

Joel Villatoro

CONTACT INFORMATION

Department of Mathematics
Indiana University Bloomington
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EDUCATION

Department of Mathematics, University of Illinois

Ph.D. in Mathematics, August 2018

- Dissertation Title: Stacks in Poisson Geometry
- Advisor: Rui Fernandes

University of Oklahoma

B.S. in Mathematics, May 2012

ACADEMIC POSITIONS

Lecturer, Indiana University Bloomington

Fall 2024-Present

NSF Postdoc, Washington University in St. Louis

Spring 2022-Spring 2024 (Funded by MPS-Ascend grant, Award No. 2137999)

Guest, Max Planck Institute for Mathematics in Bonn, Germany

Fall 2021

Postdoctoral Fellow, KU Leuven in Belgium

September 2018-August 2021

HONORS AND AWARDS

2021	Awarded MPS Ascend Fellowship from the NSF
2017–2018	NSF AGEP (Alliances for Graduate Education and the Professoriate) Research support
2016	On UIUC's 'List of Teachers Ranked as Excellent'
2014	NSF AGEP Research support
2014	UIUC Research Board Award
2013	On UIUC's 'List of Teachers Ranked as Excellent'
2012–2013	UIUC GAAN (Graduate Assistance in Areas of National Need) Research Fellowship

PUBLICATIONS & PREPRINTS

David Miyamoto, Joel Villatoro, Regular diffeological groups (*in preparation*)

Joel Villatoro, Pseudo-effective integrations of PMCTs (*in preparation*)

Pooja Joshi, Joel Villatoro, On the holonomy of Lie algebroids, arXiv:2608.19399 (2026) (*preprint*) link

Xiang Tang, Joel Villatoro, Simplicial sheaves of modules and Morita invariance of groupoid cohomology, arXiv:2509.07285 (2025) (*preprint*) link.

Angel Román, Joel Villatoro, Convolution algebras of double groupoids and strict 2-groups, SIGMA 20 (2024), 093, 26 pages link.

Joel Villatoro, On the integrability of Lie algebroids by diffeological spaces, *Indagationes Mathematicae* 37 (2026), no. 4, 1192–1242. [link](#).

Joel Villatoro, On sheaves of Lie-Rinehart algebras, *arXiv:2010.15463* (2020) (*preprint*) [link](#).

Alfonso Garmendia, Joel Villatoro, Integration of Singular Foliations via Paths, *International Mathematics Research Notices*, Volume 2022, Issue 23, December 2022, Pages 18401-18445. [link](#)

J. Villatoro. Picard groups of b-symplectic manifolds. *Journal of Symplectic Geometry* (2021), vol. 19, no. 3, 723-775. <https://dx.doi.org/10.4310/JSG.2021.v19.n3.a6>. [link](#)

J. Villatoro, Stacks in Poisson Geometry. (2018 PhD Thesis). *arXiv:1806.01939*. [link](#)

J. Villatoro. Poisson manifolds and their associated stacks. *Letters in Mathematical Physics* (2018), no. 3, 897-926. <https://doi.org/10.1007/s11005-017-1012-5>. [link](#)

TEACHING EXPERIENCE

Indiana University Bloomington

Spring 2025–Spring 2026		Brief Calculus (Instructor, 4 sections) Introductory calculus course for non-STEM majors.
Spring	2026	Math of Decision and Beauty (Instructor, 2 sections) Gen Ed topics course exploring mathematical ideas in decision-making and aesthetics.
Fall	2025	First Year Seminar (Instructor) Seminar for first-year students on the transition to college.
Fall 2024–Spring 2025		Calculus II (Instructor, 3 sections) Standard undergraduate calculus for STEM majors.
Fall	2024	Calculus I (Instructor) Standard undergraduate calculus for STEM majors.

Washington University in St. Louis

Fall	2022	Differential Equations (Instructor) Undergraduate course in differential equations.
Spring	2022	Calculus of Several Variables (Instructor) Junior (300 level) course in multivariable calculus.

KU Leuven

Spring	2021	Student Seminar Grader: Evaluate and provide feedback on individual bachelor student presentations
Fall	2020	Differential Equations(TA): Monitor and advise students as they work individually on assigned exercises.
Spring	2020	Symplectic Geometry(Instructor): Graduate level course. Design a curriculum based on a syllabus of required topics. Give lectures, write and grade exams and homework. Switched to synchronous lectures after COVID.
Fall	2019	Wiskunde 1(TA): Single variable calculus for non-mathematics majors. Monitor and advise students as they work individually on assigned exercises.

University of Illinois at Urbana-Champaign

	2012–2017	Teaching Assistant / Tutor: Calculus I, Calculus III, Linear Algebra.
SUPERVISION	Spring 2021	Bachelor project supervisor: Mentor a group of 6 Bachelor students in studying a new topic and preparing a presentation.
	Spring 2018	Illinois Geometry Lab: graduate student assistant. Graduate student supervisor for a team of students working on computation based research project about Poisson structures on Euclidean space.
	Fall 2017	Illinois Geometry Lab: graduate student assistant. Graduate student supervisor for a team of students working on computation based research project about modeling a partial differential equation.
DIVERSITY EQUITY AND INCLUSION	Fall 2023	Puertas College Prep: Organizer and mentor for Junior and Senior level highschool students from disadvantaged backgrounds.
	Spring 2023	WashU Mathematics DEI Committee: Served on the math department’s committee.
	Fall 2022	WashU Mathematics DEI Committee: Served on the math department’s committee.
	Fall 2022	Puertas College Prep Mentor and Organizer: Organizer and mentor for Junior and Senior level highschool students from disadvantaged backgrounds.
	2015–2017	SLOAN Peer Mentor: Work with an assigned junior graduate student from underrepresented background. Provide mentorship, advise to mentee as they adapt to life as a new graduate student.
	Summer 2012	Project Transformation Camp Counselor: Worked at an educational summer camp for low income children in the OKC metro area.
ORGANIZATIONAL EXPERIENCE		

	Summer	2025	Poisson Geometry, Lie Theory and Symmetry: Co-organizer of an international research conference held at Instituto Superior Técnico, Lisbon; co-PI on the NSF grant supporting U.S. participants. Contributed to scientific planning, speaker selection, and coordination of the event. https://sites.google.com/view/ipgls2025/(link)
	Fall	2023	UIUC–WUSTL Joint Seminar Organizer: Co-organized a joint research seminar between the University of Illinois and Washington University in St. Louis.
	Spring	2022	WashU Geometry Seminar Organizer: Organized weekly research seminars in geometry.
	Fall	2022	WashU Geometry Seminar Organizer: Organized weekly research seminars in geometry.
	Spring	2021	AGEP–GRS Conference Steering Committee: Served on the steering committee for a graduate research symposium, contributing to planning and organization.
	Fall	2020	Junior Seminar Organizer: Organized and led a seminar for junior graduate students.
	Fall–Spring	2019– 2020	KU Leuven Weekly Poisson Meetings Organizer: Organized regular research meetings in Poisson geometry.
	Fall–Spring	2018– 2019	KU Leuven Weekly Poisson Meetings Organizer: Organized regular research meetings in Poisson geometry.
SERVICE	Spring 2026		IU First Year Seminar Advisory Team: Volunteer member. Gave feedback on the coordination of the First Year Seminar program and made recommendations on learning outcomes, resources and curriculum for future cohorts.
	Spring 2023		WashU Mathematics DEI Committee: Served on the math department’s committee.
	Fall 2022		WashU Mathematics DEI Committee: Served on the math department’s committee.
	Spring 2022		Washington University Math Club: Organized meetings for the undergraduate mathematics club.
	Spring 2022		Glenridge Elementary School Math Club: Mathematics outreach and lessons at local elementary school.
SELECTED TALKS	<i>A (slightly different) way to integrate Lie algebroids</i> , University of Illinois at Urbana-Champaign, Urbana, Illinois USA. (September 2026)		
	<i>The flow product and integrating algebroids</i> , Geometry & Topology Seminar. Washington University in St. Louis, St. Louis, MO (March 2026).		
	<i>Singular spaces in Poisson and symplectic geometry</i> , University of Toledo Department of Mathematics and Statistics Colloquium, Toledo, OH (October 2025).		
	<i>Haar systems and convolution algebras for double groupoids</i> , Gone Fishing 2024. Northwestern University, Evanston, IL (April 2024).		
	<i>A diffeological approach to integrating infinite dimensional Lie algebras</i> , Mathematics Colloquium. Central Michigan University, Mount Pleasant, MI (April 2023).		
	<i>Integration and differentiation for diffeological groupoids</i> , 5-day workshop on Poisson Geometry, Lie Groupoids and Differentiable Stacks. BIRS, Banff (June 2022).		

Recording: <https://www.birs.ca/events/2022/5-day-workshops/22w5035/videos/watch/202206101030-Villatoro.html>

Diffeological Solutions to the Integration Problem Gone Fishing (2020-2022). Savannah, GA (April 2022).

A diffeological approach to solving the integration problem, Symplectic and Poisson Geometry Seminar. University of Illinois at Urbana-Champaign (April 2022).

A diffeological approach to solving the integration problem, Geometry and Topology Seminar. Washington University in St. Louis, St. Louis, MO (February 2022).

Diffeological vector bundles vs sheaves of modules, Western University. London, Ontario CA. (October 2020).

On the homotopy theory and algebraic geometry of sheaves of Lie-Rinehart algebras, Junior Global Poisson Workshop 2020. Online, (September 2020).

Recording: https://www.youtube.com/watch?v=VFVr4xPkDRw&feature=emb_title

A path approach to holonomy for singular foliations, University of Illinois at Urbana-Champaign. Urbana, Illinois USA. (December 2019).

Holonomy for Singular Foliations, University of Antwerp. Antwerp, Belgium. (November 2019).

Symplectic Morita Equivalence and Stacks, Max Planck Institute for Mathematics. Bonn, Germany (February 2019).

On the singularities of the Weinstein groupoid, Higher Geometric Structures along the Lower Rhine XII. Radboud University, Nijmegen, NL (January 2019).

Transversely Integrable Lie Algebroids and Asymmetric Orbispaces, Utrecht University. Utrecht, Netherlands (October 2018).

Geometric stacks for groupoids with geometry, Poisson 2018. University of Toronto, Toronto Canada (August 2018).

Picard groups of b-symplectic manifolds, 3rd Pacific Rim Mathematical Association (PRIMA) congress. Instituto Tecnológico de Oaxaca, Oaxaca Mexico (August 2017).

Morita type equivalences for non-integrable algebroids, Conference on Poisson Geometry and Stacks. The Fields Institute, University of Toronto (July 2017).

Poisson manifolds and their associated stacks, 5-day workshop on Geometric Structures on Lie Groupoids. BIRS, Banff (April 2017).

Recording: <https://www.youtube.com/watch?v=rEz1q8118CQ>

Poisson manifolds and their stacks, Symplectic and Poisson Geometry Seminar. University of Illinois at Urbana-Champaign (March 2017).

Picard Groups of b-Symplectic Manifolds Symplectic and Poisson Geometry Seminar. University of Illinois at Urbana-Champaign (October 2016).