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I am currently a second year master's student at the City University of New York's (CUNY) Graduate Center. My current research is in studying starspots using light curve inversion techniques.

Education

2023 - Present **CUNY Graduate Center**, M.S. in Astrophysics.

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

2017 - 2019 **Bernard M. Baruch College**.

Research Experience

August 2023 – Present **Starspot Inference with Light Curve Inversion Techniques**, Advisor: Dr. Lucy Lu, American Museum of Natural History.

May 2021 – Present **Towards Mapping Brown Dwarf and Giant Exoplanet Atmospheres**, Brown Dwarfs in New York City, Advisor: Dr. Johanna Vos, American Museum of Natural History.

- Mapping the clouds of observed brown dwarfs from existing light curve data.

May 2020 – May 2021 **Chemodynamically Characterizing the Jhelum Stellar Stream with APOGEE-2**, Sloan Digital Sky 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 – May 2020 **Looking at Star Formation Through Chemistry**, AstroCom NYC, Advisor: Dr. Allyson Sheffield, American 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 – Aug 2018 **Two-Point Statistics in the Star Forming ISM**, AstroCom NYC, Advisor: Dr. Chang-Goo Kim, Center 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 – Sept 2019 **Staying in Science**, National Science Foundation, Advisor: Dr. Preeti Gupta, American Museum of Natural 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

- Git, Bash

Beginner

- HTML & CSS, MATLAB, Java

Languages

- Bengali (Basic speaking)
- Arabic (Basic speaking, reading & writing; *Fusha*)

Academic Presentations

2025 **Poster**, *"Starspot Inference with Light Curve Inversion Techniques"*, 245th American Astronomical Society Meeting, American Astronomical Society.

2024 **Poster**, *"Star Spots with Starry"*, The 22nd Cambridge Workshop on Cool Stars, Stellar Systems, and the Sun, University of California San Diego.

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.