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

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 *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"

New York University *Modeling and Simulation Group Meeting* **2022**
Talk: "Rank, screening, and noise: The Vecchia approximation for kernel matrices"

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