-Marseille)
Ivrii, Oleg (University of Helsinki)
Koskela, Pekka (University of Jyväskylä)
Kotus, Janina (Warsaw University of Technology)
López, Marco (University of North Texas)
Mattila, Pertti (University of Helsinki)

Mihalache, Nicolae (Université Paris Est Créteil)
Montes de Oca Balderas, Marco Antonio (BUAP)
Moreno Rocha, Monica (Centro de Investigacion en Matematicas)
Palmisano, Liviana (Institute of Mathematics of Polish Academy of Sciences)
Prause, István (University of Helsinki)
Rohde, Steffen (University of Washington)
Shishikura, Mitsuhiro (Kyoto University)
Sibony, Nessim (Université Paris-Sud-Bat 425)
Vigny, Gabriel (Université de Picardie- Jules Verne)
Winckler, Björn (Stony Brook University)
Wold, Erlend Fornaess (University of Oslo)
Younsi, Malik (Stony Brook University)
Zinsmeister, Michel (Université d'Orléans)

Asymptotic Patterns in Variational Problems: PDE and Geometric Aspects

September 25 - 30, 2016

Organizers:

Thomas Bartsch (Universität Giessen)
Susana Terracini (Università de Torino)

Norman Dancer (University of Sydney)
Angela Pistoia (Università di Roma La Sapienza)



This five-day workshop provided a forum for the dissemination of current advances in the analysis of pattern formation in various nonlinear problems sharing a variational structure and its links with the entire and self similar solutions to semilinear elliptic and parabolic systems. Applications may be found in theoretical physics (Bose-Einstein condensation, superfluids, Quantum electrodynamics), fluid mechanics, population dynamics and material sciences.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/5-day-workshops/16w5065>

Participants:

Ackermann, Nils (UNAM)
Azpeitia, Carlos García (UNAM)
Barutello, Vivina (University of Torino)
Bronsard, Lia (McMaster University)
Byeon, Jaeyoung (Korea Advanced Institute of Science and Technology)
Chagoya Saldana, Julian Fernando (UNAM)
Clapp, Mónica (UNAM)
D'Aprile, Teresa (Università di Roma Tor Vergata)
Dancer, Norman (University of Sydney)
Davila, Juan (Universidad de Chile)
Dipierro, Serena (University of Melbourne)
Dolbeault, Jean (Université Paris-Dauphine)
Fall, Mouhamed Moustapha (African Institute for Mathematical Sciences of Senegal)
Faya, Jorge (Universidad de Chile)
Fernández, Juan Carlos (UNAM)
García Ruíz, Fernando (UNAM)
Gladiali, Francesca (Università di Sassari)
Grossi, Massimo (Sapienza Università di Roma)

Gui, Changfeng (University of Connecticut)
Ianni, Isabella (Seconda Università di Napoli)
Mendoza de la Luz, Erick (Universidad Autónoma Del Estado de México)
Musso, Monica (Pontificia Universidad Católica de Chile)
Nys, Manon (Università degli studi di Torino)
Pacella, Filomena (Università di Roma)
Pistoia, Angela (Sapienza Università di Roma)
Quittner, Pavol (Comenius University)
Ruiz, David (Universidad de Granada)
Salazar González, Yaneri Viridiana (UNAM)
Sire, Yannick (Johns Hopkins University)
Tanaka, Kazunaga (Waseda University)
Tavares, Hugo (Universidade de Lisboa)
Terracini, Susanna (Università di Torino)
Valdinoci, Enrico (University of Melbourne)
Verzini, Gianmaria (Politecnico di Milano)
Wang, Zhi-Qiang (Utah State University)
Yan, Shusun (University of New England)

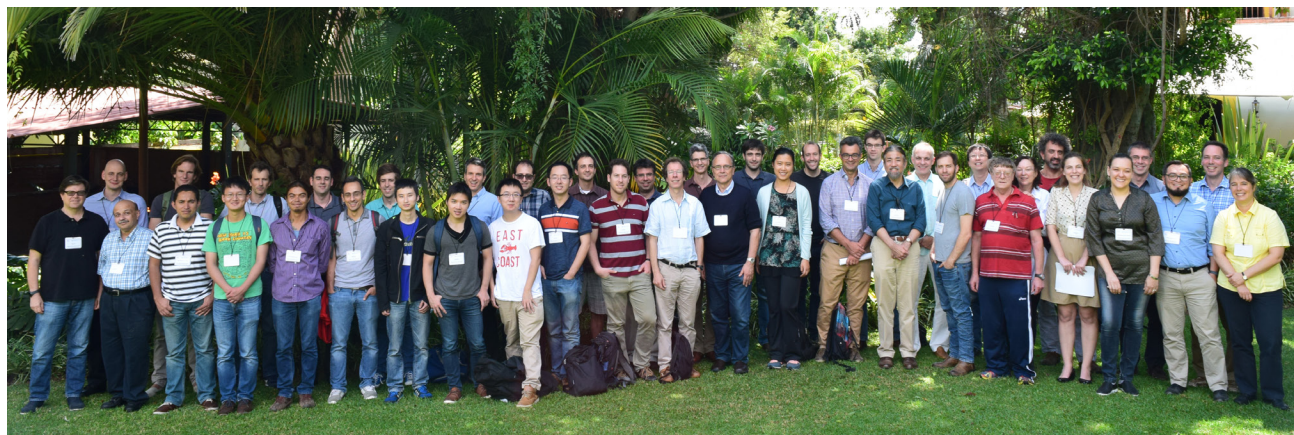
Applied Harmonic Analysis, Massive Data Sets, Machine Learning, and Signal Processing

October 16 - 21, 2016

Organizers:

Amit Singer (Princeton University)
Thomas Strohmer (University of California, Davis)

Ronald Coifman (Yale University)
Emmanuel Candes (Stanford University)



The workshop brought together world leading experts at the intersection of applied harmonic analysis, machine learning, optimization, and signal processing to present recent developments and to foster new interactions. Applied harmonic analysis builds novel architectures for information. Machine learning extracts features from large data sets. Signal processing is concerned with the denoising, recovery, and transformation of data. Optimization provides powerful numerical algorithms utilized by the other three areas. Until now, these four areas have interacted only in ad hoc ways. The direct interaction of mathematicians, statisticians, engineers, and computer scientists, made possible by this workshop, will make for an efficient intellectual feedback loop, which is central to achieving the urgently needed breakthroughs in the area of “Big Data”.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/5-day-workshops/16w5136>

Participants:

Bach, Francis (INRIA)
Bandeira, Afonso S. (Courant Institute, NYU)
Bodmann, Bernhard (University of Houston)
Candes, Emmanuel (Stanford University)
Casazza, Pete (University of Missouri)
Chen, Yuxin (Stanford University)
Cloninger, Alexander (Yale University)
d’Aspremont, Alexandre (CNRS -ENS)
Guibas, Leonidas (Stanford University)
Kuo, Han-wen (Columbia)
Kutyniok, Gitta (Technische Universität Berlin)
LeCun, Yann (Facebook)
Lederman, Roy (Princeton University)
Lerman, Gilad (University of Minnesota)
Li, Yang (University of California - Davis)
Ling, Shuyang (University of California Davis)
Ma, Yi (University of Illinois at Urbana-Champaign)
Maggioni, Mauro (Duke University)
Mallat, Stéphane (Ecole Polytechnique)
Martínez Martínez, Asael Fabian (Centro de Investigación en Matemáticas A.C.)
Mhaskar, Hrushikesh (California Institute of Technology and Claremont Graduate University)
Montalvo Urquizo, Jonathan (Centro de Investigación en Matemáticas)
Nadler, Boaz (Weizmann Institute of Science)
Needell, Deanna (Claremont McKenna College)
Plan, Yaniv (University of British Columbia)
Qu, Qing (Columbia University)
Recht, Benjamin (University of California, Berkeley)
Reveles Gurrola, Fermín Omar (Centro de Investigación en Matemáticas A.C.)
Rieser, Antonio (CONACYT-CIMAT)
Saab, Rayan (UC San Diego)
Saito, Naoki (University of California in Davis)
Sharon, Nir (Princeton University)
Simoncelli, Eero (New York University)
Singer, Amit (Princeton University)
Soltanolkotabi, Mahdi (University of Southern California)
Strohmer, Thomas (University of California, Davis)
Talmon, Ronen (Technion)
Tremain, Janet C. (University of Missouri)
Tropp, Joel (California Institute of Technology)
Valero, Carlos (Universidad de Guanajuato)
Villarreal, Soledad (UT Austin)
Villarreal Marroquín, María Guadalupe (CIMAT)
Wright, John (Columbia University)
Zhao, Zhizhen (University of Illinois Urbana - Champaign)

Transversal, Helly and Tverberg type Theorems in Geometry, Combinatorics and Topology III

October 23 - 28, 2016

Organizers:

Luis Montejano (National University of Mexico)
Imre Bárány (Alfred Renyi, Institute of Mathematics)
Deborah Oliveros (UNAM)

János Pach (École Polytechnique Fédérale de
Lausanne)
Emo Welzl (ETH Zurich)



One of the most celebrated results in discrete geometry is due to Eduard Helly (1913). Helly's Theorem, gives the conditions for the members of a family of convex sets (sets with convex boundary and without holes) to have a common point. This theorem has generated, literally, hundred of research papers and has given rise to numerous generalizations, variants and important applications, not only in other areas of mathematics, but in other sciences as well, such as biology and social sciences. The workshop assembled the key people working in this area, in order to explore recent progress and to help focus on future directions of research in geometric transversal, and some others generalizations of Helly's theory.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/5-day-workshops/16w5064>

Participants:

Ambrus, Gergely (Alfred Renyi Institute)
Amenta, Nina (University of California)
Arelio Ríos, Isaac (UNAM)
Aronov, Boris (New York University)
Bárány, Imre (Alfred Renyi, Institute of Mathematics)
Barba, Luis (Universite Libre de Bruxelles)
Bezdek, Andras (Auburn University)
Bisztriczky, Ted (University of Calgary)
Bracho, Javier (UNAM)
Bukh, Boris (Carnegie Mellon University)
De Loera, Jesus (University of California)
Deza, Antoine (McMaster University)
Díaz Patiño, Juan Carlos (UNAM)
Fodor, Ferenc (University of Szeged)
Frick, Florian (Cornell University)
Garcia-Colin, Natalia (INFOTEC Centro de Investigación e Innovación en tecnologías de la información y comunicación)
Gómez-Gutiérrez, Vinicio Antonio (UNAM)
Holmsen, Andreas (KAIST)
Jiménez de Santiago, Valentín (UNAM)
Karasev, Roman (Moscow Institute of Physics and Technology)

Kuperberg, Wlodzimierz (Auburn University)
Martínez, Leonardo (UNAM)
Medina Graciano, Carolina (Universidad Autónoma de San Luis Potosí)
Meunier, Frederic (ENPC)
Montejano, Luis (National University of Mexico)
Musin, Oleg (University of Texas Rio Grande Valley)
Naszodi, Marton (Eötvös University)
Oliveros, Deborah (UNAM)
Patak, Pavel (Hebrew University of Jerusalem)
Patáková, Zuzana (Hebrew University of Jerusalem)
Pérez Contreras, Eric (UNAM)
Por, Attila (Western Kentucky University)
Ramirez Alfonsin, Jorge (Université de Montpellier)
Roldan-Pensado, Edgardo (UNAM)
Soberón, Pablo (Northeastern University)
Swanepoel, Konrad (London School of Economics and Political Science)
Tancer, Martin (Charles University in Prague)
Toth, Csaba (California State University Northridge)
Valtr, Pavel (Charles University)
Wagner, Uli (IST Austria)

Sparse Interpolation, Rational Approximation and Exponential Analysis

October 30 - November 4, 2016

Organizers:

George Labahn (University of Waterloo)
Annie Cuyt (Universiteit Antwerpen)

Avram Sidi (Israel Institute of Technology (Technion))



Our workshop brought together researchers from a diverse set of areas. These include experts involved with algorithm design for sparse polynomials either over finite fields (where the main applications come from coding theory) or over floating point numeric domains (where the main applications often come from signal processing), Padé approximation and exponential analysis. The tantalizing preliminary results showing connections in both the techniques used along with common difficulties. The connections include overlap between methods used for exact vs numeric computation and overlap in the types of sparse generating functions.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/5-day-workshops/16w5038>

Participants:

Arnold, Andrew (University of Waterloo)
Briani, Matteo (University of Antwerp Belgium)
Corless, Robert (University of Western Ontario)
Cuyt, Annie (Universiteit Antwerpen)
de Hoop, Maarten (Rice University)
Giesbrecht, Mark (U. Waterloo)
Haraldson, Joseph (University of Waterloo)
Hubert, Evelyne (INRIA Sophia Antipolis France)
Kämmerer, Lutz (Technische Universität Chemnitz)
Labahn, George (University of Waterloo)
Lasserre, Jean-Bernard (LAAS-CNRS 7, Toulouse)
Lee, Wen-shin (University of Antwerp, Belgium)
Matos, Ana (University of Lille France)

Mourrain, Bernard (INRIA Sophia-Antipolis)
Ou, M. Yvonne (University of Delaware USA)
Plonka, Gerlind (University of Goettingen Germany)
Pototskaia, Vlada (University of Goettingen Germany)
Saff, Edward (Vanderbilt University)
Schost, Eric (University of Waterloo Canada)
Sidi, Avram (Israel Institute of Technology (Technion))
Szanto, Agnes (North Carolina State University)
von der Ohe, Ulrich (Osnabrück University)
Zhang, Yang (University of Manitoba)
Zhi, Lihong (AMSS Beijing China)

Stable Processes

November 6 - 11, 2016

Organizers:

Juan Carlos Pardo Millán (CIMAT)
Davar Khoshnevisan (University of Utah)

Alexey Kuznetsov (York University)
Andreas Kyprianou (University of Bath)



Recent years have seen a confluence of research in the area of stable processes, self-similarity and stable-driven SDEs, and a discussion of common ground in these areas is certain to add to the vigour of both. Furthermore, many related areas of applied probability will benefit and contribute to this research, including the theory of branching processes and coalescence. It is an ideal time for a workshop bringing together researchers in these various fields, and developing techniques and new directions of research in stable processes and jump SDEs.

*For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/5-day-workshops/16w5123>*

Participants:

Mytnik, Leonid (Technion)
Arizmendi, Octavio (Centro de Investigacion en Matematicas (Guanajuato-Mexico))
Banuelos, Rodrigo (Purdue University)
Barrera Vargas, Gerardo (CIMAT)
Bertoin, Jean (Universität Zürich)
Bogdan, Krzysztof (Wroclaw University of Science and Technology)
Bucur, Claudia (Università degli Studi di Milano)
Caballero, MEMILIA (UNAM)
Chen, Zhen-Qing (University of Washington)
Döring, Leif (University of Manheim)
Duquesne, Thomas (University of Pierre et Marie Curie (Paris 6))
Fekete, Dorottya (University of Bath)
Fourati, Sonia (INSA Rouen)
Graczyk, Piotr (University of Angers)
Horton, Emma (University of Bath)
Korchemski, Igor (CNRS & Ecole Polytechnique)
Kuznetsov, Alexey (York University)
Kwaśnicki, Mateusz (Wrocław University of Technology)

Majka, Mateusz (University of Bonn)
Mason, David M. (University of Delaware)
Mendez, Pedro (Universidad de Costa Rica)
Palau Calderón, Sandra (CIMAT)
Pantí, Henry (UADY)
Pardo Millán, Juan Carlos (CIMAT)
Patie, Pierre (Cornell University)
Ren, Yanxia (Peking University)
Rivero, Victor (CIMAT A.C.)
Rosinski, Jan (University of Tennessee)
Samorodnitsky, Gennady (Cornell University)
Satitkanitkul, Weerapat (Pite)
Sengul, Bati (University of Bath)
Simon, Thomas (Universite de Lille 1)
Song, Renming (University of Illinois)
Uribe Bravo, Geronimo (UNAM)
Vidmar, Matija (University of Ljubljana)
Vondracek, Zoran (University of Zagreb)
Watson, Alex (University of Manchester)
Yen, Ju-Yi (University of Cincinnati)
Zak, Tomasz (Wrocław University of Technology)

Interval Analysis and Constructive Mathematics

November 13 - 18, 2016

Organizers:

Helmut Schwichtenberg (University of Munich)
Douglas Bridges (University of Canterbury)
Hannes Diener (University of Canterbury)
Baker Kearfott (University of Louisiana at Lafayette)

Vladik Kreinovich (University of Texas at El Paso)
Patricia Melin (Tijuana Institute of Technology)
Raazesh Sainudiin (University of Canterbury)



Researchers in both interval analysis and constructive mathematics have demonstrated that it is feasible to use computers as an integral part of mathematics and not simply as a visualization and approximation tool. Both areas have shown that, surprisingly, one can compute in a way that guarantees correctness. However, the approaches grew out of very different directions, with their own advantages and disadvantages. Bringing both groups together for the first time on a large scale, fostering interaction and advancing the common goal of both, will ensure that we, as mathematicians and users of mathematical methods, can rely on computers.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/5-day-workshops/16w5099>

Participants:

Benet, Luis (Instituto de Ciencias Físicas, UNAM)
Berger, Ulrich (Swansea University)
Bickford, Mark (Cornell University)
Blanck, Jens (Swansea University)
Bridges, Douglas (University of Canterbury)
Ciraulo, Francesco (University of Padova)
Diener, Hannes (University of Canterbury)
Hendtlass, Matthew (University of Canterbury)
Ishihara, Hajime (Japan Advanced Institute of Science and Technology)
Kearfott, Baker (University of Louisiana at Lafayette)
Kreinovich, Vladik (University of Texas at El Paso)
Lombardi, Henri (Université de Franche-Comté)
Lubarsky, Robert (Florida Atlantic University)

Macintyre, Angus (Queen Mary College London)
Melquiond, Guillaume (Inria)
Nemoto, Takako (Japan Advanced Institute of Science and Technology)
Petrakis, Iosif (University of Munich)
Rump, Siegfried (Hamburg University of Technology)
Sainudiin, Raazesh (University of Canterbury)
Sanders, Sam (LMU Munich & Ghent University)
Schwichtenberg, Helmut (University of Munich)
Spreen, Dieter (University of Siegen)
Tsuiki, Hideki (Kyoto University)
Valencia Vizcaino, Pedro Francisco (University of Greifswald)

Complexity and Analysis of Distributed Algorithms

November 27 - December 2, 2016

Organizers:

Philipp Woelfel (University of Calgary)
Hagit Attiya (Technion - Israel Institute of Technology)

Sergio Rajsbaum (Universidad Nacional Autonoma de Mexico)



The workshop focused on advancing new techniques for the design and analysis of shared memory algorithms, and to explore limitations of efficient concurrent computing. We explored new approaches, such as the design of heuristics for fundamental distributed computing problems, and advance current active research directions, such as the use of randomization in algorithm design, and combinatorial topology for algorithm analysis.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/5-day-workshops/16w5152>

Participants:

Aghazadeh, Zahra (University of Calgary)
Alcantara Juarez, Manuel (UNAM)
Alistarh, Dan (Microsoft Research)
Attiya, Hagit (Technion - Israel Institute of Technology)
Ben Baruch, Ohad (Ben Gurion University of the Negev)
Benavides Agredo, Fernando (UNAM)
Bender, Michael (Stony Brook University)
Castañeda, Armando (UNAM)
Delporte-Gallet, Carole (Université Paris Diderot)
Ellen, Faith (University of Toronto)
Fauconnier, Hugues (Université Paris Diderot)
Flores, David (UNAM)
Gafni, Eli (University of California Los Angeles)
Gelashvili, Rati (MIT)
Giakkoupis, George (INRIA)
Gilbert, Seth (National University of Singapore)
Golab, Wojciech (University of Waterloo)
Guerraoui, Rachid (Ecole Polytechnique Federale de Lausanne)
He, Yuan (University of California)
Hendler, Danny (Ben-Gurion University of the

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Herlihy, Maurice (Brown University)
Higham, Lisa (University of Calgary)
Keidar, Idit (Technion)
Kermarrec, Anne-Marie (INRIA Rennes)
King, Valerie (University of Victoria)
Kuhn, Fabian (University of Freiburg)
Kuznetsov, Petr (Telecom ParisTech)
Malkhi, Dahlia (VMware)
Miller, Avery (University of Manitoba)
Moses, Yoram (Technion)
Oshman, Rotem (Tel-Aviv University)
Perrin, Matthieu (Technion)
Petranc, Erez (Technion)
Rajsbaum, Sergio (UNAM)
Raynal, Michel (Université de Rennes)
Reiter, Fabian (Institut de Recherche en Informatique Fondamentale)
Rieutord, Thibault (Télécom ParisTech)
Ruppert, Eric (York University)
Welch, Jennifer (Texas A & M University)
Woelfel, Philipp (University of Calgary)
Zhu, Leqi (University of Toronto)

Algorithmic Randomness Interacts with Analysis and Ergodic Theory

December 4 - 9, 2016

Organizers:

Joseph S. Miller (University of Wisconsin–Madison)
Andre Nies (The University of Auckland)

Jeremy Avigad (Carnegie Mellon University)



The workshop brought together researchers in randomness and reverse mathematics on the one side, and computable analysis and effective ergodic theory on the other side, with the goal of clarifying the connections between these areas and then using them to obtain new information about each area. Currently the researchers are separated both geographically and by their background, to the extent that they sometimes work on closely related topics without knowing of each other.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/5-day-workshops/16w5072>

Participants:

Ackerman, Nathaniel (Harvard University)
Anglès d'Auriac, Paul-Elliot (Laboratoire d'Algorithmique, Complexité et Logique)
Avigad, Jeremy (Carnegie Mellon University)
Barmpalias, George (Chinese Academy of Sciences)
Brattka, Vasco (UniBW Munich)
Figueira, Santiago (Universidad de Buenos Aires)
Franklin, Johanna (Hofstra University)
Freer, Cameron (Borelian Corporation)
Hirschfeldt, Denis (University of Chicago)
Kihara, Takayuki (University of California at Berkeley)
Kohlenbach, Ulrich (Technische Universität Darmstadt)

Kučera, Antonín (Charles university)
Kuyper, Rutger (Victoria University)
Miller, Joseph S. (University of Wisconsin–Madison)
Monin, Benoit (Paris- Creteil)
Nandakumar, Satyadev (IIT Kanpur)
Nies, Andre (The University of Auckland)
Rojas, Cristóbal (Universidad Nacional Andres Bello)
Rute, Jason (Pennsylvania State University)
Towsner, Henry (University of Pennsylvania)
Turetsky, Dan (Victoria University)
Westrick, Linda Brown (Victoria University of Wellington)
Yokoyama, Keita (JAIST)

Geometric and Spectral Methods in Partial Differential Equations

December 11 - 16, 2016

Organizers:

Richard Melrose (Massachusetts Institute of Technology)

Pablo Suárez Serrato (UNAM)

Pierre Albin (University of Illinois, Urbana-Champaign)

Jesse Gell-Redman (Johns Hopkins University)



This workshop brought together research experts in microlocal analysis, a topic in geometric analysis related to the study of partial differential equations, with experts in different fields in the geometric analysis tent, particularly in dynamical systems, spectral theory, and invariant theory. Microlocal analysis has been shown to be an essential tool in the most central questions in current geometric analysis, as it provides a means for studying differential equations in settings which are singular (picture a cone with a sharp point or a piece of paper with a creased fold) or non-compact (infinite planes or other shapes which have no border but continue on to infinity.) As in previous conferences of this type, we expect to have a fruitful interplay between microlocal analysts and other geometers, as each even the nominally separate topics we mention have deep and growing connections.

For details, please refer to the workshop webpage
<https://www.birs.ca/events/2016/5-day-workshops/16w5066>

Participants:

Albin, Pierre (University of Illinois, Urbana-Champaign)
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Carron, Gilles (Universite de Nantes)
Charalambous, Nelia (University of Cyprus)
Christiansen, Tanya (University of Missouri)
Datchev, Kiril (Purdue University)
Dyatlov, Semyon (MIT)
Fernández, Juan Carlos (UNAM)
Gell-Redman, Jesse (Johns Hopkins University)
Hezari, Hamid (UC Irvine)
Hintz, Peter (University of California, Berkeley)
Hislop, Peter (University of Kentucky)
Jaffe, ETHAN (MIT)
Kirkpatrick, Kay (University of Illinois)
Kottke, Chris (Northeastern University)
Lanius, Melinda (UIUC)
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Perales, Raquel (UNAM)
Piazza, Paolo (University of Rome 'Sapienza')
Quan, Hadrian (University of Illinois Urbana-Champaign)
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Rowlett, Julie (Chalmers University)
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Singer, Michael (University College London)
Suárez Serrato, Pablo (UNAM)
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Villegas-Blas, Carlos (UNAM)
Weingart, Gregor (UNAM)
Wunsch, Jared (Northwestern University)
Zhu, Xuwen (Stanford University)

Casa Matemática Oaxaca (CMO) is an International research facility affiliated with the Banff International Research Station (BIRS) of Canada. CMO will host scientific activities and gather mathematicians from around the world in an environment that will promote innovative ideas in the mathematics field. CMO will also support activities to promote local development through research and teaching of mathematics.

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Brent Kearney
Miguel Ricardo Altamirano Ibarra

