# Mohammad Alvi Refat

I am a graduate of the City University of New York's (CUNY) Graduate Center's CUNY BA program in New York City. My current research is in brown dwarf atmospheres and I am primarily interested in galactic archaeology and exoplanets. I am currently doing research with the Brown Dwarfs in NYC (BDNYC) group at the American Museum of Natural History (AMNH).

### Education

- 2019 2022 **CUNY Baccalaureate for Unique and Interdisciplinary Studies**, B.S. in Computational Astrophysics, *cum laude*.
- 2017 2019 Bernard M. Baruch College.

## Research Experience

- May 2021 **Towards Mapping Brown Dwarf and Giant Exoplanet Atmospheres**, Brown Dwarfs in New York City, Present Advisor: Dr. Johanna Vos, American Museum of Natural History.
  - Mapping the clouds of observed brown dwarfs from existing light curve data.
- May 2020 Chemodynamically Characterizing the Jhelum Stellar Stream with APOGEE-2, Sloan Digital Sky May 2021 Survey Faculty And Student Team, Advisor: Dr. Allyson Sheffield, American Museum of Natural History.
  - Examined the Jhelum stellar stream in order to characterize potential members using APOGEE-2. Identified one potential member of Jhelum. Resulted in publication Sheffield et al (incl. Refat), ApJ, 2021.
- Aug 2018 **Looking at Star Formation Through Chemistry**, AstroCom NYC, Advisor: Dr. Allyson Sheffield, Ameri-May 2020 can Museum of Natural History.
  - Analyzed the spectra of the M-Giant star Arcturus to derive stellar spectra and chemical abundances. Normalized Echelle spectra and measured equivalent widths of spectral lines.
- Jun 2018 **Two-Point Statistics in the Star Forming ISM**, AstroCom NYC, Advisor: Dr. Chang-Goo Kim, Center Aug 2018 for Computational Astrophysics (CCA).
  - Performed a two-point correlation analysis to characterize metallicity correlation between stars and compared this to parameters such as velocity and star formation rate.
- Aug 2017 **Staying in Science**, National Science Foundation, Advisor: Dr. Preeti Gupta, American Museum of Natural Sept 2019 History's Education Department.
  - Wrote memos and gave information to create social network maps in order to study students' career pathways. Also studied survey data of students from historically marginalized backgrounds in STEM after they participated in science research mentoring programs.

#### Refereed Publications

[1] Allyson A. Sheffield, Aidan Z. Subrahimovic, Mohammad Refat, et al. "Chemodynamically Characterizing the Jhelum Stellar Stream with APOGEE-2." In: *The Astrophysical Journal* 913.1 (May 2021), p. 39. ISSN: 1538-4357. DOI: 10. 3847/1538-4357/abee93. URL: http://dx.doi.org/10.3847/1538-4357/abee93.

# Fellowships

- 2017 2022 AstroCom NYC, American Museum of Natural History.
  - Undergraduate mentoring program meant to pair City University of New York students with astronomers to do research.
- 2017 2019 Consortium Alumni Youth Council, American Museum of Natural History.
  - Participated in the National Science Foundation funded project Staying in Science, which investigates how
    providing high school students with authentic science experiences changes their pathways towards a science
    career.

## Computer Skills

Advanced

○ Python, LATEX

Intermediate

o Git, Bash

Beginner

o HTML & CSS, MATLAB, Java

## Languages

- Bengali (Basic speaking; Faridpur dialect)
- o Arabic (Basic speaking, reading & writing; Fusha)

#### **Academic Presentations**

- 2023 **Poster**, "Towards Mapping Brown Dwarf and Giant Exoplanet Atmospheres", Center for Computational Astrophysics Gotham Fest 2021, Center for Computational Astrophysics.
- 2023 **Poster**, "Towards Mapping Brown Dwarf and Giant Exoplanet Atmospheres", 241st American Astronomical Society Meeting, American Astronomical Society.
- 2022 **Talk**, "Towards Mapping Brown Dwarf and Giant Exoplanet Atmospheres", 240th American Astronomical Society Meeting, American Astronomical Society.
- 2021 **Poster**, "Towards Mapping Brown Dwarf and Giant Exoplanet Atmospheres", Center for Computational Astrophysics Gotham Fest 2021, Center for Computational Astrophysics.
- 2021 Talk, "Towards Mapping Brown Dwarf and Giant Exoplanet Atmospheres", Center for Computational Astrophysics/City University of New York/American Museum of Natural History Symposium, Center for Computational Astrophysics.
- 2021 **Poster**, "Chemodynamically Characterizing the Jhelum Stellar Stream with APOGEE-2", 237th American Astronomical Society Meeting, American Astronomical Society.
- 2020 **Talk**, "Chemodynamically Characterizing the Jhelum Stellar Stream with APOGEE-2", American Museum of Natural History REU Symposium, American Museum of Natural History.
- 2019 **Poster**, "Where Were Stars Born in The Milky Way?", New York University Astrofest, New York University.
- 2019 Talk, "Where Were Stars Born in The Milky Way?", American Museum of Natural History Research Experience for Undergraduates Symposium, American Museum of Natural History.
- 2018 **Talk**, "Two-Point Statistics in the Star Forming ISM", Center for Computational Astrophysics Research Experience for Undergraduates Symposium, Simons Foundation.

#### Outreach

2021 Science Research Mentoring Program Meeting, American Museum of Natural History, Speaker.

- 2020 Science Research Mentoring Program Family Orientation, American Museum of Natural History, Panelist.
- 2019 Science Research Mentoring Program Family Orientation, American Museum of Natural History, Panelist.