Tanveer Karim

PhD in astrophysics, with an interest in science policy

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Education

Expected 2022	PhD in Astrophysics	Harvard University
2019	MA in Astrophysics	Harvard University
2017	BS in Physics & Astronomy	University of Rochester
2015	Study Abroad in Russian	Saint Petersburg State University

Astrophysics Experiences

2017 – Present — Harvard University

As a National Science Foundation (NSF) Graduate Research Fellow working with Dr. Daniel Eisenstein, I currently participate in the in the Dark Energy Spectroscopic Instrument (DESI) experiment collaboration to

- empirically validate what target selection algorithms would be most useful to select emission-line galaxies to meet DESI's scientific goals,
- perform joint data analysis of the cosmic microwave background and DESI data to constraint cosmological parameters of interest such as the sum of neutrino masses

2016 – 2017 — Maria Mitchell Observatory, Nantucket, MA

As an NSF-funded summer Researcher Experiences for Undergraduate (REU) intern to Dr. Andrew Fox of the Space Science Telescope Institute, I characterized properties of Southern Fermi Bubble, a recently discovered component of the Milky Way, by analyzing its absorption spectra and discovered new high-velocity clouds within the Southern Fermi Bubbles.

2013 – 2016 — University of Rochester

As an undergraduate research assistant to Dr. Eric Mamajek, I derived new estimates of the location of the North Galactic Pole and proposed a new definition of the Galactic Coordinate System. In addition, I provided a new estimate of the Sun's height above the Milky Way midplane from our catalogs as well as catalogs published over the last century.

2015 – 2016 — Vanderbilt University & Cerro Tololo Inter-American Obseratory, Chile

As an NSF-funded REU intern to Dr. Cesar Briceño and Dr. Keivan Stassun, I measured and classified rotation periods of 2000 T-Tauri stars in the Orion OB1 association and verified theoretical models pertaining to the evolution of stellar angular momentum evolution.

Science Policy Experiences

2016 – 2017 Stanford US-Russia Forum

As a US delegate, I participated in the Stanford US-Russia Forum, a Stanford University-led initiative dedicated to fostering better relationship between the US and Russia, where I investigated issues that hinder scientific collaboration between the two countries, identified new research areas for collaboration, and presented findings to Russian and US policymakers in Moscow, Russia and in Stanford, CA respectively.

Selected Honors and Awards

2019 National Science Foundation Graduate Research Fellow

2015 – 2017 Take Five Scholar, selective tuition-free one year scholarship provided to undergraduates at the University of Rochester to pursue a topic outside the student's major. Topic: "Muslim Characters in Russian Literature"

2016 Goldwater Scholar, highly selective federal scholarship awarded to approximately 200 students annually who show exceptional promise of becoming the next generation of research leaders in STEM fields

2015 National Society of Physics Students Leadership Scholarship, awarded annually to 12 students who exhibit high scholarship performance and exhibit the potential and intention for continued scholastic development in physics

2015, 2016 President's Award for Undergraduate Research, the highest undergraduate research award at the University of Rochester

2013 – 2016 Continuing Student Scholarship, highly selective scholarship awarded to approximately 30 students annually to recognize the outstanding achievements of University of Rochester students

Journal Publications

Science Policy

1. **Karim**, M. T., Paramanova, K., Stepanova, D., "The Hidden Potential of University-level Science and Technology Collaborations between the US and Russia", The Stanford US-Russia Forum Research Journal, Vol. VIII, 1, 2017.

Astrophysics

4. **Karim**, T. et al., "Validation of Emission-Line Galaxies Target Selection Algorithms for the Dark Energy Spectroscopic Survey Using the MMT Binospec" (in preparation), 2019.
3. **Karim**, M. T. et al., "Probing the Southern Fermi Bubble in Ultraviolet Absorption Using Distant AGNs", ApJ 860, 98, 2018.
2. **Karim** M. T. & Mamajek,"Revised Geometric Estimates of the North Galactic Pole and the Suns Height Above the Galactic Midplane", MNRAS, 465, 472, 2017.
1. **Karim**, M .T. et al., "The Rotation Period Distributions of 4-10 Myr T Tauri Stars in Orion OB1: New Constraints on Pre-main-sequence Angular Momentum Evolution", AJ 152, 198, 2016.

Selected Talks

Invited talk

3. **Karim** T., "Successes and Outstanding Problems of 21st Century Cosmology Experiments", Beacon Hill Seminars, 2020.
2. **Karim** T., "Problem of the Model Minority Stereotype in Sciences & Affirmative Action", Banneker Institute Summer Talks, Harvard University, 2019.
1. **Karim** M. T., & Lerner, A. M., "Rethinking Academic Collaboration: Encouraging Exchanges in the Sciences and Humanities", Fort Ross Dialogue, 2017.

Contributed talk

5. **Karim**, T. & Eisenstein, D. J., “Results from the Binospec Study: A Case for Sliding Cuts for ELG Target Selection" DESI Collaboration Meeting, talk, 2019.
4. **Karim**, M. T., Lee, J. H., Eisenstein, D. J., “ELG Target Selections in DESI", Understanding Emission-Line Galaxies Meeting, poster, 2018.
3. **Karim**, M. T. et al., “Probing the Southern Fermi Bubble in Ultraviolet Absorption", AAS Meeting 229, talk, 2017.
2. Rose et al., "Long-term Accretion Variations of the Magnetic Cataclysmic Variable Star QQ Vulpecula, AAS Meeting 229, poster, 2017.
1. **Karim**, M. T. et al., “Measuring the rotation periods of 4-10 Myr T-Tauri stars in the Orion OB1 association", AAS Meeting 227, poster, 2016.

Selected Service & Outreach Experiences

2019 – Present	Reviewer for the Astrophysical Journal
2019 – Present	Boston Astronomy on Tap: For the Boston chapter of the popular after-work astronomy outreach program, I help organize and advertise the monthly talk.
2018 – 2019	Banneker Institute, Harvard University: As an instructor for this summer program geared towards students from underrepresented background, I taught them courses on the celestial coordinate system and public speaking.
2018 – 2019	United States Astronomy and Astrophysics Olympiad: As a coach for the national team, I helped prepare the team for the most prestigious international high-school competition, the International Olympiad on Astronomy and Astrophysics. In addition, I was also the fundraising manager and helped raise money to send the team to the international competitions.
2018 – 2019	Equity & Inclusion Journal Club, Harvard University: As an organizer, I maintained the website of the journal club and helped identify speakers to give talks on various aspects of diversity and identity that pertain to astronomy and astrophysics as a field as well as the broader society.

Additional Skills

Programming Languages	Python (numpy, scipy, matplotlib, pandas, scikit-learn), C and R
Languages	Bengali (native), English (native), Russian (intermediate), Hindi (conversational)