Alina Lynn Kochocki

Curriculum Vitae (Winter 2026)

CONTACT INFORMATION

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EDUCATION

Technical University of Munich (TUM) *June 2025 – June 2026*
Visiting graduate student within the group of Elisa Resconi

Michigan State University (MSU) *September 2021 – June 2026*
Advised by Nathan Whitehorn
Doctor of Philosophy in Physics (expected 2026). GPA: 3.89
Dissertation with focus on stochastic modeling and statistical inference for partially observed systems, domain applications

University of California, Los Angeles (UCLA) *September 2017 – March 2021*
Advised by Rene Ong, Nathan Whitehorn and Alexander Kusenko
Bachelor of Science in Physics. GPA: 3.89
Magna Cum Laude, Highest Departmental Honors

RESEARCH INTERESTS

- Measure-theoretic probability and stochastic processes
- Interacting particle systems and agent-based models
- Dynamic networks and transport over networks
- Scaling limits relevant within spatiotemporal population dynamics
- Statistical inference of complex systems

  Applications in ecology, anthropology and social systems

SELECTED PREPRINTS AND WORK IN PROGRESS

- *(In prep for Journal of Theoretical Biology)* Alina Kochocki. 2026 "Threshold Redistribution on a Network". A process of threshold-based resource redistribution on networks. Studied a two-dimensional stepping-stone population model with local interactions and redistribution dependent on agent lineage network structure. Focused on the relation between network topology, resource density, and population persistence.
- *(Work in progress)* Alina Kochocki. 2026 Ph.D. Thesis Section, "Statistical Inference for a Rare-Event Process with High-Dimensional, Observational Data". Develops statistical inference methods for rare-event stochastic processes under partial observability using measure-theoretic probability, with applications to high-energy physics and astrophysics.
- *(Work in progress)* Alina Kochocki. 2026 Ph.D. Thesis Section, "Machine Learning Processes with Applications in High-Energy Physics". A discussion of classification and generative modeling for observational data, with emphasis on statistical structure and assumptions.

AWARDS AND HONORS

Dissertation Completion Fellowship, Michigan State University	October 2025
Michigan State University STEM Ambassador, STEMAP	February 2023
National Science Foundation GRFP – Honorable Mention	April 2022
University Distinguished Fellowship, Michigan State University	February 2021
College of Natural Science Fellowship, Michigan State University	February 2021
Recruiting Fellowship, Michigan State University	February 2021
Selected Graduate Fellowships – declined for personal reasons [1] :	February 2021

- **James Mills Peirce Fellowship**, Harvard Physics
- **Stanford Graduate Fellow**, Stanford Physics
- **KIPAC Graduate Fellowship**, Stanford Physics
- **Princeton Graduate Fellowship**, Princeton Physics

USRA Distinguished Undergraduate Award – Honorable Mention	August 2020
Undergraduate Research Scholar, UCLA URC	August 2020
Honors Summer Research Stipend Award, UCLA College Honors	June 2020
Undergraduate Research Scholar, UCLA URC	August 2019
Frederick R. Waingrow Peterson Publishing Company Scholarship	April 2019
Undergraduate Research Fellow, UCLA URC	December 2018
Invited Member of UCLA College Honors Program	April 2017

SELECTED TALKS

- *Three plenaries and sixteen parallel presentations between 2022 and 2025 at IceCube collaboration meetings. Meetings are typically attended by ∼200 collaborators and are held twice yearly – within and outside of the United States.*
- International Cosmic Ray Conference (Geneva, Switzerland) – July 2025.
- (***Invited***) Northwestern CIERA Theory Seminar (Evanston, USA) – April 2025.
- (***Invited***) UCLA TEPAPP Seminar (Los Angeles, USA) – March 2025.
- American Physical Society Global Physics Summit (Anaheim, USA) – March 2025.
- (***Invited***) PACIFIC (Moorea, French Polynesia) – August 2024.
- (***Invited***) Turbulence in Astrophysical Environments (Santa Barbara, USA) – February 2024.
- TeV Particle Astrophysics (Napoli, Italy) – September 2023.
- 27th European Cosmic Ray Symposium (Nijmegen, the Netherlands) – July 2022.
- 237th Meeting of the American Astronomical Society – January 2021.
- UCLA Undergraduate Research Virtual Showcase – May 2020.

OTHER SELECTED PUBLICATIONS

- *(In prep)* The IceCube Collaboration[2] . 2025 "Timing Resolution of the IceCube Upgrade mDOM".
- *(In prep)* Alina Kochocki, Sam Hori, Emma Kun. 2025 "Delayed Gamma-ray and Radio Flaring Activity in a Selection of Fermi-LAT AGN".
- *(In prep)* Alina Kochocki and Xavier Rodrigues. 2025 "A Leptonic Jet Model for Delayed Radio Flares in Neutrino Blazars".
- *(Collaboration review)* The IceCube Collaboration. 2025 "A Time-Dependent Search for Neutrino Emission from Flaring X-ray Binaries".

[1] Declined fellowship offers are not traditionally listed. As these were also exceptional offers, I have chosen to list them.
[2] IceCube authorship policies are described here. The listed papers represent first-author contributions.

- Kochocki et al. for the IceCube Collaboration. 2025 "A Search for Astrophysical Neutrinos from Flaring X-ray Binaries with IceCube". *PoS*, ICRC, 1077
- *(Accepted, ApJ)* The IceCube Collaboration and Atacama Cosmology Telescope. 2024 "A Search for Millimeter-Bright Blazars as Astrophysical Neutrino Sources".
- Alina Kochocki for the IceCube-Gen2 Collaboration. 2023 "Forecasted Sensitivity of IceCube-Gen2 to the Astrophysical Diffuse Spectrum". *PoS*, ECRS, 100
- Alina Kochocki, Volodymyr Takhistov, Alexander Kusenko and Nathan Whitehorn. 2021 "Contribution of Secondary Neutrinos from Line-of-Sight Cosmic Ray Interactions to the IceCube Diffuse Astrophysical Flux". *ApJ*, 914, p.91

TEACHING EXPERIENCE

Elementary Particle Physics Laboratory *September 2020 – December 2020*

A cosmic-ray detector is simulated and built from a photomultiplier tube and scintillator. Contributed to development of the virtual course syllabus structure and content. Responsible for creation and oversight of the simulation component of this course; produced a cookbook for the construction of optical physics simulations catered towards students with minimal background in experimental particle physics. Produced original Python analysis and Geant4 simulation tutorials presented in class.

RECENT SELECTED STUDIES

Probability – Applied through research, self-study from "Probability: Theory and Examples" (Rick Durrett)
Analysis – Formal study at UCLA, as well as recent review
Statistical Mechanics – Formal study at UCLA, as well as recent self-study following "Statistical Mechanics of Lattice Systems" (Friedli and Velenik)
Nonlinear Dynamics, System Dynamics – Audited, TUM
Network Analysis – Self-study following Leonid Zhukov's online lecture series
Classical Mechanics – MSU
Modeling Environmental and Social Systems – MSU
Radiative Astrophysics – MSU
Extragalactic Astrophysics – MSU
Quantum Field Theory – MSU
ISAPP 2023: Neutrino Physics, Astrophysics and Cosmology – INFN School (Varenna, Italy)
Special Topics in High-Energy Physics, Collider Phenomenology – MSU

TECHNICAL SKILLS

Mathematical Methods: Monte Carlo methods, likelihood-based inference, stochastic simulation, numerical simulation, numerical optimization.
Programming Languages: C, C++, Python, Bash, Perl, Java, Boost (with Python bindings via Boost.Python).
Mathematical Computing Software: Mathematica, SOLIDWORKS.
Relevant Libraries/Frameworks: TensorFlow, XGBoost, BLAS, LAPACK, Celerite2, NumPy, SciPy.
Scientific Software: Pythia, Geant4, Arduino, SCPI.
Domain-Specific Data Processing: ROOT (particle physics data processing), IceTray (high-energy neutrino and cosmic-ray data processing), VEGAS and Fermitools (gamma-ray data processing).
Distributed Computing: TORQUE, Sun Grid Engine, Slurm, HTCondor.
Computing Experience: Extensive experience with CPU/GPU simulations and model training. Efficient parallelization of tasks across resources.
Communication: GitHub, LaTeX, Overleaf, Wiki Markup, Microsoft Office, Google Workspace.
Backend/Frontend Development: HTML, CSS.

SERVICE

IceCube Neutrino-Sources Technical Lead *March 2024 – present*
Technical lead for the IceCube Collaboration Neutrino-Sources (astrophysics) working group. Oversee software reviews for analyses, provide assistance with software, likelihood implementation, data and computing resources.

MSU Physics Graduate Organization President *July 2024 – July 2025*
President of the MSU Physics Graduate Organization. Involvement in departmental advisory. Supported student-organized services and representatives. Assisted departmental leadership in communicating effectively with the student body during periods of funding instability and policy changes. Provided students with resources during periods of instability. Led survey to understand student needs and experiences.

Graduate Colloquium Committee Representative *July 2023 – October 2024*
Organized and hosted student-postdoctoral lunches with visiting colloquium speakers. Worked with local colloquium committee to improve departmental colloquium experience and attendance.

HEP Social Organization *July 2023 – December 2024*
Hosted socials and happy hours for the high-energy physics (HEP) group at MSU.

OUTREACH

Astronomy on Tap,"IceCube and Astrophysical Neutrinos" *July 2024*
Invited to speak on IceCube and neutrino astrophysics for a public audience in East Lansing, Michigan.

Outreach Activity, "Academic Research and Community with IceCube" *January 2023*
Developed an outreach event for high school students at St. Catherine of Siena Academy (Wixom, MI). Presented on my own work with IceCube, entering science and academia, and led a guided discussion with small groups to consider the lifestyle of a researcher, bridging potential misconceptions held about STEM education and careers. Assessed activity efficacy with an IRB-approved survey.

STEM Ambassador Program *September 2022 – February 2023*
Accepted into the 2022 cohort of the NSF-supported STEM Ambassador Program (STEMAP). Attended a set of regular workshops to learn best practices for outreach and in building community trust in science. Developed and carried out a novel outreach activity.

UCLA Exploring Your Universe (EYU) Science Fair *November 2018, 2020*
Presenter at UCLA's Exploring Your Universe fair. Helped manage organization of the 2020 cosmology and astroparticle physics virtual booth.

Head Telescope Operator, UCLA Public Viewing Nights *September 2017 – February 2019*
Organized weekly shows, presented scientific background to audiences, and mentored club members.

LANGUAGES

English – Native
Spanish – Limited working proficiency (five years of classroom study)
German – Elementary proficiency (B1 level)

HOBBIES

Regular – Running and weight-training for sport pole dance
Less-frequent – Mixing and creating music with Ableton, water and oil painting