

# Tyler Kloefkorn, PhD

Science and Technology Policy Fellow  
American Association for the Advancement of Science  
Hosted at the National Science Foundation

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## Education

### **Ph.D. in Mathematics**, June 2014

Thesis: On Algebras Associated to Finite Ranked Posets and Combinatorial Topology: the Koszul, Numerically Koszul and Cohen-Macaulay Properties

Advisor: Professor Brad Shelton

University of Oregon, Eugene, OR

### **B.A. in Mathematics**, Cum Laude, May 2007

Whittier College, Whittier, CA

## Employment

### **Science & Technology Policy Fellow**, September 2017 – present

American Association for the Advancement of Science

Supervisor: Sylvia Spengler

BIGDATA Program, Harnessing the Data Revolution (HDR) Initiative

Division of Information & Intelligent Systems (IIS)

Directorate for Computer & Information Science & Engineering (CISE)

National Science Foundation (NSF)

### **Instructor**, August 2018 – present

Department of Mathematics, University of Arizona Online

### **Teaching Postdoctoral Fellow**, August 2014 – August 2017

Department of Mathematics, University of Arizona

### **Instructor**, Summer 2012 and 2013

Oregon Young Scholars Program, University of Oregon

### **Graduate Teaching Fellow**, September 2007 – June 2014

Department of Mathematics, University of Oregon

### **Intern**, May – August 2007

Navigation & Geopositioning Systems, The Aerospace Corporation

## Awards

### **Teaching and Service Award**, May 2016

University of Arizona Department of Mathematics award recognizing instructors, lecturers, and postdoctoral fellows who have made exceptional contributions in teaching and service

### **Donald and Darel Stein Graduate Student Teaching Award**, June 2013

University of Oregon Graduate School (university wide) award recognizing students who have demonstrated outstanding teaching performance as Graduate Teaching Fellows while at the same time excelling in their own academic program

### **Frank W. Anderson Graduate Teaching Award**, June 2012

University of Oregon Department of Mathematics award recognizing an advanced graduate student with the Department's most outstanding teaching record

### **Dan Kimble First Year Teaching Award**, August 2008

University of Oregon Graduate School (university wide) award recognizing outstanding teaching performances by Graduate Teaching Fellows in their first year of teaching

- Work at NSF** Contribute to the NSF BIGDATA and HDR solicitations, workshop reports, memorandums of understanding, and other CISE policy documents  
 Coordinate and support HDR meetings  
 Complete BIGDATA portfolio analyses and reviews, and present results to CISE leadership  
 Coordinate with public cloud providers for the BIGDATA and other CISE initiatives  
 Survey data science leaders in higher education for the Data Science Leadership Summits  
 Co-organize BIGDATA PI meetings and BIGDATA review panels  
 Co-organize and contribute to undergraduate data science pedagogy workshops and reports  
 Facilitate review panels for the NSF Graduate Research Fellowship Program in mathematical sciences
- Fellowships and Grants** **Catalyst Grant for Classroom Technology Upgrade**, December 2014  
 University of Arizona Information Technology Services (UITS) mini grant awarded for introducing technology into the vector calculus curriculum  
**Project NExT Fellowship (Gold Dot)**, August 2014 – August 2015  
 MAA fellowship awarded to recent mathematics PhD recipients  
**Rose Hills Foundation Graduate Fellowship**, June 2008 - May 2009  
 Fellowship given to mathematics students at the University of Oregon
- Academic Service** **Member** - Advisory Group  
 International Data Science in Schools Project  
**Voting Member** - Subcommittee on Research By Undergraduates  
 Council on Programs and Students in the Mathematical Science  
 Mathematics Association of America, Spring 2017 – Spring 2020  
**Supervisor** - Undergraduate Teaching Assistant Program  
 Department of Mathematics, University of Arizona, Spring 2016 and Spring 2017  
**Supervisor** - Graduate Teaching Assistant Program  
 Department of Mathematics, University of Arizona, Fall 2015 and Spring 2017  
**Non-voting Member** - Undergraduate Committee  
 Department of Mathematics, University of Arizona, Fall 2015 – Fall 2016  
**Committee Chair** - Association for Women in Mathematics K-12 Outreach Committee  
 Department of Mathematics, University of Oregon, Spring 2013 – Spring 2014  
**Voting Member** - Graduate Advisory Board  
 Graduate School, University of Oregon, Fall 2011 – Spring 2013
- Training** **NSF Data 101, 301** - Introduction to Structured Query Language (SQL)  
 LearnNSF, National Science Foundation, March 2018  
**Merit Review Basics I, II** - Criteria, COI, Strategies, Fairness, and Communication  
 LearnNSF, National Science Foundation, November 2017  
**Collaborative Institutional Training Initiative**, Human Subject Component  
 Human Subjects Protection Program, University of Arizona, May 2016
- Mentoring** **Undergraduate Research Mentor**, January 2015 – present  
 Mentoring research projects for 3 University of Arizona undergraduate math majors  
 One project is ongoing and resulted in a presentation (Victoria Sanders at JMM 2018) and a paper  
**Undergraduate Teaching Assistant Mentor**, August 2014 – July 2017  
 Mentored 6 University of Arizona undergraduate math majors for teaching assistantships

**Teaching**

For the following courses I was the **instructor of record** (unless otherwise noted).  
 Note: \*-flipped learning; \*\*-hybrid (lecture and flipped learning);  
 \*\*-project-based; \*\*\*\*-online

University of Arizona: Supervisor: Robert Indik

**MATH 491: Undergraduate Teaching Assistant Seminar\*\*\*\*** [Spring 2016, Spring 2017]

**MATH 399: Introduction to Proofs Supplemental Seminar\*** [Fall 2015, Spring 2016]

**MATH 399: Mathematical Computing\*\*\*\*** [Spring 2016]

**MATH 396L: Wildcat Proofs Workshop\*** [Fall 2016]

**MATH 323: Formal Mathematical Reasoning and Writing\*\*** [2 sections, Summer 2015; 2 sections, Summer 2016; 2 sections, Summer 2017]

**MATH 263: Introduction to Statistics and Biostatistics** [2 sections, Spring 2017]

**MATH 223: Vector Calculus** [2 sections, Spring 2015; 2 sections, Fall 2015; Fall 2016]

**MATH 196V: Vector Calculus Supplemental Seminar\*** [Spring 2015, Fall 2015, Spring 2016, Fall 2016]

**MATH 122B: First-Semester Calculus** [Fall 2014]

**MATH 122A: Functions for Calculus** [Fall 2014, Spring 2016]

**MATH 120R: Calculus Preparation** [Fall 2014]

**MATH 116 Online: Calculus Concepts for Business I\*\*\*\*** [Fall 2018]

University of Oregon: Supervisor: Michael Price

**MATH 281: Multi-Variable Calculus I** [Summer 2014]

**MATH 256: Introduction to Differential Equations** [Spring 2012]

**MATH 253: Calculus III** [Winter 2012, Fall 2012, Winter 2013]

**MATH 252: Calculus II** [Spring 2010, Summer 2011, Fall 2011]

**MATH 251: Calculus I** [Winter 2010, Winter 2011, Spring 2011]

**MATH 246: Calculus for Biological Sciences I** [Fall 2010]

**MATH 243: Introduction to Probability and Statistics\*\*\*\*** [Summer 2013]

**MATH 242: Calculus for Business and Social Sciences II (TA)** [Spring 2009]

**MATH 241: Calculus for Business and Social Sciences I** [Summer 2010]

**MATH 211: Fundamentals of Elementary Mathematics I** [Summer 2012]

**MATH 112: Elementary Functions** [Summer 2008, Fall 2008, Fall 2009]

**MATH 111: College Algebra** [Fall 2007, Winter 2008, Spring 2008]

- Publications**
- Weakly Cohen-Macaulay posets and a class of finite-dimensional graded quadratic algebras**, <https://doi.org/10.1016/j.jalgebra.2017.05.023>, Journal of Algebra 487 (2017), pp. 138-160
- Splitting Algebras: Koszul, Cohen-Macaulay and Numerically Koszul** (with Brad Shelton), <http://dx.doi.org/10.1016/j.jalgebra.2014.08.050>, Journal of Algebra 422C (2015), pp. 660-685
- Trimmed serendipity finite element differential forms** (with Andrew Gillette), Mathematics of Computation, accepted & in press, Preprint: <https://arxiv.org/abs/1607.00571>
- Toolkit: Preparing a Poster** (with Azadeh Rafizadeh), MAA Focus, Vol. 38, No. 6, December 2018/January 2019
- Computational serendipity and tensor product finite element differential forms** (with Andrew Gillette and Victoria Sanders), accepted, Preprint: <https://arxiv.org/abs/1806.00031>
- Data Science Leadership Summit; Summary Report** (with Lucy C. Erickson, Vandana P. Janeja, and Jeannette M. Wing), <https://dl.acm.org/citation.cfm?id=3293458>
- Counting dots on tetrahedra and cubes: Accelerating computation by identifying patterns** (with Andrew Gillette), submitted
- Error detection in an introductory proofs course** (with Jason Aubrey, Kyle Pounder, and Aditya Adiredja), in preparation
- Selected Talks**
- Idea for research study: error detection in an introductory proofs course**  
2<sup>nd</sup> Northeastern Research on Undergraduate Mathematics Education (RUME) Conference Rutgers University, Brunswick, NJ, October 2018
- Support for a variety of pathways to undergraduate research**  
*Invited talk*, AMS Spring Western Sectional Meeting  
Washington State University, Pullman, WA, April 2017
- Trimmed serendipity finite elements**  
*Invited talk*, CMAT-UA Workshop  
University of Arizona, Tucson, AZ, March 2017  
*Invited talk*, Structure and Scaling in Computational Field Theories ERC Project  
University of Oslo, Oslo, Norway, October 2016
- Weakly Cohen-Macaulay posets and a class of finite-dimensional Koszul algebras**  
AMS Fall Sectional Meeting: Combinatorics, at the Crossroads of Algebra, Geometry, and Topology  
Bowdoin College, Brunswick, ME, September 2016
- Introducing technology to a vector calculus course**  
MAA Mathfest: Scholarship of Teaching and Learning in Mathematics  
Washington D.C., August 2015
- Koszulity and a class of algebras associated to finite ranked posets**  
Algebra and Number Theory Seminar University of Arizona, Tucson, AZ, September 2014
- Splitting algebras: Koszul and Cohen-Macaulay**  
AMS General Talk: Noncommutative Algebra and Lie Theory  
Joint Mathematics Meetings, Baltimore, MD, January 2014
- Splitting Algebras: Koszulity and the Cohen-Macaulay property**  
Algebra Seminar  
Wake Forest University, Winston-Salem, NC, September 2013

- Posters**
- Trimmed serendipity finite elements**  
SIAM Conference on Computational Science and Engineering, Atlanta, GA, February 2017
- Trimmed serendipity finite elements**  
NSF Mathematics Institutes' Modern Mathematics Workshop, Long Beach, CA, October 2016
- Academic Interests** finite element systems; homological algebra; combinatorial topology; data science; undergraduate education; undergraduate research
- Educational Technology** Proficient with Blackboard, D2L, L<sup>A</sup>T<sub>E</sub>X, Microsoft Office, MyMathLab, Webassign, and WeBWorK
- Programming** Proficient with HTML, MATLAB, Python, and Sage
- Memberships**
- Society for Industrial and Applied Mathematics**, January 2017 – present
- Society for Advancement of Chicanos/Hispanics and Native Americans in Science**, July 2016 – present
- Mathematics Association of America**, August 2014 – present
- Association for Women in Mathematics**, May 2013 – present
- American Mathematical Society**, 2007 – present
- References** Teaching reference is indicated with an asterisk.
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| Andrew Gillette<br>Department of Mathematics<br>University of Arizona<br>agillette@math.arizona.edu | Robert Indik*<br>Department of Mathematics<br>University of Arizona<br>indik@math.arizona.edu |
| Michael Price*<br>Department of Mathematics<br>University of Oregon<br>mprice@uoregon.edu           | Brad Shelton<br>Department of Mathematics<br>University of Oregon<br>shelton@uoregon.edu      |
| Sylvia Spengler<br>CISE/IIS<br>National Science Foundation<br>sspengle@nsf.gov                      |   |