

MARIA VINCENT

Graduate Student
Institute for Astronomy

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EDUCATION

University of Hawai'i at Manoa

Ph.D Astronomy, Institute for Astronomy 2026

M.S. Astronomy, Institute for Astronomy 2023

University of California, Los Angeles

2020

B.S. Geophysics, B.S. Astrophysics GPA: 3.91/4.00

Magna cum Laude Highest Departmental Honors for both majors

DOCTORAL THESIS

Developments in Direct Imaging: Implementing Deformable Mirror Upgrade and Characterizing Protoplanetary Disks

- Testing and characterizing a high order deformable mirror as a part of WM Keck Observatory's High Order Advanced Keck Adaptive Optics (HAKA) upgrade. This upgrade will expand exoplanet detectability and protoplanet imaging.
- Near infrared survey of infrared bright protoplanetary disks (~ 10 – 13 mag targets) using Subaru/SCEXAO, that will constrain 3D disk structure (complementing ALMA data), grain based morphology, and planet signatures.

RESEARCH EXPERIENCE

NASA Postdoctoral Fellow

Jet Propulsion Laboratory

Sep 2026- Present

Graduate Research Assistant

Institute for Astronomy

Jan 2022- Aug 2026

UH Manoa

Project prior to doctoral thesis:

- High Contrast, Multi-Wavelength Imaging of a Debris Disk
- Focal Plane Speckle Suppression at Keck

Visiting Student

Adaptive Optics Development

May 2024- Jul 2026

W.M. Keck Observatory

Project: High Order Keck Adaptive Optics Upgrade (part of Doctoral Thesis)

Undergraduate Researcher

Earth, Planetary & Space Sciences

April 2018- December 2020

Physics & Astronomy, UCLA

Jan - Dec '20: Investigation of Coma Morphology in Long & Short Period Comets; Unusual Activity of a Distant Long Period Comet (Undergraduate Honors Theses)

Jan - Dec '19: CCD Image Reduction and Comet Photometry

Apr - Sep '18: X-Ray Mapping of Carbonaceous Chondrites

Undergraduate Research Fellow

Dept. Geological, and Planetary Sciences

June 2019- August 2019

California Institute of Technology

Project: Formation of Snow on Planets as a Consequence of Gravity

Visiting Student Researcher

Physical Research Laboratory

January 2018-March 2018

Ahmedabad, India

Project: "Relevance of Argon, Krypton, Xenon in meteorites" conducted at national research facility under the Department of Space, Government of India.

Undergraduate Research Assistant

Dept. Earth Planetary and Space Sciences

August 2017-October 2017

UCLA

Prepared, imaged and mapped various meteorite samples, for meteorite analyses at the UCLA Secondary Ion Mass Spectrometry Lab.

TEACHING EXPERIENCE

Teaching Assistant, Physics & Astronomy, UH Manoa, Course: Survey of Astronomy (Fall '21 and Spring '22)– Introduction to the astronomical universe: sky and celestial objects, planetary motion, galaxies, cosmology and the universe.

Code/Astro (*Jun '24*): Astronomy software development workshop where I taught sessions on Python libraries and advised students on developing open-source packages

Intro2Astro (*Jun-Aug '22-'25*): An introductory online course to teach aspiring astronomers, especially undergraduate students, the basics and rudimentary skills for research and get started on a career in this field.

OBSERVING TIME

PI, Subaru SCEXAO (S26A-UH006-A): Ophiuchus Disk Survey

PI, Subaru SCEXAO (S25B-UH011-A): Exploring extincted disks in Orion & Taurus

PI, Subaru SCEXAO (S25A-UH005-A), (S24A-UH007-A): Ophiuchus Disk Survey

PI, Subaru IRCS (S24B-UH013-A): Further Exploration of Dracula's Chivito

PI, Subaru SCEXAO (S23A-UH002-S): High Contrast, Multi-Wavelength Imaging of Circumstellar Disks

Co-I, Subaru SCEXAO (S23B-UH034-B, S23A-UH015-B2, S22B-UH027-B, S22A-UH029-A): High Contrast Spectropolarimetric Imaging of Protoplanetary Disks

TECHNICAL SKILLS

Programming & Computing: Nearly 10 years in Python (scientific data analysis, modular software architecture, contributions to data-reduction/analysis pipelines, and PyQt5 GUIs); 2+ years in MATLAB. Emphasis on testing, documentation, and version control (Git/GitHub).

Instrumentation & Hardware: Deformable mirrors (ALPAO DM3k), Infrared detector characterization (SAPHIRA), EM-CCD (OCAM2K). Experience designing test plans and building lab workflows to test/characterize AO hardware on a bench; writing control and analysis code that interfaces with vendor-provided software development kits; real-time data capture, calibration, and performance verification.

Software & Scholarly Tools: Astronomical tools and databases including SAOImage DS9, NASA ADS, and SIMBAD; domain libraries such as Astropy where appropriate. L^AT_EX for technical writing. Comfortable across Linux, macOS, and Windows environments.

PUBLICATIONS

Vincent, M. et al. Multi-wavelength, High contrast view of Infrared Bright Disks (*submitted*)

Vincent, M. et al. High Order Keck Adaptive Optics: Results from lab integration and testing of the High Order Deformable Mirror, SPIE, 2026

Vincent, M., et al. Subaru/IRCS view of “Dracula’s Chivito”: Infrared Imaging of the Protoplanetary Disk Around IRAS 23077+6707, (*in prep* [[1](#)])

Currie, T. et al. (incl. **Vincent, M.**) SCEXAO/CHARIS and Gaia Direct Imaging and Astrometric Discovery of a Superjovian Planetw 3–4 λ /D from the Accelerating Star HIP 54515, AJ, Vol 171, No 1, 2025

Lucas, M., et al. (incl. **Vincent, M.**) Dynamical Analysis of the HD 169142 Planet-Forming Disk: Twelve Years of High-Contrast Polarimetry, AJ, Vol 170, No 5, 2025

Williams, J.W., et al. (incl. **Vincent, M.**) Radiative Transfer Modeling of a Shadowed Protoplanetary Disk assisted by a Neural Network, ApJ, Vol 991, No 2, 2025

Lozi, J., et al. (incl. **Vincent, M.**) AO3k at Subaru: First on-sky results of the facility extreme-AO, SPIE, 2024.

Vincent, M., et al. SCEXAO/CHARIS Multi-Wavelength, High-Contrast Imaging of the BD+45°598 Debris Disk, AJ, Vol 168, No 1, 2024.

Guthery, C.E., et al. (incl. **Vincent, M.**) From Demonstration to Operation: High Contrast Imaging Tools at Keck Observatory, AO4ELT7, 2023.

Margot, J.L., et al. (incl. **Vincent, M.**) A Search for Technosignatures Around 11,680 Stars with the Green Bank Telescope at 1.15–1.73 GHz, AJ, Vol 166, No. 5, 2023.

Chen, M., et al. (incl. **Vincent, M.**) Post-processing CHARIS integral field spectrograph data with PYKLIP, RAS Techniques and Instruments, Vol 2, No 1, 2023.

Vincent, M., McCain, K., and McKeegan, K., X-Ray Mapping of Carbonaceous Chondrites: A Hunt for Carbonate Minerals, UCLA Undergraduate Science Journal, 2019.

FIRST AUTHORED PRESENTA- TIONS

Spirit of Lyot & SPIE Astronomical Telescopes + Instrumentation, 2026 (Poster). High Order Keck Adaptive Optics: Results from characterization and lab testing of the High Order Deformable Mirror

Exo-ELT, 2025 (Contributed Talk). Subaru/IRCS view of “Dracula’s Chivito”: Infrared Imaging of the Protoplanetary Disk Around IRAS 23077+6707

AO4ELT8, 2025 (Contributed Talk). High Order Keck Adaptive Optics: First results from lab integration and testing of the High Order Deformable Mirror

NASA Exoplanet Explorers Science Talk, 2024. Entering a new Era of Adaptive Optics with more powerful Deformable Mirrors

Sagan Summer Workshop, Caltech, 2024 (Poster). Entering a new Era of Adaptive Optics with more powerful Deformable Mirrors

Protostars and Planets 7, Kyoto, 2023 (Poster). SCExAO/ CHARIS High Contrast, Mutli-Wavelength Imaging of the BD+45°598 Debris Disk.

AAS Division of Planetary Sciences Meeting, 2020 (Virtual Poster). The Investigation of Coma Morphology of Long and Short Period Comets.

Undergraduate Research Symposium, UCLA, 2020 (Talk). The Unusual Activity of a Distant Long Period Comet.

American Geophysical Union Fall Meeting, 2019 (Poster). Condensation and Formation of Ice on Planets as a Consequence of Gravity

Southern California Undergraduate Research Conference, 2018 (Poster). X-Ray Mapping of Carbonaceous Chondrites: A Hunt for Carbonate Minerals

LA Basin Student Research Symposium, 2018 (Talk). Survey of noble gases in Martian Meteorites

GRANTS AND AWARDS

NASA Postdoctoral Fellowship, NASA Postdoctoral Program *2026*

AO4ELT Student Travel Scholarship, Adaptive Optics for ELTs meeting *(2025)*

Exoplanet Explorers, NASA Exoplanet Exploration Program *(2024)*

Graduate Student Organisation Travel Grant, University of Hawai’i *(2023)*

International Travel Grant, American Astronomical Society *(2022)*

Handin Award for Academic Excellence, Department of Earth, Planetary and Space Sciences (EPSS), UCLA *(2020)*

Fall Meeting Student Travel Grant, American Geophysical Union *(2019)*

Summer Research Fellowship, California Institute of Technology *(2019)*

Vice-Provost Prize for Best Research Article in Physical Sciences, UCLA Undergraduate Science Journal *(2019)*

Vice-Provost Recognition for Undergraduate Research, UCLA Undergraduate Research Poster Day *(2018, 2019)*

Straus Family Award for Undergraduate Research, EPSS, UCLA *(2019)*

Donald Carlisle Undergraduate Research Endowment Fund, UCLA *(2018)*

Dean’s Honors List, UCLA *(Fall 2016- Spring 2020)*

SEG Foundation Annual Scholarships, Society of Exploration Geophysicists (SEG) *(2016-2020)*

PROFESSIONAL DEVELOPMENT WORKSHOPS

AO Summer School (*Aug ’23*): Astronomical instrumentation summer school to learn and gain experience on adaptive optics and its applications in astronomy and vision science.

AstroTech Summer School (*Aug ’22, Jul ’23*): Astronomical instrumentation summer school to learn and gain hands-on experience designing, building, and testing an optical instrument and building ethical teamwork skills.

Code/Astro (*Jun ’22*): A week-long astronomy software development workshop to learn and develop fundamental software engineering skills and best practices for building sustainable open-source packages for astronomy applications.

**MENTORSHIP
AND
GUIDANCE**
(*invited, ★talks)

RESEARCH MENTORSHIP

Mentor, Maunakea Scholars Program (*Oct '22 - '24*): Mentoring high school students on capstone projects, as well as on writing observing proposals.

CAREER GUIDANCE

Letters to Pre-Scientist (2025): A pen-pal program that pairs middle/high-school students with STEM professionals for yearlong letter exchanges to introduce students to STEM careers and give them guidance on pursuing scientific work and research.

Career Opportunities, Development and Enrichment, IHS, Dubai★ (*Jan '23*): Talk and interactive session with middle and high school students at my alma mater on experiences in high school and beyond, and my career trajectory.

Career Talk, Dubai British School★ (*Jan '23*): Guidance talk on academic path to becoming an astronomer, and what to expect in the job.

COLLEGE GUIDANCE

Panelist, “Applying to Graduate School”, UH Manoa (*Nov '22*): Panel discussion for undergrads in Physics & Astronomy about grad school application process.

Panelist, “Undergraduate Research Experience”, UCLA* (*Nov '19*): Panel on undergrad research experience for underclassmen seeking research positions.

OUTREACH
(*invited, ★talks)

CLASSROOM SESSIONS

Journey through the Universe★ (*Mar '23, Feb '24 & '25*): Classroom talks geared towards promoting science education at Hawai'i Island school districts.

Guest Speaker, Exploring Life on other bodies, Dubai British School★: Classroom talk for Year 8 to support STEM project to design a Mars Rover to assess habitability conditions on Mars.

Skype-a-Scientist★ (*Sep '21 - Present*): Invited talks for classrooms in schools around the world (US, Europe, and Asia) virtually and in-person, as a part of a global program to connect various groups of the public to scientists.

EVENT JURY AND COMPETITIONS

Event Supervisor, Hawaii State Science Olympiad (*2022-'25*): Categories: Solar System (Middle School) and Astronomy (High School)

Judge- Hawaii State Science & Engineering Fair (*Mar '22, Apr '23, Apr '24*), Theoretical Sciences Junior Division

PUBLIC EVENTS

Volunteer- Hawaii Astronomy Events with IfA (*Sep '21 - Present*): Astronomy events like IfA Open House, Astro Day (Hilo and Kona), Girls Scouts STEM Fest, and other public events in Honolulu (Ohana Stargazing, Hawaii Geek Meet, Makahiki Fair, Bishop Museum Night, Manoa Open House).

Volunteer- International Observe the Moon Night (*Oct '19*) Annual worldwide celebration of lunar science and exploration, where we engage the public in telescope observations and lectures on the moon and lunar exploration.

Volunteer- National Science Day Exhibition (*Feb '18*) at Physical Research Laboratory, India as a part of the nationwide celebration of science

Volunteer- Explore Your Universe (*Nov '16-'21*): An annual science outreach day held in UCLA with demos, and talks in many subfields.

Volunteer and Member- Dubai Astronomy Group (*2016*): a non-profit organization that promotes and encourages the study of Astronomy in the region.

OTHERS

Writer- Astrobites (*Jan '24- Present*) Writer for a daily astro-ph journal covering papers, interviews of Astronomers, socio-political and other events within the Astronomy community.

Docent- UCLA Meteorite Gallery (*Jun '18 - Feb '20*) Guiding visitors across the gallery and talks for school students.

COMMITTEES & PANELS
(*invited)

Executive Secretary, Proposal Review Panel, NASA Science Mission Directorate (2025)
Grad Rep, Graduate Research Oversight Group, Institute for Astronomy, UH Manoa
(*Sep '24- June '25*)
Student Rep, UH Time Allocation Committee, Institute for Astronomy, UH Manoa
(*Spring 2024*)
Grad Rep, Colloquium Committe, Institute for Astronomy, UH Manoa (*Aug '23- May '24*)
Undergraduate-Graduate Relations Working Group*, UH Manoa (*Mar '23- May '23*)
Faculty Mentor Program Working Group, Institute for Astronomy, UH Manoa (*Sep '22- Feb '23*)

REFERENCES

Michael Bottom Assistant Professor, Astronomy	mbottom@berkeley.edu University of California, Berkeley
Antonin Bouchez Head of Adaptive Optics Development	aboutchez@keck.hawaii.edu W.M. Keck Observatory
Jonathan Williams Astronomer, Institute for Astronomy	jw@hawaii.edu University of Hawai'i at Manoa