

Melody A.H. Molander

CONTACT INFORMATION

mmolander@math.ou.edu
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EDUCATION

University of Oklahoma
Ph.D Mathematics (in progress)

August 2014 - present

University of California, Davis
B.S. Mathematics

September 2010 - June 2014

RESEARCH INTERESTS

Differential Geometry, Lie Theory, Riemannian Geometry, Representation Theory

TEACHING EXPERIENCE

Teaching Assistant
MATH 2924 - Calculus 2
University of Oklahoma

Spring 2016

Teaching Assistant
MATH 1923 - Calculus 1
University of Oklahoma

Fall 2015

Instructor
MATH 1503 - College Algebra
University of Oklahoma

Summer 2015

Instructor
MATH 1503 - College Algebra
University of Oklahoma

Spring 2015

Instructor
MATH 1503 - College Algebra
University of Oklahoma

Fall 2014

RESEARCH EXPERIENCE

Research Assistant
University of California, Davis
Matrix completion algorithms using Semi-Definite Programming and Optimization methods to solve Sudoku and Shidoku expanded sparse matrices. Compressed sensing and algebraic statistics for ranking algorithms and fair division for voting systems. Use Kemeny ranking to predict how often preference voting and majority voting result in different winners. Funded through REU program.
Advisor: Jesus De Loera, Professor of Mathematics at UC Davis

September 2012 - June 2014

Research Assistant
University of California, Davis
Studied Fluid mechanics and shallow water equations and how to more accurately model shallow water. Funded through REU program.
Advisor: Mark Rummel, Lecturer of Mathematics at UC Davis

June 2012 - August 2012

Research Assistant
University of California, Davis
Algebraic combinatorics and the diameter of simplicial complexes. Created a program in GAP to find the shortest path between two nodes of a simplicial complex in 2-dimensions. Final program was used in De Loera's published paper on the bounds of any path between two nodes of a simplicial complex in n-dimensions.
Advisor: Jesus De Loera, Professor of Mathematics at UC Davis

September 2011 - March 2012

WORK EXPERIENCE	Tutor Mathematics Department University of Oklahoma Tutor university students in College Algebra, Trigonometry, Business Calculus and Calculus 1 - 4	August 2014 - present
	Reader Mathematics Department University of California, Davis Grade and critic homework sets for courses in abstract algebra	August 2013 - June 2014
	Tutor Student Academic Success Center University of California, Davis Tutor college students in Real Analysis and Calculus	August 2013 - June 2014
CONFERENCES	TORAS, Co-Organizer Texas-Oklahoma Representation Theory and Automorphic Forms for Students University of Oklahoma	March 2015
	Undergraduate Research Conference, Student Poster Session University of California, Davis <i>Comparing Voting Systems Using Kemeny Rankings</i>	April 2014
	MAA Golden Section Meeting, Student Poster Session Sonoma State University <i>Comparing Voting Systems Using Kemeny Rankings</i>	February 2014
PRESENTATIONS	<i>An Introduction to Hyperbolic Metric Spaces</i> Student Topology/Geometry Seminar University of Oklahoma	February 2016
	<i>Fractals and the World Around Us</i> (with Dr. Jeffrey Meyer) Math Day Fun Session University of Oklahoma	November 2015
	<i>An Introduction to Morphisms</i> Student Algebra Seminar University of Oklahoma	October 2015
	<i>Equivalence of Categories</i> Student Category Seminar University of Oklahoma	September 2015
	<i>Semidirect Products and Solvability of Lie Algebras</i> Student Algebra Seminar University of Oklahoma	April 2015
	<i>Finite Reflection Groups and their Relation to Coxeter Groups</i> Student Algebra Seminar University of Oklahoma	November 2014
	<i>Comparing Voting Systems Using Kemeny Rankings</i> Undergraduate Research Conference, Student Poster Session University of California, Davis	April 2014

Comparing Voting Systems Using Kemeny Rankings
MAA Golden Section Meeting, Student Poster Session
Sonoma State University February 2014

Shidoku and Semidefinite Programming
Combinatorics, Algebra, Convexity, Algorithms and Optimization Seminar
University of California, Davis January 2014

Barbers, Painters, and Berry: Famous Paradoxes and Their Relation to Mathematics
Math Club at UC Davis October 2013

Matrix Completion and Singular Value Thresholding Algorithms
Combinatorics, Algebra, Convexity, Algorithms, and Optimization Research Seminar
University of California, Davis September 2013

Lower Bound Estimates for Goodness of Kemeny Rankings
Combinatorics, Algebra, Convexity, Algorithms, and Optimization Research Seminar
University of California, Davis April 2013

AWARDS

Department of Mathematics Graduate Fellowship, University of Oklahoma
Mathematics Department,
University of Oklahoma
Awarded to graduate students who make exceptional contributions to the
mathematics department 2015 - 2020

Richard V. Andree Memorial Scholarship
Mathematics Department,
University of Oklahoma
Awarded to graduate students who have shown academic excellence, department
and university citizenship, and activity in support of Pi Mu Epsilon 2015

Yueh-Jing Lin Fund
Mathematics Department,
University of California, Davis
Awarded to high-achieving graduate or undergraduate students. 2013

**ACADEMIC
SERVICE**

Organizer and Co-founder
Norman Math Circle Fall 2016

Graduate Mentor
Directed Reading Program Spring 2016

Graduate Coordinator
Math Teacher's Circle in OKC Fall 2015 - present

Math Day Fun Session Co-Coordinator
Math Day at OU Fall 2015

TORAS, Co-Organizer
Texas-Oklahoma Representation Theory and Automorphic Forms for Students
University of Oklahoma Spring 2015

Undergraduate Volunteer
Davis Math Circle
Help tutor students in Knot Theory through the Davis Math Circle program
December 2012 - April 2013

Coach
SF Bay Area/NorCal American Regions Mathematics League
Help tutor mathematics skills and concepts to high school and middle school students
in preparation for the American Regions Mathematics League competition.

December 2012 - June 2013

PROGRAMMING Extensive knowledge of MATLAB, Mathematica, C, GAP, HTML, CSS, and LaTeX