Last updated: September 6, 2022

Rajan Amit Mehta

Department of Mathematics & Statistics
44 College Lane
Northampton, MA 01063

Positions held

Associate Professor	Smith College	2016–present
Assistant Professor	Smith College	2013–2016
Lecturer	Smith College	2012–2013
Lecturer/Research Associate	Pennsylvania State University	2011–2012
Chauvenet Postdoctoral Lecturer	Washington University in Saint Louis	2007–2010
CNPq Postdoctoral Researcher	Instituto Nacional de Matemática Pura e Aplicada (IMPA), Rio de Janeiro	2006–2007
Teacher	Arrowsmith Academy, Berkeley, CA	1999–2001

Education

Ph.D.	May 2006	University of California, Berkeley	Mathematics. Thesis: Supergroupoids, double structures, and equivariant cohomology
B.A.	May 1999	University of Pennsylvania	Mathematics, Economics

Publications

(Asterisk indicates undergraduate student coauthor)

1. Ivan Contreras, *Molly Keller, Rajan Amit Mehta. Frobenius objects in the category of spans. *Rev. Math. Phys.* **Online Ready** (2022), .
2. Miquel Cueca, Rajan Amit Mehta. Courant cohomology, Cartan calculus, connections, curvature, characteristic classes. *Comm. Math. Phys.* **381** (2020), 1091–1113.
3. Rajan Amit Mehta, *Ruoqi Zhang. Frobenius objects in the category of relations. *Lett. Math. Phys.* **110** (2020), no. 7, 1941–1959.
4. A. Gracia-Saz, M. Jotz Lean, K. C. H. Mackenzie, R. A. Mehta. Double Lie algebroids and representations up to homotopy. *J. Homotopy Relat. Struct.* **13** (2018), 287–319.
5. Rajan Amit Mehta, Xiang Tang. Constant symplectic 2-groupoids. *Lett. Math. Phys.* **108** (2018), 1203–1223.
6. Rajan Amit Mehta, Xiang Tang. Symplectic structures on the integration of exact Courant algebroids. *J. Geom. Phys.* **127** (2018), 68–83.

7. Alfonso Gracia-Saz, Rajan Amit Mehta. $\mathcal{VB}$-groupoids and representation theory of Lie groupoids. *J. Sympl. Geom.* **15** (2017), no. 3, 741–783.

8. Rajan Amit Mehta. Modular classes of Lie groupoid representations up to homotopy. *SIGMA* **11** (2015), 058, 10 pages.

9. Rajan Amit Mehta, Mathiéu Stienon, Ping Xu. The Atiyah class of a dg-vector bundle. *Comptes Rendus Math.* **353** (2015), no. 4, 357–362.

10. Rajan Amit Mehta. Lie algebroid modules and representations up to homotopy. *Indag. Math.* **25** (2014), no. 5, 1122–1134.

11. Rajan Amit Mehta. Differential graded contact geometry and Jacobi structures. *Lett. Math. Phys.* **103** (2013), 729–741.

12. Rajan Amit Mehta, Marco Zambon. L_∞-algebra actions. *Diff. Geom. Appl.* **30** (2012), 576–587.

13. Rajan Amit Mehta, Xiang Tang. From double Lie groupoids to local Lie 2-groupoids. *J. Braz. Math. Soc.* **42** (2011), no. 4, 651–681.

14. Rajan Amit Mehta. On homotopy Poisson actions and reduction of symplectic Q-manifolds. *Diff. Geom. Appl.* **29** (2011), 319–328.

15. Alfonso Gracia-Saz, Rajan Amit Mehta. Lie algebroid structures on double vector bundles and representation theory of Lie algebroids. *Adv. Math.* **223** (2010), no. 4, 1236–1275.

16. Rajan Amit Mehta. Q-algebroids and their cohomology. *J. Sympl. Geom.* **7** (2009), no. 3, 263–293.

17. Rajan Amit Mehta. Q-groupoids and their cohomology. *Pacific J. Math.* **242** (2009), no. 2, 311–332.

Preprints

1. M. Jotz Lean, R. A. Mehta, T. Papantonis. Modules and representations up to homotopy of Lie n-algebroids. To appear in *J. Homotopy Relat. Struct.*. Preprint at arXiv:2001.01101

2. Ivan Contreras, *Adele Long, *Sophia Marx, Rajan Amit Mehta. On examples and classification of Frobenius objects in Rel. Submitted. Preprint at arXiv:2208.14716

Teaching

Smith College

MTH 111: Calculus I (Spring 2014, Fall 2017)
MTH 112: Calculus II (Spring 2013, Spring 2020, Fall 2020)
MTH 153: Discrete Math (Spring 2018, Spring 2019)
MTH 211: Linear Algebra (Fall 2012, Spring 2013, Fall 2013, Spring 2014, Spring 2015, Spring 2016, Spring 2017, Fall 2020, Spring 2021)
MTH 238: Number Theory (Fall 2014, Fall 2016, Fall 2017, Fall 2018)
MTH 280: Advanced Calculus (Spring 2014, Spring 2017, Spring 2018)
MTH 282: Complex Analysis (Spring 2020) MTH 370: Topology (Fall 2013)
MTH 381: Geometry and Mechanics (Spring 2016, Fall 2019)

MTH 382: Complex Analysis (Fall 2012, Fall 2014, Fall 2016, Fall 2018)
Special studies: Geometry of Surfaces (Spring 2013), Research in Applied Mathematics (Fall 2014), Putnam Practicum (Fall 2012, Fall 2013, Fall 2014), Algebraic Topology (Spring 2015), Complex Analysis (Spring 2016), Quantum Field Theory (Spring 2018), Topological Data Analysis (Spring 2018), Topological Quantum Field Theory (Fall 2018), Applied Category Theory (Spring 2019), Research in TQFT (Spring 2021)

Penn State

Ordinary Differential Equations

Washington University

Calculus I for Social Sciences
Calculus II for Social Sciences
Differential Equations
Calculus III
Mathematical Methods for the Physical Sciences
Advanced Linear Algebra
Topics in Geometry: Classical Mechanics on Manifolds

UC Berkeley

Instructor for Multivariable Calculus, Advanced Linear Algebra
Teaching assistant for Calculus I, Calculus II, Calculus I for Social Sciences, Multivariable Calculus, Advanced Linear Algebra

Arrowsmith Academy

Geometry, AP Calculus.

Honors & awards

Guido Weiss Award for teaching service (Washington University)
Herbert Alexander Prize for outstanding dissertations in pure mathematics (UC Berkeley)
Outstanding Graduate Student Instructor Award (UC Berkeley)
(Under review) Co-PI for NSF proposal #2232673 "Conference: Gone Fishing: a series of meetings in Poisson Geometry'
Jean Picker Fellowship (Smith College)
Postdoctoral Research Fellowship, (Brazilian National Research Council (CNPq))
NSF VIGRE Fellowship

Invited Talks

June 2022	"Frobenius objects in categories of relations and spans", Göttingen-Würzburg Oberseminar Geometrie
October 2021	"Frobenius objects in categories of relations and spans", Penn State, Geometry and Physics Seminar

October 2021	"Frobenius objects in categories of relations and spans", University of Warwick, Algebraic Topology Seminar
August 2021	"Frobenius objects in categories of relations and spans", University of Pennsylvania, Online Deformation Theory Seminar
April 2021	"Courant cohomology and Cartan calculus", Jilin University, China, Symplectic Geometry Seminar
October 2020	"Frobenius objects in categories of relations and spans", University of Illinois, Symplectic and Poisson Geometry Seminar
January 2020	"Frobenius objects in categories of relations and spans", University of Pennsylvania, Deformation Theory Seminar
December 2019	"Courant cohomology and Cartan calculus", Instituto de Matematica Pura e Aplicada, Rio de Janeiro, Brazil, International Conference on Poisson Geometry
February 2019	"The integration problem for Courant algebroids", University of Illinois, Symplectic and Poisson Geometry Seminar
September 2018	"A Cartan formula for Courant algebroid cohomology", Penn State, Geometry and Physics Seminar
May 2017	"Constant symplectic 2-groupoids", Notre Dame, Gone Fishing Poisson Geometry Meeting
April 2017	"Constant symplectic 2-groupoids", Banff International Research Station, Workshop "Geometric Structures on Lie Groupoids"
October 2016	"Constant symplectic 2-groupoids and their corresponding Courant algebroids", University of Pennsylvania, Deformation Theory Seminar
November 2015	"Modular classes for Lie groupoid representations up to homotopy", University of Pennsylvania, Deformation Theory Seminar
October 2015	"Linear groupoid structures and the adjoint representation of a Lie groupoid", Temple University, Algebra Seminar
April 2015	"Paths, symmetries, and conservation laws in mechanics", Siena College, Mathematics Colloquium
November 2014	"Representing representations up to homotopy", UC Berkeley, Gone Fishing Poisson Geometry Meeting
October 2014	"Courant algebroids and $(2+1)$-dimensional topological field theories", UMass-Amherst, Geometry and Topology Seminar
October 2014	"Linear groupoid structures and representations up to homotopy", University of Illinois, Symplectic and Poisson Geometry Seminar
September 2014	"Differential graded contact manifolds and Jacobi brackets", University of Pennsylvania, Deformation Theory Seminar
March 2014	"Integration of DG symplectic manifolds via mapping spaces", University of Pennsylvania, Deformation Theory Seminar
October 2013	"Integration of Courant algebroids and Dirac structures", Penn State, Geometry and Physics Seminar
September 2013	"Integrating exact Courant algebroids", Temple University, Gone Fishing Poisson Geometry Meeting
March 2013	"Integration of DG symplectic manifolds via mapping spaces", UC Berkeley, Seminar on integration of Courant algebroids
March 2013	"Reduction of Poisson manifolds", UMass-Amherst, Valley Geometry Seminar
August 2012	"Differential graded contact geometry", Anogia, Greece, 10^{th} Conference on Geometry and Physics (GAP X)

July 2012	"Symplectic 2-groupoids and Courant algebroids", Utrecht University, 8th Biennial Conference on Poisson Geometry (Poisson 2012)
November 2011	"Adjoint representations of Lie groupoids and Lie algebroids", University of Pennsylvania, Deformation Theory Seminar
October 2011	"Double Lie groupoids, Lie 2-groupoids, and integration of Courant algebroids", Washington University, Gone Fishing Poisson Geometry Meeting
October 2011	"The fundamental group(oid) of a Lie groupoid", Cornell University, PSU-Cornell Joint Symplectic Seminar
September 2011	"Homotopy Poisson actions", Penn State, Geometry and Physics Seminar
March 2011	"Double Lie groupoids, Lie 2-groupoids, and integration of Courant algebroids", Instituto Nacional de Matemática Pura e Aplicada, Math-Physics Seminar
November 2010	"Homotopy Poisson actions", University of Toronto, Symplectic Geometry Seminar
November 2010	"From double groupoids to 2-groupoids", University of Victoria, Mathematics Colloquium
September 2009	"(Super)representations of Lie groupoids", University of Missouri-Saint Louis, Mathematics Colloquium
July 2009	"From double groupoids to 2-groupoids", University of Porto, Geometry Seminar
July 2009	"$\mathcal{VB}$-algebroids and characteristic classes", University of Porto, XVIIIth Oporto Meeting on Geometry, Topology, and Physics
July 2009	"From double groupoids to 2-groupoids", University of Sheffield, Differential Geometry Seminar
November 2008	"On models for the adjoint representation of a Lie algebroid", University of Göttingen, Born-Hilbert Seminar
January 2008	"A supergeometric approach to Courant algebroid and generalized complex reduction", University of Toronto, Symplectic Geometry Seminar
April 2007	"Simplicial Lie algebroids", ETH Zürich, Mathematical Physics Seminar
April 2006	"Q-groupoids, double structures, and double complexes", Stanford University, Northern California Symplectic Geometry Seminar

Service

Refereed papers for *Journal of Differential Geometry*, *Compositio Mathematica*, *Communications in Mathematical Physics*, *Journal of Geometry and Physics*, *International Mathematics Research Notices*, *Journal of Symplectic Geometry*, *Letters in Mathematical Physics*, *Reviews in Mathematical Physics*, *Differential Geometry and Its Applications*, *Pacific Journal of Mathematics*, *Indagationes Mathematicae*, *Journal of Geometric Mechanics*, *Israel Journal of Mathematics*, *Journal of Homotopy and Related Structures*, *SIGMA*, *Travaux Mathématiques*, *Symmetry*, and *Topology Proceedings*.

Served on Ph.D thesis committee for Theocharis Papantonis (Göttingen, 2021)

Served on Ph.D. thesis committee for Miquel Cueca Ten (IMPA, 2020)

Webmaster for Mathematics & Statistics Department	2014–2016
Putnam Competition Organizer	2012–2015, 2016–present
Monthly Math Problem Contest Organizer	2012–2015
Hiring Committee	2013–2018, 2019–2021

Curriculum Committee	2018–present
Women in Mathematics in New England Conference Co-organizer	2018–2020
Board of Advisors, Global Financial Institutions Concentration	2022 – present
Mentor for STEM Posse 4	2018 – 2020
AEMES Committee	2018 – 2019
Science Center Committee on Diversity (Co-chair in 2019–2020)	Spring 2017 – 2021
Multicultural Recruitment Working Group	Fall 2016 – 2018
Served on panel for AEMES Lunchbag on Graduate School	February 2015
Served on panel discussion about graduate studies and careers in STEM fields	October 2013
Faculty coordinator for the Washington University Undergraduate Math Club	2009–2010
Supervisor for a graduate student reading course on partial differential equations on manifolds, Washington University	Fall 2009