LOGAN RAMANATHAN

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EDUCATION

Brown University *Providence, RI*

Sc.B. in Engineering & Physics — GPA: 4.0/4.0 *Expected May 2028*

Relevant coursework: Thermodynamics, Quantum Mechanics, Photonics, Computational Physics, Gravitational Fields & Data Analysis, Electricity & Magnetism, Statistics, Linear Algebra, Multivariable Calculus, Differential Equations, Infectious Disease Modeling

SKILLS

Programming: Python (OpenCV, scikit-learn, LangChain), R, MATLAB, Arduino, Claude Code, Codex
Test & Measurement: Oscilloscopes, multimeters, power supplies, function/signal generators, vector network analyzer (VNA); LabVIEW data acquisition; vacuum chambers, pumps, and pressure gauges; RF power & impedance matching; plasma diagnostics
Software & CAD: Fusion 360 (CAD & CAM), Siemens NX/Teamcenter, QGIS, JMARS, OpenFOAM CFD
Fabrication: Soldering, CNC/manual mills, routers, hand tools, TIG/MIG welding, 3D printers, laser cutters, GD&T
Languages: English (Native), Russian (Intermediate), Japanese (Intermediate), Tamil (Elementary)

EXPERIENCE

Stanford Plasma Physics Lab *Stanford, CA*

Research Intern — Prof. Mark Cappelli & Dr. Saptarshi Biswas *June 2026 – Aug. 2026*

- Co-lead the experimental component of a DARPA-funded project to characterize inductively coupled, radio-frequency driven plasmas.
- Design, fabricate, and operate RF self-compensating Langmuir probes for measurements of plasma properties on two experiments.
- Built tunable and rapidly swappable RF chokes for distortion suppression across 5-40MHz, translating probe tips for spatially resolved measurements, and a data-acquisition workflow; took measurements of an RF-magnetron thruster and an inductively coupled plasma.
- Cross-validate plasma measurements using optical-emission spectroscopy with collisional-radiative models and microwave interferometry; quantify diagnostic agreement and uncertainty; work with plasma theorists to develop methods for sensor-fusion.
- Redesigned and rebuilt vacuum chamber around available equipment after electronics failures saving >3 weeks; built custom fixtures; troubleshot leaks, plasma ignition, and impedance matching; designed and built optical collection system and performed calibration.

Head Group, Brown University — Mission Engineering (NASA Innovative Advanced Concepts) *Providence, RI*

Research Fellow — Prof. James Head & Apollo 15 Cmdr. David Scott *Aug. 2025 – Present*

- Analyzed lunar power consumption with Python and LROC QuickMap terrain data to size candidate grid layouts; built framework for logistics, reactor siting, redundancy, fault tolerance, and energy storage to sustain power throughout a 500-day mission concept.
- Built an electro-thermal power-transmission model in Python enabling the quantification of constraints and infrastructure demands.
- Quantified plume-surface interaction effects on mission design, identified hazards; designed landing infrastructure layout. Delivered presentation on findings and recommendations to 100+ attendees including NASA stakeholders and Artemis program engineers.

Rocket Lab *Long Beach, CA*

Integration & Test Engineering Intern *June 2023 – Aug. 2023*

- Designed the thermal, mechanical, and electrical systems for the camera module of the Pioneer spacecraft series in Siemens NX.
- Fabricated test harness for hardware and software validation on the hardware-in-the-loop rack ahead of vehicle integration.
- Brought sub-system from inception to design review in <6 weeks and integrated on spacecraft in <8 weeks; camera operational in LEO.
- Updated spacecraft CAD to document assembly processes and supported vehicle testing in the clean room. Received return offer.

Daubar Group, Brown University — Martian Geomorphology *Providence, RI*

Research Fellow — Prof. Ingrid Daubar & Dr. Aleksandra Sokolowska *Oct. 2024 – Aug. 2025*

- Analyzed asymmetric impact streaks by developing a database of 500+ Martian impact sites with QGIS, JMARS, and Python; built and statistically analyzed a directional-impact model linking ejecta-streak orientation to oblique-impact dynamics.

RESEARCH OUTPUT

1. **Ramanathan, L.**, & Head, J. W. (2026). …Plume–surface interaction in Artemis lunar operations... *57th LPSC*, #1063 (talk).
2. **Ramanathan, L.**, & Head, J. W. (2026). Lunar surface power technology and architecture... *57th LPSC*, #1129 (poster).
3. Head, J. W., Scott, D. R., … **Ramanathan, L.**, et al. (2026). …Human-robotic exploration of the Moon and Mars. *57th LPSC*, #1057.
4. Sokolowska, A., Daubar, I., **Ramanathan, L**…., et al. (2026). Origin of Martian "blast zone streaks" from small impacts. *EPSC*, #EPSC2026-1114.
5. **Ramanathan, L.,** et al. (2026). Development…of an RF-Compensated Langmuir Probe*. 68th APS Division of Plasma Physics (DPP)* (submitted).
6. Biswas, S., **Ramanathan, L**., et al. (2026)….Excitation, Electron Density, and RF Loading in a 40 MHz Argon ICP. *68th APS DPP* (submitted).
7. Sokolowska, A., Daubar, I., **Ramanathan, L…**, et al. (in prep.). Dark blast zone streaks reveal impact trajectories in new Martian craters.
8. Head, J. W., Scott, D. R., … **Ramanathan, L.**, et al. (in prep.). Human-robotic exploration of the Moon and Mars.

ADDITIONAL

Awards: NASA Rhode Island Space Grant Consortium Travel Grant (2026); Brown Undergraduate Teaching & Research Award (2x); U.S. Invitational Young Physicists Tournament National Champion (2023); #1 nationally in Parliamentary Debate (2023–24); New York Times STEM Writing Competition International Winner (2023).
Interests: Aviation, Scuba Diving (PADI Advanced Open Water, Nitrox, Reef Restoration, Night Diver), Guitar, Golf