

Akash Gupta

CONTACT INFORMATION	Peyton Hall, 110 Princeton University Princeton, NJ 08544	<i>Email:</i> akashgpt@princeton.edu <i>Website:</i> www.akashgpt.com
RESEARCH INTERESTS	Planet formation & evolution; planet demographics; atmospheric escape; atmosphere-interior interactions; celestial mechanics; ab-initio molecular dynamics; N-body simulations; and habitability.	
APPOINTMENTS	51 Pegasi b Fellow, Harry H. Hess Postdoctoral Fellow, and Future Faculty in Physical Sciences Fellow <i>Princeton University</i> Department of Astrophysical Sciences & Department of Geosciences NASA Future Investigator (FINESST grantee) Graduate Student Researcher <i>University of California, Los Angeles</i> Department of Earth, Planetary, and Space Sciences (EPSS)	2023 - 2020-23 2017-23
PROFESSIONAL TRAINING	Princeton University (PU) Postdoctoral Fellow <i>Mentors:</i> Prof. Adam Burrows & Prof. Jie Deng University of California, Los Angeles (UCLA) Ph.D., M.S., Planetary Science <i>Thesis:</i> Unraveling the evolution of super-Earths and sub-Neptunes <i>Advisor:</i> Prof. Hilke E. Schlichting Indian Institute of Technology, Kanpur (IIT-K) B.Tech. - M.Tech. Dual degree, Aerospace Engineering	2023- 2017-23 2011-16
SELECT AWARDS & HONORS	<ul style="list-style-type: none"><i>51 Pegasi b Fellowship</i>, Heising-Simons Foundation<i>Future Faculty in Physical Sciences Fellowship</i>, Princeton University<i>Harry H. Hess Postdoctoral Fellowship</i>, Princeton University<i>Future Investigators in NASA Earth & Space Science & Technology (FINESST) grant</i><i>Exoplanet Summer Program Mini Grant</i> by Heising-Simons Foundation & UC Santa Cruz<i>American Astronomical Society (AAS) Rodger Doxsey Travel Prize</i> awarded annually to 10 early-career researchers for presenting their PhD dissertation at the AAS meeting<i>UCLA EPSS Outreach Award</i> for DEI initiativesTravel grant from MIAPbP[†] to attend <i>Planet Formation Workshop 2022</i> in Germany<i>Harold and Mayla Sullwold Scholarship</i> by EPSS, UCLA for excellence in research	2023 - 2023 - 2023 - 2020-23 2023 2023 2022 2022 2020

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

- *Constantine and Perina Panunzio Scholarship* by EPSS, UCLA for excellence in research 2019
- *UCLA's University Fellowship* 2017
- *EPSS Scholarship Award*, UCLA 2017
- Travel grant from IIT - Finnish Consortium of Higher Education program to conduct research with Prof. Heikki Salo, University of Oulu, Finland 2015
- Secured ~ 99 percentile in the Indian national exam GATE[‡] (Aerospace Engineering) 2015
- Secured ~ 99.8 percentile among ~ 1.1 million candidates in the national exam AIEEE[§] 2011
- Secured ~ 99.6 percentile among ~ 0.5 million candidates in the national exam IIT-JEE[¶] 2011

PEER-REVIEWED JOURNAL PUBLICATIONS (*students directly mentored: **)

PUBLICATIONS

1. **Gupta, A.**, and Stixrude, L. 2023. 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. *MNRAS*. 518, 4357-4371.
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

[‡]Graduate Aptitude Test in Engineering

[§]All India Engineering Entrance Examination (for admission to science & engineering colleges in India)

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

Moderately Volatile Elements

OBSERVING PROGRAMS AWARDED	1. W.M. Keck Observatory, 3 nights, Co-I (PI: Erik Petigura) <i>The KPF Disordered Multis Survey</i>	2023
	2. Gemini MAROON-X, 25.7 hrs, Co-I (PI: Erik Petigura) <i>Probing the Role of Mass Loss in the Formation of Super-Earths and Sub-Neptunes with MAROON-X</i>	2022
	3. Hubble Space Telescope Cycle 28, 15 primary spacecraft orbits, Co-I (PI: Paul Cauley) <i>Measuring mass loss via metal lines from the very young planet AU Mic b</i>	2020
SEMINARS	MIT Kavli Institute, <i>Brown Bag Lunch Seminar</i>	2022
	NASA Jet Propulsion Laboratory, <i>Exoplanet Journal Club Seminar</i>	2022
	University of Arizona, <i>Origins Seminar</i>	2022
	University of Texas, <i>Austin Stars and Planets Seminar</i>	2022
	Caltech, <i>Dix Planetary Science Seminar</i>	2022
	Yale, <i>Exoplanets and Stars Seminar</i>	2022
	Cornell, <i>Planetary Lunch Seminar</i>	2022
	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
	MIT, <i>Planetary Lunch Seminar</i>	2020
	UCLA, <i>Planetary Science Seminar</i>	2018, '19, '21
CONFERENCES	TALKS	
	241 st AAS Meeting, Seattle, WA	2023
	Planet Formation Workshop by MIAPbP [‡] , Munich, Germany (invited)	2022
	240 th AAS Meeting, Pasadena, CA, US	2022
	Exoplanets IV, Las Vegas, NV, US	2022
	Stars and Planets in the Ultraviolet, virtual conference	2021
	Exoplanet Demographics, virtual conference	2020
	Exoplanets III, virtual conference	2020
	Bay Area Exoplanet Meeting, virtual conference	2020
	New Horizons in Planetary Systems, Victoria, BC, Canada	2019
	POSTERS	
	ExSoCal 2020, virtual conference	2020

	<i>Extreme Solar Systems IV</i> , Reykjavik, Iceland	2019
	<i>NASA Sagan Summer Workshop</i> , Pasadena, CA, US	2019
	<i>Kepler & K2 Science Conference V</i> , Pasadena, CA, US	2019
	<i>11th Annual EPSS Student Research Symposium</i> , UCLA, Los Angeles, CA, US	2018
	<i>48th DPS Meeting and 11th EPSC</i> , Pasadena, CA, US	2016
TECHNICAL SKILLS	<i>Programming languages</i> : Python, C, MATLAB, FORTRAN, IDL, Bash. <i>Select softwares/codes</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, OUTREACH & PROFESSIONAL SERVICES	MENTORING (RESEARCH): - Lorraine Nicholson (UCLA undergrad/UC LEADS fellow → NSF GRFP fellow and Ph.D. student at U. of Florida) 2020-22 Project: <i>Planet evolution under core-powered mass-loss around ultra-cool M-dwarfs</i> - Sohanjit Ghosh (IIT Kanpur/IIST undergrad → Ph.D. student at Johns Hopkins U.) 2017-18 Project: <i>Understanding the dynamics of rings around non-spherical minor planets</i> MENTORING (OTHER): - Mentor, <i>EPSS Family Mentorship Program (EFMP)</i> , UCLA 2021-23 - Mentor, <i>Counseling Service</i> , IIT Kanpur 2012-13 TEACHING: - Guest Lecturer, Planetary & Orbital Dynamics (EPS SCI 219), UCLA Spring 2019 - Teaching Assistant, Solar System and Planets (EPS SCI 9), UCLA Winter 2019 - Teaching Assistant, Solar System and Planets (EPS SCI 9), UCLA Winter 2018 - Teaching Assistant, Experiments in Aerospace Engineering III (AE451A), IIT Spring 2016 - Teaching Assistant, Experiments in Aerospace Engineering II (AE351A), IIT Fall 2015 REVIEWS: - Reviewer for <i>NASA, European Research Council (ERC)</i> 2022 - - Referee for <i>Nature Astronomy, PNAS, MNRAS^{**}, ApJ^{††}</i> 2019 - - Judge, AAS Chambliss Astronomy Achievement Student Awards 2023	
	Proceedings of the National Academy of Sciences ^{**} Monthly Notices of the Royal Astronomical Society ^{††} Astrophysical Journal	

OTHER DIVERSITY, EQUITY & INCLUSION ACTIVITIES

- Founder & Organizing Committee Member, *EPSS Family Mentorship Program* 2021-23
- Department Representative, *Mathematics & Physical Sciences Council*, UCLA 2017-19
- Departmental Undergraduate Committee, Aerospace Engr., IIT Kanpur 2012-13

OTHER PROFESSIONAL SERVICES AND ACTIVITIES

- Member, *NSF Physics Frontiers Center: Center for Matter at Atomic Pressures (CMAP)* 2023 -
- Member, *American Astronomical Society (AAS)* 2022-
- Member, *Division for Planetary Sciences* of the AAS 2022-
- Founder & Organizer, *Planets & Exoplanets Journal Club*, UCLA 2020-22
- Global Organizing Committee member, *Exoplanets III* conference 2020

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.

^{††}Society of Automotive Engineers