Christian Camaño

California Institute of Technology
Applied & Computational Mathematics

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Personal Website

Degree	College/University	Year	GPA
Ph.D. Applied & Computational Mathematics	California Institute of Technology	2024–Present	3.95
B.A. Mathematics	San Francisco State University	2021–2023	3.954
B.S. Computer Science	San Francisco State University	2021–2024	3.959

Research Experience

RESEARCH POSITIONS

- **Ph.D. Student | Caltech** **June 2024–Present**
  - *Randomized Linear Algebra, Tensor Networks, Efficient Low-Rank Approximation*
  - Third-year graduate student in Dr. Joel A. Tropp's research group, funded by the NSF GRFP and an internal fellowship. We are developing new methods at the intersection of randomized linear algebra and tensor network algorithms.
- **Student Researcher | San Francisco State University / CAHSI NSF Fellow** **February 2022–May 2024**
  - *Gaussian Process Theory, Bayesian Deep Learning, Dimension Reduction*
  - Collaboration with Dr. Daniel Huang focused on efficient approximate Gaussian process models and concurrent programming techniques for Bayesian deep learning.

RESEARCH STAYS

- **Visiting Researcher | EPFL** **June 2026**
  - *Randomized Linear Algebra, Random Tensor Networks, Quantum Simluation*
  - Invited for a research stay at EPFL to work with Dr. Laura Grigori on random tensor networks.
- **Visiting Researcher | Caltech** **June 2023-August 2023**
  - *Randomized Linear Algebra, Tensor Networks, Hamiltonian Simulation*
  - Collaboration with Dr. Ethan N. Epperly and Dr. Joel A. Tropp on a randomized algorithm for the compressed MPO–MPS product. Funded by the California State University Pre-Doctoral Award.
- **Visiting Researcher | Lawrence Berkeley National Laboratory (LBNL)** **June 2022-August 2022**
  - *Randomized Linear Algebra, Tensor Networks, Hamiltonian Simulation*
  - Research under the guidance of Dr. Roel Van Beeumen and Dr. Xiaoye Sherry Li on adapting the Sketched Rayleigh–Ritz algorithm to tensor networks.

Publications

- **Faster Linear Algebra Algorithms with Structured Random Matrices** **FOCM, 2026**
  Chris Camaño, Ethan N. Epperly, Raphael A. Meyer, Joel A. Tropp
- **Debiasing Polynomial and Fourier Regression** **SOSA 2025**
  Chris Camaño, Raphael Meyer, Kevin Shu
- **Successive Randomized Compression: A Randomized Algorithm for the Compressed MPO–MPS Product** **Quantum 2025**
  Chris Camaño, Ethan N. Epperly, Joel A. Tropp
- **High-Dimensional Gaussian Process Regression with Soft Kernel Interpolation** **TMLR 2025**
  Chris Camaño, Daniel Huang

Preprints

- **Linear algebra at exponential scale via tensor network dimension reduction** **In review, 2026**
  Chris Camaño, Ethan N. Epperly, Raphael A. Meyer, Joel A. Tropp
- **Linear Systems and Eigenvalue Problems: Open Questions from a Simons Workshop** **2026**
  Noah Amsel, Yves Baumann, Paul Beckman, Peter Bürgisser, Chris Camaño, et al.
- **Push: Concurrent Probabilistic Programming for Bayesian Deep Learning** **2023**
  Daniel Huang, Chris Camaño, Jonathan Tsegaye, Jonathan Austin Gale

Invited talks & Presentations

INVITED TALKS

- **Invited Talk | SIAM MDS 2026** **November 2026**
  - Invited to speak at the SIAM Conference on Mathematics of Data Science on randomized tensor network dimension reduction.

- **Seminar Speaker | The Online Seminar for Tensors: Theory and Application** **November 2026**
  - Invited to speak at the SIAM Conference on Mathematics of Data Science in the minisymposium *Randomized, Iterative Algorithms for Data Science* on randomized tensor network dimension reduction.
- **Seminar Speaker | Princeton University** **October 2026**
  - Invited to speak at the IDeAS Seminar in the Program in Applied and Computational Mathematics (PACM) on random tensor networks and tensor network dimension reduction.
- **Invited Talk | Flatiron Institute** **September 2026**
  - Invited to speak at the Center for Computational Quantum Physics (CCQ) workshop *New Methods and Applications of Tensor Networks* on new developments in random tensor networks and tensor network dimension reduction.
- **Invited Talk | UC Berkeley** **September 2026**
  - Invited to speak at the Applied Mathematics Seminar on random tensor networks and tensor network dimension reduction.
- **Invited Talk | ETH Zurich** **June 2026**
  - Invited by Dr. Afonso S. Bandeira to speak at the Data, Algorithms, Combinatorics, and Optimization (DACO) Seminar on moment calculations for random tensor networks using Penrose diagrams.
- **Invited Talk | Bernoulli Center for Fundamental Studies** **June 2026**
  - Invited to speak at the RandNLA workshop on random tensor network dimension reduction.
- **Invited Talk | ILAS 2026** **May 2026**
  - Invited to present at the International Linear Algebra Society Conference on random tensor network Krylov methods.
- **Invited Talk | SOSA 2026** **January 2026**
  - Invited to present at the Symposium on Simplicity in Algorithms on random matrix theory for debiased polynomial regression.
- **Invited Talk | SOCAMS 2025** **April 2025**
  - Invited to present at the Southern California Applied Mathematics Symposium on random tensor networks.
- **Seminar Speaker | University of California San Diego** **April 2025**
  - Invited to speak at the Mathematics of Information, Data, and Signals (MINDS) Seminar on random tensor networks.
- **Workshop Panelist | Argonne National Laboratory** **February 2025**
  - Invited to present at the workshop *Toward Next-Generation Ecosystems for Scientific Computing* on random tensor networks.
- **Workshop Panelist | Sustainable Horizons Institute** **October 2024**
  - Participated as a panelist on graduate funding support and graduate school preparation for underrepresented communities.
- **Conference Panelist | SIAM PP22** **February 2022**
  - Invited panelist at the SIAM Conference on Parallel Processing for Scientific Computing, discussing diversity, equity, and inclusion in applied mathematics and representing the undergraduate community.

POSTER PRESENTATIONS

- **Poster Presenter | Institute for Computational and Experimental Research in Mathematics (ICERM)** **February 2026**
  - Invited to present a poster on oblivious subspace injections at the ICERM workshop on Randomized Numerical Linear Algebra.
- **Poster Presenter | Simons Institute** **October 2025**
  - Invited to present a poster on oblivious subspace injections at the Simons Institute workshop on Linear Systems and Eigenvalue Problems.
- **Poster Presenter | Joint Mathematics Meetings (JMM) 2024** **January 2024**
  - Presented research on randomized algorithms for efficient tensor network contraction at the Joint Mathematics Meetings in San Francisco, California.
- **Poster Presenter | Great Minds in STEM Conference 2023** **October 2023**
  - Presented research findings on UMAP and manifold embedding algorithms at the undergraduate research competition during the Great Minds in STEM Conference in Pasadena, California. Received third place in the research poster competition.
- **Poster Presenter | 51st Annual Whiskeytown Lake Mathematics Conference** **October 2023**
  - Presented research findings on UMAP and manifold embedding algorithms and participated in a discussion on projective geometry.
- **Poster Presenter | Joint Mathematics Meetings (JMM) 2023** **January 2023**
  - Presented research conducted at Lawrence Berkeley National Laboratory during a poster session at the Joint Mathematics Meetings in Boston.
- **Poster Presenter | Lawrence Berkeley National Laboratory (LBNL)** **August 2022**
  - Presented research on tensor networks and eigensolvers at Lawrence Berkeley National Laboratory to staff and fellow undergraduate researchers.

Awards & Fellowships

- **NSF Early Career Travel Award (ILAS 2026)**, *National Science Foundation* **2026**
- **NSF Early Career Travel Award (SOSA 2026)**, *National Science Foundation* **2026**
- **NSF Graduate Research Fellowship, three years of support (GRFP)**, *National Science Foundation* **2024**

- **Caltech Kortschak Graduate Fellowship, two years of support**, *California Institute of Technology* **2024**
- **CSU Pre-Doctoral Summer Research Grant**, *California State University System* **2023**
- **Latinos in Technology Scholar 2023–2024**, *Silicon Valley Community Foundation* **2023**
- **LSAMP Proud Award**, *National Science Foundation* **2023**
- **BMC Scholarship in Computer Science**, *San Francisco State University* **2023**
- **Classes of the 1960s Endowed Scholarship**, *San Francisco State University* **2023**
- **Lilly M. Berry Scholarship**, *San Francisco State University* **2023**
- **Pamela Fong Scholarship in Mathematics**, *San Francisco State University* **2023**
- **SFSU Alumni Senior Scholarship**, *San Francisco State University* **2023**
- **Weinstein Family Scholarship**, *San Francisco State University* **2023**
- **SIAM Conference on Computational Science and Engineering (CSE23) travel award**, *SIAM* **2023**
- **Data Analytics Hackathon Challenge Winner**, *Great Minds in STEM Conference* **2023**
- **Google Explore CSR Scholarship Recipient**, *Google* **2022**
- **CSU Pre-Doctoral Sally Casanova Scholarship**, *California State University System* **2022**
- **Science Undergraduate Laboratory Internships (SULI) Scholar**, *Lawrence Berkeley National Laboratory / U.S. DOE* **2022**
- **SIAM Student Chapter Certificate of Recognition 2021–2022**, *SIAM* **2022**
- **CAHSI REU Scholarship Recipient**, *National Science Foundation* **2022**
- **Jack R. and Marjorie J. Fraenkel Scholarship in Computer Science**, *San Francisco State University* **2022**
- **Jules H. Strauss Scholarship in Computer Science**, *San Francisco State University* **2022**
- **Latinos in Technology Scholarship 2022–2023**, *Silicon Valley Community Foundation* **2022**

Research Workshops & Summer Schools

- **Summer School Participant | Flatiron Institute** **Summer 2026**
  - *Tensor Networks, ITensor, Quantum Many-Body Methods*
  - Participated in the 2026 ITensor School at the Flatiron Institute.
- **Invited Workshop Speaker | Flatiron Institute** **September 2026**
  - Invited to speak at the Flatiron Institute workshop *New Methods and Applications of Tensor Networks* on September 25, 2026, on random tensor networks and tensor network dimension reduction.
- **Workshop Participant | Institute for Computational and Experimental Research in Mathematics** **February 2026**
  - *Randomized Linear Algebra, Tensor Methods, Sketching Methods*
  - Participated in the ICERM workshop on Randomized Numerical Linear Algebra, presenting a poster on sparse and tensor sketching.
- **Workshop Participant | Simons Institute for the Theory of Computing** **October 2025**
  - *Linear Systems, Eigenvalue Problems, Tensor Decomposition*
  - Participated in the Simons Institute workshop on Linear Systems and Eigenvalue Problems, contributing to the tensor section of the Simons 25 open problems collection.
- **Summer School Participant | Institute for Pure and Applied Mathematics (IPAM)** **August 2025**
  - *Randomized Orthogonalization, Inverse Problems, Advanced Krylov Solvers*
  - Collaboration with Dr. Julianne Chung and Dr. Silvia Gazzola on integrating randomized orthogonalization into Krylov solvers such as GMRES and LSQR for ill-posed inverse problems. Hosted as part of the IPAM 2025 RNLA workshop.
- **Summer School Participant | Mathematical Sciences Research Institute (MSRI/SLMath)** **June 2023**
  - *Dependent Type Theory, Formal Proof Verification*
  - Invited to attend a graduate seminar on theorem proving in `Lean4`, representing San Francisco State University. Formalized a proof in functional analysis regarding the nonlinear Hahn–Banach theorem, now available in `mathlib`.

Teaching

- **Teaching Assistant:** Point Set Topology – *San Francisco State University* **2024**
- **Teaching Assistant:** Functional Analysis – *San Francisco State University* **2024**
- **Teaching Assistant:** Complex Analysis – *San Francisco State University* **2024**
- **Teaching Assistant:** Functional Programming – *San Francisco State University* **2023**
- **Teaching Assistant:** Java Programming – *San Francisco State University* **2023**

Community Engagement

- **Mentor, Caltech Connection** **October 2025–May 2026**
  - Engaged in a six-month student mentorship program for promising undergraduate students at community colleges.
- **President, SIAM Chapter at Caltech** **July 2025–January 2026**
  - Former president of the Caltech SIAM Chapter.
- **President, SIAM Chapter at San Francisco State University** **February 2022–May 2024**
  - Former president of the San Francisco State University SIAM Chapter.

- **Mathematics Tutor & Project Lead, San Francisco State University** **February 2022–May 2024**
  - Provided tutoring services in a range of subjects, from introductory calculus to advanced linear algebra and analysis.

Reviewing

- SIAM Journal on Scientific Computing (SISC) **2026**
- SIAM Journal on Matrix Analysis and Applications (SIMAX) **2025**