

DR. MUNAZZA K. ALAM

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RESEARCH INTERESTS

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

EMPLOYMENT

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| Carnegie Earth & Planets Laboratory , Carnegie EPL Postdoctoral Fellow | 2021– |
| Harvard University , Postdoctoral Researcher | 2021 |

EDUCATION

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| Harvard University 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 | 2016–2021 |
| Macaulay Honors College at Hunter College, City University of New York (CUNY) B.A., Physics and Astronomy – <i>Summa Cum Laude (Salutatorian)</i> | 2012–2016 |

FELLOWSHIPS & GRANTS

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

SELECTED HONORS & AWARDS

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

ACCEPTED OBSERVING PROPOSALS (AS PI)

A Sharper Look: Observing a Clear Atmosphere Exoplanet Simultaneously at Low & High Spectral Resolution, Magellan/MIKE + Magellan/IMACS 2021B semester, 1 night, **PI: Alam**, Co-Is: Teske, Gao

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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| Colloquium American University, <i>Exoplanet Exploration with Hubble</i> | Feb 2022 |
| Seminar NASA ExoExplorers, <i>The First Near-Infrared Transmission Spectrum of HIP 41378f, a Low-Mass Temperate Jovian World in a Multi-Planet System</i> | Jan 2022 |
| Seminar Carnegie EPL, <i>A NIR Transmission Spectrum for HIP 41378f</i> | Dec 2021 |
| Guest Lecture University of Windsor, <i>Exotic Exoplanets and How to Find Them</i> | Nov 2021 |
| Guest Lecture American University, <i>Exotic Exoplanets and How to Find Them</i> | Oct 2021 |
| Colloquium Oberlin College, <i>Characterizing Exoplanet Atmospheres with Hubble</i> | Oct 2021 |
| Seminar University of Michigan, <i>A Cloud-Free Atmosphere for WASP-62b</i> | Oct 2020 |
| Talk 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 |
| Seminar UC Berkeley & UCLA, <i>Characterizing Giant Planet Atmospheres with Hubble</i> | Sept 2020 |
| Seminar University of Chicago, <i>Characterizing Giant Planet Atmospheres with Hubble and Large Ground-based Telescopes</i> | Aug 2020 |
| Seminar University of Exeter, <i>Characterizing Giant Planet Atmospheres with HST</i> | Aug 2020 |
| Talk University of Hawaii Institute for Astrophysics, <i>Characterizing Giant Planet Atmospheres</i> | Feb 2020 |
| Seminar Columbia University, <i>The HST PanCET Program: Characterizing the Atmospheres of Inflated Hot Jupiters</i> | Apr 2019 |
| Seminar Geneva Observatory, <i>Precise Optical Transmission Spectra for a Hot Jupiter and a Nearby Super-Earth</i> | Sept 2018 |
| Seminar Pontificia Universidad Católica, <i>An Optical Transmission Spectrum for WASP-52b</i> | Aug 2018 |
| Talk 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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| Talk 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 |
| Conference Cloud Academy I, <i>An Optical Transmission Spectrum for WASP-52b</i> | Sept 2018 |
| Conference Exoplanets II, <i>An Optical Transmission Spectrum of the Inflated Hot Jupiter WASP-52b</i> | Jul 2018 |
| Conference Boston Area Exoplanet Science Meeting 2, <i>Precise Optical Transmission Spectra for a hot Jupiter and a nearby super-Earth</i> | Mar 2018 |
| Conference CfA Stars & Planets Science Extravaganza 2, <i>A Tale of Two Planets</i> | Oct 2017 |
| Conference Keele University Transiting Exoplanets, <i>Characterizing HD 21934b, the Nearest Transiting Rocky Planet</i> | Jul 2017 |

SELECTED PUBLIC TALKS

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| Public talk Virginia Living Museum, <i>Weather on Other Worlds</i> | Apr 2021 |
| Assembly speaker Nightingale-Bamford School, <i>My Journey as an Astronomer</i> | Jan 2020 |
| Public talk National Geographic Explorer Nights, <i>Exploring the Universe</i> | Apr 2019 |
| Public talk National Geographic Student Matinee, <i>Keep Looking Up: My Journey in Astronomy</i> | Mar 2019 |
| Public talk CfA Observatory Night, <i>Weather on Other Worlds: Studying Exoplanet Atmospheres</i> | Feb 2019 |
| Keynote speaker Virginia Association of Science Teachers, <i>Building Stronger Classrooms</i> | Nov 2018 |
| Keynote speaker Virginia Science Education Leadership Association, <i>Diversify & Strengthen Science for All</i> | Nov 2018 |
| Public talk Macaulay Honors College Professional Lunch Series, <i>My Path to Astronomy</i> | Oct 2018 |
| Public talk 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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| Book National Geographic Kids, <i>No Boundaries</i> | Feb 2022 |
| Book Millbrook Press, <i>Who is a Scientist?</i> | Oct 2021 |
| Magazine Harvard Gazette, <i>Quick, hand me my worm pick</i> | Sept 2021 |
| Magazine Eos, <i>Munazza Alam: Searching for New Worlds</i> | Sept 2021 |
| Magazine Smithsonian Magazine, <i>The Five Big Ways JWST Will Help Astronomers Understand the Universe</i> | Aug 2021 |
| | Aug 2021 |

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| Podcast <i>HMSC Science Connects!</i> , Pondering Distant Suns | Jun 2020 |
| Book National Geographic Kids, Absolute Expert: Space! | Jun 2020 |
| Magazine <i>National Geographic</i> , “Women: A Century of Change” | Mar 2020 |
| Radio show RMWorldTravel with Robert & Mary Carey and Rudy Maxa | Aug 2019 |
| Podcast KPCC Radio, <i>Tell Them, I Am</i> (Episode 20) | May 2019 |
| Magazine <i>National Geographic Kids</i> , “Dare to Explore” | Mar 2019 |
| Video Explorer Academy: The Truth Behind | Oct 2018 |
| Television CUNY TV Study with the Best (Culture and Identity) | May 2018 |
| Book <i>National Geographic Kids Solve This!</i> : Wild & Wacky Challenges for the Genius Engineer in You | Mar 2018 |
| Book <i>National Geographic Kids Explorer Almanac 2019</i> | May 2018 |
| Article <i>National Geographic</i> , Woman of Impact in Science , Meet Munazza Alam: the woman searching for planet Earth’s twin | Mar 2018 |
| Article <i>National Geographic</i> , Finding Clarity in the Stars | Oct 2016 |

SELECTED OUTREACH & SERVICE

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| Organizer Carnegie EPL Astronomy Seminar | 2022– |
| Postdoc representative Carnegie EPL Library Committee | 2021– |
| Graduate student representative CfA Director Search Committee | 2021 |
| Student representative Harvard Graduate Admissions Committee | 2021 |
| Committee member Center for Astrophysics Harvard & Smithsonian APS-IDEA | 2020–2021 |
| Coordinator Harvard Astronomy Peer Mentoring Program | 2019–2021 |
| Reviewer <i>Hubble Space Telescope</i> Proposal Review Committee, Mid-Cycles 26 & 27 | 2019–2020 |
| Co-founder Open Labs at Harvard | 2016–2019 |
| Poster judge National Collegiate Research Conference | 2017, 2018 |

PUBLICATIONS

23 refereed or submitted papers, 6 first and second author (via [NASA ADS](#)).

FIRST & SECOND AUTHOR PUBLICATIONS

6. **Alam, M.K.**, Kirk, J., Dressing, C.D., López-Morales, M., Ohno, K., Gao, P., Akisanmi, B., Santerne, A., Grouffal, S., Adibekyan, V., Barros, S.C.C., Buchhave, L., Crossfield, I.J.M., Dai, F., Deleuil, M., Giacalone, S., Lillo-Box, J., Marley, M., Mayo, A.W., Mortier, A., Santos, N.C., Sousa, S.G., Turtelboom, E.V., Wheatley, P.J., Vanderburg, A.M. *The First Near-Infrared Transmission Spectrum of HIP 41378f, a Low-Mass Temperate Jovian World in a Multi-Planet System* (accepted to ApJL, arXiv DOI: 2201.02686).
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

18. Fu, G., Sing, D.K., Deming, D., Sheppard, K., Wakeford, H.R., Mikal-Evans, T., **Alam, M.K.**, dos Santos, L.A., López-Morales, M. *The Hubble PanCET program: Emission spectrum of hot Jupiter HAT-P-41b*, accepted to the Astronomical Journal (2022).
17. McGruder, C.D., López-Morales, M., Kirk, J., Espinoza, N., Rackham, B.V., **Alam, M.K.**, Allen, N., Nikolov, N., Weaver, I.C., Ortiz Ceballos, K., Osip, D.J., Apai, D., Jordán, A., Fortney, J.J. *ACCESS: Confirmation of a Clear Atmosphere for WASP-96b and a Comparison of Light Curve Detrending Techniques*, submitted to the Astronomical Journal (2022).
16. 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**, accepted to Astronomy & Astrophysics, arXiv DOI: 2111.11370 (2021).
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 (2021).
14. 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*, The Astronomical Journal, 923, 2, pp.247-277 (2021).
13. Fu, G., Deming, D., May, E., Stevenson, K.B., Sing, D.K., Lothringer, J., Wakeford, H.R., Nikolov, N., Evans, T., Bourrier, V., Dos Santos, L., **Alam, M.K.**, Henry, G.W., García Muñoz, A., López-Morales, M. *The Hubble PanCET program: Transit and Eclipse Spectroscopy of the Hot Jupiter WASP-74b*, The Astronomical Journal, 162, 6, pp.271-294 (2021).
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*, The Astronomical Journal, 162, 4, pp.138-158 (2021).
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 H₂O 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 H₂O, 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

6. Rackham, Espinoza et al. (**including Alam, M.K.**) *The Effect of Stellar Contamination on Space-based Transmission Spectroscopy*, NASA Exoplanet Exploration Program SAG21 Final Report
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).