

# MELINDA LANIUS

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## EDUCATION

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*University of Illinois at Urbana-Champaign, Urbana, IL*  
Ph.D., Mathematics, in progress, advised by Pierre Albin, target completion: August 2018  
M.S., Mathematics, 2014

*Wellesley College, Wellesley, MA*  
B.A., Honors Mathematics, magna cum laude 2012

## PREPRINTS AND PUBLICATIONS

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### DIFFERENTIAL GEOMETRY

*“Rigged algebroids and A-Poisson cohomology.”*

Ralph L. Klaasse and Melinda Lanius. In preparation.

*“A classification of star log symplectic structures on a compact oriented surface.”*

Melinda Lanius. Submitted. arXiv preprint arXiv:1705.01793 (2017).

*“Poisson cohomology of a class of log symplectic manifolds.”*

Melinda Lanius. Submitted. arXiv preprint arXiv:1605.03854 (2016).

*“Symplectic, poisson, and contact geometry on scattering manifolds.”*

Melinda Lanius. Submitted. arXiv preprint arXiv:1603.02994 (2016).

### ANALYTIC NUMBER THEORY

*“Pair correlation of fractional parts derived from rational valued sequences, II.”*

Sneha Chaubey, Melinda Lanius, Alexandru Zaharescu. J. Number Theory 158 (2016), 151-164.

*“Pair correlation of fractional parts derived from rational valued sequences.”*

Sneha Chaubey, Melinda Lanius, Alexandru Zaharescu. J. Number Theory 151 (2015), 147-158.

*“Irrational factor races.”*

Sneha Chaubey, Melinda Lanius, Alexandru Zaharescu. Proc. Indian Acad. Sci., Math. Sci. 124 (2014), no. 4, 471-479.

## WRITING CONTRIBUTIONS TO THE PROFESSION

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*“Interview with Reinhard Laubenbacher.”*

Melinda Lanius. Notices of the American Mathematical Society 64.5 (2017): 456 - 460.

*“Interview with Lucas Sabalka.”*

Melinda Lanius. Notices of the American Mathematical Society 64.6 (2017): 576 - 579.

*“Interview with Sharon Arroyo.”*

Melinda Lanius. Notices of the American Mathematical Society, January 2018.

*“Interview with Kathryn Hess.”*

Melinda Lanius. Notices of the American Mathematical Society, March 2018.

## SELECT PRESENTATIONS

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### INVITED TALKS

Purdue University, Scattering and Spectral Theory Seminar	January 24, 2018
University of Notre Dame, Geometry Seminar	January 22, 2018
Wellesley College, Mathematics Department Colloquium	November 14, 2017
“Poisson cohomology of minimally degenerate Poisson structures” PRIMA Conference in Oaxaca, Mexico	August 17, 2017
“Scattering-symplectic geometry” The Fields Institute, Conference on Poisson Geometry and Stacks	August 1, 2017
“Rescaled tangent bundles in Poisson geometry ” BIRS-CMO Workshop: Geometric and Spectral Methods in P.D.E.s	December 16, 2016
“3 Weird Tricks Using The Determinant!” University of Illinois, Graduate Student Colloquium	November 2, 2016
“Computing Poisson cohomology” Utrecht University, Friday Fish Seminar	October 7, 2016

### OTHER TALKS

Gone Fishing: Poisson Geometry Meeting, University of Notre Dame	May 7, 2017
Graduate Student Topology and Geometry Conference, Michigan State	April 8, 2017
Graduate Student Geometry and Topology Conference, Indiana University	April 2, 2016
Gone Fishing: Poisson Geometry Meeting, University of Colorado	March 11, 2016

### POSTERS

AWM Workshop Poster Session, Joint Math Meetings, Atlanta	January 6, 2017
MAA Poster Session: <i>Mathematical outreach programs</i>	January 5, 2017
“ $\mathcal{A}$ -Symplectic Geometry” Poisson 2016, ETH Zurich	July 5, 2016

## SELECT WORKSHOPS & SUMMER SCHOOLS ATTENDED

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Geometric and Spectral Methods in P.D.E.s, Casa Matemática Oaxaca	December 2016
Developments in Contact and Symplectic Topology, University of Glasgow	June 2016
Summer School on Poisson Geometry, University of Geneva	July 2016
Summer School on Spectral Geometry, University of Göttingen	September 2014

## FELLOWSHIPS, GRANTS, AND AWARDS

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U of I Graduate College Dissertation Completion Fellowship (\$20,000)	2017 - 2018
Wolfgang Haken Prize in Geometry and Topology	2017 - 2018
Brahana TA Instructional Award (\$500)	2017
Honorable Mention (\$100) and People’s Choice Award (\$100), Image of Research <i>A contest sponsored by Scholarly Commons and the Graduate College at the University of Illinois. Graduate and professional students are invited to submit entries consisting of an image and brief text that articulates how the image relates to the research.</i>	2017

## GRANTS FOR SUMMER ILLINOIS MATH CAMP

Public Engagement Grant (PI, \$1,000), University of Illinois Public Engagement 2016  
Dolciani Math Enrichment Grant (Coauthor, \$6,000), MAA 2016

## TEACHING

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*Teaching Assistant, University of Illinois at Urbana-Champaign* Fall 2012 - Spring 2017

*A star (\*) indicates I was ranked excellent or outstanding by student course evaluations.*

*A (#) indicates the number of students enrolled in my course.*

*A (#;#) indicates I had two sections with enrollment numbers for both.*

### RECITATION/DISCUSSION SECTIONS

I prefer to teach in an activity based format, aiming for students to learn in small groups through guided exploration with questions or activities I have prepared.

My recitation sections met weekly and complemented a large lecture. Merit recitation indicates a special program focused on recruiting and retaining under-represented students in mathematics.

Precalculus (Math 115), merit recitation	Fall 2013 (24; 21), Spring 2014* (17) Fall 2015* (21; 15), Fall 2016* (24)
Calculus (Math 220), merit recitation	Fall 2014* (22)
Business Calculus (Math 234), recitation	Spring 2013* (33; 32)
Calculus II (Math 231), recitation	Fall 2012* (24; 27)

### INSTRUCTOR

Finite Mathematics (Math 124) Spring 2017\* (25; 26)

I taught this course in a blended format: part of the content was delivered via lecture and in person discussion, part was delivered online in videos and interactive platform Piazza.

### COURSE TUTOR

Introduction to Differential Equations (Math 285) Spring 2014 (77; 77)

I ran a 2 hour long tutor room 3 times a week to assist students in the course: understanding content, completing homework assignments, and preparing for exams. Depending on attendance, I encouraged students to work together in small groups.

### *Large lecture experience, University of Illinois at Urbana-Champaign*

While the instructor of record was away, I prepared and delivered a series of hour long lectures for students in lecture halls requiring I wear a microphone.

Preparation for Calculus (Math 115),	Spring 2014 (89), Fall 2015 (214; 143) Fall 2016 (169; 188)
Business calculus (Math 234),	Spring 2015 (241; 198; 224)

## TEACHING SERVICE

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*Text book editor and contributor* Summer 2017

I edited and added content to the activity packet for “Methods of Finite Mathematics” by Brown and Sherbert (the text book and activity packet are bound together and made available to students for purchase). I updated 120 pages by adding additional exposition and figures. I contributed 3 new sections (4 pages) of original content covering fractions, decimals, and Gaussian elimination.

*Teaching mentor* Spring 2016, Fall 2016

I participated in a teaching training program for graduate students who have little teaching experience. I worked with 2 teachers (one Pre-calculus, one Calculus I): I demonstrated good teaching practice by co-teaching their course 3 or 4 times throughout the semester. Following the co-teach, we would meet to discuss what worked well and what to change moving forward.

*Undergraduate Adviser* Summers 2014, 2015, 2016, & 2017

Over the course of 4 summers, I recruited more than 300 talented incoming freshman into a program focusing on retaining underrepresented populations in science, technology, engineering, and mathematics. I met with students in short one-on-one meetings, discussing their math background and career aspirations. I'd conclude the session with a math course recommendation.

*Founder and Lead Organizer, Teaching Assistant Training* Summers 2016 & 2017

In conjunction with one graduate student, the assistant chair, and the chair of the mathematics department, I organized a 2 day workshop for the 120+ mathematics teaching assistant work force. We developed content and themes, invited outside experts to lead sessions, and managed logistics such as food and venues.

## OUTREACH

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### LEADERSHIP POSITIONS

*Outreach activity development* Summer 2017

I created a 35 page activity book for pre K-12<sup>th</sup> grade students to be used in the Fall 2017 4-Color Fest math carnival at the university of Illinois.

Available here: [math.illinois.edu/~lanius2/LaniusPoster.pdf](http://math.illinois.edu/~lanius2/LaniusPoster.pdf)

*Outreach Manager, Illinois Geometry Lab* 2016 - 2017

I trained a team of 4 graduate students to assist in facilitating an hour-long hands-on activity I'd developed for K12 students. With the help of my team, in Spring 2017 I led the following groups through the classification of regular tilings on the plane:

17 tenth graders from Rantoul Township High School, Rantoul, IL

22 third graders from Stratton Elementary School, Champaign, IL

28 tenth graders at University of Illinois Laboratory High School, Urbana, IL

*Assistant director and Instructor, Summer Illinois Math Camp* Summers 2015 & 2016

With a team of 5 graduate students, I founded and organized a week long day camp for mathematically talented local high school and middle school students hosted at the University of Illinois at Urbana-Champaign Department of Mathematics. In 2015, we had 23 rising 9th - 12th graders. In 2016 I supervised 2 undergraduate teaching assistants. We taught 21 rising 8th-9th graders and 19 rising 9th - 12th graders.

## EVENTS ORGANIZED

### *Sonia Math Day*

2015 - 2017

Full day program for high school girls provided by the University of Illinois at Urbana-Champaign student chapter of the Association for Women in Mathematics. Themes included: “Games on Surfaces”, “Logic in Wonderland: Discovering Mathematical Logic”, and “Mathematical Paradoxes”. I typically organize and manage a team of 10 undergrad and grad student teaching assistants, with a post doctorate or early-career faculty as a guest instructor. In the 2016 - 2017 academic year we hosted 35 girls in grades 8 through 12.

### *Math Carnivals: ‘Gathering for Gardner’, ‘Pi Day’, & ‘4-color Fest’*

2014 - 2017

A series of annual math carnivals celebrating recreational mathematics and fun math puzzles, sponsored by the Department of Mathematics at the University of Illinois. I developed and co-organized these events with a math Professor Philipp Hieronymi.

For the Spring 2017 event, I trained and managed a team of 20 undergrad and grad students. In small groups, these helpers staffed 9 booths such as *Magical Wonders and Secrets* where visitors could watch and learn rope tricks (topology), *Riddle Mania* where kids worked through boat crossing puzzles with farm animal figurines (logic), or *Tile Emporium* where folks arranged various combinations of tiles (geometry). We estimate that between 750 and 1000 people from the community attended.

## UNIVERSITY SERVICE

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### *Graduate Student Topology and Geometry Conference*

Spring 2015

I assisted in writing the grant application to fund, as well as helped run, this 13th annual conference with 200 participants at the University of Illinois.

### *Student chapter officer, Association for Women in Math*

Summer 2015 - Spring 2017

Social chair (2015 - 2016): I organized community events such as bi-weekly coffee and holiday parties. I organized a mentoring program pairing in-coming graduate students with an older graduate student mentor.

Outreach chair (2016 - 2017): I cataloged past outreach initiatives to establish an institutional memory for our program.

## PROFESSIONAL MEMBERSHIPS

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Member, Association for Women in Mathematics (AWM)

Member, American Mathematical Society (AMS)