



# Banff International Research Station for Mathematical Innovation and Discovery



# Casa Matemática Oaxaca Centro de investigación y enseñanza



# 2017 Calendar

## JANUARY

- 1/15 - 1/20 **Transport in Unsteady Flows: from Deterministic Structures to Stochastic Models & Back Again:** Sanjeeva Balasuriya (U. Adelaide), Daan Crommelin (Centrum voor Wiskunde en Informatica), Gary Froyland (U. New South Wales), Adam Monahan (U. Victoria), Nicholas Ouellette (Stanford), Laure Zanna (Oxford)
- 1/22 - 1/27 **String & M-theory geometries: Double Field Theory, Exceptional Field Theory & their Applications:** David Berman (Queen Mary U. London), Martin Cederwall (Chalmers U. of Technology), Jeong-Hyuck Park (Sogang U.)
- 1/22 - 1/27 **Combinatorial Reconfiguration:** Naomi Nishimura (Waterloo), Marcin Kamiński (U. Warsaw), Takehiro Ito (Tohoku U.), Amer Mouawad (U. Bergen)
- 1/29 - 2/3 **Data-Driven Methods for Reduced-Order Modeling & Stochastic Partial Differential Equations:** J. Nathan Kutz (U. Washington), Karen Willcox (MIT), Rachel Kuske (U. British Columbia)

## FEBRUARY

- 2/5 - 2/10 **Newton-Okounkov Bodies, Test Configurations, & Diophantine Geometry:** Alex Küronya (Goethe Universität Frankfurt), Michael Roth (Queen's), Tomasz Szemberg (Pedagogical U. Cracow)
- 2/12 - 2/17 **Mathematical Approaches to Evolutionary Trees & Networks:** Caroline Colijn (Imperial College London), Leonid Chindelevitch (Simon Fraser U.), Tandy Warnow (U. Illinois), Amaury Lambert (U. Pierre & Marie Curie), Marta Luksza (Institute of Advanced Study, Princeton), Vincent Moulton (U. East Anglia)
- 2/19 - 2/24 **Validating & Expanding Approximate Bayesian Computation Methods:** Christian Robert (Université Paris-Dauphine), Luke Bornn (Simon Fraser U.), Gael Martin (Monash U.), Jukka Corander (U. Helsinki), Dennis Prangle (U. Newcastle), Richard Wilkinson (U. Sheffield)
- 2/26 - 3/3 **Brain Dynamics & Statistics: Simulation versus Data:** Susanne Ditlevsen (U. Copenhagen), Andre Longtin (U. Ottawa), Priscilla Greenwood (U. British Columbia)

## MARCH

- 3/5 - 3/10 **Optimization & Inference for Physical Flows on Networks:** Michael Chertkov (Los Alamos National Laboratory), Daniel Bienstock (Columbia U.), Anatoly Zlotnik (Washington U.), Sidhant Misra (MIT), Marc Vuffray (EPFL)
- 3/12 - 3/17 **New Trends in Arithmetic & Geometry of Algebraic Surfaces:** Matthias Schuett (Leibniz U. Hannover), Noam D. Elkies (Harvard), Keiji Ogiso (Osaka U.)
- 3/19 - 3/24 **Communication Complexity & Applications, II:** Amit Chakrabarti (Dartmouth College), Funda Ergun (Simon Fraser U.), Andrew McGregor (U. Massachusetts Amherst), Anup Rao (U. Washington)
- 3/26 - 3/31 **Statistical & Computational Challenges in Large Scale Molecular Biology:** Jacob Laurent (CNRS), Barbara Engelhardt (Princeton), Anna Goldenberg (U. Toronto), Jeff Leek (John Hopkins U.), Manolis Kellis (MIT), Stephen Montgomery (Stanford)

## APRIL

- 4/2 - 4/7 **Mostly Maximum Principle:** Isabeau Birindelli (Sapienza Università di Roma), Antonio Vitolo (Università di Salerno), Italo Capuzzo Dolcetta (Sapienza Università di Roma)
- 4/9 - 4/14 **Generated Jacobian Equations: from Geometric Optics to Economics:** Nestor Guillen (U. Massachusetts), Jun Kitagawa (Michigan State U.), Robert McCann (U. Toronto)
- 4/16 - 4/21 **Geometric Structures on Lie Groupoids:** Rui Loja Fernandes (U. Illinois at Urbana-Champaign), Eckhard Meinrenken (U. Toronto), Henrique Bursztyn (INMPA)
- 4/23 - 4/28 **Quantum Field Framework for Structured Light Interactions:** David Andrews (U. East Anglia), Mark Dennis (U. Bristol), Duncan O'Dell (McMaster U.), Konstantin Bliokh (RIKEN Interdisciplinary Theoretical Science Research Group), Robert Boyd (U. Ottawa), Alexander Lvovsky (U. Calgary)
- 4/30 - 5/5 **Phase Transitions Models:** Petru Mironescu (Université Claude Bernard Lyon 1), Yaniv Almog (Louisiana State U.)

## MAY

- 5/7 - 5/12 **Topological Methods in Brain Network Analysis:** Mark Daley (U. Western Ontario), Natasa Jonoska (U. South Florida), Isabel Darcy (U. Iowa)
- 5/7 - 5/12 **Rigorous Numerics for Infinite Dimensional Nonlinear Dynamics:** Jean-Philippe Lessard (Université Laval), Jan Bouwe van den Berg (Vrije Universiteit Amsterdam), Konstantin Mischaikow (Rutgers), Michael Plum (Karlsruhe Institute of Technology), JF Williams (Simon Fraser U.)
- 5/14 - 5/19 **Algebraic Combinatorixx 2:** Julie Beier (Earlham College), Tricia Brown (Armstrong Atlantic State U.), Stephanie van Willigenburg (U. British Columbia), Rosa Orellana (Dartmouth College)
- 5/21 - 5/26 **Recent Advances in Discrete & Analytic Aspects of Convexity:** Vladyslav Yaskin (U. Alberta), Karoly Bezdek (U. Calgary), Alexander Koldobsky (U. Missouri), Dmitry Ryabogin (Kent State U.), Artem Zvavitch (Kent State U.)
- 5/28 - 6/2 **Arithmetic Aspects of Explicit Moduli Problems:** Samir Siksek (U. Warwick), Nils Bruin (Simon Fraser U.), Kiran Kedlaya (UC, San Diego), John Voight (Dartmouth College)

## JUNE

- 6/4 - 6/9 **Mathematical Analysis of Biological Interaction Networks:** David Anderson (U. Wisconsin-Madison), Matthew Johnston (San Jose State U.), Anne Shiu (Texas A&M), Casian Pantea (West Virginia U.), Lea Popovic (Concordia U.)
- 6/11-6/16 **Connections in Geometric Numerical Integration & Structure-Preserving Discretization:** Jean-Christophe Nave (McGill U.), Alexander Bihlo (Memorial U.), Christopher Budd (U. Bath), Stanly Steinberg (U. New Mexico), Andy Wan (CRM)
- 6/18 - 6/23 **Nilpotent Fundamental Groups:** Adam Topaz (UC, Berkeley), Florian Pop (U. Pennsylvania), Ján Mináč (Western U.), Kirsten Wickelgren (Georgia Institute of Technology)
- 6/25 - 6/30 **Mathematical Approaches to Interfacial Dynamics in Complex Fluids:** Chun Liu (Pennsylvania State U.), Jie Shen (Purdue U.)

## JULY

- 7/2 - 7/7 **Diophantine Approximation & Algebraic Curves:** Michael Bennett (U. British Columbia), Aaron Levin (Michigan State U.), Jeff Thunder (Northern Illinois U.)
- 7/9 - 7/14 **Challenges in the Statistical Modeling of Stochastic Processes for the Natural Sciences:** Peter Craigmile (Ohio State U.), Richard Lockhart (Simon Fraser U.), Wendy Meiring (UC, Santa Barbara), Vladimir Minin (U. Washington), Debashis Mondal (Oregon State U.), Paul Sampson (U. Washington)
- 7/16 - 7/21 **Women in Control: New Trends in Infinite Dimensions:** Luz de Teresa (UNAM), Kirsten Morris (Waterloo), Irena Lasiecka (U. Virginia)
- 7/23 - 7/28 **Mean Dimension & Sofic Entropy Meet Dynamical Systems, Geometric Analysis & Information Theory:** Elon Lindenstrauss (Hebrew U.), Masaki Tsukamoto (Kyoto U.), Yonatan Gutman (Institute of Mathematics, Polish Academy of Sciences)
- 7/30 - 8/4 **Topological Data Analysis:** Anthea Monod (Duke U.), Ulrich Bauer (Technische Universität München)

## AUGUST

- 8/6 - 8/11 **Latest Advances in the Theory & Applications of Design & Analysis of Experiments:** Douglas Wiens (U. Alberta), Weng Kee Wong (UC, Los Angeles), Holger Dette (Ruhr-Universität Bochum)
- 8/13 - 8/18 **Women in Numbers 4:** Chantal David (Concordia U.), Jennifer Balakrishnan (U. Oxford), Michelle Manes (U. Hawaii at Manoa), Bianca Viray (U. Washington)
- 8/20 - 8-25 **Geometric & Structural Graph Theory:** Bojan Mohar (Simon Fraser U.), János Pach (EPFL), Paul Seymour (Princeton)
- 8/27 - 9/1 **The Analysis of Gauge-Theoretic Moduli Spaces:** Rafe Mazzeo (Stanford), Sergey Cherkis (U. Arizona), Michael Singer (U. College London)

## SEPTEMBER

- 9/3 - 9/8 **Future Targets in the Classification Program for Amenable C\*-Algebras:** Aaron Tikuisis (U. Aberdeen), George Elliott (U. Toronto), Zhuang Niu (U. Wyoming)
- 9/10-9/15 **Photonic Topological Insulators:** Mikael Rechtsman (Pennsylvania State U.), Michael Weinstein (Columbia U.), Marin Soljacic (MIT)
- 9/17 - 9/22 **Lattice walks at the Interface of Algebra, Analysis & Combinatorics:** Marni Mishna (Simon Fraser U.), Mireille Bousquet-Mélou (Université de Bordeaux, CNRS), Stephen Melczer (Waterloo), Singer Michael (North Carolina State U.)
- 9/24 - 9/29 **Symmetries of Surfaces, Maps & Dessins:** Marston Conder (U. Auckland), Nigel Boston (U. Wisconsin-Madison), Gabino González-Diez (Universidad Autónoma de Madrid), Gareth Jones (U. Southampton), Thomas Tucker (Colgate U.)

## OCTOBER

- 10/1 - 10/6 **p-adic Cohomology & Arithmetic Applications:** Ambrus Pal (Imperial College London), Christopher Lazda (U. Padova), Kiran Sridhara Kedlaya (UC, San Diego), Tomoyuki Abe (Kavli Institute)
- 10/8 - 10/13 **Computational Uncertainty Quantification:** Serge Prudhomme (École Polytechnique de Montréal), Roger Ghanem (U. Southern California), Mohammad Motamed (U. New Mexico), Raúl Tempone (King Abdullah U.)
- 10/15 - 10/20 **New Perspectives in Representation Theory of Finite Groups:** Pham Tiep (U. Arizona), Gunter Malle (Technische Universität Kaiserslautern), Gabriel Navarro (Universidad de Valencia), Britta Spahn (Bergische Universität Wuppertal)
- 10/22 - 10/27 **Stochastic Analysis & its Applications:** Zhen-Qing Chen (U. Washington), Edwin A. Perkins (U. British Columbia), Jeremy Quastel (U. Toronto)
- 10/29 - 11/3 **Automorphic Forms, Mock Modular Forms & String Theory:** Daniel Persson (Chalmers U. Technology), Terry Gannon (U. Alberta), David Ginzburg (Tel Aviv U.), Axel Kleinschmidt (Max Planck Institute for Gravitational Physics), Stephen Miller (Rutgers), Boris Pioline (Conseil Européen pour la Recherche Nucléaire)

## NOVEMBER

- 11/5 - 11/10 **Forest & Wildland Fire Management:** Douglas Woolford (U. Western Ontario), David Brillinger (UC, Berkeley), David Martell (U. Toronto), Frederic Schoenberg (UC, Los Angeles), B. Michael Wotton (Canadian Forest Service)
- 11/12 - 11/17 **Approximation Algorithms & the Hardness of Approximation:** Mohammad Salavatipour (U. Alberta), Jochen Koenemann (Waterloo), David Williamson (Cornell), Julia Chuzhoy (Toyota Tech Institute), Nishheeth Vishnoi (EPFL)
- 11/19 - 11/24 **Nonlinear & Stochastic Problems in Atmospheric & Oceanic Prediction:** Youmin Tang (U. Northern British Columbia), Shouhong Wang (Indiana U.), Mu Mu (Chinese Academy of Sciences), Olivier Talagrand (Laboratoire de Météorologie Dynamique)
- 11/26 - 12/1 **Partial Order in Materials:** Apala Majumdar (U. Bath), Jeff Chen (Waterloo), Changyou Wang (Purdue U.), Pingwen Zhang (Peking U.)

## DECEMBER

- 12/3 - 12/8 **Inferential Challenges for Large Spatio-Temporal Data Structures:** John Braun (U. British Columbia), Patrick Brown (U. Toronto), Charmaine Dean (Western U.), Jamie Stafford (U. Toronto)
- 12/10 - 12/15 **Mathematics for Developmental Biology:** Przemyslaw Prusinkiewicz (U. Calgary), Eric Mjolsness (UC, Irvine)

## APRIL

- 4/30 - 5/5 **Optimal Transport meets Probability, Statistics & Machine Learning:** Guillaume Carlier (Université Paris Dauphine), Marco Cuturi (Kyoto U.), Brendan Pass (U. Alberta), Carola-Bibiane Schönlieb (Cambridge)

## MAY

- 5/7 - 5/12 **Beyond Toric Geometry:** Nathan Ilten (Simon Fraser U.), Milena Hering (Edinburgh U.), Kalle Karu (U. British Columbia)
- 5/14 - 5/19 **Ordinary & Symbolic Powers of Ideals:** Christopher Francisco (Oklahoma State U.), Tai Ha (Tulane U.), Adam Van Tuyl (McMaster)
- 5/21 - 5/26 **Geometric Properties of Local & Non-Local PDEs:** Maria del Mar Gonzalez (Universitat Politècnica de Catalunya), Juncheng Wei (U. British Columbia), Jeffrey Case (Pennsylvania State U.), Manuel del Pino (U. Chile)
- 5/28 - 6/2 **High Dimensional Probability:** Rafal Latala (U. Warsaw), Jose Figueroa-Lopez (Washington U.), Nathael Gozlan (Université Paris Est Marne-la-Vallée), Mokshay Madiman (U. Delaware), Patricia Reynaud-Bouret (U. Nice)

## JUNE

- 6/4 - 6/9 **Field Theories & Higher Structures in Mathematics & Physics:** Thomas Strobl (Universite de Lyon), Yael Fregier (Artois U., Lens), Nicolai Reshetikhin (UC, Berkeley)
- 6/11 - 6/16 **Structure & Geometry of Polish groups:** Christian Rosendal (U. Illinois at Chicago), Julien Melleray (Université Lyon 1), Pierre-Emmanuel Caprace (Université Catholique de Louvain), Stevo Todorovic (U. Toronto)
- 6/18 - 6/23 **Geometrical Methods, non Self-Adjoint Spectral Problems, & Stability of Periodic Structures:** Peter Miller (U. Michigan), Jared Bronski (U. Illinois at Urbana-Champaign), Ramón Plaza (UNAM)
- 6/25 - 6/30 **Analysis of Dislocation Models for Crystal Defects:** Enrico Valdinoci (Weierstrass Institut), Adriana Garroni (Università di Roma Sapienza)

## JULY

- 7/30 - 8/4 **Thirty Years of Floer Theory for 3-Manifolds:** Robert Lipshitz (U. Oregon), Jennifer Hom (Georgia Institute of Technology), Daniel Ruberman (Brandeis U.)

## AUGUST

- 8/6 - 8/11 **Low Dimensional Topology & Gauge Theory:** David Auckly (Kansas State U.), Daniel Ruberman (Brandeis U.), Adam Levine (Princeton), Anar Akhmedov (U. Minnesota), Yi-Jen Lee (Chinese U. Hong Kong)
- 8/13 - 8/18 **Mathematical & Numerical Methods for Time-Dependent Quantum Mechanics – from Dynamics to Quantum Information:** Emmanuel Lorin (Carleton U.), Andre Bandrauk (Université de Sherbrooke), Barry Sanders (U. Calgary)
- 8/20 - 8/25 **Symmetries of Discrete Structures in Geometry:** Eugenia O'Reilly-Regueiro (UNAM), Dimitri Leemans (U. Auckland), Egon Schulte (Northeastern U.)
- 8/27 - 9/1 **New perspectives on State Space Models:** David Campbell (Simon Fraser U.), Marie Auger-Methe (Dalhousie U.), Len Thomas (U. St. Andrews)

## SEPTEMBER

- 9/3 - 9/8 **Distributed Data for Dynamics & Manifolds:** Jiguo Cao (Simon Fraser U.), Giles Hooker (Cornell), James Ramsay (McGill U.), Laura Sangalli (Politecnico di Milano), Fang Yao (U. Toronto)
- 9/10 - 9/15 **Principles of Gene Circuit Design:** Pablo Meyer (IBM), Michael Elowitz (CalTech), Alexandra Walczak (École Normale Supérieure), Diego Ferreira (Universidad de Buenos Aires), Thierry Mora (CNRS)
- 9/17 - 9/22 **Splitting Algorithms, Modern Operator Theory, & Applications:** Heinz Bauschke (U. British Columbia), D. Russell Luke (U. Göttingen), Regina Burachik (U. South Australia)
- 9/24 - 9/29 **Geometry & Computation for Interactive Simulation:** Jorg Peters (U. Florida), Dinesh Pai (U. British Columbia), Ulrich Reif (Technische Universität Darmstadt)

## OCTOBER

- 10/1 - 10/6 **Complex Creeping Fluids: Numerical Methods & Theory:** Bryan Quafe (Florida State U.), George Biros (U. Texas)
- 10/15 - 10/20 **Mathematical Advances in Electron Microscopy:** Peter Binev (U. South Carolina), Rachel Ward (U. Texas at Austin), Nigel Browning (Pacific Northwest National Laboratory), Wolfgang Dahmen (RWTH - Aachen), Thomas Vogt (U. South Carolina - NanoCenter), Paul Voyles (U. Wisconsin - Madison)
- 10/22 - 10/27 **Beyond Convexity: Emerging Challenges in Data Science:** Stephen Wright (U. Wisconsin-Madison), Tamara Kolda (Sandia National Laboratories)
- 10/29 - 11/3 **Synthesis of Statistics, Data Mining & Environmental Sciences in Pursuit of Knowledge Discovery:** Leticia Ramirez Ramirez (Centro de Investigación en Matemáticas), Yulia Gel (U. Texas at Dallas), Viacheslav Lyubchich (U. Maryland Center for Environmental Science)

## NOVEMBER

- 11/5 - 11/10 **The Geometry & Topology of Knotting & Entanglement in Proteins:** Kenneth Millett (UC, Santa Barbara), Dorothy Buck (Imperial College London), Mario Eudave-Munoz (UNAM), Eric Rawdon (U. Saint Thomas), Joanna Sulikowska (U. Warsaw)

- 11/12 - 11/17 **Workshop on Arithmetic & Complex Dynamics:** Holly Krieger (MIT), Laura DeMarco (Northwestern U.), Mattias Jonsson (U. Michigan)

- 11/26 - 12/1 **Challenges & Synergies in the Analysis of Large-Scale Population-Based Biomedical Data:** Quaid Morris (U. Toronto), Jennifer Listgarten (Microsoft Research)

## DECEMBER

- 12/3 - 12/8 **Bayesian Nonparametric Inference: Dependence Structures & their Applications:** Ramsés Mena (UNAM), Peter Mueller (U. Texas at Austin), Igor Pruenster (U. Torino & Collegio Carlo Alberto)

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