Ishan Mishra

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Research Interests: Planetary Science, Spectroscopy and Photometry of Planetary Surfaces in the Solar System and Beyond

Career & Education

- JPL Postdoctoral Fellow — October 2022 - present
  Jet Propulsion Laboratory, California Institute of Technology
- PhD in Astronomy *Cornell University* — August 2022
- M.S. in Astronomy *Cornell University* — February 2020
- B.Tech. in Electronics & Communications Engineering — May 2016
  Indian Institute of Technology, Guwahati, India

Honors and Awards

- OPAG Meeting Early Career Travel Stipend, *USRA* — 2022
- Graduate Conference Grant, *Cornell University* — 2018, 2021
- Future Investigators in NASA Earth and Space Science and Technology (FINESST) — 2020
- Research Travel Grant (suspended due to COVID-19), *Cornell University* — 2020
- Carl Sagan Institute Travel Grant, *Cornell University* — 2018,2020
- Other Worlds Lab Summer Research Fellowship, *U.C. Santa Cruz* — 2019
- Summer Research Fellowship, *Academia Sinica Institute of Astronomy and Astrophysics, Taiwan* — 2016
- KVPY fellowship (declined), *Indian Academy of Sciences* — 2011

Peer-Reviewed/Refereed Publications

- **Mishra, I.**, Dhingra, R., Buratti, B., Seignovert, B., & White, O. L., *Investigating the extent of bladed terrain on Pluto via photometric surface roughness*, 2023, *in review*, Geophysical Research Letters
- Buratti, B. J., Pittichova, J., **Mishra, I.**, & 11 co-authos, *Pre-impact albedo map and photometric properties of Dimorphos from DART and ground-based data*, 2023, submitted to Icarus
- First, E., **Mishra, I.**, & 4 co-authors, *Mid-infrared spectra for basaltic rocky exoplanets*, 2023, in review at Nature Astronomy
- **Mishra, I.**, Lewis, Lewis, N., Lunine, J., Hand, K. P., *An Assessment of Organics Detection and Characterization on the Surface of Europa with Infrared Spectroscopy*, 2023, in review at Planetary Science Journal
- **Mishra, I.**, Lewis, N., Lunine, J., Hand, Kevin P., Helfenstein, P., Carlson, R.W., & MacDonald, R.J., *A comprehensive revisit of select Galileo/NIMS observations of Europa*, 2021, Planetary Science Journal 2, 183.
- **Mishra, I.**, Lewis, N., Lunine, J., Helfenstein, P., MacDonald, R.J., Filacchione, & G., Ciarniello, M., *Bayesian analysis of Juno/JIRAM's NIR observations of Europa*, 2021, Icarus 357, 114215.
- Lewis, N.K. + 21 co-authors including **Mishra, I.**, *Into the UV: The Atmosphere of the Hot Jupiter HAT-P-41b Revealed*, 2020, The Astrophysical Journal Letters, 902, L19.
  Performed a statistical analysis on a grid of forward models of the transmission spectra of HAT-P-41b's atmosphere.
- Bhattacharya, S., **Mishra, I.**, Vaidya, K., & Chen, W.P., *Disintegration of the Aged Open Cluster Berkeley 17*, 2017, The Astrophysical Journal, 847, 138
  Co-led the analysis of imaging data of the open cluster taken by Pan-STARRS survey that revealed its tidal tails.

Conference Proceedings/Abstracts

- White, J., **Mishra, I.** and Lewis, N., *High Resolution JWST Transmission Spectra and Their Retrievals for GJ1214b*, 2021, American Astronomical Society Meeting Abstracts, 531.03
- Kutsop, N. + 12 co-authors including **Mishra, I.**, *Addressing Diversity, Inclusion, and Values in the Cornell Astronomy Community: The Graduate Students Response*, 2021, AAS/Division for Planetary Sciences Meeting Abstracts, 502.08
- **Mishra, I.**, Lewis, N. and Lunine, J., *Revisiting select Galileo/NIMS observations of Europa with Bayesian inference*, 2020, AAS/Division for Planetary Sciences Meeting Abstracts, 106.01
- Schwamb, Megan E. + 6 co-authors including **Mishra, I.**, *Assessing the Main-Belt Comet Population with Comet Hunters*, 2017, American Astronomical Society Meeting Abstracts, 112.04

Approved Grants and Observing Proposals

- JWST Cycle 1, 13 hrs, GO 2358 (PI: MacDonald, R.J. + 14 Co-I's including **Mishra, I.**) 2021
  Revealing the Atmospheric Composition of a White Dwarf Planet
- Future Investigators in NASA Earth and Space Science and Technology (FINESST) 2020
  Grant Number 80NSSC20K1381 (FI: **Mishra, I.**; PI: Lewis, N.K.)
  Providing new constraints on Europa's surface composition

Select Presentations

- *Decoding the chemical and physical nature of airless planetary bodies: examples from studies of Europa and Pluto* (**talk**) 2023
  Colloquium for Department of Physical and Astronomy, Cal State LA
- *Europa Clipper: Exploring an Alien Ocean World* (**talk**)
  SPACEweek at Dawson College, Montreal (*invited*) 2023
  Planetary Lunch Seminar, Department of Astronomy, Cornell University (*invited*) 2023
- *How Widespread are the Bladed Terrains on Pluto?* (**talk**)
  54^{th} Lunar and Planetary Science Conference 2023
  New Horizons Science Team Meeting (*invited*) 2023
- *Providing new constraints on Europa's surface composition* (**talk**)
  University of Arizona Origins Seminar Series (*invited*) 2022
  UC Berkeley CIPS Seminar Series (*invited*) 2022
  Yale Exoplanets and Stars Seminar Series (*invited*) 2022
  Carnegie Earth and Planets Laboratory exoplanets seminar (*invited*) 2022
- *Assessing the feasibility of detection and characterization of organics on Europa* (**talk**) 2021
  American Geophysical Union Fall 2021 meeting
- *Revisiting select Galileo/NIMS observations of Europa with Bayesian inference* (**talk**) 2020
  AAS Division of Planetary Science meeting #52
- *Unlocking the secrets of HAT-P-41b's atmosphere* (**poster**) 2019
  ERES-V, Cornell University, USA
- *Detectability of Organics on Europa's Surface* (**poster**) 2018
  AGU Fall Meeting, Washington D.C., USA

Outreach/Media

- *Panelist for press event 'NASA's New Horizons: Distant Discoveries in the Outer Solar System'* 2023
  54^{th} Lunar and Planetary Science Conference
- *Co-leader of NYS-4H 2021 Challenge: Galactic Quest* 2021-2022
  Hands-on learning projects and workshops conducted virtually for school kids to get them interested in STEM
- *Author for* astrobites.org 2020-Present
  Write brief paper summaries accessible to undergraduate level students
- *Volunteer for Museum in the Dark* (Ithaca, NY) 2017 - Present
  Co-organize an annual Halloween-themed outreach event at a local museum with astronomy and planetary science related demos.
- *Volunteer for Expanding Your Horizons* (Cornell University) 2018 - Present

Helped run astronomy workshop activities for this yearly STEM outreach event for middle school girls.

- *Intern for citizen science project 'Comet Hunters'* 2016
  Academia Sinica Institute of Astronomy and Astrophysics, Taiwan

Teaching/Mentoring experience

- *Graduate student mentor for Cornell Astronomy's REU program* Summers 2020 & 2021
  Mentored two undergraduate students in separate projects involving analysis of transmission spectra of super-Earths and reflectance spectra of rocky planetary surfaces respectively.
- *Astronomy Teaching Assistant (ASTRO 2202)* (Cornell University) Fall 2018
  Assisted in teaching students how to write popular science articles, graded written homework and gave feedback and held office hours.
- *Astronomy Teaching Assistant (ASTRO 1101/1102)* (Cornell University) Fall 2017-Spring 2018
  Taught recitation sections and lab sections that involved exercises on introductory astronomy topics. Assisted in writing and grading homework assignments and exams.

Professional service and affiliations

- Member of the Science Organizing Committee (SOC) of the joint *DPS-EPSC 2023* meeting 2023
- Executive Secretary for NASA's *New Frontiers Data Analysis Program (NFDAP)* review panel (Asteroids) 2023
- Reviewer for *AAS* Journals and *Icarus* (2 papers reviewed), 2021-
- Graduate student affiliate, *Europa Clipper Mapping and Imaging Spectrometer (MISE) team* 2020-2022
- Postdoctoral Affiliate, *Europa Clipper Project Science team* 2022-present
- *Co-organizer of Cornell Astronomy REU Program's Python workshop* 2020
  Conducted a multi-day workshop on introduction to scientific programming with python.
- *Co-organizer of Introduction to GitHub workshop at ERES-V* 2019
  Conducted a 3-hour workshop on open-source software development using GitHub.