

LIAM PACKER

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EDUCATION

Cornell University *Ithaca, NY*

August 2023–Present

PhD—Applied Mathematics (Expected Graduation: May '28)

Swarthmore College *Swarthmore, PA*

Aug 2016–May 2020

Bachelor of Arts—Double Major with High Honors in Mathematics and Physics

WORK EXPERIENCE

Johns Hopkins University Applied Physics Laboratory *Laurel, MD*

Jun 2020–Jun 2023

Scientific Analysis, Machine Learning, and Software Design

SES/SRN: Space Analysis and Applications Group (Feb 2022–Jun 2023):

The SRN group of the space sector is a research group focused in aiding research across all levels of technology, from theoretical underpinnings to flight-ready design. Primarily NASA-sponsored.

AOS/QAT: Tactical Intelligence Systems Group (Jun 2020–Feb 2022):

The QAT group of the Asymmetric Operations sector focuses in building intelligent systems for flight-ready situations. Primarily sponsored by the DoD's Chief Digital and Artificial Intelligence Office (CDAO).

AWARDS

Cornell Math Teaching Development Fellow

Spring 2026

Cornell University Graduate Resident Fellowship

Jun 2024–Present

NSF Graduate Research Fellowship Program (HM)

Spring 2025

Swarthmore College Summer Research Fellowship

Summer 2019

Swarthmore College Summer Research Fellowship

Summer 2018

PUBLICATIONS

- [1] Liam Packer, Kihoon Seong, and Phil Sosoe. Large Deviation Principles for the Gross-Pitaevskii Gibbs Measure at Low Temperature. *forthcoming*, 2025.

Work Publications (*JHU/APL*)

- [2] Scott Murchie, Frank Seelos, Katie Hancock, David Stephens, Ryan Poffenbarger, Giuseppe Romeo, Christina Viviano, Katelyn Frizzell, and Liam Packer. CRISM Global Visible/Infrared Spectral Maps of Mars. Technical report, Copernicus Meetings, 2025.
- [3] Frank P Seelos, Kimberly D Seelos, Scott L Murchie, M Alexandra Matiella Novak, Christopher D Hash, M Frank Morgan, Raymond E Arvidson, John Aiello, Jean-Pierre Bibring, Janice L Bishop, et al. The CRISM investigation in Mars orbit: Overview, history, and delivered data products. *Icarus*, 419:115612, 2024.
- [4] Y Itoh, LL Packer, MS Kawamura, G Romeo, A Matiella Novak, FP Seelos, and SL Murchie. Empirical Geometric Normalization for TER/MTRDR Processing of CRISM Restricted Gimbal Range Targeted Observations. In *54th Lunar and Planetary Science Conference*, volume 2806, page 2433, 2023.
- [5] Eryk Banatt, Vickram Rajendran, and Liam Packer. Target domain data induces negative transfer in mixed domain training with disjoint classes. *arXiv preprint arXiv:2303.01003*, 2023.

Undergraduate Publications (*Swarthmore College*)

- [6] Liam Packer, Brian Jenike, Ari Liloia, Amy Graves, and Sean Ridout. Jammed solids held together with pins: structure and dynamics. *Bulletin of the American Physical Society*, 65, 2020.
- [7] Amy Graves, Liam Packer, Brian Jenike, Ari Liloia, and Sean Ridout. Jammed solids held together with pins: The effect of pin geometry on structure and mechanical response. *Bulletin of the American Physical Society*, 65, 2020.

TEACHING

- Teaching Assistant (Math 6110)** *Cornell University* **Fall 2025**
Graduate core course in analysis. Teaching advanced topics weekly in recitation, office hours, and grading.
- TA Training (Math Dept)** *Cornell University* **Aug 2025**
Instructing on roles and responsibilities for Cornell math TAs.
- Instructor (UNLIWYL 1407)** *Cornell University* **Spring 2025**
Course on academic communication, co-taught with house professor and peer resident fellow.
- Teaching Assistant (Math 4710)** *Cornell University* **Fall 2024**
Upper-level introductory probability. Weekly recitations, office hours, and grading.
- Teaching Assistant (Math 2240)** *Cornell University* **Jan 2024–May 2024**
Honors-track course modeled after Harvard 55a/b. Weekly recitations, office hours, and grading.
- Teaching Assistant (Math 1920)** *Cornell University* **Fall '23, Spring '25**
Held weekly recitations for ≈ 75 students. Prepared quizzes and section materials from scratch.
- Math Clinician** *Math Department, Swarthmore College* **Sep 2019–May 2020**
Walk-in mathematics peer tutor for over a hundred students, in all math classes offered by the department.
- Teaching Assistant** *Physics Department, Swarthmore College* **Dec 2018–May 2020**
Held weekly three-hour office session for students in Mechanics, E&M, Thermodynamics, and Optics.
- Algorithms Grader** *Computer Science Department, Swarthmore College* **Fall 2018, Fall 2019**
Assessed ≈ 80 pages of proof-based work weekly for the advanced algorithms class.

MENTORING

- Directed Reading Program** *Cornell University* **Aug 2024–Present**
Paired with ambitious undergraduate, reading topics in high-dimensional probability and percolation.
- CAM Mentoring Program Coordinator** *Cornell University* **Aug 2024–Aug 2025**
Pairing new PhD students with experienced students; programming to help the transition to grad school.
- Graduate Resident Fellow** *Cornell University* **Aug 2024–Present**
Residential fellow of the William Keeton House; focus on community-building.
- Cornell Math Modeling Judge** *Cornell University* **Fall '23, '24, '25**
Judged undergraduate submissions for the Cornell Mathematical Contest in Modelling (CMCM)
- AWM ZigZag Mentor** *Cornell University* **Nov 2023–Present**
Volunteer mentor for women or gender identities historically marginalized in mathematics.
- Intern Advisor** *Johns Hopkins Applied Physics Lab* **Jun 2022–Jun 2023**
Direct manager of selected interns; focus on task scoping and talent cultivation.
- Information Technology Services Student Associate** *Swarthmore College* **Jun 2017–Dec 2017**
Provided assistance and guidance for any technological difficulties suffered by students and faculty.

PRESENTATIONS AND TALKS

- Uniqueness of the ϕ_2^4 field via Holley-Stroock *Cornell, PhD Candidacy Exam* **Dec 2025**
- Roles and Responsibilities as a TA *Cornell, Math TA training* **Aug 2025**
- Langevin Dynamics and Heat Semigroups *Cornell, CAM student seminar* **Oct 2024**
- Percolation on \mathbb{Z}^2 and Kesten's theorem *Cornell, CAM student seminar* **May 2024**
- Kalman Filters and Hilbert Spaces *Cornell, Applied Dynamics Seminar* **Feb 2024**

Kalman Filters and Hilbert Spaces	<i>Cornell, Sarah Dean Group</i> Feb 2024
Spectral Graph Theory for Clustering in CRISM MSV data	<i>SES/SRN</i> Oct 2022
CV Techniques for Unsupervised Clustering of Hyperspectral Imagery	<i>SES/SRN</i> Aug 2022
SAR Sensor Planning: Optimizing Pointing Decisions for Unusual Sensors	<i>AOS/QAT</i> Sep 2021
Neuro-symbolic Methods in Image-to-Text Generation	<i>AOS/QAT</i> Sep 2020
Jammed solids held together with pins: structure and dynamics	<i>Swarthmore College</i> Dec 2019
Predicting Cluster Memory Usage for Adaptive Network RAM	<i>Swarthmore College</i> Aug 2018

SUMMER SCHOOLS ATTENDED

Cornell Probability Summer School	Summer 2024
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TECHNICAL PROFICIENCIES

Computer Languages	C++, Python, Julia, C, Scheme, Racket, Java, OCaml
Mathematical Computing	Maxima, Mathematica, \LaTeX , IDL, Matlab
Software & Frameworks	Emacs, Linux, Pytorch, Scikit-Learn, ReactJS, Pandas
v Tooling & Build Systems	Git, Docker, Tmux, Maven, Make, CMake, Dune
Languages	Japanese & Spanish (limited working proficiency)

EXTRACURRICULAR

- Co-president of *Kizuna*, the resident Japanese Culture group at Swarthmore College (2017–2019).
- President of Swarthmore’s Smash club, hosting weekly tournaments with up to 30 entrants (2018–2020).
- Classically trained flutist. Performed in a number of venues including Carnegie Hall.
- Recreating the (computational) wheel in Chez Scheme: monadic parsing, matrix computations, see github.com/liampack.