

# Aleksei Gregory Sorokin

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**Research** Scientific Machine Learning, Gaussian Processes, Quasi-Monte Carlo, Probabilistic Numerics

**Programming** Python (PyTorch, GPyTorch, Pandas, Matplotlib), Julia, C, MATLAB, R, SQL, Wolfram

**Tools** AWS (SageMaker, EC2), GitHub (general, actions, pages),  $\text{\LaTeX}$ , Docker

## Education

2026.01 - 2028.05 **Postdoc.** Department of Statistics, University of Chicago. Advisors *Yuehaw Khoo and Lek-Heng Lim*.

2021.08 - 2025.12 **PhD in Applied Math.** Illinois Institute of Technology (IIT). GPA 3.89/4. Advisor *Fred J Hickernell*.

2017.08 - 2021.05 **Master of Data Science.** IIT. Summa Cum Laude. GPA 3.94/4.

2017.08 - 2021.05 **B.S. in Applied Math, Minor in Computer Science.** IIT. Summa Cum Laude. GPA 3.94/4.

## Experiences

2025.01 - 2025.12 **DOE SCGSR Fellow in Applied Math** at **Sandia National Laboratory** in Livermore, CA. I produced scientific ML models for machine-precision solutions to nonlinear PDEs [1]. I developed scalable multi-fidelity Gaussian processes regression models and open-source software implementations [7, 8].

2024.05 - 2024.08 **Scientific Machine Learning Researcher** at **FM (Factory Mutual Insurance Company)**. I deployed scientific ML models, including PINNs DeepONets, to accelerate CFD fire dynamics simulations [9].

2023.05 - 2023.08 **Graduate Intern** at **Los Alamos National Laboratory**. I modeled multi-fidelity solutions to PDE with random coefficients using efficient and error aware Gaussian processes regression models [10].

2022.05 - 2022.08 **Givens Associate Intern** at **Argonne National Laboratory**. I derived error bounds and a sequential sampling method for efficiently estimating failure probabilities with probabilistic models [13].

2021.05 - 2021.08 **ML Engineer Intern** at **SigOpt, an Intel Company**. In a six-person ML team, I contributed production code for meta-learning model-aware hyperparameter tuning via Bayesian optimization [14].

2022.09 - 2022.11 **Participant** in **Argonne National Laboratory's Course on AI Driven Science on Supercomputers**. Key topics included handling large scale data pipelines and parallel training for neural networks.

2018.05 - 2019.08 **Instructor** for the **STARS Computing Corps' Computer Discover Program**. I taught and developed curriculum for middle school and high school girls to learn programmatic thinking in Python.

2021.08 - 2025.01 **Teaching Assistant** at **IIT**. I led reviews for PhD qualifying exams in analysis and computational math.

## Open-Source Software

**QMCPy Quasi-Monte Carlo Python Software** (qmcsoftware.github.io/QMCSoftware). I led dozens of col-laborators across academia and industry to develop QMC sequence generators, automatic variable transformations, adaptive error estimators, and diverse use cases [5, 6, 15, 16, 17, 18, 3, 4].

**FastGPs Scalable Gaussian Processes in Python** (alegresor.github.io/fastgps). This supports GPU scaling, batched inference, hyperparameter optimization, multi-fidelity GPs, and efficient Bayesian cubature. FastGPs is the first package to implement GPs which require only  $\mathcal{O}(n)$  storage and  $\mathcal{O}(n \log n)$  computations compared to the typical  $\mathcal{O}(n^2)$  storage and  $\mathcal{O}(n^3)$  computations requirements [8, 7].

**QMCGenerators.jl Randomized Quasi-Monte Carlo Sequences in Julia** (alegresor.github.io/QMCGenerators.jl).

**QMCToolsCL Randomized Quasi-Monte Carlo Sequences in C/OpenCL** (qmcsoftware.github.io/QMCToolsCL/).

**TorchOrthoPolys Orthogonal Polynomials in PyTorch** (alegresor.github.io/TorchOrthoPolys/) with GPU support.

## Awards

2025.01 - 2025.12 **DOE SCGSR Fellow in Applied Math**, Sandia National Laboratory, Livermore California.

2025.01 **Karl Menger Student Award for Exceptional Scholarship (Graduate)**, IIT.

2024.01 **College of Computing Excellence in Dissertation Research**, IIT.

2024 **Teaching Assistant Award**, IIT.

2023.08 **Outstanding Math Poster**, Los Alamos National Laboratory.

2017.08 - 2025.05 **Deans List Member**, IIT, every semester.

## References

PhD Advisor **Fred J. Hickernell** (hickernell@iit.edu) Vice Provost for Research and Professor of Applied Math, IIT.

Mentor **Nicolas W. Hengartner** (nickh@lanl.gov) Senior Scientist, Los Alamos National Lab.

Mentor **Michael J. McCourt** (mikemccourt1234@gmail.com) CTO and Co-Founder at Distributional.

Mentor **Pieterjan M. Robbe** (pmrobbe@sandia.gov) Senior Member of Technical Staff, Sandia National Lab.

- [1] Aras Bacho, Aleksei G. Sorokin, Xianjin Yang, Théo Bourdais, Edoardo Calvello, Matthieu Darcy, Alexander Hsu, Bamdad Hosseini, and Houman Owhadi. "Operator learning at machine precision". In: *ArXiv preprint abs/2511.19980* (2025). URL: <https://arxiv.org/abs/2511.19980>.
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