# Banff International Research Station
## for Mathematical Innovation and Discovery

# CMO Casa Matemática Oaxaca
### Oaxaca, Mexico

# 2020 Calendar

## JANUARY

- 1/12 – 1/17 Mathematical Modelling in Glaciology: Ian Hewitt (Oxford), Christian Schoof (UBC), Omar Ghattas, (U. Texas), Sophie Nowicki (NASA Goddard Center)
- 1/19 – 1/24 Proof Complexity: Jakob Nordstrom (KTH Royal Institute of Technology), Albert Atserias (Politecnica de Catalunya), Pavel Pudlak (Czech Academy of Sciences), Rahul Santhanam (Oxford)
- 1/26 – 1/31 Fractons and Beyond: Rahul Nandkishore (U. Colorado - Boulder), Xie Chen (Caltech), Yong Baek Kim (U. Toronto), Zhenghan Wang (Microsoft)

## FEBRUARY

- 2/2 – 2/7 Dynamics in Geometric Dispersive Equations and the Effects of Trapping, Scattering and Weak Turbulence: Jeremy Marzuola (U. North Carolina - Chapel Hill), Stephen Gustafon (UBC), Daniel Tataru (UC - Berkeley)
- 2/9 – 2/14 Geometric Tomography: Vladyslav Yaskin (U. of Alberta), Alexander Koldobsky (U. of Missouri), Dmitry Ryabogin (Kent State U.)
- 2/16 – 2/21 Advances in Theoretical and Experimental Methods for Analyzing Complex Regulatory Networks: Elijah Roberts (Johns Hopkins U.), Michael Assaf (Hebrew U. of Jerusalem), Andreas Hilfinger (U. Toronto)
- 2/23 – 2/28 Use of Wearable and Implantable Devices in Health Research: Ashkan Ertefaie (U. of Rochester), Susan Murphy (Harvard), Ciprian Crainiceanu (Johns Hopkins), Max Little (Aston U.)

## MARCH

- 3/1 – 3/6 Equivariant Stable Homotopy Theory and $p$-adic Hodge Theory: Andrew Blumberg (U. Texas - Austin), Michael Hill (UCLA), Teena Gerhardt (Michigan State U.)
- 3/8 – 3/13 The Interface Between Selective Inference and Machine Learning: William Fithian (UC - Berkeley), Rina Foygel Barber (U. of Chicago), Daniel Yekutieli (Tel Aviv U.)
- 3/15 – 3/20 New Perspectives in Colouring and Structure: Alex Scott (Oxford), Bojan Mohar (SFU), Paul Seymour (Princeton)
- 3/22 – 3/27 Stochastic Mass Transports: Jan Obloj (Oxford), Mathias Beiglbock (U. of Vienna), Martin Huesmann (U. Bonn)
- 3/29 – 4/3 New Directions in Geometric Flows: Jeff Streets (UC - Irvine), Richard Bamler (UC - Berkeley), Robert Haslhofer (U. Toronto), Gang Tian (Beijing U.)

## APRIL

- 4/5 – 4/10 Analysis and Geometry of Metric Spaces - a Bridge between Smooth and Fractal Views: Jun Kigami (Kyoto U.), Mario Bonk (UCLA)
- 4/12 – 4/17 Almost-Periodic Spectral Problems: David Damanik (Rice U.), Svetlana Jitomirskaya (UC - Irvine), Leonid Parnovski (U. College London)
- 4/19 – 4/24 Statistical Methods for Computational Advertising: David Banks (Duke U.), Nancy Reid (U. Toronto), Nancy Heckman (UBC)
- 4/26 – 5/1 Restriction, Kakeya, and Carleson-Type Problems: Joshua Zahl (UBC), Nets Katz (Caltech), Victor Lie (Purdue U.)

## MAY

- 5/3 – 5/8 Mathematical Questions in Wave Turbulence: Jalal Shatah (NYU), Tristan Buckmaster (Princeton), Pierre Germain (NYU), Zaher Hani (U. of Michigan)
- 5/10 – 5/15 Optimal Transport and Analysis for Machine Learning: Young-Heon Kim (UBC), Marco Cuturi (U. Paris-Saclay), Hyung Ju Hwang (Pohang U. of S & T), Dejan Slepčev (Carnegie Mellon)
- 5/17 – 5/22 Connections in Infinite Dimensional Dynamics: Jan Bouwe van den Berg (Vrije U. Amsterdam), Jean-Philippe Lessard (McGill), Jason Mireles James (Florida Atlantic U.), Konstantin Mischaikow (Rutgers U.)
- 5/17 – 5/22 A Convergence of Computable Structure Theory, Computable Analysis, and Randomness: Timothy McNicholl (Iowa State U.), Johanna Franklin (Hofstra U.)
- 5/24 – 5/29 Stochastic Analysis, Mathematical Finance and Economics: Gordan Zitkovic (U. Texas - Austin), Constantinos Kardaras (London School of Economics), Walter Schachermayer (U. of Vienna)
- 5/31 – 6/5 Model Theory of Differential Equations, Algebraic Geometry, and their Applications to Modeling: Gleb Pogudin (NYU), Thomas Scanlon (UC - Berkeley), Rahim Moosa (U. of Waterloo), Marisa Eisenberg (U. of Michigan)

## JUNE

- 6/7 – 6/12 Interactions of Gauge Theory with Contact and Symplectic Topology in Dimensions 3 and 4: Hans Boden (McMaster U.), John Baldwin (Boston College), John Etnyre (Georgia Tech), Liam Watson (UBC)
- 6/14 – 6/19 Mathematical Frameworks for Integrative Analysis of Emerging Biological Data Types: Aedin Culhane (Harvard), Kim-Anh Le Cao (U. of Melbourne), Elana Fertig (John Hopkins)
- 6/21 – 6/26 Algorithms for Linear Groups: Jon Carlson (U. of Georgia), Bettina Eick (U. of Braunschweig), O'Brien Eamonn (U. of Auckland), Alexander Hulpke (Colorado State U.)
- 6/28 – 7/3 Modern Challenges between Financial Mathematics, Financial Technology and Financial Economics: Antonis Papapantoleon (National Technical U. of Athens), Agostino Capponi (Columbia U.), Christoph Frei (U. of Alberta), Ronnie Sircar (Princeton)

## JULY

- 7/5 – 7/10 Moving Frames and their Modern Applications: Francis Valiquette (Monmouth U.), Alexander Bihlo (Memorial U.), Irina Kogan (North Carolina State U.), Peter Olver (U. of Minnesota - Twin Cities)
- 7/12 – 7/17 Markov Chains with Kinetic Constraints and Applications: Cristina Toninelli (CNRS and U. Paris Dauphine), Fabio Martinelli (U. Roma Tre), Shirshendu Ganguly (UC - Berkeley)
- 7/12 – 7/17 New Developments in Quantum Machine Learning: Peter Wittek (U. Toronto), Valerii Fedorov (ICON), Barry Sanders (U. of Calgary)
- 7/19 – 7/24 Singularity Formation in Nonlinear PDEs: Monica Musso (U. of Bath), Robert Jerrard (U. Toronto), Juncheng Wei (UBC)
- 7/26 – 7/31 Mathematical Models in Biology: from Information Theory to Thermodynamics: Peter Thomas (Case Western Reserve U.), Gasper Tkacik (Institute for Science and Technology - Austria), Peter Swain (U. of Edinburgh)

## AUGUST

- 8/2 – 8/7 Interfacial Phenomena in Reaction-Diffusion Systems: Hiroshi Matano (Meiji U.), Peter Polacik (U. of Minnesota), Luca Rossi (EESS - Paris), Hirokazu Ninomiya (Meiji U.)
- 8/9 – 8/14 Applied and Computational Differential Geometry and Geometric PDEs: Yanyan Li (Rutgers U.), Joel Hass (UC - Davis), David Glickenstein (U. of Arizona), Haomin Zhou (Georgia Tech)
- 8/16 – 8/21 Causal Inference with Big Data: Peng Ding (UC - Berkeley), Fabrizia Mealli (U. of Florence), Marloes Maathuis (ETH - Zürich), Lihua Lei (Stanford)
- 8/23 – 8/28 The Mathematics of Microbial Evolution: Beyond the Limits of Classical Theory: Lindi Wahl (U. of Western Ontario), Helen Alexander (Oxford), Sarah Otto (UBC), Sylvain Gandon (CNRS)
- 8/30 – 9/4 Modern Breakthroughs in Diophantine Problems: Samir Siksek (U. of Warwick), Michael Bennett (UBC), Nils Bruin (SFU), Bianca Viray (U. of Washington)

## SEPTEMBER

- 9/6 – 9/11 Arithmetic Aspects of Algebraic Groups: Mikhail Ershov (U. of Virginia), Alex Lubotzky (Hebrew U. of Jerusalem), Gopal Prasad (U. of Michigan), Dave Morris (U. of Lethbridge)
- 9/13 – 9/18 Permutations and Probability: Omer Angel (UBC), James Martin (Oxford), Balint Virag (U. Toronto)
- 9/20 – 9/25 Women in Mathematical Physics: Ana Ros Camacho (U. Utrecht), Nezhla Aghaei (U. of Bern)
- 9/27 – 10/2 Combinatorial and Geometric Discrepancy: Aleksandar Nikolov (U. Toronto), Christoph Aistleitner (Graz U. of Technology), Nicole Tomczak-Jaegermann (U. of Alberta), Christian Weiss (Hochschule Rurh West)

## OCTOBER

- 10/4 – 10/9 Biological Active Porous Materials: Modeling, Simulation and Experimentation: Scott MacLachlan (Memorial U.), Filiz Ates (Mayo Clinic), Luis Dorfmann (Tufts U.), Oliver Röhrle (U. of Stuttgart)
- 10/11 – 10/16 Statistical Modeling for Large Complex Time Dependent Systems: Robert Lund (Clemson U.), Scott Holan (U. of Missouri), Vladas Pipiras (U. of North Carolina), McElroy Tucker (US Census Bureau)
- 10/18 – 10/23 Mathematical Approaches for Data Assimilation of Atmospheric Constituents and Inverse Modeling: Richard Menard (Climate Change - Canada), Kayo Ide (U. of Maryland - College Park), Fuqing Zhang (Penn State U.), Dylan Jones (U. Toronto)
- 10/25 – 10/30 Dynamical Algebraic Combinatorics: Tom Roby (U. of Connecticut), James Propp (U. of Massachusetts - Lowell), Jessica Striker (North Dakota State U.), Nathan Williams (U. Texas - Dallas)

## NOVEMBER

- 11/1 – 11/6 Derived, Birational, and Categorical Algebraic Geometry: David Favero (U. of Alberta), Matthew Ballard (U. of South Carolina)
- 11/8 – 11/13 Algebraic Dynamics and its Connections to Difference and Differential Equations: Dang Khoa Nguyen (U. of Calgary), Jason Bell (U. of Waterloo), Thomas Scanlon (UC - Berkeley)
- 11/15 – 11/20 WIN5: Women in Numbers 5: Renate Scheidler (U. of Calgary), Alina Bucur (UC - San Diego), Wei Ho (U. of Michigan)
- 11/22 – 11/27 Multiscale Models for Complex Fluids: Modeling and Analysis: Miroslav Bulicek (Charles U.), Agnieszka Świerczewska-Gwiazda (U. of Warsaw)
- 11/29 – 12/4 Interactions Between Topological Combinatorics and Combinatorial Commutative Algebra: Sara Faridi (Dalhousie U.), Satoshi Murai (Osaka U.), Isabella Novik (U. of Washington), Adam Van Tuyl (McMaster U.)
- 11/29 – 12/4 Topology and Entanglement in Many-Body Systems: Sven Bachmann (UBC), Martin Fraas (Virginia Tech), Fernando Brandao (Caltech)

## DECEMBER

- 12/6 – 12/11 Foundations for a Distributed Ledger: Valerie King (U. of Victoria), Maurice Herlihy (Brown U.), Jared Saia (U. of New Mexico), Elaine Shi (Cornell U.)

## APRIL

- 4/26 – 5/1 Using Quantum Invariants to do Interesting Topology: Liam Watson (UBC), Elisenda Grigsby (Boston College), Andrew Lobb (Durham U.)

## MAY

- 5/3 – 5/8 Kinetic Equations: Recent Developments and Novel Applications: Marie-Therese Wolfram (U. of Warwick), Jose Carrillo (Imperial College), Min Tang (Shanghai Jiao Tong U.), Alina Chertock (North Carolina State U.)
- 5/10 – 5/15 Geometric and Analytical Aspects of Nonlinear Elliptic Equations and Related Evolution Problems: Filomena Pacella (Sapienza U. of Rome), Monica Clapp (UNAM), Bernhard Ruf (U. degli Studi di Milano)
- 5/17 – 5/22 Modeling and Engineering of the Mammalian Embryo: Jianping Fu (U. of Michigan - Ann Arbor), Janet Rossant (U. Toronto), Eric Siggia (Rockefeller U.)
- 5/24 – 5/29 Topological Complexity and Motion Planning: Daniel Cohen (Louisiana State U.), Jesus Gonzalez (Cinvestav), Lucile Vandembroucq (U. do Minho)
- 5/31 – 6/5 Outstanding Challenges in Computational Methods for Integral Equations: Michael O'Neil (NYU), Stephanie Chaillat-Loseille (CNRS), Adrianna Gillman (Rice U.), Per-Gunnar Martinsson (U. Texas - Austin)

## JUNE

- 6/7 – 6/12 Advances in Mixed Characteristic Commutative Algebra and Geometric Connections: Karl Schwede (U. of Utah), Linquan Ma (Purdue U.), Luis Núñez-Betancourt (CIMAT)
- 6/14 – 6/19 Higher Segal Spaces and their Applications to Algebraic K-Theory, Hall Algebras, and Combinatorics: Julie Bergner (U. of Virginia), Mark Penney (Max Planck Institute for Mathematics)
- 6/21 – 6/26 Mathematical and Conceptual Aspects of Quantum Theory: Robert Oeckl (UNAM), Chryssomalis Chryssomalakos (UNAM)

## JUNE

- 6/28 – 7/3 Moduli, Motives and Bundles – New Trends in Algebraic Geometry: Alexander Schmitt (Freie U. Berlin), Frank Neumann (U. of Leicester), Pedro Luis del Angel Rodriguez (CIMAT)

## AUGUST

- 8/2 – 8/7 Applied Functional Analysis: Feng Dai (U. of Alberta), Ronald DeVore (Texas A&M U.), Vladimir Temlyakov (U. of South Carolina), Sergey Tikhonov (ICREA - Barcelona)
- 8/9 – 8/14 Statistical and Computational Challenges Arising from Ubiquitous Molecular Measurements: Jeffrey Leek (Johns Hopkins Bloomberg School of Public Health), Anna Goldenberg (SickKids Research Center), Sara Mostavafi (UBC), Elizabeth Purdom (UC - Berkeley)
- 8/16 – 8/21 $M^5$ - Mathematics of Multiphase, Multiscale, Multiphysics Models: Krishnaswamy Nandakumar (Louisiana State U.), Wei Ge (Chinese Academy of Sciences), Samir Khanna (British Petroleum – USA), Francois Bertrand (Ecole Polytechnique)
- 8/23 – 8/28 Statistical Challenges in the Identification, Validation, and Use of Surrogate Markers: Layla Parast (RAND), Peter Gilbert (Fred Hutchinson Cancer Center), Lang Wu (UBC)
- 8/30 – 9/4 Convex Integration and Paradoxical Shapes: Boris Thibert (U. Grenoble Alpes), Francis Lazarus (CNRS), Vincent Borrelli (U. Lyon 1)

## SEPTEMBER

- 9/6 – 9/11 Theory and Computational Methods for SPDEs: David Cohen (Umeå U.), Annika Lang (Chalmers U. of Technology and U. of Gothenburg), Samy Tindel (Purdue U.), Marta Sanz-Solé (U. of Barcelona)
- 9/13 – 9/18 Multiscale Modeling of Plant Growth, Pattern Formation and Actuation: Anja Geitmann (McGill)
- 9/20 – 9/25 Approximation Algorithms and the Hardness of Approximation: Jochen Konemann (U. of Waterloo), Zachary Friggstad (U. of Alberta), Julia Chuzhoy (Toyota Technical Institute - Chicago), Rico Zenklusen (Swiss Federal Institute of Technology in Zurich)
- 9/27 – 10/2 Bases for Cluster Algebras: Alfredo Nájera Chávez (UNAM), David Hernandez (U. Paris Diderot - Paris VII), Jan Schroer (U. of Bonn), Laurent Demonet (Nagoya U.)

## OCTOBER

- 10/4 – 10/9 Geometric and Variational Methods in Celestial Mechanics: Renato Calleja (UNAM), Marcel Guardia (U. Politècnica de Catalunya), Jacques Féjoz (U. Paris), Susanna Terracini (U. di Torino)
- 10/18 – 10/23 Locality and Functoriality in Symplectic Geometry: Vivek Shende (UC - Berkeley)
- 10/25 – 10/30 Algebraic Methods in Coding Theory and Communication: Felice Manganiello (Clemson U.), Elisa Gorla (U. of Neuchatel), Hiram H. López Valdez (Autónomous U. of Aguascalientes), Marcus Greferath (Aalto U.)

## NOVEMBER

- 11/1 – 11/6 Integral and Metric Geometry: Dmitry Faifman (U. de Montréal), Andreas Bernig (Goethe U. Frankfurt), Alexander Lytchak (U. of Cologne), Alina Stancu (Concordia U.)
- 11/8 – 11/13 Mathematics and Statistics of Genomic Epidemiology: Leonid Chindelevitch (SFU), Alexandre Bouchard-Cote (UBC), Jesse Shapiro (U. of Montreal)
- 11/15 – 11/20 Learning in Networks: Performance Limits and Algorithms: Bruce Hajek (U. of Illinois), Yihong Wu (Yale U.), Jiaming Xu (Duke U.)
- 11/29 – 12/4 Langlands Program: Number Theory and Representation Theory: Luis Lomeli (Pontificia U. Catolica de Valparaiso), Anne-Marie Aubert (Sorbonne U.), Luis Dieulefait (U. de Barcelona), Manish Mishra (IISER Pune)

## 数学高等研究院
# INSTITUTE FOR ADVANCED STUDY IN MATHEMATICS
### Hangzhou, China

ZHEJIANG UNIVERSITY 1897

## SEPTEMBER

- 9/6 – 9/11 Geometry and Physics of Quantum Toroidal Algebra: Satoshi Nawata (Fudan U.), Boris Feigin (Higher School of Economics - Moscow), Hiraku Nakajima (U. of Tokyo), Peng Shan (Tsinghua U.)
- 9/13 – 9/18 Cell and Tissue Mechanics: Modeling Meets Experiments: Xinpeng Xu (Guangdong Technion - Israel Institute of Technology), Leonid Pismen (Technion), Alexander Bershadsky (National U. of Singapore), Baohua Ji (Zhejiang U.)
- 9/20 – 9/25 Modular Forms in Number Theory and Physics: Ling Long (Louisiana State U.), Jaap Top (U. of Groningen), Noriko Yui (Queen's U.), Wadim Zudilin (Radboud U. Nijmegen)
- 9/27 – 10/2 Noncommutative Geometry meets Topological Recursion: Masoud Khalkhali (U. of Western Ontario), Gaetan Borot (Max Planck Institute for Mathematics), Hannah Markwig (U. of Tuebingen), Raimar Wulkenhaar (U. Munster)

## OCTOBER

- 10/4 – 10/9 Topological Data Analytic Applications of Persistent Cohomology: Anthea Monod (Columbia U.), Vin de Silva (Pomona College)
- 10/11 – 10/16 Poisson Geometry and Artin-Schelter Regular Algebras: Zheng Hua (U. of Hong Kong), James Zhang (U. of Washington), Thomas Nevins (U. of Illinois - Urbana-Champaign), Diming Lu (Zhejiang U.)
- 10/18 – 10/23 Periods and Branching Problems for Representations of Real, $p$-adic and Adeline Groups: Birgit Speh (Cornell U.), Toshiyuki Kobayashi (U. of Tokyo)
- 10/25 – 10/30 Structured Mesh Methods for Moving Interface and Free Boundary Problems and Applications: Qinghai Zhang (Zhejiang U.), Zhilin Li (North Carolina State U.), John Stockie (SFU)

## NOVEMBER

- 11/1 – 11/6 The Mathematics of Soft Active Materials: Michael Shelley (Flatiron Institute), Eva Kanso (U. of Southern California), Dan Hu (Shanghai Jiao Tong U.)
- 11/8 – 11/13 Nonlocal Problems in Mathematical Physics, Analysis and Geometry: Itai Shafrir (Technion), Michel Chipot (U. of Zurich)