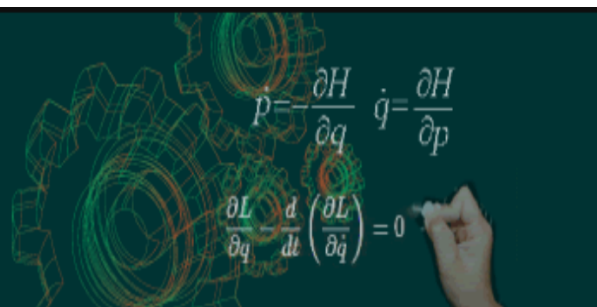# GMC Network

Geometry, Mechanics and Control Network Infosheet

February 2022

Editors: Viviana Díaz, Iván Gutiérrez, Rodrigo Sato

CONTENTS

Network's activities

VII Iberoamerican Meeting on Geometry, Mechanics and Control (Virtual format).
7–11 March 2022, Bahía Blanca, Argentina.

14th International Summer School on Geometry, Mechanics and Control.
4–8 July 2022, Burgos, Spain.

Virtual seminars

Online Seminar of the Geometry, Mechanics and Control Thematic Network.
Instituto de Ciencias Matemáticas' seminars on these topics.

Online Seminar on Geometry, Dynamics and Mechanics.
A series of online seminars on these topics.

Colloquium on Geometry and Physics.
Online colloquium about interface of the two fields.

One World IAMP Mathematical Physics Seminar.
Seminar of International Association of Mathematical Physics.

Virtual Seminar on Geometry with Symmetries.
On the topic of Lie group actions in Riemannian geometry.

Control and Optimization Seminar.
Louisiana State University.

Utrecht Geometry Centre Seminar.
Mathematical Institute, Utrecht University.

Differential Geometry Seminar Torino.
CRM-Montreal, Princeton/IAS, Tel Aviv, and Paris Seminar.

Latin American Seminar on Differential Geometry.
Virtual seminar aims to establish contact with several research groups and mathematicians in Latin America.

ICMAT Geometry Seminar.
Instituto de Ciencias Matemáticas' seminars on algebraic and differential geometry.

Symplectic Zoominar.
Online Seminar organized by University of Torino.

Geometry and Topology Online.
Warwick Mathematics Institute.

Regensburg Low-Dimensional Geometry and Topology Seminar.
About arithmetic geometry and global analysis.

Theory of Duality Seminar.
Department of Mathematical Methods in Physics, University of Warsaw.

Conferences

Differential Geometry and Integrable Systems.
1–21 March 2022, Osaka, Japan.

Interactions of Gauge theory with contact and symplectic topology in dimensions 3 and 4.
6–11 March 2022, Banff, Canada.

Advancing Quantum Mechanics with Mathematics and Statistics Tutorials.
8 March–11 June 2022, Los Ángeles, USA.

Recent Development in Representation Theory and Mathematical Physics.
20 – 26 March 2022, Oberwolfach, Germany.

Braids in Symplectic and Algebraic Geometry.
21 – 25 March 2022, Providence, USA.

Supergeometry and Bracket Structures in Mathematics and Physics.
21 – 25 March 2022, Toronto, Canada.

Homotopical Methods in Geometry and Physics.
21 – 25 March 2022, Illinois, USA.

Geometry and Analysis on Non-Compact Manifolds.
28 March – 1 April 2022, Luminy, France.

Multiscale Approaches in Quantum Mechanics.
28 March – 1 April 2022, Los Ángeles, USA.

Symplectic singularities in geometry and representation theory.
4 – 8 April 2022, Luminy, France.

Model Reduction in Quantum Mechanics.
11 – 15 April 2022, Los Ángeles, USA.

Energy-Based Modeling, Simulation, and Control of Complex Constrained Multiphysical Systems.
18 – 22 April 2022, Luminy, France.

Large-Scale Certified Numerical Methods in Quantum Mechanics.
2 – 6 May 2022, Los Ángeles, USA.

Strings and Geometry.
2 – 5 May 2022, Uthecht, Netherlands.

Deformations and higher structures.
16 – 20 May 2022, Vancouver, Canada.

Monte Carlo and Machine Learning Approaches in Quantum Mechanics.
23 – 27 May 2022, Los Ángeles, USA.

Poisson Geometry, Lie Groupoids and Differentiable Stacks.
5–10 June 2022, Banff, Canada.

Great Lakes Mathematical Physics Meeting.
9–12 June 2022, Michigan, USA.

Deep Exploration of non-Euclidean Data with Geometric and Topological Representation Learning.
10–15 June 2022, Banff, Canada.

String Math.
11–15 June 2022, Warsaw, Poland.

Mathematical and Conceptual Aspects of Quantum Theory.
12–17 June 2022, Oaxaca, Mexico.

Recent developments in gauge theory - string theory duality (Online).
13–17 June 2022, Moscow, Russia.

Theoretical and numerical trends in inverse problems and control for PDE's, and Hamilton-Jacobi equation.
13–17 June 2022, Luminy, France.

Geometric and Variational Methods in Celestial Mechanics.
19–24 June 2022, Banff, Canada.

Geometry, Mechanics and Computation: from Soft Matter to Animation and Beyond.
19–24 June 2022, Banff, Canada.

Optimization, Simulation and Control.
20–22 June 2022, Ulaanbaatar, Mongolia.

VI International Conference on Finite Dimensional Integrable Systems in Geometry and Mathematical Physics.
20–24 June 2022, Tel-Aviv, Israel.

Summer Graduate School on Geometric Flows.
20 June–1 July 2022, Athens, Greece.

Physics and Quantum Physics (Hybrid).
22–23 June 2022, Berlin, Germany.

Spectral Theory and Mathematical Physics.
22 –26 June 2022, Saint Petersburg, Russia.

Mathematical Physics, Geometry and Integrability.
26 June–2 July 2022, Moscow, Russia.

Probability and Mathematical Physics.
28 June–5 July 2022, Helsinki, Finland.

41th Benelux Meeting on Systems and Control.
5–7 July 2022, Brussels, Belgium.

The 34th International Colloquium on Group Theoretical Methods in Physics.
18–22 July 2022, Strasbourg, France.

Geometry and Physics of ALX Metrics in Gauge Theory.
25–29 July 2022, California, USA.

Moduli Spaces and Vector Bundles — New Trends.
25–29 July 2022, Coventry, United Kingdom.

Driving Global Inference for New Physics with Machine Learning, Big Data and Large-scale Statistical Simulation.
31 July–5 August 2022, Banff, Canada.

Frontiers in Geometry and Topology Summer School.
1–5 August 2022, Trieste, Italy.

Frontiers in Geometry and Topology Conference.
8–12 August 2022, Trieste, Italy.

Calculus of Variations.
14–20 August 2022, Oberwolfach, Germany.

Quantum Dynamics: From Electrons to Qbits.
22 August– 9 September 2022, Trieste, Italy.

Geometric Structures and Supersymmetry 2022.
23–26 August 2022, Tromsø, Norway.

Control and Optimization with Industrial Applications.
24–26 August 2022, Baku, Azerbaijan.

Connections Workshop: Analytic and Geometric Aspects of Gauge Theory.
25–26 August 2022, Berkeley, USA.

Introductory Workshop: Analytic and Geometric Aspects of Gauge Theory.
29 August–2 September 2022, Berkeley, USA.

Quantum Information in many body physics: a mathematical invitation.
29 August–2 September 2022, Munich, Germany.

Job offers, fellowships and supports

Ph.D. offers

Ph.D. Studentship in Numerical Analysis.
Charles University, Prague, Czech Republic
Closing date: 7 March 2022.

PhD position in Mathematics.
Umea Universitet, Umea, Sweden
Closing date: 11 March 2022.

PhD position.
University of Zurich, Zurich, Switzerland
Closing date: 14 March 2022.

PhD position in Mathematics.
Delft University of Technology, Delft, Netherlands
Closing date: 16 March 2022.

PhD position in PDEs.
Technische Universitat Dresden, Dresden, Germany
Closing date: 17 March 2022.

PhD position.
University of Goettingen, Goettingen, Germany
Closing date: 10 April 2022.

PhD in Analysis of singular and random systems.
University of Bielefeld, Bielefeld, Germany

3 PhD positions in Geometry, Probability, and Deep Learning.
NTU Singapore, Singapore

PhD in stochastic geometric mechanics.
Wilfrid Laurier University, Waterloo, Canada

PhD positions.
TU Delft, Delft, The Netherlands

Postdoctoral fellowships

Postdoctoral Research Scientist in Numerical Analysis.
Charles University, Prague, Czech Republic

Postdoc position in PDEs.
Ecole Normale Superieure de Rennes, Rennes, France

Postdoctoral Fellow.
Harvard University, Massachusetts, United States

Postdoctoral Fellowship in Mathematics.
Pohang University of Science and Technology, Pohang, Korea

Postdoc position in PDEs.
Technische Universitat Dresden, Dresden, Germany

Postdoctoral Fellow in Mathematics.
University of Toronto, Toronto, Canada

PhD position.
Universidad del País Vasco, Bizkaia, Spain

3 postdoc positions in Geometry, Probability, and Deep Learning.
NTU Singapore, Singapore

Postdoctoral fellowships in algebraic geometry and mathematical sciences.
Harvard University, Massachusetts, United States

Postdoctoral positions in Mathematics.
Einstein Institute of Mathematics, Jerusalem, Israel

Humboldt research fellowship for postdoctoral researchers.
Alexander von Humboldt Foundation

Lisa Meitner program.
FWF Austrian Science Fund, Vienna, Austria

Funded postdoctoral fellowship.
University of Reading, United Kingdom

Offers for researchers

Assistant Professor in Mathematics.
Trinity College Dublin, Dublin, Ireland

Professorship of Quantum Physics.
University of Cambridge, Cambridge, UK

Assistant Professor in Pure Mathematics.
University of Durham, Durham, UK

Lecturer in Theoretical Physics.

King's College London, London, UK

Senior Lecturer in Mathematics.
King's College London, London, UK

Professor in Algebraic Geometry .
University of Antwerp, Antwerp, Belgium

Tenure-track Associate Professor.
The University of Hong Kong, Hong Kong

Tenure-track Assistant Professor.

Offers for visiting researchers

Abel Visiting Scholar Program.
International Mathematical Union.
Postdoctoral mathematician to visit a research collaborator for a month.

Simons Visiting Professors at Mathematisches Forschunginstitut Oberwolfach.
Oberwolfach, Germany.
Junior or senior scientists from outside Europe.

Focused research groups in Banff, Canada.
Banff International Researh Station, Canada.
Up to 8 researchers for periods of 1 to 2 weeks.

Research in Teams in Banff, Canada.
Banff International Researh Station, Canada.
Teams of 2 to 4 researchers for 1 to 2 weeks.

International Research in Groups at CIRM.
Centre International de Rencontres Mathématiques (CIRM), France.

California State University, Fresno, United States

Small groups of researchers for 2 to 4 weeks.

Research in Residence at CIRM.
Centre International de Rencontres Mathématiques (CIRM), France.
2 to 4 researchers.

Visiting scholar opportunity in Cambridge.
University of Cambridge, United Kingdom.
Scholars and fellows for development of research, teaching and collaboration.

Small team visiting the CRM.
Centre de Recerca Matemàtica, Catalonia, Spain.
Postdoctoral positions and research in pairs.

Visiting research fellow in Kent State University.
Mathematics Department-KSU, Ohio, USA.
Visiting for scholar researchers.

Financial support for research projects and conferences

Thematic programs at MSRI.
Mathematical Sciences Research Institute, Berkeley, United States.

Hot topics Workshop at MSRI.
Mathematical Sciences Research Institute, Berkeley, United States.

Summer graduate schools at MSRI.
Mathematical Sciences Research Institute, Berkeley, United States.

Workshop at CIRM.
Centre International de Rencontres Mathématiques, France.

CIMPA Online courses program.

Geographic areas of activities of CIMPA (Africa, Central or South America, Asia).

Support for workshop organization at Banff.
Banff International Research Station.

Proposal of a workshop in the Mathematisches Forschunginstitut Oberwolfach.
Oberwolfach, Germany.

Hosting a workshop at AIMS South Africa.
Contributions for workshops about AIMS's research focus areas.

International Mathematical Union - Conference support program.
For conferences in developing or economically disadvantaged countries.

Preprints

Network's members

Alexandre Anahory Simões, Sebastián J. Ferraro, Juan Carlos Marrero and David Martín de Diego: *Nonholonomic Newmark method.*
2201.13162
[math.NA, cs.NA, math-ph, math.DG, math.MP]

Leonardo Colombo, Manuela Gamonal Fernández and David Martín de Diego: *Variational integrators for non-autonomous systems with applications to stabilization of multi-agent formations.*
2202.01471
[eess.SY, cs.NA, cs.SY, math.NA, math.OC]

Alberto Enciso, Alba García-Ruiz and Daniel Peralta-Salas: *Inverse localization and global approximation for some Schrödinger operators on hyperbolic spaces.*
2202.02116
[math.SP, math-ph, math.AP, math.MP]

Pierre Berger, Anna Florio and Daniel Peralta-Salas: *Steady Euler flows on $\mathbb{R}^3$ with wild and universal dynamics.*
2202.02848
[math.DS, math.AP]

Marco Castrillón López and Álvaro Rodríguez Abella: *Gauge reduction in covariant field theory.*
2202.04578
[math.DG, math-ph, math.DS, math.MP]

O. Esen, M. de León, M. Lainz, C. Sardón and M. Zając: *Reviewing the Geometric Hamilton-Jacobi Theory concerning Jacobi and Leibniz identities.*
2202.06896
[math.DG, math-ph, math.MP]

J. Fernando Barbero G., Marc Basquens, Bogar Díaz and Eduardo J. S. Villaseñor: *Consistent and non-consistent deformations of gravitational theories.*
2202.07997
[gr-qc, hep-th, math-ph, math.MP]

María Emma Eyrea Irazú and Leonardo J. Colombo: *Hybrid Routhian reduction for simple hybrid forced Lagrangian systems.*
2202.08588
[math.DS, math.SG]

Kehan Long, Vikas Dhiman, Melvin Leok, Jorge Cortés and Nikolay Atanasov: *Safe Control Synthesis with Uncertain Dynamics and Constraints.*
2202.09557
[cs.RO, math.OC]

José F. Cariñena, Eduardo Martínez and Miguel C. Muñoz-Lecanda: *Infinitesimal time reparametrisation and its applications.*
2202.09581
[math-ph, math.MP]

Alexandre Anahory Simões and Leonardo Colombo: *Variational problems on Riemannian manifolds with constrained accelerations.*
2202.11600 (version 2)
[math.OC, math-ph, math.MP]

Ángel Ballesteros, Iván Gutiérrez-Sagredo and Francisco J. Herranz: *The noncommutative space of light-like worldlines.*
2202.11767
[hep-th, gr-qc, math-ph, math.MP]

Leonardo J. Colombo, Manuela Gamonal Fernández and Juan I. Giribet: *Learning-Based Fault-Tolerant Control for an Hexarotor with Model Uncertainty.*
2202.12736
[eess.SY, cs.SY, math.OC]

Javier de Lucas, Xavier Gràcia, Xavier Rivas, Narciso Román-Roy and Silvia Vilariño: *Reduction and reconstruction of multisymplectic Lie systems.*
2202.13748
[math-ph, math.DG, math.MP, nlin.SI]

Network's collaborators

Elena Celledoni, Andrea Leone, Davide Murari and Brynjulf Owren: *Learning Hamiltonians of constrained mechanical systems.*
2201.13254
[math.NA, cs.LG, cs.NA, math.DS]

Álvaro Rodríguez Abella and Melvin Leok: *Discrete*

Dirac reduction of implicit Lagrangian systems with abelian symmetry groups.
2202.00803
[math-ph, cs.NA, math.DS, math.MP, math.NA]

Tomoki Ohsawa: *Shape Dynamics of N Point Vortices on the Sphere.*

2202.01860
[math-ph, math.MP, math.SG, physics.flu-dyn]

Benjamin Couéraud and François Gay-Balmaz: *Variational discretization of the Navier-Stokes-Fourier system.*
2202.03502
[math.DG, cs.NA, math.DS, math.NA]

Nataliya A. Balabanova and James Montaldi: *Hamiltonian approach for point vortices on non-orientable surfaces I: the Mobius band.*
2202.06160
[math.DS]

Mark Iwen, Benjamin Schmidt and Arman Tavakoli: *Characterizing unit spheres in Euclidean spaces via reach and volume.*
2202.06161
[math.DG, 53Z50]

François Gay-Balmaz: *General relativistic Lagrangian continuum theories – Part I: reduced variational principles and junction conditions for hydrodynamics and elasticity.*
2202.06560

[math-ph, gr-qc, math.MP]

Joakim Arnlind, Kwalombota Ilwale and Giovanni Landi: *Levi-Civita connections on quantum spheres.*
2202.07331
[math.QA, math-ph, math.MP]

Giovanni Canepa and Alberto S. Cattaneo: *Corner Structure of Four-Dimensional General Relativity in the Coframe Formalism.*
2202.08684
[math-ph, gr-qc, hep-th, math.MP, math.QA, math.SG]

Bernhard Maschke, Friedrich Philipp, Manuel Schaller, Karl Worthmann and Timm Faulwasser: *Optimal control of thermodynamic port-Hamiltonian Systems.*
2202.09086
[math.OC]

Andreas Fring, Takanobu Taira and Rebecca Tenney: *Time-dependent C-operators as Lewis-Riesenfeld invariants in non-Hermitian theories.*
2202.10965
[quant-ph, hep-th, math-ph, math.MP]

Links of interest

Geometry, Mechanics and Control Network

Journal of Geometric Mechanics - December 2021, Volume 13, Issue 4

International Mathematical Union (IMU) Newsletter - January 2022

International Association of Mathematical Physics Bulletin - January 2022

European Mathematical Society

Royal Spanish Mathematical Society (RSME)

International Association of Mathematical Physics

Open Access American Institute of Mathematical Sciences (AIMS) Journal

Euraxess Spain

International Centre for Theoretical Physics (ICTP)

European Research Council

European Commission - Research and Innovation

International Center of Pure and Applied Mathematics (CIMPA)

Mathematical and physical sciences funding,National Science Foundation, USA

Open Access Mathematics Journals

Open Access Physics Journals

Societat Catalana de Matemàtiques (SCM) journal on Mathematics

SIAM Activity Group on Control and Systems Theory Prize

SIAM Activity Group on Control and Systems Theory Best SICON Paper Prize

International Mathematical Union Awards and Prizes

Other Prizes of International Mathematical Union

American Mathematical Society Prizes and Awards

Mathematical Association of America Awards

Association for Women in Mathematics Awards

IEEE Control Systems Society Awards

Royal Society of London Premier Medals and Awards

London Mathematical Society Prizes

The Shaw Prize

The Henri Poincarè Prize

European Mathematical Society Prizes

European Mathematical Society Funding and Sponsorship

The Royal Society Grants

The Royal Society's medals and award

NOTE: If you want to include information in this info-sheet, please send it to gmcactivities@gmail.com