

Victoria Kala

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EDUCATION

University of California, Los Angeles (UCLA) Ph.D. Mathematics Advisors: Joseph Teran, Andrea Bertozzi	Los Angeles, CA Jun 2024
University of California, Santa Barbara (UCSB) M.A. Applied Mathematics	Santa Barbara, CA Jun 2017
Utah Valley University (UVU) B.S. Mathematics, <i>cum laude</i> B.S. Physics, <i>cum laude</i>	Orem, UT May 2014

APPOINTMENTS

University of Utah <i>Postdoctoral Fellow, C.R. Wiley Instructor</i>	Salt Lake City, UT Jul 2024 – Present
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- Received the 2026 Outstanding Postdoc Teaching Award for outstanding teaching performance.
- Number of undergraduate students advised: 3
- Lower division courses taught: Introduction to Differential Equations.
- Upper division courses taught: Introduction to Numerical Analysis I, Introduction to Numerical Analysis II.
- Average instructor-recommendation rating over 6 courses: 9.8/10

RESEARCH INTERESTS

Computational and applied mathematics, physics-based simulations, computer graphics, material point methods (MPM), fluids, continuum mechanics, numerical partial differential equations

PUBLICATIONS

8. **Kala, Victoria**, Theo Rogers, Asher Merrill, Tyler Evans, and Kenneth Golden. “A Material Point Method for Sea Ice Floes.” In preparation.
7. Cali Cannon, Madelyn Warr, and **Victoria Kala**. “Optimizing Thread Use For Cross Stitching.” In preparation.
6. **Kala, Victoria**, Jingyu Chen, David Hyde, Alexey Stomakhin, and Joseph Teran. “A Thermomechanical Hybrid Incompressible Material Point Method”. In preparation.
5. Kaneda, Ayano, Osman Akar, Jingyu Chen, **Victoria Kala**, David Hyde, and Joseph Teran. “A Deep Conjugate Direction Method for Iteratively Solving Linear Systems.” In International Conference on Machine Learning, pp. 15720-15736. PMLR, 2023.
4. Chen, Jingyu, **Victoria Kala**, Alan Marquez-Razon, Elias Gueidon, David A.B. Hyde, and Joseph Teran. “A momentum-conserving implicit material point method for surface tension with contact angles and spatial gradients.” ACM Transactions on Graphics (TOG) 40, no. 4 (2021): 1-16.

3. **Kala, Victoria**, Katherine Guo, Elizabeth Swantek, Alan Tong, Monique Chyba, Yuriy Mileyko, Chris Gray, Thomas Lee, and Alice Koniges. “Pandemics in Hawai’i: 1918 Influenza and COVID-19.” IARIA, 2020, 26-31.
2. Hollifield, Elliott, **Victoria Treviño**, and Adam Zarn. “A Survival Analysis of the Duration of Olympic Records.” arXiv preprint arXiv:1207.6133 (2012).
1. French, Brigham S., Joseph B. Jensen, John P. Blakeslee, Nathan Boyer, and **Victoria Treviño**. “Calibrating the IR Surface Brightness Fluctuation Distance Scale Using HST WFC3.” AAS 220 (2012): 332-02.

AWARDS AND HONORS

- Outstanding Postdoc Teaching Award, University of Utah, 2026
- Mathematical Association of America (MAA) Project NExT Fellowship for commitment to innovative teaching of undergraduate mathematics, University of Utah, 2025–2026
- Latinx in the Mathematical Sciences Poster Honorary Mention, Institute for Pure and Applied Mathematics (IPAM) at UCLA, 2025
- Latinx in the Mathematical Sciences Conference Travel Grant, Institute for Pure and Applied Mathematics (IPAM) at UCLA, 2025
- National Science Foundation (NSF) Research Training Group (RTG) “Optimization and Inversion for the 21st Century Workforce” Grant, University of Utah, 2024–2027
- C.R. Wiley Instructorship, University of Utah, 2024–2027
- Liggett Fellow Award for outstanding performance as a teaching assistant, UCLA, 2024
- Balbes Award for top-performing female graduate student, UCLA, 2022
- Eugene V. Cota-Robles Fellowship, UCLA, 2020–2021
- Graduate Student Research Fellowship, UCLA, 2020
- Critical Issues in Mathematics Education Travel Grant, Mathematical Sciences Research Institute (MSRI) at UC Berkeley, 2018
- Eugene V. Cota-Robles Fellowship, UCLA, 2017–2018
- Excellence in Teaching Award, UCSB, 2016
- Tutor of the Year, UVU, 2012
- Astrophysics Research Scholarship, UVU, 2012
- Exemplary Merit Scholarship, UVU, 2009–2014

SERVICE AND OUTREACH

- Founder of University of Utah Math Craft Circle, Salt Lake City, UT, Mar 2025 – Present
- *Organizer*
 - Co-organizer for town hall session at Math Fest, Boston, MA, Aug 2026
 - Co-organizer for Project NExT session at Math Fest, Boston, MA, Aug 2026
 - Co-organizer for Project NExT session at Joint Mathematics Meeting, Washington, DC, Jan 2026
 - Co-organizer for University of Utah Applied Mathematics Seminar, Salt Lake City, UT, Aug 2024 – Present
- *Committee Member*
 - UCSB Graduate Student Association Excellence in Teaching Award Committee, Santa Barbara, CA, Apr 2017
- *Mentorship*

- UCLA Women in Mathematics, Los Angeles, CA, Sep 2017 – Jun 2024
- UVU Math Girls Rock!, Orem, UT, Aug 2011 – May 2012

PRESENTATIONS

Invited

- Panelist for UCLA Women in Mathematics Postdoctoral Panel, Los Angeles, CA, Apr 2026
- Panelist for Spectra Career Workshop Panel at Joint Mathematics Meeting, Washington, DC, Jan 2026
- University of Utah Applied Math Collective, “Mentoring and Project NExT”, Salt Lake City, UT, Oct 2025
- University of Utah Applied Mathematics RTG Meeting, “Thermomechanical Material Point Methods”, Salt Lake City, UT, Oct 2024
- University of Utah Applied Mathematics Seminar, “Thermomechanical Material Point Methods for Simulation of Burning and Melting Solids”, Salt Lake City, UT, Sep 2024
- Utah Valley University Physics Colloquium, “Insights from a UVU Math & Physics Alumni on Navigating Undergraduate Research and Internship Opportunities”, Orem, UT, Feb 2024
- École Polytechnique, “Simulation and Optimization of Multilayer Mirrors,” Palaiseau, France, Jul 2013
- Joint Mathematics Meeting, “A Survival Analysis of the Duration of Olympic Records,” San Diego, CA, Jan 2013

Contributed

- IPAM Latinx in the Mathematical Sciences, “A Thermomechanical Hybrid Incompressible Material Point Method”, Los Angeles, CA, Mar 2025
- International Conference on Machine Learning, “A Deep Conjugate Direction Method for Iteratively Solving Linear Systems”, Honolulu, HI, Jul 2023
- SIGGRAPH, “A Momentum-Conserving Implicit Material Point Method for Surface Tension with Contact Angles and Spatial Gradients”, Los Angeles, CA, Aug 2021
- Nebraska Conference for Undergraduate Women in Mathematics (NCUWM), “Math Projects that Spark the Interest of High School Girls”, Lincoln, NE, Jan 2012

SKILLS

- **Mathematics:** solid background in computational and applied mathematics, including numerical analysis, numerical linear algebra, numerical differential equations, ordinary and partial differential equations, optimization
- **Programming:** C++, Python, MATLAB, Mathematica, Maple, L^AT_EX, Houdini, Git, CMake, vim, Eigen, TBB, GDB, Valgrind
- **Operating Systems:** Mac OS X, Windows, Linux

TEACHING EXPERIENCE AS STUDENT

University of California, Los Angeles
Graduate Teaching Assistant

Los Angeles, CA
 Jun 2018 – Jun 2024

I received the Liggett Fellow Award for outstanding performance as a teaching assistant in 2024.

Lower division: Precalculus, Differential and Integral Calculus, Integration and Infinite Series, Calculus of Several Variables, Linear Algebra, Differential Equations.

Upper division: Applied Numerical Methods.

Average teaching rating over 25 courses: 9.44/10

Teaching Assistant Consultant (TAC)

Sep 2023 – Dec 2023

I co-lead the mathematics department pedagogy and training seminar for new teaching assistants. Additionally, I supported new teaching assistants through consultation, observations, and feedback. I further developed insight into learning communities, equitable and inclusive teaching, backward design, universal design for learning, and active and collaborative learning through the TAC Academy.

Graduate Student Instructor (Instructor of Record)

Jan 2022 – Sep 2023

Lower division: Calculus of Several Variables.

Upper division: Applied Numerical Methods.

Average teaching rating over 3 courses: 9.54/10

University of California, Santa Barbara

Graduate Teaching Assistant

Santa Barbara, CA

Sep 2014 – Jul 2017

I received the Graduate Student Association's campus-wide Excellence in Teaching Award for the 2015–2016 school year.

Lower division: Calculus, Linear Algebra, Differential Equations, Vector Calculus.

Upper division: Introduction to Numerical Analysis, Methods of Analysis.

RESEARCH EXPERIENCE AS STUDENT

University of California, Los Angeles

Graduate Student Research

Los Angeles, CA

Apr 2019 – Jun 2024

I collaborate with my advisor, graduate students, and researchers to develop and manage a codebase for physics-based simulations for multiple materials involving material point methods (MPM), finite element methods, hybrid Lagrangian material point methods, and incompressible fluid simulation using continuum mechanics, numerical analysis, and multithreading. My research projects have included thermomechanical material point methods and incompressible fluid simulation for simulation of burning solids, melting solids, and coupling between incompressible fluids and MPM solids.

University of Michigan, Ann Arbor

Institut d'Optique Graduate School

Optics in the City of Light International REU

Simulation and Optimization of Multilayer Mirrors

Ann Arbor, MI

Palaiseau, France

Jun 2013 – Aug 2013

I performed simulation and optimization of period and aperiodic multilayer mirrors using MATLAB and IMD. I also assisted with multilayer mirror deposition in a clean room.

California State University, Fresno

CSU Fresno Mathematics REU

A Survival Analysis of the Duration of Olympic Records

Fresno, CA

Jun 2012 – Jul 2012

I performed statistical analysis on Olympic data to determine the duration of Olympic records. My research group also made predictions on which Olympic records were at risk of being broken for the 2012 Olympics. Programming languages SAS and R were used to perform the analysis and predictions.

Utah Valley University

Astrophysics Research Project

Calibrating the IR Surface Brightness Fluctuation Distance Scale Using HST WFC3

Orem, UT

May 2012 – Jun 2012

I performed image processing techniques and data analysis on several galaxy images taken by Hubble Telescope WFC3/IR. These techniques were used to calculate surface brightness fluctuation magnitudes and determine distances to galaxies.

PROFESSIONAL EXPERIENCE AS STUDENT

Weta FX (formerly Weta Digital)
Simulation Intern

Los Angeles, CA
Jun 2021 – Nov 2021

I collaborated with researchers at Weta FX to develop a method for simulating burning of solid materials, as well as coupling between incompressible fluids and MPM solids.

PROGRAM PARTICIPATION AS STUDENT

University of Nebraska, Lincoln
Nebraska IMMERSE

Lincoln, NE
Jun 2014 – Jul 2014

IMMERSE (Intensive Mathematics: a Mentoring, Education and Research Summer Experience) is a preparation program for students who are about to enter their first year of graduate study in mathematics.

Institute of Advanced Study
IAS Women and Mathematics Program
Topic: Random Matrix Theory

Princeton, NJ
May 2014

The Women and Mathematics program is an annual program with a mission to recruit and retain more women in mathematics.