

# Akash Gupta

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; akashgpt.ucla@gmail.com <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. and M.S. in Planetary Science</i> (expected) 2017-23 <i>Thesis:</i> Unraveling the evolution of super-Earths and sub-Neptunes <i>Advisor:</i> Prof. Hilke E. Schlichting <b>Indian Institute of Technology (IIT), Kanpur</b> <i>B.Tech. and M.Tech. 'Dual degree' in Aerospace Engineering</i> 2011-16 <i>Thesis:</i> Dynamics of rings around minor planets <i>Advisors:</i> Prof. Ishan Sharma and Dr. Sharvari Nadkarni-Ghosh	
RESEARCH EXPERIENCE	<b>NASA Future Investigator</b> 2020 - present <b>Graduate Student Researcher</b> 2017 - present <i>Advisor:</i> Prof. Hilke E. Schlichting (2017-) and Prof. Lars Stixrude (2021-) <i>Department of Earth, Planetary, and Space Sciences (EPSS), UCLA</i> <b>Research Associate</b> 2016-17 <i>Advisor:</i> Prof. Ishan Sharma <i>Mechanics &amp; Applied Mathematics Group, IIT Kanpur</i> <b>Summer Research Student</b> Summer 2015 <i>Advisor:</i> Prof. Heikki Salo <i>Astronomy Research Unit, Department of Physics, University of Oulu, FI</i> <b>Undergraduate Researcher</b> 2013-16 <i>Advisors:</i> Prof. Ishan Sharma & Dr. Sharvari Nadkarni-Ghosh <i>Mechanics &amp; Applied Mathematics Group and Dept. of Aerospace Engr., IIT Kanpur</i>	
SELECT AWARDS & HONORS	<i>Exoplanet Summer Program Mini Grant</i> by Heising-Simons Foundation & UC Santa Cruz 2023 <i>AAS<sup>†</sup> Rodger Doxsey Travel Prize</i> awarded annually to support 10 early-career researchers in presenting their PhD dissertation research at the winter AAS meeting 2023 <i>EPSS Outreach Award</i> for DEI initiatives 2022 Selected for the <i>Exoplanet Summer Program 2022 org</i> by UC Santa Cruz & Heising-Simons 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 <b>Future Investigators in NASA Earth &amp; Space Science &amp; Technology (FINESST) grant</b> 2020-23 <i>Constantine and Perina Panunzio Scholarship</i> by EPSS, UCLA for excellence in research 2019 <b>UCLA's University Fellowship</b> 2017 <i>EPSS Scholarship Award</i> , UCLA 2017 Travel grant for research from IIT to work with Prof. Heikki Salo, U. of Oulu, Finland 2015 <b>Secured 99.6+ percentile among ~ 0.5 million candidates in the national exam IIT-JEE<sup>§</sup></b> 2011	

<sup>†</sup>American Astronomical Society

<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)

PEER-  
REVIEWED  
PUBLICATIONS

JOURNAL PUBLICATIONS

Total citations: 370 (first-author: 342 — Google Scholar, Jan 2023)

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. 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 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

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| 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 |
| UC Berkeley, Center for Integrative Planetary Science Seminar  | 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	241 <sup>st</sup> AAS Meeting, Seattle, WA. Talk.	2023
(*: INVITED)	* <i>Planet Formation Workshop</i> by MIAPbP <sup>‡</sup> , Munich, Germany. Talk.	2022
	240 <sup>th</sup> AAS Meeting, 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
	11 <sup>th</sup> Annual EPSS Student Research Symposium, UCLA. Los Angeles, CA, US. Poster.	2018
	48 <sup>th</sup> DPS Meeting and 11 <sup>th</sup> EPSC. 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	OWL <i>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/IIST 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 &amp; 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  
In effort to promote interdisciplinary dialogue; now also financially supported by Prof. David Jewitt/iPLEX institute
- Global Organizing Committee member, *Exoplanets III* conference 2020
- Co-founder and Manager of the *UCLA Planets & Exoplanets mailing list* 2019 - present  
In effort to promote interdisciplinary dialogue; currently has 130+ members from across three UCLA departments

#### 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<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 Dept. of Earth, Planetary, and Space Sciences University of California, Los Angeles hilke@ucla.edu	Prof. Lars Stixrude Dept. of Earth, Planetary, and Space Sciences University of California, Los Angeles lstixrude@epss.ucla.edu
Dr. James E. Owen Department of Physics (Astrophysics Group) Imperial College London james.owen@imperial.ac.uk	Prof. Erik Petigura Department of Physics & Astronomy University of California, Los Angeles petigura@astro.ucla.edu
Prof. Edward D. Young Dept. of Earth, Planetary, and Space Sciences University of California, Los Angeles eyoung@epss.ucla.edu	

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<sup>¶</sup>Society of Automotive Engineers