



Banff International Research Station for Mathematical Innovation and Discovery



2021 Calendar



JANUARY

- **1/10 – 1/15 Continuum Models and Optimisation for Deep Neural Networks:** Carina Geldhauser (U. of Sheffield), Gitta Kutyniok (Technische U. Berlin), Carola-Bibiane Schönlieb (U. of Cambridge)
- **1/17 – 1/22 Adaptive Modelling and Discretization Error Control:** Stefan Sauter (U. Zürich), Mark Ainsworth (Brown U.), Nilima Nigam (SFU), Ricardo Nochetto (U. of Maryland)
- **1/24 – 1/29 Mathematics of Human Environmental Systems:** Mark Lewis (U. of Alberta), Simon Levin (Princeton), Pauline van den Driessche (U. of Victoria), Yoh Iwasa (Kwansei Gakuin U.)
- **1/24 – 1/29 Driving Global Inference for New Physics with Machine Learning, Big Data and Large-scale Statistical Simulation:** Matthias Danninger (SFU), Pat Scott (U. of Queensland), Anders Kvellestad (U. of Oslo), Jonathan Cornell (U. of Cincinnati)
- **1/31 – 2/5 Geometry, Analysis, and Quantum Physics of Monopoles:** Jacques Hurtubise (McGill U.), Benoit Charbonneau (U. of Waterloo), Sergey Cherkis (U. of Arizona), Akos Nagy (Duke U.)

FEBRUARY

- **2/7 – 2/12 Optimization under Uncertainty: Learning and Decision Making:** Claudia Schillings (U. of Mannheim), Johannes Royset (Naval Postgraduate School), Thomas Surowiec (Philipps-U. Marburg), Lars Ruthotto (Emory U.)
- **2/14 – 2/19 Quantum Chaos and Holography:** Moshe Rozali (UBC), Hong Liu (MIT), Anatoli Polkovnikov (Boston U.)
- **2/21 – 2/26 Geometry, Topology and their Applications in Control System Design:** Mohamed Ali Belabbas (University of Illinois - Urbana-Champaign), Anthony Bloch (U. of Michigan), Xudong Chen (U. of Colorado - Boulder)
- **2/28 – 3/5 Astrostatistics in Canada and Beyond:** Pauline Barmby (Western U.), Eadie Gwendolyn (U. Toronto), David Stenning (Imperial College London), Sivakoff Gregory (U. of Alberta)

MARCH

- **3/7 – 3/12 Stochastics and Geometry:** Maria Gordina (U. of Connecticut), Todd Kemp (UC - San Diego), Tai Melcher (U. of Virginia)
- **3/14 – 3/19 Quantum Field Theories and Quantum Topology Beyond Semisimplicity:** Thomas Creutzig (U. of Alberta), Christoph Schweigert (U. of Hamburg), Nathan Geer (Utah State U.)
- **3/21 – 3/26 Mathematical and Statistical Methods for Pathogen Genomics:** Caroline Colijn (SFU), Jesse Shapiro (U. of Montreal), Lauren Cowley (U. of Bath), Jukka Corander (U. of Oslo)
- **3/28 – 4/2 Algebraic Aspects of Matroid Theory:** Matt Baker (Georgia Tech), June Huh (Princeton), Kristin Shaw (U. of Oslo)

APRIL

- **4/4 – 4/9 Dynamics of Henon Maps: Real, Complex and Beyond:** Jasmin Raissy (U. Paul Sabatier), Tanya Firsova (Kansas State U.), Gabriel Vigny (U. of Picardie Jules Verne)
- **4/11 – 4/16 Advances in Stein's Method and its Applications in Machine Learning and Optimization:** Murat Erdogdu (U. Toronto), Krishnakumar Balasubramanian (UC - Davis), Larry Goldstein (U. of Southern California), Lester Mackey (Microsoft Research)
- **4/18 – 4/23 Big Data Inverse Problems:** Matthias Chung (Virginia Tech), Johnathan Bardsley (U. of Montana), Carola-Bibiane Schönlieb (U. of Cambridge)
- **4/25 – 4/30 Tangent Categories and their Applications:** Robin Cockett (U. of Calgary), Geoffrey Cruttwell (Mount Allison U.)

MAY

- **5/2 – 5/7 Efficient Simulation Algorithms for Viscoelastic and Viscous non-Newtonian Fluids:** Patrick Farrell (U. of Oxford), Scott MacLachlan (Memorial U.), Niall Madden (National U. of Ireland Galway), Josef Málek (Charles U.)
- **5/9 – 5/14 Applications of Stochastic Control to Finance and Economics:** Dylan Possamai (Columbia U.), Jaksša Cvitanic (Caltech), George Georgiadis (Northwestern U.), Nizar Touzi (École Polytechnique)
- **5/16 – 5/21 Perspectives on Knot Homology:** Slava Krushkal (U. of Virginia), Mina Aganagic (U. of Berkeley), Ben Webster (U. of Waterloo)

- **5/23 – 5/28 Single Cell Plus – Data Science Challenges in Single Cell Research:** Jean Yee Hwa Yang (U. of Sydney), Hongyu Zhao (Yale U.), Sara Mostavafi (UBC), Xuegong Zhang (Tsinghua U.)
- **5/30 – 6/4 Quantum Foundations, Gravity, and Causal Order:** Robert Mann (U. of Waterloo), Lucien Hardy (Perimeter Institute), Flaminia Giacomini (U. of Vienna)

JUNE

- **6/6 – 6/11 Modeling Fluid-Driven Fracture – at the Crossroads of Applied Mathematics, Earth Science, and Earth Resources Engineering:** Andrew Bungler (U. of Pittsburgh), Anthony Peirce (UBC), Dmitri Garagash (Dalhousie U.), Egor Dontsov (W.D. VonGonten Laboratories LLC)
- **6/13 – 6/18 Novel Mathematical Methods in Material Science: Applications to Biomaterials:** Eleni Panagiotou (U. of Tennessee - Chattanooga), Mariel Vazquez (UC - Davis), Carme Calderer (U. of Minnesota)
- **6/20 – 6/25 Entropic Regularization of Optimal Transport and Applications:** Soumik Pal (U. of Washington), Brendan Pass (U. of Alberta), Aaron Palmer (UBC)
- **6/27 – 7/2 Systematic Effects and Nuisance Parameters in Particle Physics Data Analyses:** Olaf Behnke (DESY Hamburg), Richard Lockhart (SFU), Louis Lyons (Oxford U.)

JULY

- **7/4 – 7/9 Fundamental Groups and their Representations in Arithmetic Geometry:** Adam Topaz (U. of Alberta), Anna Cadoret (Sorbonne U.), Florian Pop (U. of Pennsylvania)
- **7/11 – 7/16 Geometry via Arithmetic:** Brian Lehmann (Boston College), Timothy Browning (Institute of Science and Technology Austria), David McKinnon (U. of Waterloo), Sho Tanimoto (Kumamoto U.)
- **7/18 – 7/23 Arithmetic Aspects of Deformation Theory:** Patrick Allen (UIUC), Preston Wake (Michigan State U.), Chandrashekhara Khare (UC - Los Angeles)
- **7/25 – 7/30 New Mechanisms for Regularity, Singularity, and Long Time Dynamics in Fluid Equations:** Hao Jia (U. of Minnesota), Jacob Bedrossian (U. of Maryland), Alexandru Ionescu (Princeton), Alexander Kiselev (Duke U.)

AUGUST

- **8/1 – 8/6 Diophantine Methods in Algebraic Dynamics:** Holly Krieger (U. of Cambridge), Thomas Tucker (U. of Rochester), Khoa Nguyen (U. of Calgary), Nicole Looper (Brown U.)
- **8/8 – 8/13 Random Graphs and Statistical Inference: New Methods and Applications:** Michael Molloy (U. Toronto), Amin Coja-Oghlan (U. of Frankfurt), Pu Gao (U. of Waterloo), Mihyun Kang (TU Graz)
- **8/15 – 8/20 Totally Disconnected Locally Compact Groups via Group Actions:** George Willis (U. of Newcastle - New South Wales), Robert Guralnick (U. of Southern California), Donna Testerman (Ecole Polytechnique Federale de Lausanne), Katrin Tent (U. of Muenster)
- **8/22 – 8/27 Supersingular Isogeny Graphs in Cryptography:** Victoria de Quehen (ISARA Corp), Kristin Lauter (Microsoft Research), Christophe Petit (U. of Birmingham), Chloe Martindale (U. of Bristol)
- **8/29 – 9/3 Women in Operator Algebras II:** Maria Grazia Viola (Lakehead U.), Sarah Reznikoff (Kansas State U.), Zahra Afsar (U. of Sydney)

SEPTEMBER

- **9/5 – 9/10 Nonlinear Potential Theoretic Methods in Partial Differential Equations:** Andrea Cianchi (U. di Firenze), Giuseppe Mingione (U. di Parma), Igor Verbitsky (U. of Missouri), Jerome Vetois (McGill U.)
- **9/12 – 9/17 Random Growth Models and KPZ Universality:** Firas Rassoul-Agha (U. of Utah), Benedek Valko (U. of Madison - Wisconsin), Ivan Corwin (Columbia U.), Jeremy Quastel (U. Toronto)
- **9/19 – 9/24 New Directions in Statistical Inference on Networks and Graphs:** Sharmodeep Bhattacharyya (Oregon State U.), Liza Levina (U. of Michigan), Carey E Priebe (Johns Hopkins U.), Tianxi Li (U. of Virginia)
- **9/26 – 10/1 Connecting Network Structure to its Dynamics: Fantasy or Reality?:** Tomas Gedeon (Montana State U.), Konstantin Mischaikow (Rutgers U.), Steve Haase (Duke U.)

OCTOBER

- **10/3 – 10/8 Lattices and Cohomology of Arithmetic Groups:** Geometric and Computational Viewpoints: Paul Gunnells (U. of Massachusetts), Philippe Elbaz-Vincent (U. Grenoble Alpes), Graham Ellis (National U. of Ireland)
- **10/10 – 10/15 Cohomology of Arithmetic Groups: Duality, Stability, and Computations:** Jennifer Wilson (U. of Michigan), Jeremy Miller (Purdue U.)
- **10/17 – 10/22 Mathematics of the Cell: Integrating Signaling, Transport and Mechanics:** William Holmes (Vanderbilt U.), Alexandra Jilkine (Notre Dame), Jay Newby (U. of Alberta), Maria-Veronica Ciocanel (Ohio State U.)
- **10/24 – 10/29 Gravitational Emergence in AdS/CFT:** Sebastian Fischetti (McGill U.), Netta Engelhardt (MIT), Mark Van Raamsdonk (UBC)
- **10/31 – 11/5 Statistical Aspects of Non-Linear Inverse Problems:** Gabriel Paternain (U. of Cambridge), Francois Monard (UC - Santa Cruz), Angkana Ruland (Max Planck Institute for Mathematics in the Sciences)

NOVEMBER

- **11/7 – 11/12 Locally Conformal Symplectic Manifolds: Interactions and Applications:** Baptiste Chantraine (U. de Nantes), Vestislav Apostolov (UQAM), Andrei Moroianu (CNRS), Emmy Murphy (Northwestern U.)
- **11/14 – 11/19 Basic Functions, Orbital Integrals, and Beyond Endoscopy:** Julia Gordon (UBC), Tasho Kaletha (U. of Michigan), James Arthur (U. Toronto)
- **11/21 – 11/26 Graph Product Structure Theory:** Pat Morin (Carleton U.), Vida Dujmović, (U. of Ottawa), Sergey Norin (McGill U.), David Wood (Monash U.)
- **11/28 – 12/3 Mathematical Statistics and Learning:** Gabor Lugosi (ICREA & Pompeu Fabra U.), Luc Devroye (McGill U.)

DECEMBER

- **12/5 – 12/10 Women in Inverse Problems:** Chryssoula Tsogka (UC - Merced), Liliana Borcea (U. of Michigan)

MAY

- **5/2 – 5/7 Quantization in Derived Algebraic Geometry and Representation Theory:** Francesco Sala (U. di Pisa), Andrea Appel (U. degli Studi di Parma), Mauro Porta (U. de Strasbourg), Olivier Schiffmann (U. Paris-Saclay)
- **5/9 – 5/14 Contextual Integrity for Differential Privacy:** Rachel Cummings (Georgia Institute of Technology), Helen Nissenbaum (Cornell Tech), Michael Tschantz (International Computer Science Institute), Joel Reardon (U. of Calgary)
- **5/16 – 5/21 Analysis on Singular Spaces:** Pierre Albin (U. of Illinois - Urbana-Champaign), Noé Bárcenas Torres (UNAM), Jesse Gell-Redman (U. of Melbourne), Richard Melrose (MIT)
- **5/23 – 5/28 Chromatic Homotopy and Algebraic K-Theory:** Benjamin Antieau (U. of Illinois - Chicago), Gijs Heuts (U. of Utrecht), Thomas Nikolaus (U. Munster)
- **5/30 – 6/4 Frontiers in Billiard Dynamics:** Renato Feres (Washington U. - St. Louis), Timothy Chumley (Mount Holyoke College), Scott Cook (Tarleton State U.), Hong-Kun Zhang (U. of Massachusetts - Amherst)

JUNE

- **6/6 – 6/11 International Workshop on Numerical Methods for Non-Newtonian Flows:** J. Esteban López-Aguilar (UNAM), Lin Zhou (The City U. of New York), Seyed Mohammad Taghavi (Laval U.), Michael Graham (U. of Wisconsin)
- **6/13 – 6/18 Women in Shape Analysis 4:** Kathryn Leonard (Occidental College), Erin Wolf Chambers (St. Louis U.)
- **6/20 – 6/25 Knots, Surfaces and 3-manifolds:** Jennifer Schultens (UC - Davis), Mario Eudave Munoz (UNAM)
- **6/27 – 7/2 Thermodynamic Formalism for Geodesic Flows:** Daniel Thompson (Ohio State U.), Keith Burns (Northwestern U.), Agnieszka Zelerowicz (U. of Maryland)

AUGUST

- **8/1 – 8/6 Multivariable Operator Theory and Function Spaces in several Variables:** Constanze Liaw (U. of Delaware), John McCarthy (Washington U. - St. Louis), Stefan Richter (U. of Tennessee, Knoxville), Alan Sola (Stockholm U.)
- **8/8 – 8/13 Trends in the Classification of Algebraic Varieties and their Sheaves:** César Lozano Huerta (CONACYT - UNAM), Anand Deopurkar (Australian National U.), Jarod Alper (U. of Washington)
- **8/15 – 8/20 Iwasawa Theory for GL(2) and Applications: Open Problems and New Directions:** Antonio Lei (Laval University), Ashay Burungale (Caltech), Francesc Castella (UC - Santa Barbara), Christopher Skinner (Princeton)
- **8/22 – 8/27 Bound-Preserving Space and Time Discretizations for Convection-Dominated Problems:** Manuel Quezada de Luna (King Abdullah U. of Science and Technology), Dmitri Kuzmin (TU Dortmund U.), Tzanio Kolev (Lawrence Livermore National Laboratory), Gerardo Hernández Dueñas (UNAM)
- **8/29 – 9/3 Algebraic Techniques in Theoretical Computer Science:** Raghu Meka (UC - Los Angeles), Hamed Hatami (McGill U.), Shachar Lovett (UC - San Diego), Ryan O'Donnell (Carnegie Mellon U.)

SEPTEMBER

- **9/5 – 9/10 New Trends in Nonlinear Diffusion: a Bridge between PDEs, Analysis and Geometry:** Matteo Bonforte (U. Autónoma de Madrid), Matteo Muratori (Politecnico di Milano), Bruno Volzone (U. di Napoli "Parthenope"), Pedro Aceves Sánchez (North Carolina State U.)
- **9/12 – 9/17 Integration of Model- and Data-Driven Methods for Medical Imaging:** Demetrio Labate (U. of Houston), Tatiana Bubba (U. of Helsinki), Sergio Daniel Vera Rea (CIMAT)
- **9/19 – 9/24 Computations and Data in Algebraic Statistics:** Carlos Améndola (Technical U. of Munich), Anthea Monod (Tel Aviv U.), Elina Robeva (UBC), Bernd Sturmfels (UC - Berkeley)
- **9/26 – 10/1 Modeling and Computational Approaches to Individual and Collective Cell Movement in Complex Environments:** Hans Othmer (U. of Minnesota), Thomas Hillen (U. of Alberta)

OCTOBER

- **10/3 – 10/8 Motives and Invariants: Theory and Applications to Algebraic Groups and their Torsors:** Stephen Scully (U. of Victoria), Stefan Gille (U. of Alberta), Anne Quéguiner-Mathieu (U. Paris 13), Detlev Hoffmann (Technische U. Dortmund)
- **10/17 – 10/22 Real Polynomials: Counting and Stability:** Frédéric Bihan (U. Savoie Mont Blanc - Campus Scientifique), Timo De Wolff (Technische U. Braunschweig), Alicia Dickenstein (U. de Buenos Aires), Thorsten Theobald (Goethe U. Frankfurt)
- **10/24 – 10/29 Geometry & Learning from Data:** Pablo Suárez Serrato (UNAM), Minh Ha Quang (RIKEN), Rongjie Lai (Rensselaer Polytechnic Institute), Guido Montúfar, (UCLA)
- **10/31 – 11/5 Rules of Protein-DNA Recognition: Computational and Experimental Advances:** Juan Fuxman Bass (Boston U.), Polly Fordyce (Stanford U.)

NOVEMBER

- **11/7 – 11/12 Strings: Geometry and Symmetries for Phenomenology:** Saul Ramos-Sanchez (UNAM), Anamaria Font (U. Central de Venezuela), Hans Peter Nilles (U. of Bonn), Fernando Quedvedo (U. of Cambridge)
- **11/14 – 11/19 Detection and Analysis of Gravitational Waves in the era of Multi-Messenger Astronomy: From Mathematical Modelling to Machine Learning:** Marco Cavaglia (Missouri U. of Science and Technology), Elena Cuoco (European Gravitational Observatory), Shaon Ghosh (U. of Wisconsin - Milwaukee), Jade Powell (Swinburne U. of Technology)
- **11/28 – 12/3 Foundations of Objective Bayesian Methodology:** Eduardo Gutierrez-Peña (UNAM), Tamara Broderick (MIT), Peter Müller (U. of Texas - Austin), Christian Robert (Paris Dauphine U.)

DECEMBER

- **12/5 – 12/10 5th Meeting of Mexican Mathematicians in the World:** Felipe García-Ramos (U. Autónoma de San Luis Potosí), Victoria Cantoral Farfán (Katholieke U. Leuven), Daniel Juan Pineda (UNAM - Campus Morelia), Jose Antonio Seade (UNAM - Mexico City)



数学高等研究院

INSTITUTE FOR ADVANCED STUDY IN MATHEMATICS

Hangzhou, China

MAY

- **5/16 – 5/21 Geometric PDE and Applications to Problems in Conformal and CR Geometry:** Sun-Yung Alice Chang (Princeton), Jiayu Li (U. of Science and Technology of China), Andrea Malchiodi (Scuola Normale Superiore di Pisa), Weimin Sheng (Zhejiang U.)
- **5/23 – 5/28 Phenomenology of Black Holes in Quantum Gravity:** Anzhong Wang (Baylor U.), Ronggen Cai (Chinese Academy of Sciences - Beijing), Valeri Frolov (U. of Alberta), Don Page (U. of Alberta)
- **5/30 – 6/4 New Trends in Symbolic Dynamics and Ergodic Theory: Dynamical Obstructions arising from Complexity Theory:** Xiangdong Ye (U. of Science and Technology of China), Nikos Frantzikinakis (U. of Crete), Bryna Kra (Northwestern U.), Alejandro Maass (U. de Chile)

MAY

- **9/12 – 9/17 New Frontiers in Proofs and Computation:** Ulrich Kohlenbach (Darmstadt U. of Technology), Michael Rathjen (U. of Leeds), Mathias Baaz (Vienna U. of Technology), Yong Cheng (Wuhan U.)
- **9/19 – 9/24 Subfactors, Vertex Operator Algebras, and Tensor Categories:** Robert McRae (Tsinghua U.), Terry Gannon (U. of Alberta), Vaughan Jones (Vanderbilt U.), Jinwei Yang (Shanghai Jiaotong U.)

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OCTOBER

- **10/17 – 10/22 Interaction Between Partial Differential Equations and Convex Geometry:** Deping Ye (Memorial U.), Dmitry Ryabogin (Kent State U.), Elisabeth Werner (Case Western Reserve U.), Ning Zhang (Huazhong U. of Science and Technology)
- **10/24 – 10/29 Mathematical Methods in Cancer Biology, Evolution and Therapy:** Peter Van Loo (The Francis Crick Institute), Quaid Morris (U. Toronto), Ronglai Shen (Memorial Sloan - Kettering Cancer Center), Wenyi Wang (U. of Texas MD Anderson Cancer Center)

MAY

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