

# 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; 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	<b>University of California, Los Angeles (UCLA)</b> <i>Ph.D. in Planetary Science</i> <sup>†</sup> <i>Thesis:</i> Unraveling the evolution of super-Earths and sub-Neptunes <i>Master of Science in Planetary Science</i> <sup>†</sup> (2019) Advisor: Prof. Hilke E. Schlichting	(expected) 2017-23
	<b>Indian Institute of Technology (IIT), Kanpur</b> <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	<b>NASA Future Investigator</b>	2020 - present
	<b>Graduate Student Researcher</b> Advisor: Prof. Hilke E. Schlichting (2017-) and Prof. Lars Stixrude (2021-) <i>Department of Earth, Planetary, and Space Sciences (EPSS), UCLA</i>	2017 - present
	<b>Research Associate</b> Advisor: Prof. Ishan Sharma <i>Mechanics &amp; Applied Mathematics Group, IIT Kanpur</i>	2016-17
	<b>Summer Research Student</b> Advisor: Prof. Heikki Salo <i>Astronomy Research Unit, Department of Physics, University of Oulu</i>	Summer 2015
	<b>Undergraduate Researcher</b> Advisors: Prof. Ishan Sharma & Dr. Sharvari Nadkarni-Ghosh <i>Mechanics &amp; Applied Mathematics Group and Dept. of Aerospace Engr., IIT Kanpur</i>	2013-16
	<i>EPSS Outreach Award</i> for DEI initiatives	2022
SELECT AWARDS & HONORS	Selected for the <i>OWL Summer Exoplanet Program 2022</i> at UC Santa Cruz	2022
	Travel grant from MIAPbP <sup>‡</sup> 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 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 <sup>§</sup>	2011

<sup>†</sup>formally, *Geophysics & Space Physics*

<sup>‡</sup>Munich Institute for Astro-, Particle and BioPhysics (Garching, Germany)

<sup>§</sup>Indian Institute of Technology - Joint Entrance Examination (for admission to science & engineering colleges in India)

PUBLICATIONS *Total citations: 325 (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 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.  
*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.  
*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

- ℥MIT Kavli Institute, Brown Bag Lunch Seminar 2022
- ℥NASA Jet Propulsion Laboratory, Exoplanet Journal Club Seminar 2022
- ℥University of Arizona, Origins Seminar 2022
- ℥Caltech, Dix Planetary Science Lunch Seminar 2022
- ℥Yale, Exoplanets and Stars Seminar 2022
- Cornell, Planetary Lunch Seminar 2022
- UC Berkeley, Center for Integrative Planetary Science Seminar 2022
- Princeton, Exoplanet Discussion Group Seminar 2022

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℥Scheduled for Oct and Nov, 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 <sup>‡</sup> , Munich, Germany. Talk.	2022
(*: INVITED)	<i>240<sup>th</sup> 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 &amp; K2 Science Conference V</i> . Pasadena, CA, US. Poster.	2019
	<i>11<sup>th</sup> Annual EPSS Student Research Symposium, UCLA</i> . Los Angeles, CA, US. Poster.	2018
	<i>48<sup>th</sup> DPS Meeting and 11<sup>th</sup> EPSC</i> . Pasadena, CA, US. Poster.	2016
TECHNICAL SKILLS	<i>Programming languages: FORTRAN, C, MATLAB, Python, IDL, Shell Script.</i>	
	<i>Select open-source codes used: VASP, REBOUND, MESA, emcee, dynesty.</i>	
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, <i>Planetary &amp; Orbital Dynamics (EPS SCI 219)</i> , UCLA	Spring 2019
	- Teaching Assistant, <i>Solar System and Planets (EPS SCI 9)</i> , UCLA	Winter 2019
	- Teaching Assistant, <i>Solar System and Planets (EPS SCI 9)</i> , UCLA	Winter 2018
	- Teaching Assistant, <i>Experiments in Aerospace Engineering III (AE451A)</i> , IIT	Spring 2016
	- Teaching Assistant, <i>Experiments in Aerospace Engineering II (AE351A)</i> , 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
- 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<sup>||</sup> 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.

#### REFERENCES

Prof. Hilke E. Schlichting  
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Prof. Lars Stixrude  
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Dr. James E. Owen  
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Imperial College London  
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<sup>||</sup>Society of Automotive Engineers