Jo Nelson

PERSONAL INFORMATION	Rice University Department of Mathematics	jo.nelson@rice.edu http://www.math.rice.edu/~jkn3

<small>RESEARCH INTERESTS</small> Symplectic and contact geometry and topology, singularity theory, and their interactions; various flavors of Floer, symplectic, and contact homology; symplectic dynamics

<small>EMPLOYMENT</small>

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

<small>VISITING APPOINTMENTS</small>

Simons Center for Geometry and Physics, Stony Brook
 Visiting Assistant Professor, Spring 2014

Institute for Advanced Study
 Visitor, 2013-2014

<small>EDUCATION</small>

University of Wisconsin - Madison, USA
Ph.D. in Mathematics, August 2013
- Dissertation: *Applications of automatic transversality in contact homology*
- 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

<small>HONORS & AWARDS</small>

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, 2013
European Science Foundation - Short Travel Grant CAST, 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

1. (with M. Weiler) Embedded contact homology of Seifert Fiber Spaces, in preparation.

2. (with M. Hutchings) Invariance and an integral lift of cylindrical contact homology for dynamically convex contact forms, in preparation.

3. (with M. Hutchings) S^1-equivariant cylindrical contact homology for hypertight contact forms, arXiv:1906.03457, 88 pages, submitted.

4. (with M. Hutchings) Axiomatic S^1 Morse-Bott theory, arXiv:1711.09996, 48 pages, *To appear in Alg. Geom. Topol.*

5. Automatic transversality for contact homology II: filtrations and computations, *Proc. Lon. Math. Soc.* Vol. 120, 6 (2020), 853–917.

6. (with K. Christianson) Symplectic embeddings of 4-dimensional polydisks into balls, *Alg. & Geo. Top.* 18 (2018) 2151–2178. (REU)

7. (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. (REU)

8. (with M. Hutchings) Cylindrical contact homology for dynamically convex contact forms in three dimensions, *J. Symp. Geom.* 14 (2016), No. 4, 983–1012.

9. From Dynamics to Contact and Symplectic Topology and Back, *The Institute for Advanced Study Newsletter, Summer 2016.*

10. Automatic transversality for contact homology I: regularity, *Abh. Math. Semin. Univ. Hambg.* 85 (2015), no. 2, 125-179.

ACADEMIC
VISITS

University of California at Berkeley	January 5-11, 2020
Instituto de Matemática Pura e Aplicada, Rio de Janeiro	August 4-31, 2019
Humboldt Universität Berlin, Germany	June 7-17, 2019
Institute for Advanced Study, Princeton	March 10-24, 2019
University of California at Berkeley	January 8-13, 2019
Humboldt Universität Berlin, Germany	May 14-24, 2018
Universität Augsburg, Germany	May 23-28, 2017
Humboldt Universität Berlin, Germany	May 16-22, 2017
Institute for Advanced Study, Princeton	February 28 - March 3, 2017
Humboldt Universität Berlin, Germany	January 18-24, 2017
Ruhr-Universität Bochum, Germany	January 12-17, 2017
IRMA, Université de Strasbourg, France	July 30 - August 3, 2016
University of California at Berkeley	November 9-13, 2015
Institut des Hautes Études Scientifiques, France	July 5-18, 2015
University of California at Berkeley	May 6-13, 2015
University of California at Berkeley	December 1-5, 2014
University of California at Berkeley	October 6-10, 2014
Université Pierre et Marie Curie, France	September 6-13, 2014
University of California at Berkeley	December 2-6, 2013
Institute for Advanced Study, Princeton	July 1 - August 31, 2013
Institute for Advanced Study, Princeton	January 17-18, 2013
Ludwig-Maximilians-Universität München, Germany	June 28 - July 6, 2012
Institute for Advanced Study, Princeton	May 14 - June 7, 2012
Simons Center for Geometry and Physics, Stony Brook	April 7-8, 2011
Korean National Institute for Mathematical Sciences, Seoul	Fall 2009

Lecture series

School on Symplectic Topology, IMPA, Brazil, August 2019 (2 lectures)
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)

Conferences

Annual Conference on Geometric Analysis at Rutgers University (May 2020)
IPAM-UCLA Geometry and Topology Workshop (January 2020)
Conference on Symplectic Topology, IMPA, Brazil (August 2019)
Midwest Topology Seminar, Michigan State University (May 2019)
Texas Topology and Geometry Conference, TCU, Fort Worth, TX (February 2019)
Modern Math Workshop, Research Session & IAS/PCMI representative (October 2018)
AMS Southeastern Sectional Meeting, University of Arkansas (November 2018)
Geometric structures on 3 and 4 Manifolds in Dubrovnik (June 2018)
Symplectic Dynamics Workshop, Seoul National University (February 2018)
Oberwolfach Dynamische Systeme Workshop, Germany (July 2017)
MAA Mathfest, Symplectic Topology Invited Session (August 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 (August 2016)
Symplectic geometry and topology conference for Dusa McDuff, ICMS (July 2016)
IHÉS Summer School on Moduli Problems in Symplectic Geometry (July 2015)
Georgia Topology Conference (May 2015)
Gökova Geometry and Topology Conference (May 2015)
Gökova Geometry and Topology Conference, evening expository talks (May 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 (December 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 Louisiana - Lafayette, Fall 2019
University of Wisconsin - Madison, April 2019
IAS Mathematical Conversations, March 2019
University of Melbourne, February 2018
Northeastern University, January 2018
Rice University, January 2018

Notre Dame, January 2018
Duke, December 2016

International Seminars

Instituto Superior Técnico Lisboa, Geometria Seminar (Summer 2019)
Berlin-Hamburg Seminar zur symplektischen Geometrie (Summer 2019)
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 Seminars

IAS Symplectic Dynamics and 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, 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 Undergrad 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 EXPERIENCE	**Rice University**	
	Math 444/539: Geometric Topology	Fall 2018 & 2019
	Math 401: Curves and Surfaces	Fall 2019
	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 PhD Theses   Subsequent position

Leo DiGiosia   (in progress)   Rice University

Supervision of Junior Researchers   Subsequent position

Morgan Weiler   2019-   Rice University

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   Subsequent PhD candidacy

Teresa Brown	Columbia University	
Quang Dao	Columbia University	
Mariya Delyakova	Columbia University	
Lucas Furtado	Columbia University	
Myeonhu Kim	Columbia University	
Evan Wickenden	Columbia University	UC Boulder Physics (theory)

Symplectic Packings and Embeddings, 2017   Subsequent PhD candidacy

Theodore Coyne	Columbia University	UC Berkeley
Sara Edelman-Muñoz	Barnard College	Rice University
Greyson Potter	Columbia University	Boston University
Chunying Hungdai	Barnard College	

Obstructions of Symplectic Embeddings, 2016   Subsequent PhD candidacy

Katherine Christianson	Columbia University	NSF GRF UC Berkeley
Irit Huq-Kuruvilla	Columbia University	NSF GRF UC Berkeley
Greyson Potter	Columbia University	Boston University
Rox Sayde	Barnard College	Northwestern University
Elizabeth Yoo	Columbia University	Princeton University ORFE

Obstructions of Symplectic Embeddings, 2015   Subsequent PhD candidacy

Katherine Christianson	Columbia University	NSF GRF UC Berkeley
Irit Huq-Kuruvilla	Columbia University	NSF GRF UC Berkeley
Nawaz Sultani	Columbia University	University of Michigan

Reeb dynamics on the link of the A_n-singularities, 2014   Subsequent PhD candidacy

Leonardo Abbrescia	Columbia University	NSF GRF Michigan State
Irit Huq-Kuruvilla	Columbia University	NSF GRF UC Berkeley
Nawaz Sultani	Columbia University	University of Michigan

OUTREACH & MENTORING	**Horizons in Mathematics**, Rice University	2018-

Horizons in Mathematics, Rice University   2018-
Founded a colloquium series with Dr. Allison Miller to bring outstanding mathematicians from traditionally under-represented backgrounds to Rice University.
https://sites.google.com/view/anmiller/horizons

Mathematical Perspectives for Prospective Majors, Rice University   2018-2019
Organized events to advertise the mathematics major and minor.

Math Alliance Mentor, Facilitated Graduate Applications Process (F-GAP)   2016-2018

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
Organized the career panel discussion and research seminar talks.

Math Night, Robert E. Willett Elementary School, Volunteer   Spring 2015

Julia Robinson Math Festival, Princeton University, Co-Organizer   Spring 2015

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, Co-Organizer   Spring 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 for local 3rd and 4th grade Girl Scouts.

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<tr><td>P<small>ROFESSIONAL</small>
A<small>CTIVITIES</small></td><td>

Conferences, Workshops, and Summer Schools Organized

Dubrovnik 2020: Holomorphic curves and low dimensional topology,   June 22-26, 2020
     Inter-University Center, Croatia with T. Mark, G. Matic, and A. Wand

New advances in symplectic and contact topology, with M. Weiler   April 8-9, 2019
     AWM Research Symposium Special Session, Rice University

Facets of Symplectic Topology, with T. Holm and J. Weitsman   April 21-22, 2018
     AMS Eastern Meeting Special Session, Northeastern University

Augmentations and Legendrians at the IAS   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   December 8-12, 2014
     AIM Research Workshop, with J.W. Fish, M. Hutchings, and K. Wehrheim

Seventh Annual Graduate Student Topology and Geometry Conference   April 18-19, 2009
     University of Wisconsin - Madison, with N. Addington, T.-S. Lien, M. Childers
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Past seminar organization

Symplectic Geometry and Gauge Theory Seminar, Columbia University	2017-18
Joint Columbia and IAS symplectic seminar	2014-2016
Joint Princeton and IAS symplectic seminar	2014-2016
Working seminar in contact and symplectic topology, Simons Center	Spring 2014
Foundations of contact homology working seminar, Columbia University	Fall 2013
Symplectic Geometry and Gauge Theory Seminar, Columbia University	Fall 2013
Women in Mathematics at Wisconsin, UW Madison	2009-2013

Information of Potential Interest
Member: American Mathematical Society, Association for Women in Mathematics
Languages: English (native), deutsch (nicht schlecht), français (un peu)

S<small>ERVICE</small>

International Service to the Mathematics Community
Trustee: Association of Members of the Institute for Advanced Study (AMIAS) 2019-2021

Grant Evaluator: German-Israeli Foundation for Scientific Research and Development

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

National Service to the Mathematics Community
Panelist: National Science Foundation

Service to the Rice University Mathematics Department

2018-2020	Graduate Student Admissions Committee
2018-2020	Diversity Committee
2018-2020	Topology Qualifying Exam
2018-2019	Colloquium Committee, chair
2018-2019	Evans Instructor Hiring
2018-2019	Topology Seminar