

Education

- New York University** 2020-
PhD in Mathematics
Thesis: Fast transform methods for Gaussian random fields
Advisor: Michael O'Neil
- The University of Chicago** 2015-2019
BS with Honors in Computational and Applied Mathematics
Thesis: Nonstationary Gaussian process approximations of piecewise analytic computer codes
Advisor: Mihai Anitescu

Research

- Lawrence Berkeley National Laboratory** *CSGF Practicum* 2023
Advisors: Xiaoye Sherry Li, Yang Liu
Towards an optimal complexity black-box butterfly factorization from matrix-vector products
- Argonne National Laboratory** *Predoctoral Researcher* 2019-2020
Advisor: Mihai Anitescu
Maximum likelihood for nonstationary Gaussian processes with rank-structured covariance matrices
- Lawrence Berkeley National Laboratory** *BLUR Intern* 2018
Advisor: Chao Yang
Clustering-based shift selection in parallel shift-invert spectrum slicing eigensolver
- Lawrence Livermore National Laboratory** *SULI Intern* 2017
Advisors: Jean-Luc Fattebert, Daniel Osei-Kuffuor
Geometric initial guess for the locations of localized electronic orbital centers in biological systems
- University of Chicago Computation Institute** *Undergraduate Researcher* 2016-2017
Advisors: Ian Foster, Kyle Chard
Statistical data mining software; streaming and storage systems for sensor network data

Publications & Reports

Christopher J. Geoga, **Beckman, Paul G.**. "Nonparametric spectral density estimation from irregularly sampled data." arXiv preprint arXiv: 2503.00492 (2025).

Beckman, Paul G., Michael O'Neil. "A Nonuniform Fast Hankel Transform." arXiv preprint arXiv: 2411.03029 (2024).

Beckman, Paul G., Christopher J. Geoga. "Fast Adaptive Fourier Integration for Spectral Densities of Gaussian Processes." *Statistics and Computing* 34, no. 6 (2024): 217.

Beckman, Paul G., Christopher J. Geoga, Michael L. Stein, and Mihai Anitescu. "Scalable Computations for Nonstationary Gaussian Processes." *Statistics and Computing* 33, no. 4 (2023): 84.

Williams–Young, David B., **Paul G. Beckman**, and Chao Yang. “A Shift Selection Strategy for Parallel Shift-Invert Spectrum Slicing in Symmetric Self-Consistent Eigenvalue Computation.” *ACM Transactions on Mathematical Software (TOMS)* 46, no. 4 (2020): 1-31.

Beckman, Paul G., Jean-Luc Fattebert, Edmond Y. Lau, and Daniel Osei-Kuffuor. *A geometric initial guess for localized electronic orbitals in modular biological systems*. No. LLNL-TR-738503. Lawrence Livermore National Lab. 2017.

Awards

Courant Institute of Mathematical Sciences *Moses A. Greenfield Research Prize* 2024

Department of Energy *Computational Science Graduate Fellowship* 2020

Presentations

SIAM *Computational Science and Engineering (Minisymposium co-organizer)* 2025
Talk: “Fast adaptive Fourier integration of spectral densities”

Princeton University *PACM IDeAS Seminar* 2025
Talk: “A nonuniform fast Hankel transform”

SIAM *Uncertainty Quantification* 2024
Talk: “Fast adaptive Fourier integration of spectral densities”
Poster: “Butterfly-accelerated Gaussian random fields on manifolds”

ICIAM *International Congress on Industrial and Applied Mathematics* 2023
Talk: “Boundary integral methods for computing covariances in inverse source problems”

SIAM *Mathematics of Data Science (Minisymposium co-organizer)* 2022
Talk: “Fast algorithms for elliptic PDEs with Gaussian boundary noise”

Teaching

Mathematic Statistics *Teaching Assistant* Spring 2024
New York University MATH-UA.2340

Statistics *Teaching Assistant* Fall 2021
New York University MATH-GA.2962

Computational Statistics *Teaching Assistant* Spring 2021
New York University MATH-GA.2080

Software

Primary developer `FastHankelTransform.jl`, `SpectralKernels.jl`

Contributor `FastGaussQuadrature.jl`, `chunkIE`

Outreach and Service

Petey Greene Program *Volunteer Tutor*

2020-

Math and science instructor for currently and formerly incarcerated students

- Taught everyday mathematical literacy and elementary through middle school subjects for adults
- Prepared students for high school equivalency exams (GED and TASC)
- Tutored algebra to college students

Courant Institute of Mathematical Sciences *DEI Reading Group*

2020-2024

Co-founded a department reading group on diversity, equity, and inclusion (DEI) in mathematics

- Selected articles on progress towards accessible math higher education for historically excluded groups
- Facilitated discussion of readings between students, postdocs, and faculty

Courant Institute of Mathematical Sciences *Department Climate Survey*

2020-2022

Co-designed, administered, and reviewed a survey for Courant PhD students

- Wrote survey questions regarding available resources, biases, and other student concerns
- Analyzed responses and suggested corresponding departmental changes to leadership