

SARAH J FREI

CONTACT INFORMATION

Department of Mathematics
Rice University
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EMPLOYMENT

Rice University, Houston, TX, USA
RTG Lovett Instructor

2019–present

EDUCATION

University of Oregon, Eugene, OR, USA

2014–2019

Ph.D. in Mathematics, June 2019

Advisor: Dr. Nicolas Addington

Dissertation: *Moduli spaces of sheaves on K3 surfaces and Galois representations*

Colorado State University, Fort Collins, CO, USA

2012–2014

M.S. in Mathematics, Dec. 2014

Advisor: Dr. Rachel Pries

Project: *The a-number of hyperelliptic curves*

University of Portland, Portland, OR, USA

2006–2010

B.S. in Mathematics and Chemistry, May 2010

Graduated Magna Cum Laude

RESEARCH INTERESTS

My general interests are in algebraic geometry and arithmetic geometry, including moduli spaces of sheaves, hyperkähler varieties, and generalizing results from complex geometry to positive characteristic.

PAPERS

RESEARCH:

Rational points and derived equivalence. With N. Addington, B. Antieau, and K. Honigs. *Compositio Math.*, 157(5): 1036–1050, 2021.

Moduli spaces of sheaves on K3 surfaces and Galois representations. *Selecta Mathematica*, 26(1), 1–16, 2020.

The a -number of hyperelliptic curves. *Women in Numbers Europe II*, Springer, 107–116, 2018.

GENERAL INTEREST:

University of Oregon AWM Chapter: Creation and Evolution. With E. Bellah, L. Merrill, and K. Pohland. *Association for Women in Mathematics: The First Fifty Years*, to appear.

INVITED CONFERENCE TALKS

AMS-AWM Special Session on Women in Algebraic Geometry, Joint Mathematics Meetings, January 2022 (upcoming)

Texas Algebraic Geometry Symposium, Texas A&M University, October 2021 (upcoming)

Pacific Rim Mathematical Association (PRIMA) Summer school on Brauer classes and moduli spaces, three lectures with Nicolas Addington and Katrina Honigs, Virtual, August 2021

Algebra and Geometry of Homogeneous Spaces, Online mini-workshop, June 2021

AMS Special Session on Galois Cohomology in Arithmetic Geometry, Joint Mathematics Meetings, Virtual, January 2021

AMS Special Session on Geometry and Arithmetic of Hyperkahler Manifolds, AMS Fall South-eastern Sectional Meeting, Virtual, October 2020

Scientific session on Algebraic and Geometric Theory of Homogeneous Spaces, Canadian Mathematical Society Summer Meeting, Ottawa, ON June 2020 (canceled due to covid-19)

AMS Special Session on Algebraic Cycles in Arithmetic and Geometry, Joint Mathematics Meetings, Denver, January 2020

AMS Special Session on Rational Points on Algebraic Varieties, Joint Mathematics Meetings, Denver, January 2020

Interactions between Brauer Groups, Derived Categories and Birational Geometry of Projective Varieties Workshop, BIRS, November 2019

Texas Algebraic Geometry Symposium Fall Program, Texas A&M, October 2019

FRG Workshop on Moduli spaces of sheaves and Bridgeland stability, UIC, December 2018

AMS Fall Western Sectional Meeting, San Francisco State University, October 2018

AMS Spring Western Sectional Meeting, Portland State University, April 2018

INVITED SEMINAR TALKS

Algebra Seminar, Michigan State University, Virtual, April 2021

Algebraic Geometry Seminar, University of Washington, April 2020 (canceled due to covid-19)

Algebraic Geometry Seminar, Brown University, March 2020

Algebraic Geometry Seminar, Stanford University, February 2020

Algebraic Geometry Seminar, Duke University, November 2019

Colloquium, Texas Christian University, November 2019

Algebraic Geometry and Number Theory Seminar, Rice University, March 2019

Algebraic Geometry Seminar, University of Utah, April 2018

Number Theory Seminar, University of Oregon, February 2018

HONORS AND AWARDS

Anderson Distinguished Graduate Teaching Award, Department of Mathematics, University of Oregon, 2018.

Civin Graduate Award, Department of Mathematics, University of Oregon, 2017.

Heidi J. Arnold Early Teaching Award, Department of Mathematics, University of Oregon, 2015.

Ron Smit Senior Award in Mathematics, University of Portland, 2010.

William C Wilson Science Scholar, University of Portland, 2009-2010.

President's Scholar, University of Portland, 2006-2010.

TEACHING EXPERIENCE

RTG Lovett Instructor

Department of Mathematics, Rice University
Instructor of Record for the following courses:

- Calculus I, Fall 2019, Spring 2021
- Rice Connect, Spring 2021
- Linear Algebra, Fall 2020
- Abstract Algebra I, Fall 2021
- Abstract Algebra III, Spring 2020

2019 - present
Houston, TX

Graduate Teaching Fellow

Department of Mathematics, University of Oregon
Instructor of Record for the following courses:

- College Algebra, Fall 2014, Winter 2015, Spring 2015
- Elementary Functions, Winter 2016, Fall 2016
- Introduction to Probability and Statistics, Summer 2015, Summer 2016
- Calculus I, Spring 2016, Spring 2019
- Calculus II, Fall 2017, Winter 2019
- Calculus III, Winter 2018
- Linear Algebra II, Summer 2018

2014 - 2019
Eugene, OR

Teaching assistant for the following courses:

- Calculus for Business and Social Sciences I, Fall 2016
- Calculus for Business and Social Sciences II, Spring 2017

Graduate Teaching Assistant

Department of Mathematics, Colorado State University
Instructor of Record for the following courses:

- Calculus in Management Sciences, Summer 2014
- Calculus for Physical Scientists I, Spring 2014

2012 - 2014
Fort Collins, CO

Teaching assistant for the following course:

- Calculus for Physical Scientists II, Fall 2012

PACe Center Assistant Director

Department of Mathematics, Colorado State University

Spring, Summer, and Fall 2013
Fort Collins, CO

OUTREACH AND MENTORING

AT RICE UNIVERSITY:

Member, Mobilizing for Social Justice Initiative	2021-present
Mentor, Rice Math Directed Reading Program	2021-present
Co-organizer, Anti-Racist Teaching Seminar	2020-2021
Reading course supervisor for mathematics graduate student	2020
Co-organizer, Horizons Seminar	2019-present

AT UNIVERSITY OF OREGON:

Co-organizer, Women in Mathematics Reading Room	2018-2019
Mentor, UO Math Directed Reading Program	2018-2019
Mentor, AWM Undergraduate Reading Program	2017-2018
Mentor, first-year graduate student mentoring program	2017-2019
Mathematics Instructor, Oregon Young Scholars Program	2017-2018
Committee Chair, UO AWM Distinguished Speaker Series	2015-2016, 2017-2018
President, UO AWM Student Chapter	2016-2017
Volunteer, Oregon Invitational Mathematics Tournament (OIMT)	2015

AT COLORADO STATE UNIVERSITY:

Volunteer, SIAM Conference on Applied Algebraic Geometry	2013
Volunteer, Math Day	2012

PROFESSIONAL SERVICE

Co-organizer, Texas Algebraic Geometry Symposium (canceled due to covid-19) Rice University	2019-2020
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DEPARTMENTAL SERVICE

AT RICE UNIVERSITY:

Colloquium committee	2021-present
Diversity committee	2020-present
Undergraduate Colloquium committee	2020-2021
Advanced Exam committees	2020-2021
Co-organizer, Algebraic Geometry and Number Theory Seminar	2019-present

AT UNIVERSITY OF OREGON:

Organizer, Graduate Notions Seminar	2017-2019
Co-organizer, Ring-op Seminar	2017-2019

WORKSHOPS AND CONFERENCES ATTENDED

Algebra and Geometry of Homogeneous Spaces, Online mini-workshop, June 2-4, 2021 (Virtual)
Mathematics Teacher-Scholar Symposium, Reed College, May 22-23, 2021 (Virtual)
Joint Mathematics Meetings, Washington D.C., Jan 6-9, 2021 (Virtual)
Derived, Birational, and Categorical Algebraic Geometry, BIRS, Nov 2-6, 2020 (Virtual)
Women in Algebraic Geometry, ICERM Workshop, July 27-31, 2020 (Virtual)
Arizona Winter School on Nonabelian Chabauty, Mar 7-11, 2020
Joint Mathematics Meetings, Denver, Jan 15-18, 2020
FRG Workshop on Stability, Moduli Spaces and Applications, UIC, Dec 6-8, 2019
Interactions between Brauer Groups, Derived Categories and Birational Geometry of Projective Varieties Workshop, BIRS, Nov 10-15, 2019
Joint Mathematics Meetings, Baltimore, Jan 16-19, 2019
FRG Workshop on Moduli spaces of sheaves and Bridgeland stability, UIC, Dec 7-9, 2018
AMS Fall Western Sectional Meeting, San Francisco State University, Oct 27-28, 2018
Western Algebraic Geometry Symposium, University of Oregon, Oct 6-7, 2018
Summer Graduate School on Derived Categories, MSRI, June 25-July 6, 2018
AMS Spring Sectional Meeting, Portland State University, April 14-15, 2018
Arithmetic of Algebraic Curves, University of Wisconsin–Madison, April 6-8, 2018
Western Algebraic Geometry Symposium, San Francisco State University, March 17-18, 2018
Moduli of Sheaves and Strange Duality workshop, Pennsylvania State University, Dec 8-10, 2017
Western Algebraic Geometry Symposium, UCLA, Oct 14-15, 2017
Texas Algebraic Geometry Symposium, Rice University, Houston, April 21-23, 2017
Western Algebraic Geometry Symposium, University of British Columbia, April 8-9, 2017
Arizona Winter School on Perfectoid Spaces, University of Arizona, March 11-15, 2017
Western Algebraic Geometry Symposium, Colorado State University, Oct 22-23, 2016
Derived categories and Chow groups of hyperkaehler and Calabi-Yau varieties, Stony Brook University, Sept 19-23, 2016
Arizona Winter School on Arithmetic Statistics, University of Arizona, March 15-19, 2014