

SIMONE LILAVOIS

929-275-5943 · slilavois28@amherst.edu · [LinkedIn](#)

SKILLS

Programming: Python, R | **Software/Tools:** GitHub, SolidWorks, High-Performance Computing | **Hardware:** PCB design, microcontrollers, sensor interfacing, telemetry systems, precision machining (lathe, mill, bandsaw)

EDUCATION

Amherst College, August 2024 – Present

- B.A. in Physics (Expected May 2028)
- GPA: 3.89 | Division III competitive swimmer

Advanced Coursework: *Quantum Mechanics, Linear Algebra, Signals and Noise Laboratory, Mathematical Reasoning and Proofs, The Newtonian Synthesis: Dynamics of Particles and Systems, The Maxwellian Synthesis: Dynamics of Charges and Fields, Oscillations and Waves, Modern Physics, Machine Shop Course*

RESEARCH EXPERIENCE

Guest Researcher, Center for Computational Astrophysics, Flatiron Institute, May 2026 – Present

Dr. Tiger Lu

- Developing Python simulations using REBOUND and celmech to investigate how migrating outer giant planets sweep secular resonances and destabilize compact inner planetary systems
- Modeling the long-term evolution of planetary eccentricities and inclinations to study the exchange of angular momentum deficit and its role in driving dynamical instability

Binary Worlds Lab Research Assistant, Amherst College, April 2025 – Present

Dr. Daniella Bardalez Gagliuffi

- Leading Markov Chain Monte Carlo analyses combining radial velocity, absolute astrometry, and relative astrometry data to generate probability distributions for orbital parameters of binary and multiple-body star systems within 20 parsecs
- Deriving precise temperatures based on new dynamical masses and existing evolutionary models
- Conducting large-scale data analysis to identify population-level trends among semi-major axis, eccentricity, and mass ratio

Electronics Team Lead, Cansat 2026 Paraglider Instrument Delivery Mission, September 2025 – June 2026

- Leading development of payload electronics system integrating sensors, power monitoring, and onboard data acquisition
- Designing telemetry architecture and radio communication to transmit real-time flight data to ground station

T.E.S.S. Exoplanet Vetter, MIT Kavli Institute for Astrophysics and Space Research, June 2025 – Present

Katharine Hesse

- Analyzing TESS light curves, difference images, and periodograms to identify exoplanet candidates

Research Intern, Space Agriculture Laboratory Analysis Database (SALAD), December 2023 – Present

Dr. Rafael Loureiro

- Developing Python scripts to automate simulations within BioSim, a simulation of a Bioregenerative Life Support System, to establish plant growth baselines for future Moon and Mars missions
- Investigating how initial resources and multi-crop hydroponic systems affect crew survival rates within BioSim

Research Intern, American Museum of Natural History (AMNH), January – August 2024

Dr. Céline Martin

- Analyzed and digitized electron microprobe mineral standards for the Department of Earth and Planetary Sciences
- Created a comprehensive database comparing published and experimental values to be consulted for future analyses

Data Analysis Intern, Growing Beyond Earth (GBE), June 2023 – December 2023

Marion Litzinger

- Led experiments for 9 herb species in growth chambers designed after the Vegetable Production System on the ISS
- Analyzed growth chamber data from 300+ international GBE citizen science experiments
- Completed ANOVA tests that demonstrated statistical significance for faster growth rates of Basil Persian and Basil Cinnamon compared to the other herbs

PRESENTATIONS & PUBLICATIONS

Talks

- “BioSim: Simulating Bioregenerative Life Support Systems,” NASA Plant Analysis Working Group Meeting, April 2026
- “Binary Worlds Lab Summer Research Lightning Talk,” Wesleyan Exoplanet Picnic, July 2025
- “Centralizing Astrobotany Research With The Space Agriculture Laboratory Analysis Database (SALAD) Article Repository,” 2024 American Society for Gravitational and Space Research (ASGSR) Conference, December 2024

Posters

- “Data in All Dimensions: Model Independent Masses and System Architectures Within 20 Parsecs,” American Astronomical Society 247 Winter Meeting, January 2026
- “Deriving Temperatures for Substellar Objects Within 20 Parsecs Using New Dynamical Masses,” 2025 ASGSR Conference, December 2025
- “Simulating the Effects of Multi-Crop Production in Bioregenerative Life Support Systems,” 2025 ASGSR Conference, December 2025
- “Deriving Temperatures for Substellar Objects Within 20 Parsecs Using New Dynamical Masses,” Amherst College STEM Summer Research Poster Session, September 2025
- “Optimizing Plant Yield in a Simulated ISS Plant Growth Chamber - Accumulated Results from 300 Middle and High Schools,” 2023 ASGSR Conference, December 2023

Publications

- Lilavois et al. (2026, in prep), “The Orbital Architecture of 36 Ophiuchi”
- Flores et al. (2026, submitted; including Lilavois, S.), “Precise Radii of Visual Binaries with Dynamical Masses: ξ Bootis & 70 Ophiuchi”
- Jankowski et al. (2026, submitted; including Lilavois, S.), “Assessing Planetary Stability and Long-Term Habitability in Nearby Stellar Binaries: 70 Oph, 36 Oph, γ Leo”
- Giovinazzi et al. (2026, in prep; including Lilavois, S.), “Companions to Accelerating Stars within 20 pc”
- Clark et al. (2026, in prep; including Lilavois, S.), “Updated Orbital and Stellar Parameters for the Nearby K Dwarf Binary Star p Eri (GJ 66AB)”

HONORS & AWARDS

- Charles Hamilton Houston Summer Funding Award, May 2026
- American Astronomical Society Chambliss Astronomy Achievement Student Award, Honorable Mention, 2026
- ASGSR Undergraduate Poster Competition, First place, 2025
- Amherst College Gregory S. Call 2025 Fall Research Award
- Science Undergraduate Research Fellowship, Amherst College, June - August 2025
- Amherst College Gregory S. Call 2024 Fall Research Award
- Pinkerton Science Scholar, 2022

LEADERSHIP

Student Board President-Elect, American Society for Gravitational and Space Research, January 2026 – Present

- Elected to be President-Elect for the Student Board to serve a two-year term to lead monthly Board meetings, manage education and outreach events, coordinate monthly webinars, design and publish monthly newsletters, and advocate for space science funding during annual Capitol Hill visits

Student Board Membership Chair, American Society for Gravitational and Space Research, January – December 2025

- Elected by society members as Membership Chair to increase conference attendance
- Established program to invite high school students to the 2025 ASGSR Conference, hosted an abstract writing workshop for undergraduate and high school students, designed flyers and newsletters

Research Mentor, NYC Science Research Mentoring Consortium, June – August 2024

- Assisted four high school students in the STEM Research Academy with bioinformatics software navigation, scientific writing and editing, presentation skills, LinkedIn networking, and scientific poster formatting

I have learned that although science champions objectivity, talent alone is often not enough to succeed -- many passionate students are limited not by ability, but by access to information, resources, and mentorship. In fact, my own path into astronomy and physics has been unconventional. I attended a New York City public high school that did not offer physics or calculus, leading me to seek opportunities beyond the classroom. Despite taking weekend and summer courses at local colleges and online courses through Coursera, I entered college feeling less prepared than my peers. I questioned whether I should consider something other than the physics major. Since overcoming the academic challenges and imposter syndrome I faced early in my undergraduate career, I vowed to become a scientist who actively engages with and inspires students.

This is something I have already started through my outreach work as an undergraduate at Amherst College, a liberal arts institution with fewer research opportunities than larger research universities. At Amherst, I am on the Physics Climate and Community Committee, where I write the physics and astronomy newsletter, manage the Undergraduate REU and Internship database, and host related events for students. Additionally, as President-Elect of the American Society for Gravitational and Space Research (ASGSR) Student Board, I established a program that invites local high school students to ASGSR's annual conference, organized abstract-writing workshops and speed-networking events, and advocated for NASA's Division of Biological and Physical Sciences funding to staffers and politicians on Capitol Hill. If elected as Student Representative, I hope to build on my previous work and foster confidence in students to pursue what they care about, regardless of how familiar they are with navigating academia.

As an undergraduate candidate, I would also bring a perspective that is less commonly represented. During my term, I will be navigating the graduate school application process alongside many other students in the DPS community. At a time when the lack of available and reliable funding has made graduate school applications increasingly intimidating, I hope to help make the process more transparent by connecting undergraduates with valuable resources and mentors. At the recent DDA meeting in Chicago, I found myself sitting at a table with a new faculty member, an incoming postdoc, graduate students at different stages, and me, a rising junior undergraduate. It was one of the most insightful conversations I have had because everyone openly discussed navigating graduate school, research, and career decisions from their own perspectives. I left wishing every undergraduate had opportunities like that. Specifically, as Student Representative, I hope to work with DPS leadership to expand the MentorNet program and transform it into a year-long initiative that supports students during transition periods. Whether that be from high school to undergraduate, undergraduate to graduate, or graduate to postdoc, I aim to connect students across a range of career stages.

Ultimately, my experience places me in a unique position to represent students preparing for the next stage of their careers while ensuring undergraduate voices remain an active part of DPS discussions. If elected, I will work to strengthen mentorship across career stages, improve access to opportunities, and help ensure that every student, regardless of their background or institution, can see a clear path toward a future in planetary science.