

# Curriculum Vitae

**Rachel Levanger**

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## Education

Rutgers State University of New Jersey	Mathematics	Ph.D. (2017)
University of North Florida	Mathematics & Art History	B.A. 2012

## Appointments and Employment

Graduate Assistant, Advisor: Prof. K. Mischaikow, Rutgers University	Spring 2017
NSF EAPSI Fellow, Advisor: Prof. T. Ishihara, Nagoya University	Summer 2016
Graduate Assistant, Advisor: Prof. K. Mischaikow, Rutgers University	Fall 2015 – Spring 2016
Graduate Student Coordinator, DIMACS REU	Summer 2014
Statistical Data Analyst Intern, Fidelity National Financial	Summer 2012
Business Systems Analyst, Fidelity National Financial	2005 - 2011
Business Systems Analyst, Wells Fargo Services Company	2001 - 2005

## Awards & Fellowships

Janice Pattwell Annual Mathematics Fellowship <i>Rutgers University, Department of Mathematics</i>	2013 - 2014
University Diversity Fellowship <i>Rutgers University Graduate School of Arts and Sciences</i>	2013 - 2015
Outstanding Undergraduate Student in Mathematics <i>University of North Florida Mathematics &amp; Statistics Department</i>	Apr 2012
Student Speaker Award <i>Pi Mu Epsilon National Meeting at MathFest 2011, Lexington, KY.</i>	Aug 2011
Undergraduate Scholarships for Analysis & Probability <i>University of North Florida Mathematics &amp; Statistics Department</i>	May 2011
UNF College of Arts & Sciences, Willard O. Ash Award <i>Award recognizing a senior who embodies Dean Ash's philosophy of a broad-based education in the liberal arts and sciences.</i>	Nov 2010

## Publications

- An adaptive subsample approximation for large Vietoris-Rips Filtrations (with S. Harker, M. Kramar, and K. Mischaikow) *in preparation*.
- A Comparison Framework for Interleaved Persistence Modules (with S. Harker, M. Kramar, and K. Mischaikow) *in preparation*.
- Analysis of Kolmogorov Flow and Rayleigh-Bénard Convection using Persistent Homology (with M. Kramar, J. Tithof, B. Suri, M. Xu, M. Paul, M. Schatz, and K. Mischaikow), *Physica D: Nonlinear Phenomena*, 334, 82-98 (2016)
- On singular value inequalities for matrix means (with R. Dumitru and B. Visinescu), *Linear Algebra and its Applications*, 439(8), 2405-2410 (2013)

## Selected Talks

A Comparison Framework for Interleaved Persistence Modules. <i>Joint Mathematics Meeting, Atlanta, GA.</i>	Jan. 4, 2017
A Comparison Framework for Interleaved Persistence Modules. <i>Union College Mathematics Conference, Union College.</i>	Dec. 3, 2016
New applications of persistent homology to image and time series analysis, <i>Applied topology seminar, University of Pennsylvania</i>	Nov. 15, 2016
Tracking Errors in the space of Persistence Diagrams, <i>Patterns and Waves 2016,</i> <i>Hokkaido University, Sapporo, Japan</i>	Aug. 1-5, 2016
Recent Developments in Topological Data Analysis, <i>High-Dimensional Data</i> <i>Analysis (HDDA VI), Fields Institute, Toronto</i>	May 25-27, 2016
A Comparison Framework for Interleaved Persistence Modules. <i>Applied topology seminar, University of Pennsylvania.</i>	Apr. 11, 2016
Auslander-Reiten Quivers of finite-dimensional algebras. <i>Algebra seminar, Rutgers University.</i>	Mar. 23, 2016
Generalizations of the induced matching and algebraic stability theorems. <i>MacPherson seminar, Institute for Advanced Study.</i>	Mar. 10, 2016
Dynamics of 2D fluid simulations through persistent homology. <i>Applied topology seminar, Columbia Medical University.</i>	Oct. 23, 2015
Using Persistent Homology to study dynamics in the space of persistence diagrams, Parts I & II. <i>Algebraic Topology &amp; High-Dimensional Data Analysis</i> <i>(HDDA V), University of Victoria, Victoria, BC</i>	Aug. 17-28, 2015
Bent out of Shape: Taking a look at Perturbed Eigenvalues <i>Florida MAA Conference Student Speaker, University of North Florida</i>	Feb. 18, 2012
Imagining the Banach-Tarski Paradox <i>Student Speaker, Pi Mu Epsilon National Meeting at MathFest 2011</i>	Aug. 4, 2011

## Service

Co-organizer for New York Applied Topology seminar, <i>Columbia University Medical Center</i>	Fall 2015 – Spring 2016
Co-organizer for AMS Special Session on Topological Data Analysis: Computations, Statistics and Applications, <i>Rutgers University</i>	Nov. 2015
Directed Reading Program, <i>Rutgers University</i>	Fall 2014 – Spring 2016
Pi Mu Epsilon Florida Eta Chapter, <i>President</i>	2011 - 2012
Pi Mu Epsilon Florida Eta Chapter, <i>Vice President</i>	2011

## Teaching

TA for Calculus III, Rutgers University	Fall 2016
Instructor for Graph Algorithms, RYSP, Rutgers University	Summer 2015
Mentor, DIMACS REU	Summer 2015
TA for Calculus II for Math/Science Majors, Rutgers University	Fall 2014

## **Programming and Technical Experience**

Programming: Python, shell scripting, MATLAB, Mathematica, Maple, R, JavaScript, D3, SQL, and C++.  
Data modeling experience with relational databases and domain models (UML).

OS and other: Mac OS X, and Linux environments. Microsoft Office Suite (Excel, Word, Access, Visio).  
Experience running distributed computations in HPC environments.

## **References**

Konstantin Mischaikow, Rutgers University

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Michael Schatz, Georgia Tech

[ms201@gatech.edu](mailto:ms201@gatech.edu)

Miroslav Kramar, Tohoku University

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Charles Weibel, Rutgers University

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