

Date: August 10, 2024

University of Arkansas,
Fayetteville, AR

Dear Members of the Search Committee,

I am writing to express my keen interest in the Assistant Professor position in the Department of Physics at the University of Arkansas. I am currently a Postdoctoral Fellow at the Center for Astrophysics | Harvard & Smithsonian and hold a Ph.D. in Astronomy from the University of Kentucky under the mentorship of Dr. Gary J. Ferland.

My research focuses on two pivotal areas utilizing multiwavelength observations. First, I investigate the complex physics of compact X-ray-emitting objects such as X-ray binaries. Utilizing high-resolution X-ray spectroscopy from leading observatories such as XRISM, Chandra, XMM-Newton, NICER, and NuSTAR, I aim to deepen our understanding of these complex systems. Additionally, I explore the early stages of galaxy formation by leveraging observations from the James Webb Space Telescope (JWST), focusing on their evolution, physical characteristics, and chemical compositions. My work is regularly featured in esteemed peer-reviewed journals, including the Astrophysical Journal, Astrophysical Journal Letters, Monthly Notices of the Royal Astronomical Society, and Publications of the Astronomical Society of the Pacific.

I am a key contributor to NASA/JAXA's flagship X-ray mission, XRISM, where I focus on studying the low-mass X-ray binary, GX 340+0. Additionally, I play a pivotal role in the mission planning team for the Line Emission Mapper (LEM), a proposed NASA probe mission renowned for its transformative observational capabilities. My collaborative efforts span globally, engaging with leading institutions such as the University of Cambridge, Center for Astrophysics | Harvard & Smithsonian, Harvard University, MIT, NASA Goddard Space Flight Center, University of Kentucky, Università degli Studi di Roma Tre, and INAF. I am also actively involved in the SDSS-V collaboration. Over the course of my career, I have successfully secured more than \$900,000 in external funding, serving as the Principal Investigator (PI) for over \$400,000 and as the Co-Investigator (Co-I) for over \$500,000, with grants from NASA's Chandra, XRISM, and NuSTAR.

I was featured on BBC News to discuss the "once-in-a-lifetime explosion of T Coronae Borealis," showcasing my expertise in this extraordinary event. I have been invited as a referee for top-tier journals, including Nature, the Astrophysical Journal, and Astronomy and Astrophysics. My involvement extends to serving on review panels for major X-ray and radio observatories, such as Chandra and the Giant Metrewave Radio Telescope (GMRT), both within the USA and internationally. Additionally, I have been invited to deliver lectures, seminars, and colloquia at numerous prestigious conferences worldwide, including the XRISM

conference in Japan, the high-energy seminar at the Center for Astrophysics, the IAU Hands-On Workshop in China, the CX Universe meeting in Greece, and the Fundamental Z Workshop in New Mexico.

My contributions to the field include being a core developer of two widely used spectral synthesis codes in X-ray spectroscopy—AtomDB, where I serve as associate-lead, and CLOUDY, where I am the X-ray lead. Beyond observational work, I possess extensive capabilities in conducting spectral simulations and modeling across a broad range of collisionally-ionized and photoionized astrophysical plasmas.

As the primary instructor, I have passionately taught courses on Mechanics and Electricity and Magnetism, leading 8 classes and educating 240 students over two years at the University of Kentucky. In addition to my teaching responsibilities, I play a leadership role in the REU and Latino Initiative programs at the Center for Astrophysics, where I guide and mentor students from diverse backgrounds. I am deeply committed to promoting diversity and inclusion, with a particular focus on empowering women and underrepresented minorities in the field of astronomy.

With my extensive experience, I am fully prepared to meet the challenges of a faculty role at the University of Arkansas. Enclosed are my CV, research statement, and teaching philosophy, which highlight my qualifications. I am eager to contribute to your department and am available for any additional information you may need. I sincerely appreciate your consideration and eagerly anticipate a positive response.

Sincerely,
Dr. Priyanka Chakraborty
Postdoctoral Fellow
Center for Astrophysics | Harvard & Smithsonian