

# DR. MUNAZZA K. ALAM

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## RESEARCH INTERESTS

Observations of exoplanet atmospheres, host star elemental abundances, planet formation and evolution

## EMPLOYMENT

<b>Carnegie Earth &amp; Planets Laboratory</b> , Carnegie EPL Postdoctoral Fellow	2021–
<b>Harvard University</b> , Postdoctoral Researcher	2021

## EDUCATION

<b>Harvard University</b>	2016–2021
Ph.D., Astronomy and Astrophysics	
<i>Thesis</i> : “Characterizing Distant Worlds: Atmospheric Reconnaissance of Giant Planets with <i>Hubble</i> ”	
<i>Advisor</i> : Dr. Mercedes López-Morales	
A.M. (2018), Astronomy and Astrophysics	
<b>Macaulay Honors College at Hunter College, City University of New York (CUNY)</b>	2012–2016
B.A., Physics and Astronomy – <i>Summa Cum Laude (Salutatorian)</i>	

## FELLOWSHIPS & GRANTS

<b>National Geographic Young Explorers Grant</b>	2015–
<b>NSF Graduate Research Fellowship</b>	2017–2020
<b>John P. and Carol J. Merrill Graduate Fellowship</b> , Harvard University	2017
<b>Judith and Stanley Zabar Graduate Scholarship</b> , Hunter College	2016
<b>John P. McNulty Scholarship</b> , Hunter College	2014–2016
<b>CUNY Macaulay Honors College full merit scholarship</b> , Hunter College	2012–2016

## SELECTED HONORS & AWARDS

<b>Rodger Doxsey Travel Prize</b> , AAS 237th Meeting	2021
<b>Keck Principal Investigator Data Award</b> , NExSci for NASA	2020
Nominated as one of the <b>40 Women to Watch in 2019</b> , The Tempest	2019
<b>Derek Bok Center Certificate of Distinction in Teaching</b> , Harvard University	2017, 2018
Awarded for teaching SPU 30 (Life as a Planetary Phenomenon), Spring 2017	
Awarded for teaching AY 16 (Stellar & Planetary Astronomy), Spring 2018	
<b>Best Poster Award</b> , IAC Winter School of Radiative Transfer in Stellar & Planetary Atmospheres	2017
<b>Joseph A. Gillet Memorial Prize</b> , Hunter College	2016
Award Citation: “ <i>awarded to a member of the senior class who has, in the opinion of the department, the most thorough knowledge of general physics</i> ”	
<b>Rosalyn S. Yalow Award</b> , Hunter College	2016
Award Citation: “ <i>presented to one of Hunter’s finest science students</i> ”	

## ACCEPTED OBSERVING PROPOSALS (AS PI)

*Probing Atmospheric Escape in Young Transiting Exoplanets*, Keck II/NIRSPEC 2020B semester, 1.5 nights,  
**PI: Alam**, Co-Is: dos Santos, Kirk, López-Morales, Ehrenreich, Bourrier, Allart, Siedel, Lovis, Livingston, King, Oklopčić, Zhou

*Investigating Giant Planet Origins with Elemental Abundances of Stellar Hosts*, Keck I/HIRES 2020A semester, 0.25 nights, **PI: Alam**, Co-I: López-Morales

*Investigating Giant Planet Origins: Stellar Host Elemental Abundances*, Magellan/MIKE 2019A, 2020A, & 2020B semesters, 6.5 nights, **PI: Alam**, Co-Is: López-Morales, Buchhave

## SELECTED INVITED TALKS

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<b>Colloquium</b> Oberlin College, <i>Exploring Exoplanet Atmospheres</i>	Oct 2021
<b>Guest Lecture</b> American University, <i>Exotic Exoplanets and How to Find Them</i>	Oct 2021
<b>Seminar</b> University of Michigan, <i>A Cloud-Free Atmosphere for WASP-62b</i>	Oct 2020
<b>Talk</b> NASA Jet Propulsion Laboratory, <i>A Clear Atmosphere for WASP-62b, the Only Known Gas Giant in the JWST Continuous Viewing Zone</i>	Sept 2020
<b>Seminar</b> UC Berkeley & UCLA, <i>Characterizing Giant Planet Atmospheres with Hubble</i>	Sept 2020
<b>Seminar</b> University of Chicago, <i>Characterizing Giant Planet Atmospheres with Hubble and Large Ground-based Telescopes</i>	Aug 2020
<b>Seminar</b> University of Exeter, <i>Characterizing Giant Planet Atmospheres with HST</i>	Aug 2020
<b>Talk</b> University of Hawaii Institute for Astrophysics, <i>Characterizing Giant Planet Atmospheres</i>	Feb 2020
<b>Seminar</b> Columbia University, <i>The HST PanCET Program: Characterizing the Atmospheres of Inflated Hot Jupiters</i>	Apr 2019
<b>Seminar</b> Geneva Observatory, <i>Precise Optical Transmission Spectra for a Hot Jupiter and a Nearby Super-Earth</i>	Sept 2018
<b>Seminar</b> Pontificia Universidad Católica, <i>An Optical Transmission Spectrum for WASP-52b</i>	Aug 2018
<b>Talk</b> Smithsonian Board of Regents Meeting, <i>Through the Looking Glass: Next Generation Telescopes and the Future of Astronomy</i>	Apr 2018

## SELECTED CONTRIBUTED TALKS

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<b>Talk</b> Exo-Webb Summer Series, <i>Evidence of a Clear Atmosphere for WASP-62b, the Only Known Transiting Gas Giant in the JWST Continuous Viewing Zone</i>	Jul 2020
<b>Conference</b> Cloud Academy I, <i>An Optical Transmission Spectrum for WASP-52b</i>	Sept 2018
<b>Conference</b> Exoplanets II, <i>An Optical Transmission Spectrum of the Inflated Hot Jupiter WASP-52b</i>	Jul 2018
<b>Conference</b> Boston Area Exoplanet Science Meeting 2, <i>Precise Optical Transmission Spectra for a hot Jupiter and a nearby super-Earth</i>	Mar 2018
<b>Conference</b> CfA Stars & Planets Science Extravaganza 2, <i>A Tale of Two Planets</i>	Oct 2017
<b>Conference</b> Keele University Transiting Exoplanets, <i>Characterizing HD 29134b, the Nearest Transiting Rocky Planet</i>	Jul 2017

## SELECTED PUBLIC TALKS

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<b>Public talk</b> Virginia Living Museum, <i>Weather on Other Worlds</i>	Apr 2021
<b>Assembly speaker</b> Nightingale-Bamford School, <i>My Journey as an Astronomer</i>	Jan 2020
<b>Public talk</b> National Geographic Explorer Nights, <i>Exploring the Universe</i>	Apr 2019
<b>Public talk</b> National Geographic Student Matinee, <i>Keep Looking Up: My Journey in Astronomy</i>	Mar 2019
<b>Public talk</b> CfA Observatory Night, <i>Weather on Other Worlds: Studying Exoplanet Atmospheres</i>	Feb 2019
<b>Keynote speaker</b> Virginia Association of Science Teachers, <i>Building Stronger Classrooms</i>	Nov 2018
<b>Keynote speaker</b> Virginia Science Education Leadership Association, <i>Diversify &amp; Strengthen Science for All</i>	Nov 2018
<b>Public talk</b> Macaulay Honors College Professional Lunch Series, <i>My Path to Astronomy</i>	Oct 2018
<b>Public talk</b> National Geographic Young Explorers Grants Program Workshop at Yale University, <i>Brown Dwarfs: The Cool Neighbors</i>	Apr 2016

## SELECTED MEDIA FEATURES

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<b>Magazine</b> <i>Harvard Gazette</i> , <a href="#">Quick, hand me my worm pick</a>	Sept 2021
<b>Magazine</b> <i>Eos</i> , <a href="#">Munazza Alam: Searching for New Worlds</a>	Sept 2021
<b>Magazine</b> <i>Smithsonian Magazine</i> , <a href="#">The Five Big Ways JWST Will Help Astronomers Understand the Universe</a>	Aug 2021
<b>Podcast</b> <i>HMSC Science Connects!</i> , <a href="#">Pondering Distant Suns</a>	Jun 2020
<b>Book</b> National Geographic Kids, <a href="#">Absolute Expert: Space!</a>	Jun 2020
<b>Magazine</b> <i>National Geographic</i> , “Women: A Century of Change”	Mar 2020
<b>Radio show</b> RMWorldTravel with Robert & Mary Carey and Rudy Maxa	Aug 2019
<b>Podcast</b> KPCC Radio, <i>Tell Them, I Am</i> ( <a href="#">Episode 20</a> )	May 2019
<b>Magazine</b> <i>National Geographic Kids</i> , “Dare to Explore”	Mar 2019
<b>Video</b> Explorer Academy: <a href="#">The Truth Behind</a>	Oct 2018

<b>Television</b> CUNY TV <a href="#">Study with the Best</a> (Culture and Identity)	May 2018
<b>Book</b> <i>National Geographic Kids</i> <a href="#">Solve This!</a> : Wild & Wacky Challenges for the Genius Engineer in You	Mar 2018
<b>Book</b> <i>National Geographic Kids</i> <a href="#">Explorer Almanac</a> 2019	May 2018
<b>Article</b> <i>National Geographic</i> , <a href="#">Woman of Impact in Science</a> , Meet Munazza Alam: the woman searching for planet Earth's twin	Mar 2018
<b>Article</b> <i>National Geographic</i> , <a href="#">Finding Clarity in the Stars</a>	Oct 2016

## SELECTED OUTREACH & SERVICE

<b>Graduate student representative</b> CfA Director Search Committee	2021
<b>Student representative</b> Harvard Graduate Admissions Committee	2021
<b>Committee member</b> Center for Astrophysics   Harvard & Smithsonian APS-IDEA	2020–2021
<b>Coordinator</b> Harvard Astronomy Peer Mentoring Program	2019–2021
<b>Reviewer</b> <i>Hubble Space Telescope</i> Proposal Review Committee, Mid-Cycles 26 & 27	2019–2020
<b>Co-founder</b> Open Labs at Harvard	2016–2019
<b>Poster judge</b> National Collegiate Research Conference	2017, 2018

## PUBLICATIONS

20 refereed or submitted papers, 5 first and second author (via [NASA ADS](#)).

### FIRST & SECOND AUTHOR PUBLICATIONS

5. **Alam, M.K.**, López-Morales, M., MacDonald, R., Nikolov, N., Kirk, J., Goyal, J., Sing, D.K., Wakeford, H.R., Rathcke, A.D., Deming, D.L., Sanz-Forcada, J., Lewis, N.K., Barstow, J.K., Mikal-Evans, T., Buchhave, L.A. *Evidence of a Clear atmosphere for WASP-62b, the Only Transiting Giant Planet in the JWST Continuous Viewing Zone*, The Astrophysical Journal Letters, 906, 2, pp.L10-L20 (2021).
4. **Alam, M.K.**, López-Morales, M., Nikolov, N., Sing, D.K., Henry, G.W., Baxter, C., Désert, J.M., Barstow, J.K., Mikal-Evans, T., Bourrier, V., Lavvas, P., Wakeford, H.R., Williamson, M.H., Sanz-Forcada, J., Buchhave, L., Cohen, O., García Muñoz, A. *The HST PanCET Program: An Optical to Infrared Transmission Spectrum of HAT-P-32Ab*, The Astronomical Journal, 160, 1, pp.51-70 (2020).
3. Kirk, J., **Alam, M.K.**, López-Morales, M., Zeng, Li. *Confirmation of WASP-107b's extended Helium atmosphere with Keck II/NIRSPEC*, The Astronomical Journal, 159, 3, pp.115-124 (2020).
2. **Alam, M.K.**, Nikolov, N., López-Morales, M., Sing, D.K., Goyal, J., Henry, G.W., Sanz-Forcada, J., Williamson, M.H., Evans, T.M., Wakeford, H.R., Bruno, G., Ballester, G.E., Stevenson, K.B., Lewis, N.K., Barstow, J.K., Bourrier, V., Buchhave, L.A., Ehrenreich, D., García Muñoz, A. *The HST PanCET Program: Detection of Na I & A Cloudy Atmosphere for the Inflated Hot Jupiter WASP-52b*, The Astronomical Journal, 156, 6, pp. 298-323 (2018).
1. Riedel, A.R., **Alam, M.K.**, Rice, E.L., Cruz, K.L., & Henry, T.J. *Young Stars with SALT*, The Astrophysical Journal, 840, 2, pp.87-106 (2017).

### THIRD+ AUTHOR PUBLICATIONS

15. Kirk, J., dos Santos, L.A., López-Morales, M., **Alam, M.K.**, Oklopčić, A., MacLeod, M., Zeng, L., Zhou, G. *A Keck/NIRSPEC detection and non-detection of He I in the atmosphere of two inflated hot Jupiters orbiting K dwarfs: WASP-52b and WASP-177b*, submitted to The Astronomical Journal.
14. dos Santos, L.A., Vidotto, A.A., Vissapragada, S., **Alam, M.K.**, Allart, R., Bourrier, V., Kirk, J., Siedel, J.V., Ehrenreich, D. **p – winds: an open source Python code to model planetary winds and upper atmospheres**, submitted to Astronomy & Astrophysics.
13. Zeng, L., Jacobsen, S.B., Sasselov, D., Levi, A., Kirk, J., Damasso, M., Nava, C., Lacedelli, G., Piaulet, C., López-Morales, M., Petaev, M., **Alam, M.K.** *New Perspectives on Exoplanet Radius Gap from a Mathematica Tool and Visualized Water EOS*, submitted to the Astronomical Journal.

12. Rathcke, A.D., MacDonald, R.J., Barstow, J.K., Goyal, J.M., López-Morales, M., Mendo ça, J.M., Sanz-Forcada, J., Henry, G.W., Sing, D.K., **Alam, M.K.**, Lewis, N.K., Chubb, K.L., Taylor, J., Nikolov, N., Buchaave, L.A. *HST PanCET Program: A Complete Near-UV to Infrared Transmission Spectrum for the Hot Jupiter WASP-79b*, accepted to The Astronomical Journal, arXiv DOI: 2104.10688.
11. Weaver, I.C., López-Morales, M., **Alam, M.K.**, Espinoza, N., Rackham, B.V., Goyal, J.M., MacDonald, R.J., Lewis, N.K., Apai, D., Bixel, A., Jordán, A., Kirk, J., McGruder, C.D., Osip, D.J. *ACCESS: An optical transmission spectrum of the high-gravity, hot Jupiter HAT-P-23b*, The Astronomical Journal, 161, 6, pp.279-301 (2021).
10. McGruder, C.D., López-Morales, M., Espinoza, N., Rackham, B.V., Apai, D., Jordán, A., Osip, D.J., **Alam, M.K.**, Bixel, A., Fortney, J.J., Henry, G.W., Kirk, J., Lewis, N.K., Rodler, F., Weaver, I.C. *ACCESS: Confirmation of no potassium in the atmosphere of WASP-31b*, The Astronomical Journal, 160, 5, pp.230-252 (2020).
9. Carter, A.L., Nikolov, N., Sing, D.K., **Alam, M.K.**, Goyal, J.M., Mikal-Evans, T., Wakeford, H.R., Henry, G.W., Morell, S., López-Morales, M., Smalley, B., Lavvas, P., Barstow, J.K., García Muñoz, A., Wilson, P.A., Gibson, N.P. *Detection of Na, K, and H<sub>2</sub>O in the hazy atmosphere of WASP-6b*, Monthly Notices of the Royal Astronomical Society, 494, 4, pp.5449-5472 (2020).
8. Bruno, G., Lewis, N.K., **Alam, M.K.**, López-Morales, M., Wakeford, H.R., Barstow, J.K., Sing, D.K., Ballester, G.E., Bourrier, V., Buchhave, L.A., Cohen, O., Evans, T.M., García Muñoz, A., Lavvas, P., Sanz-Forcada, J. *WASP-52b. The effect of starspot correction on atmospheric retrievals*, Monthly Notices of the Royal Astronomical Society, 491, 4, pp.5361-5375 (2020).
7. Weaver, I., López-Morales, M., Espinoza, N., Rackham, B.V., Osip, D.J., Apai, D., Jordán, A., Bixel, A., Fortney, J.J., Lewis, N.K., **Alam, M.K.**, Kirk, J., McGruder, C., Rodler, F., Fienko, J. *ACCESS: An Optical to Near-infrared Spectrum of the Hot Jupiter WASP-43b with Evidence of H<sub>2</sub>O, and Stellar Surface Heterogeneity, but no evidence of Na or K*, The Astronomical Journal, 159, 1, pp.13-34 (2020).
6. Helling, C., Iro, N., Corrales, L., Samra, D., Ohno, K., **Alam, M.K.**, Steinrueck, M., Lew, B., Molaverdikhani, K., MacDonald, R.J., Herbort, O., Woitke, P., Parmentier, V. *Understanding the atmospheric properties and chemical composition of the ultra-hot Jupiter HAT-P-7b. I. Cloud and chemistry mapping*, Astronomy & Astrophysics, 631, 1, pp.A79-A108 (2019).
5. Riedel, A.R., diTomasso, V., Rice, E.L., **Alam, M.K.**, Abrahams, E., Crook, J., Cruz, K.L., and Faherty, J.K. *Radial Velocities, Space Motions, and Nearby Young Moving Group Memberships of Eleven Candidate Young Brown Dwarfs*, The Astronomical Journal, 157, 6, pp.247-265 (2019).
4. Evans, T.M., Sing, D.K., Goyal, J., Nikolov, N., Marley, M.S., Zahnle, K., Henry, G.W., Barstow, J.K., **Alam, M.K.**, Sanz-Forcada, J., Kataria, T., Lewis, N.K., Lavvas, P., Ballester, G.E., Ben-Jaffel, L., Blumenthal, S.D., Bourrier, V., Drummond, B., García Muñoz, A., López-Morales, M., Tremblin, P., Ehrenreich, D., Wakeford, H.R., Buchhave, L.A., Lecavelier des Etangs, A., Hèbrard, G., Williamson, M.H. *An Optical Transmission Spectrum for the ultra-hot Jupiter WASP-121b Measured with the Hubble Space Telescope*, The Astronomical Journal, 156, 6, pp.283-317 (2018).
3. Bean, J.L., Stevenson, K.B., Batalha, N.M., Berta-Thompson, Z., Kriedberg, L., et al. (**including Alam, M.K.**) *The Transiting Exoplanet Community Early Release Science Program for JWST*, Publications of the Astronomical Society of the Pacific, 130, 993, pp.114402-114422 (2018).
2. Bruno, G. Lewis, N.K., Stevenson, K.B., Filippazzo, J., Hill, M., Fraine, J.D., Wakeford, H.R., Deming, D., López-Morales, M., & **Alam, M.K.** *Starspot Occultations in Infrared Transit Spectroscopy? The Case of WASP-52b*, The Astronomical Journal, 156, 3, pp.124-138 (2018).
1. Gizis, J.E., Dettman, K. G., Burgasser, A. J., Camnasio, S, **Alam, M.K.**, Filippazzo, J.C., Cruz, K.L., Metchev, S., Berger, E., & Williams, P.K.G. *Kepler Monitoring of an L Dwarf II. Clouds with Multiyear Lifetimes*, The Astrophysical Journal, 813, 2, pp.104-114 (2015).

## UNREFEREED MANUSCRIPTS

5. López-Morales, M. et al. (**including Alam, M.K.**) *Another Servicing Mission to Extend Hubble Space Telescope's Science past the Next Decade*, National Academy of Sciences Astro2020 Science White Paper (2019).

4. López-Morales, M. et al. (**including Alam, M.K.**) *Detecting Earth-like Biosignatures on Rocky Exoplanets around Nearby Stars with Ground-based Extremely Large Telescopes*, National Academy of Sciences Astro2020 Science White Paper (2019).
3. Plavchan, P. et al. (**including Alam, M.K.**) *“Exoplanet Science Strategy” and “Astrobiology Strategy for the Search for Life in the Universe”*, National Academy of Sciences Astro2020 Science White Paper (2019).
2. Fortney, J.J., et al. (**including Alam, M.K.**) *The Need for Laboratory Measurements and Ab Initio Studies to Aid Understanding of Exoplanetary Atmospheres*, National Academy of Sciences Astro2020 Science White Paper (2019).
1. **Alam, M.K.**, et al. *Photometric and Spectral Analysis of Blue and Red L Dwarfs*, Cool Stars 18 Conference Proceedings (2014).