

Robert Vandermolén

Curriculum Vitae ✉ robertv@math.sc.edu 🏠 <http://people.math.sc.edu/robertv>

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Education

Ph.D. Mathematics	University of South Carolina (Columbia, SC) Thesis Area: Algebraic Geometry Adviser: Dr. Mathew Ballard	Expected May 2020
M.Sc. Mathematics	College of Charleston (Charleston, SC) Majored in Pure Mathematics Thesis: <i>Bounded Operators with finite \mathbb{Z}-grading</i> Adviser: Dr. Oleg Smirnov	May 2014
B.Sc. Mathematics	College of Charleston (Charleston, SC) Majored in Pure Mathematics cum laude	May 2012

Teaching

University of South Carolina	Instructor of Record Calculus Workshop I&II (Fall 2019) Pre-Calculus (Fall 2018) Business Calculus (Spring 2018, Fall 2017, Summer 2016) Vector Calculus (Summer 2017) College Algebra (Fall 2016) Finite Mathematics (Spring 2016, Spring 2017)	2016-Present
College of Charleston	Instructor of Record Elementary Statistics (Fall, Spring 2015) Pre-Calculus (Fall 2015) College Algebra (Fall 2013, Spring 2014)	2013-2016
College of Charleston	Teaching Assistant Advanced Calculus (Spring 2013) Intro to Abstract Mathematics (Spring, Fall 2011, Spring 2012)	2011-2013

Research

Research interests lie in the fields of Algebraic Geometry and non-associative algebras, and recently machine learning. Specifically in the applications of geometry to neural science and theoretical physics. Worked with non-associative algebras such as Hom-Lie algebras and their categorical properties. Studied derived equivalences pertaining categories of D-branes, homological mirror symmetry, and wall crossing kernels for Toric Varieties.

Papers/PrePrints

Kernels for Grassmannian Flops	2019
M. Ballard, N. Chidambaram, D. Favero, P. McFaddin, R. Vandermolén <i>submitted</i> , arXiv:1904.12195	
Universal Embedding of Hom-Lie Triple Systems	2018
R. Vandermolén <i>submitted</i> , arXiv:1709.08714	

Mentoring

NSF Award ID #1725295

Graduate Teaching Mentor

Fall 2018-Spring 2018

Mentored Novice instructors as they transitioned from graduate teaching assistants to graduate student instructors. Conducted monthly observations of the instructors and held individual post observation meetings. Facilitated bi-weekly group meetings.

Grants/Awards

Grants (Principle Investigator)

S.P.A.R.C. Grant

2019

The Office of the Vice President Research grant
Title: Kernels for Homological Duality

Teaching Resource Development Grant

2018/2019

Center for Teaching Excellence, University of South Carolina
Title: Speech to Text Analytic Resource (S.T.A.R.)

Grants (facilitated)

Incubator Grant for Pre-Calculus Active Learning Resources

Fall 2019

Senior personnel on an internal incubator grant (\$10,000) funded by the College of Arts and Sciences. Lead a team in developing and implementing the final product of 121 pages of problems and even more pages of lesson plans for Pre-Calculus, allowing graduate students to save (under an initial analysis) of 26-30 hrs/semester of content prep, redirecting time towards student learning.

Awards

UofSC Education Foundation Outstanding Graduate Teaching Award - S.T.E.M.

2018-2019

University of South Carolina

Excellence in Teaching Award - Mathematics

2016-2017

University of South Carolina

Peer Excellence Award - Mathematics

2016-2017

University of South Carolina

Outstanding First Year Award - Mathematics

2015-2016

University of South Carolina

Presentations/Workshops

Invited Talks

Emory University

Derived Equivalences from Compactifications

Nov. 2019

Algebraic Geometry and Number Theory Seminar

Duke University

Gauged Linear Sigma Models in VGIT

Nov. 2019

Southeastern regional Mathematical
String Theory Meeting

Clemson University

Curious Kernels for VGIT

Oct. 2019

Algebraic Geometry and Number Theory Seminar

The Fields Institute

Kernels for Grassmann Flops

Aug. 2019

New Structures in Algebraic Geometry
and their Symplectic Interpretations

Workshops and Technical Talks

Insight of a Graduate Student Instructor

CTE Workshop to introduce graduate students instructors and faculty to a cycle of assessment for the instructor to better gauge implementation active learning techniques. This assessment is based on the observation protocol developed in the Peer Mentorship Program.

Sept. 2019

S.T.A.R. a New Teaching Resource

UofSC EdTech Showcase

2019

Contributed Talks

Curious New Kernels

(New) Facets in Algebraic Geometry
University of Michigan

Oct. 2019

Matrix Factorizations: The B-side of Mirror Symmetry

Graduate Summer School on
Homological Algebra of Mirror Symmetry
The Fields Institute

June 2019

The Geometry of the Brain

Pi Mu Epsilon Student Seminar
University of South Carolina

Sept. 2018

Derived Equivalences of Flops

Algebraic Geometry Seminar
University of South Carolina

Sept. 2018

Service

Event Coordinator

19th Annual High School Math Contest
University of South Carolina
Math themed game "Block Busters"

Feb. 2019

Committee for Learning Outcome Samples

Met with a 'task force' to help aid instructors by collecting and editing sample questions which would be suitable for addressing designated learning outcomes. Organized by: Undergraduate Director, Dr. Miller

Spring 2018

Volunteer

AB/BA AP-Calculus Practice Exam
University of South Carolina
Proctored Exam

May 2018

Event Coordinator

18th Annual High School Math Contest
University of South Carolina

Jan. 2018

Event Coordinator

College of Charleston Math Meet
College of Charleston
Math themed Scavenger Hunt

Feb. 2015

Volunteer

Lady Cougars STEM Education Day
College of Charleston
Designed and implemented interactive STEM workshop for middle school students

2014-2015

Volunteer

Lowcountry Regional Science and Engineering Fair
College of Charleston

2014-2015

Other

Programming Languages

L^AT_EX,HTML, Maple, Python, JAVA, Swift, JAVAScript

CRLA Certified

Mathematics Tutoring

American Mathematical Society

Student Member

Conferences

(All Conferences Attended with Full or Partial Support)

Facets in Algebraic Geometry

2019

University of Michigan

New Structures in Algebraic Geometry and their Symplectic Interpretations

2019

Fields Institute

Graduate Summer School on Homological Algebra of Mirror Symmetry

2019

Fields Institute

Between Topology and Quantum Field Theory

2019

University of Texas Austin

Georgia Algebraic Geometry Symposium

2019

Georgia Tech

7th Iberoamerican Congress on Geometry

2018

Universidad de Valladolid

Spring Southeastern Sectional Meeting AMS

2017

College of Charleston

Workshop on Topics in Algebraic Geometry

2017

University of North Carolina (Chapel Hill)

Georgia Algebraic Geometry Symposium

2017

University of Georgia

Workshop and Symposium on Quadratic Forms

2017

University of Georgia

Workshop on Symplectic Varieties and Geometric Representation Theory

2016

University of North Carolina (Chapel Hill)