

DR. MUNAZZA K. ALAM

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RESEARCH INTERESTS

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

EMPLOYMENT

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

EDUCATION

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

FELLOWSHIPS & GRANTS

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

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	2017, 2018
Awarded for teaching SPU 30 (Life as a Planetary Phenomenon), Spring 2017	
Awarded for teaching AY 16 (Stellar & Planetary Astronomy), Spring 2018	
Best Poster Award , IAC Winter School of Radiative Transfer in Stellar & Planetary Atmospheres	2017
Joseph A. Gillet Memorial Prize , 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> ”	
Rosalyn S. Yalow Award , Hunter College	2016
Award Citation: “ <i>presented to one of Hunter’s finest science students</i> ”	

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

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

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

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

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

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

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

26 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., Akinsanmi, 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*, *The Astrophysical Journal Letters*, 927, 1, pp.L5-L14 (2022).
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

20. Batalha, N.E., Wolfgang, A., Teske, J., **Alam, M.K.**, Alderson, L., Batalha, N.M., López-Morales, M., Wakeford, H.R. *The Importance of Accounting for Sample Selection in Exoplanet Atmosphere Population Studies*, submitted to ApJL (2022).
19. Ratchke, A.D., Buchhave, L.A., Mendonça, J.M., Sing, D.K., López-Morales, M., **Alam, M.K.**, Henry, G.W., Nikolov, N.K., García Muñoz, A., Mikal-Evans, T., Wakeford, H.R., dos Santos, L.A. *HST PanCET Program: A Flat Optical Transmission Spectrum for the Hot Jupiter WASP-101b*, submitted to MNRAS (2022).
18. 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).
17. 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).
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., Mendonça, 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., Hébrard, 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).