

Jo Nelson

PERSONAL INFORMATION	Rice University Department of Mathematics	jo.nelson@rice.edu http://www.math.rice.edu/~jkn3
RESEARCH INTERESTS	Symplectic and contact geometry and topology, singularity theory, and their interactions; various flavors of Floer, symplectic, and contact homology; symplectic dynamics	
EMPLOYMENT	Rice University Assistant Professor, 2018- Columbia University Ritt Assistant Professor, 2017-2018 Barnard College, Columbia University NSF Postdoctoral Fellow, 2013-2014, 2016-2017 Institute for Advanced Study Member, 2014-2016	
VISITING APPOINTMENTS	Simons Center for Geometry and Physics, Stony Brook Visiting Assistant Professor, Spring 2014 Institute for Advanced Study Visitor, 2013-2014	
EDUCATION	University of Wisconsin - Madison, USA Ph.D. in Mathematics, August 2013 <ul style="list-style-type: none">• Dissertation: <i>Applications of automatic transversality in contact homology</i>• Advisor: Mohammed Abouzaid M.A. in Mathematics, May 2009 Massachusetts Institute of Technology, USA Visiting Graduate Student, Spring 2012 University of Illinois at Urbana-Champaign, USA B.S. in Mathematics with High Distinction and Honors, Minor in German, August 2007 Technische Universität Berlin, Germany Trans Atlantic Science Student Exchange Program, Academic Year 2006-2007	
HONORS & AWARDS	NSF Standard Grant in Geometric Analysis and Topology, DMS-1840723 NSF Mathematical Sciences Research Postdoctoral Fellowship, DMS-1303903 Mary Ellen Rudin Research Prize, University of Wisconsin - Madison, 2012-2013 European Science Foundation - Short Travel Grant CAST, Summer 2012 Honored Instructor Award, University of Wisconsin - Madison Housing, 2011 Celebrating Women in Mathematics Grant, University of Wisconsin (P.I. 2009-2010) Student Ambassador Fellowship from the Technische Universität Berlin, 2006-2007 University of Illinois International Scholar (Fellowship), 2006-2007 University of Illinois List of Teachers Rated Excellent, Fall 2005 Goethe-Institut Book Prize for Undergraduate Achievement in German, 2005 The Honors Teaching Assistantship for Undergraduates, University of Illinois, 2005	

PUBLICATIONS & PREPRINTS

1. (with M. Hutchings) Invariance of cylindrical contact homology for dynamically convex contact forms, in preparation.
2. (with M. Hutchings) Equivariant cylindrical contact homology for hypertight contact forms, in preparation.
3. (with M. Hutchings) Axiomatic S^1 Morse-Bott theory, *arXiv:1711.09996*, 47 pages, submitted.
4. Automatic transversality for contact homology II: invariance and computations, *arXiv:1708.07220*, 65 pages, submitted.
5. (with K. Christianson)* Symplectic embeddings of 4-dimensional polydisks into balls, *Alg. & Geo. Top.* 18 (2018) 2151–2178.
6. (with L. Abbrescia, I. Huq-Kuruvilla, & N. Sultani)* Reeb dynamics of the link of the A_n singularity, *Involve* Vol. 10 (2017), No. 3, 417–442.
7. (with M. Hutchings) Cylindrical contact homology for dynamically convex contact forms in three dimensions, *J. Symp. Geom.* 14 (2016), No. 4, 983–1012.
8. From Dynamics to Contact and Symplectic Topology and Back, *The Institute for Advanced Study Newsletter, Summer 2016*.
9. Automatic transversality for contact homology I: regularity, *Abh. Math. Semin. Univ. Hambg.* 85 (2015), no. 2, 125–179.

* denotes supervised undergraduate research

TALKS

Lecture series

Northwestern University Geometry and Physics Seminar, Chicago, Fall 2017 (2 lectures)
ANR Contact Spectral Invariants Workshop, Houat, France, Summer 2017 (3 lectures)
Humboldt Universität Berlin, Oberseminar Geometrie, Summer 2016 (2 lectures)
University of Texas at Austin Geometry Seminar, Spring 2015 (3 lectures)
Simons Center Symplectic Seminar, Stony Brook, Spring 2014 (2 lectures)
Northeastern University, Boston, Fall 2013 (3 lectures)
Columbia University, Fall 2013 (2 lectures)
Philadelphia Area Contact Topology Seminar (PACT), Bryn Mawr, Fall 2013 (4 lectures)

Conference talks

Texas Topology and Geometry Conference, TCU, Fort Worth, TX (Spring 2019)
Modern Math Workshop, Research Session & IAS/PCMI representative (Fall 2018)
AMS Southeastern Sectional Meeting, University of Arkansas (Fall 2018)
Geometric structures on 3 and 4 Manifolds in Dubrovnik (Summer 2018)
Symplectic Dynamics Workshop, Seoul National University (Spring 2018)
Oberwolfach Dynamische Systeme Workshop, Germany (Summer 2017)
MAA Mathfest, Symplectic Topology Invited Session (Summer 2017)
AMS Northeastern Sectional Meeting, Hunter College (Spring 2017)
Workshop on Topology: Identifying Order in Complex Systems, Rutgers (Spring 2017)
AMS Southeastern Sectional Meeting, North Carolina State (Fall 2016)
Symplectic Field Theory VIII, Humboldt Universität Berlin (Summer 2016)
Symplectic geometry and topology conference for Dusa McDuff, ICMS (Summer 2016)

IHÉS Summer School on Moduli Problems in Symplectic Geometry (Summer 2015)
Georgia Topology Conference (Summer 2015)
Gökova Geometry and Topology Conference (Summer 2015)
Gökova Geometry and Topology Conference, evening expository talks (Summer 2015)
AWM Research Symposium, University of Maryland, College Park (Spring 2015)
AMS Eastern Sectional Meeting, Georgetown University (Spring 2015)
13th Graduate Topology & Geometry Conference, Young Faculty speaker (Spring 2015)
JMM, AMS Special Session on Geometries Defined by Differential Forms (January 2015)
American Institute for Mathematics Workshop on Contact Homology (Fall 2014)
JMM, AMS Special Session on Symplectic and Contact Manifolds (January 2014)
Simons Center, Graduate Workshop on Symplectic and Contact Topology (Fall 2012)
Polyfolds MIT-RTG workshop, Pajaro Dunes Resort, California (Summer 2012)
Université de Nantes, Symplectic and Contact Topology Summer School (Summer 2011)
AMS Eastern Sectional Meeting, Cornell (Fall 2011)

Colloquia

University of Wisconsin - Madison, April 2019
Northeastern University, January 2018
Rice University, January 2018
Notre Dame, January 2018
University of Melbourne, February 2018

International Seminar talks

Humboldt Universität Berlin, Seminar zur symplektischen Geometrie (Spring 2018)
Universität Augsburg, Oberseminar symplektische geometrie (Spring 2017)
Berlin-Hamburg Seminar zur symplektischen Geometrie (Spring 2017)
Ruhr-Universität Bochum, Oberseminar Dynamical Systems (Spring 2017)
Paris Symplectix Seminar, Jussieu (Fall 2014)
Ludwig-Maximilians-Universität München, Geometry Seminar (Summer 2012)
Korean Institute for Advanced Study, Geometry Seminar (Fall 2009)

Domestic Seminar talks

Princeton University and IAS Symplectic Seminar (Spring 2019)
Columbia University, Symplectic Geometry Seminar (Spring 2019)
UC Davis, Topology Seminar (Spring 2019)
University of Virginia, Topology Seminar (Fall 2018)
Rutgers, Geometry and Topology Seminar (Spring 2018)
Northern California Symplectic Geometry Seminar, Stanford University (Fall 2017)
Joint Georgia Tech and UGA Geometry and Topology Seminar (Spring 2017)
University of Pennsylvania, Deformation Theory Seminar (Spring 2017)
MIT, Topology and Geometry Seminar (Fall 2016)
Rutgers, Geometry and Topology Seminar (Fall 2016)
Triangle Topology Seminar, joint between Duke, UNC, and NC State (Fall 2016)
Duke, Geometry and Topology Seminar (Fall 2016)
Duke, Graduate/Faculty Seminar (Fall 2016)
Harvard, Gauge Theory and Symplectic Topology Seminar (Spring 2016)
UC Davis, Geometry Seminar (Fall 2015)
UC Davis, Student-Run Geometry/Topology Seminar (Fall 2015)
University of Virginia, Topology Seminar (Fall 2015)
IAS, Postdoc Talks (Fall 2015)

Columbia University, Reading group on contact and symplectic topology (Fall 2015)
 Barnard College, Columbia University, Perspectives in Mathematics (Fall 2015)
 Notre Dame, Geometry and Topology Seminar (Spring 2015)
 Bronx Community College, Research Seminar (Spring 2015)
 UIUC Symplectic Geometry Seminar (Spring 2015)
 Northern California Symplectic Geometry Seminar, UC Berkeley (Fall 2014)
 MIT, Topology and Geometry Seminar (Fall 2014)
 Columbia Undergraduate Math Seminar (Fall 2014)
 Harvard, Gauge Theory and Symplectic Topology seminar (Fall 2014)
 IAS, Postdoc Talks (Fall 2014)
 University of Rochester, New York, Geometry Seminar (Spring 2014)
 Princeton University and IAS Symplectic Seminar (Spring 2014)
 IAS, Postdoc Talks (Fall 2013)
 MIT, Symplectic Geometry Seminar (Spring 2013)
 University of Wisconsin - Madison, Geometry and Topology Seminar (Fall 2012)
 University of Texas at Austin, Geometry Seminar (Fall 2012)
 Columbia University, Symplectic Geometry Seminar (Spring 2012)
 MIT, Topology and Geometry Seminar (Spring 2011)
 University of Wisconsin Richland Center (Spring 2011)

ACADEMIC VISITS	University of California at Berkeley	Frequently since Fall 2013
	Institute for Advanced Study	March 10-24, 2019
	Humboldt Universität Berlin	May 14-24, 2018
	Universität Augsburg	May 23-28, 2017
	Humboldt Universität Berlin	May 16-22, 2017
	Institute for Advanced Study	February 16-17, 28 - March 3, 2017
	Humboldt Universität Berlin	January 18-24, 2017
	Ruhr-Universität Bochum	January 12-17, 2017
	IRMA, Université de Strasbourg	July 30 - August 3, 2016
	Institut des Hautes Études Scientifiques	July 5-18, 2015
	Université Pierre et Marie Curie	September 6-13, 2014
	Institute for Advanced Study	January 17-18 & July 1 - August 31, 2013
	Ludwig-Maximilians-Universität München	June 28 - July 6, 2012
	Institute for Advanced Study	May 14 - June 7, 2012
Simons Center for Geometry and Physics	April 7-8, 2011	
Korean National Institute for Mathematical Sciences	Fall 2009	

ACADEMIC EXPERIENCE	Rice University	
	Math 444/539: Geometric Topology	Fall 2018
	Math 212: Multivariable Calculus	Fall 2018
	Columbia University	
	Math 4081: Introduction to Differentiable Manifolds	Spring 2018
	Math 1201: Calculus III	Fall 2016 & 2017

ACADEMIC ADVISING	Supervision of Undergraduate Senior Honors Theses	Subsequent PhD candidacy	
	Theodore Coyne	Columbia University (2018)	UC Berkeley
	Sara Edelman-Muñoz	Barnard College (2018)	Rice University

Ph.D. Thesis Committee Member

Saraswathi Venkatesh (advisor: M. Abouzaid), Columbia University

March 2018

Summer Research Experience for Undergraduates at Columbia University

Arithmetic Invariants of Knots (with I. Varma), 2018

Teresa Brown	Columbia University
Quang Dao	Columbia University
Mariya Delyakova	Columbia University
Lucas Furtado	Columbia University
Myeonhu Kim	Columbia University
Evan Wickenden	Columbia University

Symplectic Packings and Embeddings, 2017

Theodore Coyne	Columbia University
Sara Edelman-Muñoz	Barnard College
Greyson Potter	Columbia University
Chunying Hungdai	Barnard College

Subsequent PhD candidacy

UC Berkeley
Rice University
Boston University

Obstructions of Symplectic Embeddings, 2016

Katherine Christianson	Columbia University
Irit Huq-Kuruvilla	Columbia University
Greyson Potter	Columbia University
Rox Sayde	Barnard College
Elizabeth Yoo	Columbia University

Subsequent PhD candidacy

NSF GRF UC Berkeley
NSF GRF UC Berkeley
Boston University
Northwestern University
Princeton University ORFE

Obstructions of Symplectic Embeddings, 2015

Katherine Christianson	Columbia University
Irit Huq-Kuruvilla	Columbia University
Nawaz Sultani	Columbia University

Subsequent PhD candidacy

NSF GRF UC Berkeley
NSF GRF UC Berkeley
University of Michigan

Reeb dynamics on the link of the A_n -singularities, 2014

Leonardo Abbrescia	Columbia University
Irit Huq-Kuruvilla	Columbia University
Nawaz Sultani	Columbia University

Subsequent PhD candidacy

NSF GRF Michigan State
NSF GRF UC Berkeley
University of Michigan

OUTREACH & MENTORING

Mathematical Mentoring Program, Rice University 2018-
Started and coordinated a mentoring program with Dr. Allison Miller between prospective majors, current math majors, and graduate students.

Mathematical Perspectives for Prospective Majors, Rice University 2018-
Organized events to advertise the mathematics major to women and underrepresented minorities.

Math Alliance Mentoring 2016-
Mentor for the Facilitated Graduate Applications Process (F-GAP)

AWM Chapter at Barnard College and Columbia University 2016-2018
Faculty advisor and mentoring program coordinator

Institute for Advanced Study, Women and Mathematics Program Spring 2016
Organized a panel discussion highlighting various careers in mathematics.

Institute for Advanced Study, Women and Mathematics Program Spring 2015
Co-organizer for the research seminar during the program, Aspects of Algebraic Geometry.
Organized a panel discussion highlighting various careers in mathematics.

Math Night, Robert E. Willett Elementary School Spring 2015
Volunteered as a math expert for an evening of math fun for local elementary schoolers.

Julia Robinson Math Festival, Princeton University Spring 2015
Co-Organizer of a day long event which explores mathematics through activities that encourage collaborative, creative problem-solving.

Sonya Kovalevsky Day, Barnard College November 21, 2014
Organized and led the one-hour workshop, "Baller geometry: when the shortest path isn't a straight line" for thirty 10th grade female students from the Urban Assembly Schools.

Upper Freehold Regional School District, New Jersey October 28, 2014
Keynote speaker for Allentown High Math and Science Honor Society Induction.

Julia Robinson Math Festival, Princeton University Spring 2014
Co-Organized the first Princeton area Julia Robinson Math festival on May 9, 2014.

The Urban Assembly School for Wildlife Conservation, the Bronx Fall 2013
Discussed careers in mathematics with small groups of 8-12th graders, developed classroom activities with the 9-12th grade math teachers, and volunteered as a teacher's aide.

Upper Freehold Regional School District, New Jersey November 21, 2013
Keynote speaker for Allentown High School World Language Honor Society Induction ceremony: "How language enriches your life and career."

Institute for Advanced Study, Women and Mathematics Program Spring 2012
Teaching assistant for the mini-course, From Linear Algebra to the Non-Squeezing Theorem of Symplectic Geometry as part of the program, 21st Century Geometry.

Camp Euclid Summer 2012
Mentored an online 8-week mathematics research program for middle and high schoolers.

Girl Scout Math Whiz Badge Session May 2010
Organized and designed a day long activity enabling local 3rd and 4th grade Girl Scouts to earn their 'Math Whiz' badge.

PROFESSIONAL
ACTIVITIES &
INFORMATION

Conferences, Workshops, and Summer Schools Organized

New advances in symplectic and contact topology

AWM Research Symposium Special Session, Rice University, April 8-9, 2019
Joint with Morgan Weiler

Facets of Symplectic Topology

AMS Eastern Meeting Special Session, Northeastern University, April 21-22, 2018
Joint with Tara Holm & Jonathan Weitsman

Augmentations and Legendrians at the IAS

IAS Workshop, February 11-12, 2016

Moduli Problems in Symplectic Geometry

IHÉS Summer School, July 6-17, 2015

Chair of organizational committee, with D. Cristofaro-Gardiner and J.W. Fish.

Transversality in Contact Homology

American Institute of Mathematics Research Workshop, December 8-12, 2014

Joint with J.W. Fish, M. Hutchings, and K. Wehrheim

Seventh Annual Graduate Student Topology and Geometry Conference

University of Wisconsin - Madison, April 18-19, 2009

Joint with 3 other graduate students

Service to the Rice University Mathematics Department

2018- Diversity Committee

2018- Colloquium Committee, chair

2018- Graduate Student Admissions

2018- Evans Instructor Hiring Committee

2018- Topology Seminar

Past seminar organization

Symplectic Geometry, Gauge Theory, and Categorification Seminar 2013, 2017-18
Columbia University

Joint Columbia and IAS symplectic seminar 2014-2016
Bi-semesterly meetings alternating between IAS and Columbia

Joint Princeton and IAS symplectic seminar 2014-2016

Working seminar in contact and symplectic topology Spring 2014
Simons Center for Geometry and Topology, Stony Brook

Foundations of contact homology working seminar Fall 2013
Columbia University

Women in Mathematics at Wisconsin 2009-2013
University of Wisconsin - Madison

Information of Potential Interest

Languages: English (native), deutsch (nicht schlecht), français (un peu)

Member: American Mathematical Society, Association for Women in Mathematics

Referee: Annals of Mathematics, Advances in Mathematics, IMRN, Inventiones Mathematicae, Journal of Differential Geometry, Journal of Topology, MathSciNet, AMS GSM textbook series