Kathryn Lampo

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EDUCATION

University of Oxford, Balliol College, Oxford, UK **Expected May 2027**
Master of Science by Research in Engineering

Columbia University, School of Engineering & Applied Science, New York, NY **May 2025**
Bachelor of Science in Mechanical Engineering, *magna cum laude* (4.0/4.0 GPA)
Semester abroad at **Universidad Carlos III de Madrid,** Leganés, Spain, Spring 2023

HONORS AND AWARDS

Marshall Scholarship, *2025*
Aviation Week 20 Twenties Laureate, *2025*
NSF Graduate Research Fellowship*, 2025* (declined)
Campbell Award, *2025* — awarded to one graduate in each Columbia school for exceptional leadership.
George Vincent Wendell Memorial Award, *2025* — awarded to one Columbia Engineering graduating senior, selected by faculty and peers, for character, scholarship and service.
Mechanical Engineering Excellence in Undergraduate Research Award, *2025*
Columbia University Senior Marshal, *2025*
Tau Beta Pi Inductee, *2025*

PUBLICATIONS

1. Zhang, K.*, Kim, D.*, Chang, E.*, Liang, H., He, Z., **Lampo, K.**, Wu, P., Kymissis, I., and Ciocarlie, M. (2025). *VibeCheck: Using Active Acoustic Tactile Sensing for Contact-Rich Manipulation*. To appear in IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) 2025. arXiv preprint, https://doi.org/10.48550/arXiv.2504.15535
2. Kipping, D., **Lampo, K.** (2025). *Torqued Accelerator using Radiation from the Sun (TARS) for Interstellar Payloads*. Accepted for publication in the Journal of the British Interplanetary Society. arXiv preprint, https://doi.org/10.48550/arXiv.2507.17615
3. Khandate, G.*, Wang, B.*, Park, S.*, Ni, W., Palacios, J., **Lampo, K.**, Wu, P., Ho, R., Chang, E., and Ciocarlie, M. (2025). *Train Robots in a JIF: Joint Inverse and Forward Dynamics with Human and Robot Demonstrations*. arXiv preprint, https://doi.org/10.48550/arXiv.2503.12297
4. Werneken, M., [...] **Lampo, K.**, [...], et al. (2024). *The Line Imaging Orbiter for Nanosatellite-Enabled Spectrographic Surveys (LIONESS)*. In Proc. SPIE 13092, Space Telescopes and Instrumentation 2024: Optical, Infrared, and Millimeter Wave, paper 1309208, Yokohama, Japan. https://doi.org/10.1117/12.3019173
5. Vega, F., Phillips, J., **Lampo, K.**, MacCurdy, R., Manchester, Z. (2024). *An Architecture Study for Low-Power Satellite-Based Wildlife Tracking*. In Proc. IEEE Aerospace Conference 2024, Big Sky, MT. https://doi.org/10.1109/AERO58975.2024.10521172

RESEARCH EXPERIENCE

Robotic Manipulation and Mobility Lab, Columbia University, New York, NY **Feb. 2024-May 2025**

Astrobee Tactile Sensing Project

- Made hardware & control updates to a tendon-driven robotic hand to introduce tactile sensing capabilities.
- Analyzed and modified joints and tendon routing to improve grasping motion. Developed a control system in ROS to provide adaptive grasping of fragile objects using capacitive feedback.

Bimanual Manipulation Station

- Developed a paired gripper system that maps human-controlled grasping motion to a robotic end-effector.
- Designed and manufactured hardware components for both controller and end-effector, optimized motor linkage design to reduce servo torque, developed serial control methods between Arduino boards.

Robotic Exploration Lab, Carnegie Mellon University, Pittsburgh, PA **June-Aug. 2023**

Cube Satellite Wildlife Tracking Project

- Developed a MATLAB algorithm to extract location data from radio pulses collected by several receivers tracking a beacon simulating a bird. Resulted in an average location error of ~22m in a km^2 area.
- Designed & built a lightweight, long-lasting radio payload to attach to a drone for experimentation.

Astronomy Department, Columbia University, New York, NY **Nov. 2021-July 2024**

Solar Sail Breakup Analysis

- Developed a Python program to simulate maximum forces, determine plausible payload exit velocities, and model the effects of tapering relevant connectors to optimize mass for a novel spinning solar sail design.

WORK EXPERIENCE

Columbia University, New York, NY **May 2024–Present**

Aerospace Program Student Lead

- Working in a team of three (two students, one faculty member) to design and develop a new program in Aerospace Engineering. Recently implemented a new Minor, currently focused on Major development.
- Responsible for tasks including curriculum development, faculty hiring, market research, and accreditation & approval. Collaborating closely with administrators and experts from across industry and academia.

NASA Ames Research Center, Mountain View, CA **June-Aug. 2024**

Fluid Mechanics Research Intern, Supercomputing Division

- Generated novel rotor blade meshes for use with NASA's OVERFLOW CFD code supporting the Dragonfly mission to Saturn's moon Titan.
- Conducted trade study on blade efficiency, leading to a 0.5% increase in rotor performance figure of merit.

Lockheed Martin Space, Longmont, CO

Systems Engineering Intern & Intern Scrum Master **May-Aug. 2022**

- Worked as a part of the Relay Integration/Verification team to test satellite uplink configuration code.
- Led 10-person intern team in scrum to develop automated tools to aid with Agile management in Jira.

Software Engineering Intern **June-Aug. 2021**

- Collaborated with a small intern team to aid with program-wide tasks, including creating Agile tool documentation and updating a Java plugin to CAMEO Systems Modeler to speed up model development.

TECHNICAL PROJECTS

Columbia Cube Satellite Team, New York, NY **Sept. 2022-May 2025**

Structures & Thermals Lead

- Co-led a team of students to design and build two satellites slated to launch in 2027. Spearheaded efforts related to payload and deployable design, 3D modeling and component placement, and thermal analysis.
- Helped author a successful NASA CubeSat Launch Initiative proposal for $300,000 in launch funding.

NASA Micro-G NExT Challenge, New York, NY

Autonomous Boat Team Lead **July-Dec. 2022**

- Led a team of 25 students to design and prototype an autonomous vehicle to locate and deliver supplies to astronauts during water landings. Contributed heavily to modeling and construction of the multihull design.

Lunar Gripper Team Member **Aug. 2021-June 2022**

- Designed & built a lunar gripping and anchoring device. Focused on foot design, actuation, and assembly.
- Selected by NASA as a national finalist and traveled to the Neutral Buoyancy Laboratory to test the design.

TEACHING EXPERIENCE

Columbia University, New York, NY

Teaching Assistant

- ENGI E1102: The Art of Engineering — *Profs. Mike Massimino & David Vallancourt* **Fall 2024, Spring 2025**
- PHYS 1402: Introduction to Electricity, Magnetism, and Optics — *Professor Hector Ochoa* **Spring 2024**
- PHYS 1201: Introduction to Mechanics and Thermodynamics — *Professor Philip Tuts* **Fall 2023**

LEADERSHIP & SERVICE

Columbia Space Initiative, New York, NY

Co-President **Feb. 2024-Mar. 2025**

- Led the largest engineering club at Columbia, home to 250 members working on 13 technical projects. Was responsible for managing a 35-student leadership team & representing the club to media and admin.
- Managed a six-figure technical budget, corporate and university fundraising efforts, and 13 national and international travel opportunities. Increased club budget by over 20% in one year.
- Coordinated a variety of high-profile speaker and panel events, including with a NASA flight director, former NASA administrator, various aerospace academics and professionals, and a live call with the ISS.

Director of Educational Outreach **July 2022-May 2024**

- Delivered hands-on engineering lessons to 1,000+ students at six underserved middle schools in NYC.
- Spearheaded an annual initiative that allows students to design, build, and launch custom model rockets.

Columbia Engineering Office of Admissions, Tour Captain & Campus Tour Guide **Aug. 2021-May 2025**
Columbia Mechanical Engineering Machine Shop, Student Superuser **Oct. 2023-May 2025**
Columbia New Student Orientation Program, Orientation Leader **Aug. 2023, Aug. 2024**
Sophie Gerson Healthy Youth Summer Camp, Astronomy Counselor **Aug. 2023, Aug. 2024**

SKILLS

Modeling: Solidworks (+ FEA), Fusion 360 (+ CAM), SolidEdge, Thermal Desktop, NASA OVERFLOW CFD
Manufacturing: 3D printing (PLA/SLS/TPU), lathe, mill, waterjet, laser cutter, vertical bandsaw, hand tools
Software/Electronics: C/C++, Python, Java, MATLAB, ROS, Git, Linux, LaTeX, circuitry, soldering