

Akash Gupta

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| CONTACT INFORMATION | Department of Earth, Planetary, and Space Sciences University of California, Los Angeles 595 Charles E. Young Drive East Los Angeles, CA 90095-1567 | <i>Email:</i> akashgpt@ucla.edu <i>Website:</i> www.akashgpt.com |
| RESEARCH INTERESTS | Planet formation and evolution; planet demographics; atmospheric escape; radiative hydrodynamics; atmosphere-interior interactions; quantum mechanical modeling of planetary building blocks; planetary dynamics and celestial mechanics; and planetary habitability. | |
| EDUCATION | University of California, Los Angeles (UCLA) <i>Ph.D. in Planetary Science</i> [†] (expected) 2017-23 <i>Thesis:</i> Unraveling the evolution of super-Earths and sub-Neptunes <i>Master of Science in Planetary Science</i> [†] (2019) Advisor: Prof. Hilke E. Schlichting Indian Institute of Technology (IIT), Kanpur <i>Bachelor's and Master's (Dual degree) in Aerospace Engineering</i> 2011-16 <i>Thesis:</i> Dynamics of rings around minor planets Advisors: Prof. Ishan Sharma and Dr. Sharvari Nadkarni-Ghosh | |
| RESEARCH EXPERIENCE | NASA Future Investigator 2020 - present Graduate Student Researcher 2017 - present Advisor: Prof. Hilke E. Schlichting (2017-) and Prof. Lars Stixrude (2021-) <i>Department of Earth, Planetary, and Space Sciences (EPSS), UCLA</i> Research Associate 2016-17 Advisor: Prof. Ishan Sharma <i>Mechanics & Applied Mathematics Group, IIT Kanpur</i> Summer Research Student Summer 2015 Advisor: Prof. Heikki Salo <i>Astronomy Research Unit, Department of Physics, University of Oulu, FI</i> Undergraduate Researcher 2013-16 Advisors: Prof. Ishan Sharma & Dr. Sharvari Nadkarni-Ghosh <i>Mechanics & Applied Mathematics Group and Dept. of Aerospace Engr., IIT Kanpur</i> | |
| SELECT AWARDS & HONORS | EPSS Outreach Award for DEI initiatives 2022 Selected for the OWL Summer Exoplanet Program 2022 at UC Santa Cruz 2022 Travel grant from MIAPbP [‡] to attend Planet Formation Workshop 2022 in Germany 2022 <i>Harold and Mayla Sullwold Scholarship</i> by EPSS, UCLA for excellence in research 2020 Future Investigators in NASA Earth & Space Science & Technology (FINESST) grant 2020-23 <i>Constantine and Perina Panunzio Scholarship</i> by EPSS, UCLA for excellence in research 2019 UCLA's University Fellowship 2017 <i>EPSS Scholarship Award, UCLA</i> 2017 Travel grant for research from IIT to work with Prof. Heikki Salo, U. of Oulu, Finland 2015 Letter of Appreciation for service & contributions as part of the Counseling Service, IIT 2013 Secured 99.6+ percentile among ~ 0.5 million candidates in the national exam IIT-JEE [§] 2011 | |

[†]formally, *Geophysics & Space Physics*

[‡]Munich Institute for Astro-, Particle and BioPhysics (Garching, Germany)

[§]Indian Institute of Technology - Joint Entrance Examination (for admission to science & engineering colleges in India)

PEER-
REVIEWED
PUBLICATIONS

JOURNAL PUBLICATIONS

Total citations: 335 (Google Scholar; Sep 2022)

Number of papers: 5 first-author (+1 in prep.), 1 second-author and 2 n^{th} -author

Students directly mentored: *

1. **Gupta, A.**, and Stixrude, L. 2022. In prep.
Investigating the solubility of hydrogen in water using ab initio molecular dynamics: implications to water-rich planets and exoplanets
2. Owen, J. E., Murray-Clay, R. A., Schreyer, E., Schlichting, H. E., David, A., **Gupta, A.**, Loyd, R. O. P., Shkolnik, E. L., Sing, D. K., Swain, M. R., 2022., In review. arXiv:2111.06094
The fundamentals of Lyman-alpha exoplanet transits
3. **Gupta, A.**, *Nicholson, L. and Schlichting, H. E. 2022. MNRAS, 516, 4585-4593.
Properties of the radius valley around low mass stars: Predictions from the core-powered ...
4. Rogers, J. G., **Gupta, A.**, Owen, J. E. and Schlichting, H. E. 2021. MNRAS, 508, 5886-5902.
Photoevaporation vs. core-powered mass-loss: Model comparison with the 3D radius gap
5. **Gupta, A.** and Schlichting, H. E. 2021. MNRAS, 504, 4634-4648.
Caught in the act: Core-powered mass-loss predictions for observing atmospheric escape
6. **Gupta, A.** and Schlichting, H. E. 2020. MNRAS 493, 792-806.
Signatures of the core-powered mass-loss mechanism in the exoplanet population: Dependence on stellar properties and observational predictions
7. Estrada, R. Swain, M., **Gupta, A.**, Sotin, C. and Valio, A.. 2020. ApJ. 898, 104-109.
Evolutionary tracks of H/He envelopes of the observed pop. of sub-Neptunes and super-Earths
8. **Gupta, A.** and Schlichting, H.E. 2019. MNRAS 487, 24-33.
Sculpting the valley in the radius distribution of small exoplanets as a by-product of planet formation: The core-powered mass-loss mechanism
9. **Gupta, A.**, Nadkarni-Ghosh, S. and Sharma, I. 2018. Icarus 299, 97-116.
Rings of non-spherical, axisymmetric bodies

SELECT CONFERENCE PROCEEDINGS

1. Tang, H., **Gupta, A.**, Schlichting, H.E. and Young E.D., 2020., 51st Annual Lunar and Planetary Science Conference, 1481
Escape from a Transient Rock Vapor Atmosphere as the Mechanism for Fractionation of the Moon's Moderately Volatile Elements

OBSERVING
PROGRAMS
AWARDED

1. Gemini MAROON-X, 25.7 hrs, Co-I (PI: Erik Petigura) 2022
Probing the Role of Mass Loss in the Formation of Super-Earths and Sub-Neptunes with MAROON-X
2. HST Cycle 28, 15 primary spacecraft orbits, Co-I (PI: Paul Cauley) 2020
Measuring mass loss via metal lines from the very young planet AU Mic b.

SEMINARS

- MIT Kavli Institute, Brown Bag Lunch Seminar 2022
- NASA Jet Propulsion Laboratory, Exoplanet Journal Club Seminar 2022
- University of Arizona, Origins Seminar 2022
- University of Texas, Austin Stars and Planets Seminar 2022
- Caltech, Dix Planetary Science Seminar 2022
- Yale, Exoplanets and Stars Seminar 2022
- Cornell, Planetary Lunch Seminar 2022

*Scheduled for Nov, 2022

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| | UC Berkeley, <i>Center for Integrative Planetary Science Seminar</i> | 2022 |
| | Princeton, <i>Exoplanet Discussion Group Seminar</i> | 2022 |
| | Carnegie Earth & Planets Laboratory, <i>Astronomy Seminar</i> | 2021 |
| | University of Arizona, <i>Disks and Exoplanets Group Seminar</i> | 2020 |
| | McMaster University, <i>Astronomy Seminar</i> | 2020 |
| | Massachusetts Institute of Technology, <i>Planetary Lunch Seminar</i> | 2020 |
| | UCLA, <i>Planetary Science Seminar</i> | 2018, '19, '21 |
| CONFERENCES | <i>*Planet Formation Workshop</i> by MIAPbP [‡] , Munich, Germany. Talk. | 2022 |
| (*: INVITED) | <i>240th AAS Meeting</i> , Pasadena, CA, US. Talk. | 2022 |
| | <i>Exoplanets IV</i> , Las Vegas, NV, US. Talk. | 2022 |
| | <i>Stars and Planets in the Ultraviolet</i> . Talk. | 2021 |
| | <i>Exoplanet Demographics</i> . Talk. | 2020 |
| | <i>Exoplanets III</i> . Talk. | 2020 |
| | <i>Bay Area Exoplanet Meeting</i> . Talk. | 2020 |
| | <i>Extreme Solar Systems IV</i> . Reykjavik, Iceland. Poster. | 2019 |
| | <i>NASA Sagan Summer Workshop</i> . Pasadena, CA, US. Poster. | 2019 |
| | <i>New Horizons in Planetary Systems</i> . Victoria, BC, Canada. Talk. | 2019 |
| | <i>Kepler & K2 Science Conference V</i> . Pasadena, CA, US. Poster. | 2019 |
| | <i>11th Annual EPSS Student Research Symposium</i> , UCLA. Los Angeles, CA, US. Poster. | 2018 |
| | <i>48th DPS Meeting and 11th EPSC</i> . Pasadena, CA, US. Poster. | 2016 |
| TECHNICAL SKILLS | <i>Programming languages</i> : FORTRAN, C, MATLAB, Python, IDL, Shell Script. <i>Select open-source codes used</i> : VASP, REBOUND, MESA, emcee, dynesty. | |
| TECHNICAL WORKSHOPS | <i>OWL Exoplanet Summer workshop</i> by UC Santa Cruz and Heising-Simons | 2022 |
| | <i>Planet Formation workshop</i> by MIAPbP in Garching, Germany | 2022 |
| | <i>Sagan Exoplanet Workshop: Astrobiology for Astronomers</i> by NExSci at Caltech | 2019 |
| | <i>Communicating Science Effectively in Today's World</i> by UCLA and EPSS | 2019 |
| | <i>XSEDE HPC Workshop: Summer Boot Camp</i> by XSEDE & PSC at UCLA | 2018 |
| | <i>High Performance Computing Workshop</i> by Intel at IIT Kanpur | 2015 |
| MENTORING, TEACHING, SERVICES & OUTREACH | MENTORING (RESEARCH): - Lorraine Nicholson (UCLA undergrad/UC LEADS fellow → NSF GRFP fellow and Ph.D. student at U. of Florida) Project: <i>Planet evolution under core-powered mass-loss around ultra-cool M-dwarfs</i> - Sohanjit Ghosh (IIT Kanpur/IEST undergrad → Ph.D. student at Johns Hopkins U.) Project: <i>Understanding the dynamics of rings around non-spherical minor planets</i> | 2020-22 2017-18 |
| | MENTORING (OTHER): - Mentor, <i>EPSS Family Mentorship Program (EFMP)</i> , UCLA - Mentor, <i>Counseling Service</i> , IIT Kanpur | 2021 - present 2012-13 |
| | TEACHING: - Guest Lecturer, <i>Planetary & Orbital Dynamics (EPS SCI 219)</i> , UCLA - Teaching Assistant, <i>Solar System and Planets (EPS SCI 9)</i> , UCLA - Teaching Assistant, <i>Solar System and Planets (EPS SCI 9)</i> , UCLA | Spring 2019 Winter 2019 Winter 2018 |

- Teaching Assistant, Experiments in Aerospace Engineering III (AE451A), IIT Spring 2016
- Teaching Assistant, Experiments in Aerospace Engineering II (AE351A), IIT Fall 2015

OTHER DIVERSITY, EQUITY & INCLUSION ACTIVITIES

- Founder & Organizing Committee Member, *EPSS Family Mentorship Program* 2021 - present
Beginning 2022-23 AY, has an annual budget allocated by the Department Chair and has been awarded ~\$2500 to-date (Sep, 2022)
- Department Representative, *Mathematics & Physical Sciences Council*, UCLA 2017-19
- Departmental Undergraduate Committee, Aerospace Engr., IIT Kanpur 2012-13

OTHER PROFESSIONAL SERVICES AND ACTIVITIES

- Referee: *Nature Astronomy*, *MNRAS*, *AAS* journals 2020 - present
- Member, *American Astronomical Society* and *Division for Planetary Sciences* 2022 - present
- Founder & Organizer, *Planets & Exoplanets Journal Club*, UCLA 2020 - 2022
- Global Organizing Committee member, *Exoplanets III* conference 2020
- Co-founder and Manager of the *UCLA Planets & Exoplanets mailing list* for promoting communication across disciplines at UCLA 2019 - present

OTHER SELECT OUTREACH ACTIVITIES

- Invited speaker, *Planning for Graduate School*, IIT Bombay, India 2021
- Invited speaker, Wildwood Institute for STEM Research and Development Poster Presentation and Lecture Series, Wildwood School, Los Angeles, CA 2019
- Volunteer, International Observe the Moon Night, UCLA 2019
- Participant, *Exploring Your Universe* - UCLA's Annual Science Outreach Festival 2017-20
- Panelist, Key to Success: Life and Physical Sciences. Grad Student Orientation, UCLA 2018

OTHER SELECT ACHIEVEMENTS Member of the first IIT Kanpur team (*IITK Motorsports*) to 'conceive, design and fabricate a small, Formula-style racing car to compete' at the *Formula SAE*, Italy'13 org. by the SAE^{||} International. 'Sangeet Bhushan' (equiv. to Diploma in Music) in playing Harmonium, an Indian classical instrument, from *Pracheen Kala Kendra*, India; 9-10 years of training in playing the instrument. 'Sangeet Bhushan/Visharad II' (equiv. to Diploma in Music) in playing Tabla, an Indian classical instrument, from *Pracheen Kala Kendra*, India; 6-7 years of training in playing the instrument.

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| REFERENCES | <p>Prof. Hilke E. Schlichting Dept. of Earth, Planetary, and Space Sciences University of California, Los Angeles hilke@ucla.edu</p> <p>Dr. James E. Owen Department of Physics Imperial College London james.owen@imperial.ac.uk</p> <p>Prof. Edward D. Young Dept. of Earth, Planetary, and Space Sciences University of California, Los Angeles eyoung@epss.ucla.edu</p> | <p>Prof. Lars Stixrude Dept. of Earth, Planetary, and Space Sciences University of California, Los Angeles lstixrude@epss.ucla.edu</p> <p>Prof. Erik Petigura Department of Physics & Astronomy University of California, Los Angeles petigura@astro.ucla.edu</p> |
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^{||}Society of Automotive Engineers