

Akash Gupta

CONTACT INFORMATION	Department of Earth, Planetary, and Space Sciences	<i>Email:</i> akashgpt@ucla.edu
	University of California, Los Angeles 595 Charles E. Young Drive East Los Angeles, CA 90095-1567	<i>Website:</i> www.akashgpt.com
RESEARCH INTERESTS	Planet formation and evolution; atmospheric escape; radiative hydrodynamics; atmosphere-interior interactions; ab initio molecular dynamics; planetary dynamics and celestial mechanics.	
EDUCATION	University of California, Los Angeles (UCLA) <i>Ph.D. in Planetary Science</i> [†] <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	(expected) 2017-23
	Indian Institute of Technology (IIT), Kanpur <i>Bachelor's and Master's (Dual degree) in Aerospace Engineering</i> <i>Thesis:</i> Dynamics of rings around minor planets Advisors: Prof. Ishan Sharma and Dr. Sharvari Nadkarni-Ghosh	2011-16
RESEARCH EXPERIENCE	NASA Future Investigator	2020 - present
	Graduate Student Researcher Advisor: Prof. Hilke E. Schlichting (2017-) and Prof. Lars Stixrude (2021-) <i>Department of Earth, Planetary, and Space Sciences (EPSS), UCLA</i>	2017 - present
	Research Associate Advisor: Prof. Ishan Sharma <i>Mechanics & Applied Mathematics Group, IIT Kanpur</i>	2016-17
	Summer Research Student Advisor: Prof. Heikki Salo <i>Astronomy Research Unit, Department of Physics, University of Oulu</i>	Summer 2015
	Undergraduate Researcher Advisors: Prof. Ishan Sharma & Dr. Sharvari Nadkarni-Ghosh <i>Mechanics & Applied Mathematics Group and Dept. of Aerospace Engr., IIT Kanpur</i>	2013-16
SELECT AWARDS & HONORS	Selected for the OWL Summer Exoplanet Program 2022 at UC Santa Cruz	2022
	Travel grant from MIAPbP [‡] to attend <i>Planet Formation Workshop 2022</i> in Germany	2022
	<i>Harold and Mayla Sullwold Scholarship</i> by EPSS, UCLA for excellence in research	2020
	<i>Future Investigators in NASA Earth and Space Science and Technology (FINESST)</i> grant	2020-23
	<i>Constantine and Perina Panunzio Scholarship</i> by EPSS, UCLA for excellence in research	2019
	<i>UCLA's University Fellowship</i>	2017-19
	<i>EPSS Department Scholarship Award, UCLA</i>	2017
	Travel grant for research from IIT to work with Prof. Heikki Salo, U. of Oulu, Finland	2015
	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)

PUBLICATIONS Total citations: 321 (Google Scholar; Aug 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 exoplanets, Solar system icy giants and planet formation
2. **Gupta, A.**, *Nicholson, L. and Schlichting, H. E. 2022. In review. MNRAS, arXiv:2205.14020.
Properties of the radius valley around low mass stars: Predictions from core-powered ...
3. 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., 2021., In review. arXiv:2111.06094
The fundamentals of Lyman-alpha exoplanet transits
4. Rogers, J. G., **Gupta, A.**, Owen, J. E. and Schlichting, H. E. 2021. MNRAS, 508, 5886.
Photoevaporation Vs. core-powered mass-loss: Model comparison with the 3D radius gap
5. **Gupta, A.** and Schlichting, H. E. 2021. MNRAS, 504, 4634.
Caught in the act: Core-powered mass-loss predictions for observing atmospheric escape
6. **Gupta, A.** and Schlichting, H. E. 2020. MNRAS 493, 792.
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.
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.
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.
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

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 (*: INVITED)

- *Astronomy Seminar, Carnegie Earth & Planets Laboratory 2021
- *Disks and Exoplanets Group Seminar, University of Arizona 2020
- *Astronomy Seminar, McMaster University 2020
- *Planetary Lunch Seminar, Massachusetts Institute of Technology 2020
- Planetary Science Seminar, UCLA 2019, '18, '21

CONFERENCES (*: INVITED)

- *Planet Formation Workshop by MIAPbP[†], Munich, Germany. Talk. 2022
- 240th AAS Meeting, Pasadena, CA, US. Talk. 2022
- Exoplanets IV, 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, UCLA</i> . Los Angeles, CA, US. Poster.	2018
	<i>48th DPS Meeting and 11th EPSC</i> . Pasadena, CA, US. Poster.	2016
OTHER MAJOR PROJECTS	Geochemical evolution of planets	2021 - present
	Asymmetry in Lunar ‘cold-spot’ craters; now led by Sophie Taylor (UCLA)	2017 - present
	Rings around irregularly shaped minor-planets; now led by Shri B. Bharath (IIT)	2016 - present
	Understanding the dynamics of Saturn’s F-ring	2015
	Adaptively optimized trajectories for rendezvous with an asteroid	2013-14
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 (awarded UC LEADS fellowship; currently NSF GRFP fellow at U. Florida)	2020-22
	Project: <i>Planet evolution under core-powered mass-loss around ultra-cool M-dwarfs</i>	
	- Sohanjit Ghosh (IITK undergraduate; currently Ph.D. student at U. Maryland)	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 - present
	- 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
OTHER DIVERSITY, EQUITY & INCLUSION ACTIVITIES		
	- Founder & Organizing Committee Member, <i>EPSS Family Mentorship Program</i>	2021 - present

Beginning 2022-23 AY, has an annual budget allocated by the Department Chair and has been awarded ~\$2500 to-date

- 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
- Founded and managed the *UCLA Planets & Exoplanets mailing list* for promoting inter-departmental communication at UCLA 2019 - 2022

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-ever IIT Kanpur team (*IITK Motorsports*) to conceive, design and fabricate a small, Formula-style racing car to compete at the *Formula SAE*, Italy'13 organized 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