

Laura Starkston

- PERSONAL INFORMATION University of California, Davis *Citizenship:* USA
Mathematics Department *E-mail:* lstarkston@math.ucdavis.edu
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Davis, CA 95616, USA
- EMPLOYMENT Associate Professor, University of California, Davis, Mathematics **Effective July 2022**
Assistant Professor, University of California, Davis, Mathematics **July 2018–June 2022**
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 **Marco Golla and Laura Starkston** Rational cuspidal curves and symplectic fillings. arXiv:2111.09700 [math.GT].
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. To appear in *Geometry & Topology*.
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. To appear in *Compositio Mathematica*.
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, 2021-2022)

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)

Reviewing:

NSF Panelist Winter 2017, Winter 2020, Fall 2020

Referee for

- Algebraic & Geometric Topology
- Annals of Mathematics
- Arnold Mathematical Journal
- Bulletin of the American Mathematical Society
- Communications in Analysis and Geometry
- 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:

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

Trisectors Workshop 2022 Western Washington University	June 27 - July 1, 2022
3CinG Symplectic versus algebraic geometry at Warwick	May 28 - June 1, 2022
ICERM Conference Braids in Symplectic and Algebraic Geometry	March 21, 2022
U Minnesota Differential Geometry and Symplectic Topology Seminar	March 17, 2022
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
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	June 25-29, 2018

- A conference in honor of Abby, Marty, and Rob
University of California, Berkeley
- Geometric Structures on 3- and 4-manifolds **June 11-15, 2018**
Dubrovnik, Croatia
- Gokova Geometry Topology Conference **May 28-June 2, 2018**
Gokova, Turkey
- Eastern Illinois Integrated Conference in Geometry, Dynamics, and Topology **April 6-8, 2018**
Charleston, Illinois
- Joint meetings **January 12-13, 2018**
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
- 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 **August 7-11, 2017**
Mittag-Leffler Institute, Sweden
- BIRS Workshop: Thirty years of Floer Theory for 3-manifolds **July 30-August 4, 2017**
Oaxaca, Mexico
- AIM Workshop on Trisections **March 20-24, 2017**
Introduction for low-dimensional trisections to symplectic manifolds,
Lefschetz fibrations, and open books
- Triangle Topology Seminar **March 6, 2017**
Joint seminar between Duke, NCSU, and UNC
- PATCH Seminar **March 3, 2017**
Joint Philadelphia area seminar: Bryn Mawr, Haverford, Penn, and Temple
- Hamilton Geometry and Topology Workshop **August 22-26, 2016**
Low-dimensional topology, complex and symplectic geometry
Dublin, Ireland
- Perspectives in topology and geometry of 4-manifolds **June 6-10, 2016**
A celebration of the work of Fintushel and Stern
Dubrovnik, Croatia

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 Symplectic topology session	April 11-12, 2015
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