209-67 Whitehall Terrace
Queens Village, NY, 11427
✉ *mohammad.refat@baruchmail.cuny.edu*
0000-0003-3149-4501
mohammadrefat23

Mohammad Refat

I am a rising senior at 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 a member of the AstroCom NYC fellowship and currently doing research with the Brown Dwarfs NYC (BDNYC) group at the American Museum of Natural History (AMNH).

Education

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

2017 - 2019 **Bernard M. Baruch College**, B.A. in Mathematics with a minor in Physics.

Research Experience

May 2021 – Present **Towards Mapping Brown Dwarf and Giant Exoplanet Atmospheres**, BDNYC, under supervision of Dr. Johanna Vos, AMNH.

- Using `Starry` to look at simulated brown dwarf data in order to create and analyze surface maps.

May 2020 – May 2021 **Chemodynamically Characterizing the Jhelum Stellar Stream with APOGEE-2**, SDSS FAST, under supervision of Dr. Allyson Sheffield, AMNH.

- 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, under supervision of Dr. Allyson Sheffield, AMNH.

- 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, under supervision of 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, under supervision of Dr. Preeti Gupta, AMNH'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

- Chemodynamically Characterizing the Jhelum Stellar Stream with APOGEE-2
  Sheffield, A. A., Subrahimovic, A. Z., **Refat, M.**, Beaton, R. L., Hasselquist, S., Hayes, C. R., Price-Whelan, A. M., Horta, D., Majewski, S. R., Cunha, K., Smith, V. V., Fernandez-Trincado, J. G., Sobeck, J. S., Munoz, R. R., Garcia-Hernandez, D. A., Lane, R. R., Nitschelm, C. Roman-Lopes, A. 2021. *ApJ*, 913, 39

Fellowships

2017 - Present **AstroCom NYC**, *AMNH*.
2017 - 2019 **Consortium Alumni Youth Council**, *AMNH*.

Computer Skills

- Python, Java, LaTeX, Git

Languages

- Bengali, Arabic

Talks and Posters

2021 **Poster**, *"Towards Mapping Brown Dwarf and Giant Exoplanet Atmospheres"*, CCA Gotham Fest, CCA.

2021 **Talk**, *"Towards Mapping Brown Dwarf and Giant Exoplanet Atmospheres"*, CCA/CUNY/AMNH Symposium, CCA.

2021 **Poster**, *"Chemodynamically Characterizing the Jhelum Stellar Stream with APOGEE-2"*, 237th AAS Meeting, AAS.

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?"*, NYU Astrofest, NYU.

2019 **Talk**, *"Where Were Stars Born in The Milky Way?"*, American Museum of Natural History REU Symposium, American Museum of Natural History.

2018 **Talk**, *"Two-Point Statistics in the Star Forming ISM"*, Center for Computational Astrophysics REU Symposium, Simons Foundation.

Outreach

2021 **Science Research Mentoring Program Meeting**, *AMNH*, Speaker.

2020 **Science Research Mentoring Program Family Orientation**, *AMNH*, Panelist.

2019 **Science Research Mentoring Program Family Orientation**, *AMNH*, Panelist.

References

Prof. Timothy Paglione
Full Professor
CUNY York College
tpaglione@york.cuny.edu

Dr. Johanna Vos
Postdoctoral Fellow
AMNH | BDNYC
jvos@amnh.org

Prof. Allyson Sheffield
Full Professor
CUNY LaGuardia Community College
asheffield@lagcc.cuny.edu