

Laura Starkston

- PERSONAL INFORMATION University of California, Davis Mathematics Department 1 Shields Avenue Davis, CA 95616, USA *Citizenship:* USA *E-mail:* lstarkston@math.ucdavis.edu www.math.ucdavis.edu/~lstarkston/
- EMPLOYMENT Assistant Professor, University of California, Davis, Mathematics Department **2018-present**
NSF Postdoctoral Fellow, Stanford University, Mathematics Department **2015-2018**
- RESEARCH Symplectic topology, contact topology, smooth 4-manifolds, singularities
- EDUCATION **University of Texas at Austin**
Ph.D. in Mathematics, May 2015
 - Dissertation Title: Classifications and Applications of symplectic fillings of Seifert fibered spaces over S^2
 - Advisor: Robert Gompf**Harvard University**
A.B. in Mathematics, magna cum laude, May 2010
 - Undergraduate thesis: Contact structures and classifications of Legendrian and transverse knots
- PUBLICATIONS AND PREPRINTS **Bahar Acu, Orsola Capovilla-Searle, Agnès Gąbbed, Aleksandra Marinković, Emmy Murphy, Laura Starkston, and Angela Wu.** Weinstein handlebodies for complements of smoothed toric divisors. arXiv:2012.08666 [math.SG].
Olga Plamenevskaya and Laura Starkston Unexpected Stein fillings, rational surface singularities, and plane curve arrangements. arXiv:2006.06631 [math.GT].
Peter Lambert-Cole, Jeffrey Meier, and Laura Starkston. Symplectic 4-manifolds admit Weinstein trisections. *Journal of Topology*, 14 (2021) no. 2, 641-673.
Bahar Acu, Orsola Capovilla-Searle, Agnès Gąbbed, Aleksandra Marinković, Emmy Murphy, Laura Starkston, and Angela Wu. An introduction to Weinstein handlebodies for complements of smoothed toric divisors. Accepted to *Research in Symplectic and Contact Geometry and Topology*. Association for Women in Mathematics Series.
Marco Golla and Laura Starkston. The symplectic isotopy problem for rational cuspidal curves. arXiv:1907.06787 [math.GT].
Laura Starkston. Arboreal singularities in Weinstein skeleta. *Selecta Math. (N.S.)*, 24 (2018), no. 5, 4105-4140.
Laura Starkston. A new approach to the symplectic isotopy problem. *J. Sympl. Geom.* 18 (2020), no. 3, 939-960.
Daniel Ruberman and Laura Starkston. Topological realizations of line arrangements. *Int. Math. Res. Not. (IMRN)*. 2019, no. 8, 2295-2331.

Laura Starkston. Comparing star surgery to rational blow-down. *J. Gökova Geom. Topol.*, 10 (2016), 60–79.

Çağrı Karakurt and Laura Starkston. Surgery along star shaped plumbings and exotic smooth structures on 4-manifolds. *Algebraic and Geometric Topology*, 16(3): 1585–1635, 2016.

Laura Starkston. Symplectic fillings of Seifert fibered spaces. *Transactions of the American Mathematical Society*, 367(8): 5971–6016, 2014.

Allison Moore and Laura Starkston. Genus two mutant knots with the same dimension in knot Floer and Khovanov homologies. arxiv:1204.2524. *Algebraic and Geometric Topology*, 15(1), 43–63, 2015.

Laura Starkston. The Khovanov homology of $(p, -p, q)$ pretzel knots. *Journal of Knot Theory and its Ramifications*, 21(5):1250056, 14, 2012.

Colin Adams, Rachel Hudson, Ralph Morrison, William George, Laura Starkston, Samuel Taylor, and Olga Turanova. The spiral index of knots. *Mathematical Proceedings of the Cambridge Philosophical Society*, 149(2):297–315, 2010.

GRANTS AND
FELLOWSHIPS

Sloan Fellowship **2021**

NSF CAREER Grant **July 2021–June 2026**
CAREER: Symplectic 4-manifolds and Singular Symplectic Surfaces
DMS 2042345
\$600,856

Hellman Fellowship **2020**

NSF Grant **July 2019–June 2022**
Symplectic Surfaces, Lefschetz Fibrations, and Arboreal Skeleta.
DMS 1904074
\$203,855

NSF Mathematical Sciences Postdoctoral Research Fellowship **2015–2018**
DMS 1501728
\$150,000

National Science Foundation Graduate Research Fellowship **2010-2015**

GRADUATE AND
UNDERGRADUATE
STUDENTS

Shanon Rubin (PhD advisee, in progress)

Victoria Quijano Beck (Undergraduate Thesis 2021)

Sari Ogami (Undergraduate Thesis 2020)

Andrew Alameda (Qualifying Committee, Dissertation Committee)

Neetal Neel (Qualifying Committee Chair, Dissertation Committee)

Initial advisor to four additional graduate students

TEACHING

University of California, Davis

Math 215B: Algebraic Topology (Winter 2021)

- Graduate course
- Simplicial, singular, and cellular homology, exact sequences

Math 390: Math TA Training (Fall 2020)

- Graduate course
- Teaching techniques and TA tools

Math 180: Manifolds (Spring 2020)

- Undergraduate topics course
- Exploring manifolds and visualization through low-dimensional examples

Math 215A: Algebraic Topology (Fall 2019)

- Graduate course
- Fundamental group, covering spaces, higher homotopy groups, fibrations

Math 022A: Linear Algebra (Fall 2019)

- Systems of linear equations, vector spaces, orthogonal projections, eigenvectors

Math 145: Combinatorics (Spring 2019)

- Introductory combinatorics, graph theory

Math 147: Topology (Fall 2018)

- Point set topology, continuity, connectedness, compactness

Stanford University

Math 146: Differentiable Manifolds

- Smooth manifolds, differential forms, Stokes' theorem

Math 52: Integral Calculus of Several Variables

- Multivariable integrals, change of variables, Stokes' theorems

Math 257A: Symplectic Geometry and Topology

- Graduate level course
- First half: introduction to symplectic topology
- Second half: topics in symplectic fillings, J-holomorphic curves, Weinstein manifolds

SERVICE AND OUTREACH

Departmental Service

Graduate Program Committee (2020-2021)

Departmental Relations Committee (2020-2021)

Faculty Supervisor for Directed Reading Program at UC Davis (2021-present)

Reading program pairing math major undergraduate mentees with PhD candidate mentors to study a selected topic together.

Events and Displays Committee (2019-2020)

Geometry Topology Seminar Organizer (2018-2019, 2019-2020)

University Service

Steering committee of MURPPS (2020-2021)

Aggie Success Seminar Facilitator—new student orientation (2020)

External Service:

Organizing:

Lead organizer of MSRI summer school *Gauge Theory in Geometry and Topology*, (July 2021).

Complex and Symplectic Curve Configurations, Institut Mittag-Leffler (July 2020—cancelled due to COVID-19 pandemic)

The topology and geometry of low-dimensional manifolds: a celebration of the mathematics of Bob Gompf (July 2018)

AIM Workshop: Symplectic 4-manifolds through branched covering (May 2018)

AIM Workshop: Arborealization of singularities of Lagrangian skeleta (March 2018)

Northern California Symplectic Geometry Seminar

Graduate Student Topology and Geometry Conference (April 2014)

Referee and Reviewing:

- Algebraic & Geometric Topology
- Annals of Mathematics
- Arnold Mathematical Journal
- Bulletin of the American Mathematical Society
- Compositio Mathematicae
- Duke Mathematical Journal
- International Mathematics Research Notices
- Inventiones Mathematicae
- Geometriae Dedicata
- Geometry & Topology
- Journal of Differential Geometry
- Journal of the London Mathematical Society
- Journal of Symplectic Geometry
- Journal of Topology
- Mathematical Research Letters
- Mathematische Nachrichten
- Notices of the AMS
- Transactions of the American Mathematical Society

Mathematical Reviews contributor

Mentoring:

Co-leader for a research group in the Women in Symplectic and Contact Geometry and Topology workshop, July 22-26, 2019

Mentor for Kylerec 2019 Workshop on Sheafy Symplectic Topology.

Mentor for Kylerec 2017 Workshop on symplectic fillings of contact manifolds. (Truckee, CA)
 Intensive five day graduate student workshop (Talbot style)
 Worked with student organizers to design the program
 Supported participant speakers during preparations and talks

Directed Reading Program mentor (UT Austin)
 Reading program pairing undergraduate students with graduate student mentors. I worked
 with four different bright students in various topics in topology.

Outreach Talks:

inteGIRLS Bay Area Chapter, Spring Math Competition speaker

UC Davis Math Club, November 2018

SUMaC (Stanford high school summer math camp), Summer 2017

SURIM (Stanford undergraduate summer research), Summer 2016

UT Austin Math Club (UT Austin undergraduates)

Math Circle interactive lecture (Austin area middle and high school students)

INVITED TALKS

CIRM Research School Milnor Fibrations, Degenerations and Deformations from a Modern Perspective	September 6-10, 2021
MSRI Summer School: Gauge theory in Geometry and Topology	July 5-16, 2021
Giroux 60 – Convexity in contact and symplectic topology	June 28-July 2, 2021
Iberoamerican Webminar of Young Researchers in Singularity Theory	June 23, 2021
Hebrew University Topology and Geometry Seminar	May 25, 2021
Princeton/IAS/Montreal/Paris/Tel-Aviv Symplectic Seminar	May 7, 2021
inteGIRLS Bay Area Chapter, Spring Math Competition	April 25, 2021
Northwestern University, Geometry and Physics Seminar	April 22, 2021
Chinese University of Hong Kong, Representations and Number Theory Seminar	April 5, 2021
UC Davis Geometry-Topology Seminar	February 9, 2021
Western Washington University Colloquium	February 4, 2021
University of Nevada, Reno, Geometry-Topology Seminar	October 2, 2020
Virtual Trisectors Meeting	June 18, 2020
Western Hemisphere Virtual Symplectic Seminar	March 27, 2020
Stony Brook Symplectic Geometry Seminar	February 23, 2020

Unifying 4-dimensional knot theory Banff International Research Station	November 3-8, 2019
New developments in 4-manifolds Max Planck Institute, Bonn	September 16-20, 2019
International Symplectic Topology Conference IMPA, Rio de Janeiro	August 26-30, 2019
Homological algebra, microlocal analysis and symplectic geometry Mini-course CRM, Montreal	June 17-21, 2019
Cascade topology seminar Portland	May 11-12, 2019
Pauline Sperry Lecture University of California, Berkeley	April 4, 2019
Categorical symplectic topology Cambridge University	March 25-29, 2019
Symplectic geometry and homotopy theory workshop UCLA	December 12-15, 2018
Knotted surfaces in 4-manifolds University of Massachusetts, Amherst	October 26-28, 2018
Geometric methods in symplectic and contact topology Asilomar, CA	August 20-24, 2018
Topology in Dimensions 3, 3.5, and 4 A conference in honor of Abby, Marty, and Rob University of California, Berkeley	June 25-29, 2018
Geometric Structures on 3- and 4-manifolds Dubrovnik, Croatia	June 11-15, 2018
Gokova Geometry Topology Conference Gokova, Turkey	May 28-June 2, 2018
Eastern Illinois Integrated Conference in Geometry, Dynamics, and Topology Charleston, Illinois	April 6-8, 2018
Joint meetings AMS-AWM Special session on women in symplectic and contact geometry and topology Special session on mathematics research from the SMALL undergraduate research program San Diego, CA	January 12-13, 2018
UC Santa Cruz Geometry and Analysis Seminar	December 7, 2017
MIT Geometry and Topology Seminar	December 4, 2017
Princeton/IAS Symplectic Geometry Seminar	October 30, 2017

San Francisco State Geometry and Topology Seminar	October 23, 2017
Northwestern Geometry/Physics Seminar	October 5, 2017
Joint University of Georgia and Georgia Tech Seminar	September 11, 2017
Columbia University SGGTC Seminar	September 8, 2017
Holomorphic curves and symplectic topology Mittag-Leffler Institute, Sweden	August 7-11, 2017
BIRS Workshop: Thirty years of Floer Theory for 3-manifolds Oaxaca, Mexico	July 30-August 4, 2017
AIM Workshop on Trisections Introduction for low-dimensional trisectors to symplectic manifolds, Lefschetz fibrations, and open books	March 20-24, 2017
Triangle Topology Seminar Joint seminar between Duke, NCSU, and UNC	March 6, 2017
PATCH Seminar Joint Philadelphia area seminar: Bryn Mawr, Haverford, Penn, and Temple	March 3, 2017
Hamilton Geometry and Topology Workshop Low-dimensional topology, complex and symplectic geometry Dublin, Ireland	August 22-26, 2016
Perspectives in topology and geometry of 4-manifolds A celebration of the work of Fintushel and Stern Dubrovnik, Croatia	June 6-10, 2016
Oregon Topology Seminar	May 10, 2016
Spring Lecture Series University of Arkansas	April 15-17, 2016
Topological and Quantitative Aspects of Symplectic manifolds A conference in honor of Dusa McDuff's 70th birthday. Columbia University, New York	March 17-20, 2016
SNU Winter School on 4-manifolds Seoul, Korea	December 20-23, 2015
Workshop on Flows, Foliations, and Contact structures Institute for Advanced Study, Princeton	December 7-11, 2015
Symplectic geometry and topology Mittag-Leffler conference Uppsala, Sweden	September 21-25, 2015
Geometry and topology of symplectic 4-manifolds workshop University of Massachusetts, Amherst	April 24-26, 2015
AWM Research Symposium at the University of Maryland	April 11-12, 2015

Symplectic topology session	
Redbud Geometry and Topology Conference Oklahoma State University	April 3-5, 2015
AMS Sectional Meeting at Georgetown University Special Session on Geometric structures on low-dimensional manifolds and their invariants	March 7-8, 2015
Tech Topology Conference Georgia Institute of Technology	December 5-7, 2014
University of Minnesota Symplectic Geometry Seminar	November 20, 2014
University of Georgia Topology Seminar	October 20, 2014
Princeton/IAS joint Topology Seminar	September 25, 2014
Columbia Topology Seminar	September 26, 2014
Workshop on the Topology and Invariants of 4-manifolds Simons Center for Geometry and Physics	August 23, 2014
LSU Topology Seminar	April 30, 2014
AMS Eastern Sectional Meeting, University of Maryland, Baltimore Special Session on Invariants in low dimensional topology	March 29, 2014
Rice University Topology Seminar	March 17, 2014
Conference on the Topology and Invariants of Smooth 4-manifolds University of Minnesota, Twin Cities	August 6, 2013
Graduate Student Geometry Topology Conference University of Notre Dame	April 6, 2013
University of Virginia Geometry Seminar	October 2, 2012
Program for Women and Mathematics: 21st Century Geometry Institute for Advanced Study	May 19, 2012