

December 1, 2018

Department of Astronomy
The University of Wisconsin Madison
475 N. Charter St.
Madison, WI 53706

Dear Professor Stanimirovic and members of the search committee,

Enclosed for your review are the materials for my application for the position of Assistant Professor in the Astronomy department at the University of Wisconsin Madison. My research leadership, strong teaching background, and extensive experience mentoring a diverse group of students make me an excellent fit for UW-Madison. At UW-Madison I will use the skills I have developed from two years as a professor, including a demonstrated ability to secure external funding, to build a vibrant, high-impact, and active research group that takes advantage of world-class observational facilities and the new opportunities available from large astronomical datasets. As a professor I will also design and teach courses that challenge students to develop and practice a wide range of professional skills applicable to their future careers.

I am a world expert on gas conditions in the unique and extreme environment of the center of our Galaxy. I have a high profile in both the Galactic and extragalactic scientific communities and an excellent reputation as a scientific communicator: I have given more than two dozen invited colloquia and review talks. I am one of few astronomers with 80 hours of awarded time on the Atacama Large Millimeter Array as a PI, and I am currently producing the first parsec-scale maps of molecular gas in the center of another galaxy, a project for which I already have a successful NSF grant. At UW-Madison, I will lead efforts using ALMA, NOEMA, the VLA, and JWST to (1) trace gas properties over the entire accretion path of gas from kiloparsec scales to the Milky Way's central supermassive black hole, (2) construct surveys of galaxy nuclei with parsec-scale observations of the molecular gas, which can be directly compared with our own Milky Way, and (3) use these surveys to constrain the impact of accretion and feedback processes on gas conditions and star formation in progressively more extreme environments that can serve as analogs to high redshift systems. The research my group will do over the next 5-10 years will yield new models of the physical, chemical, dynamical, and positional structure of gas in galaxy centers that will constrain the role of inflow and feedback in shaping their evolution.

Graduate students in my research group will become experts not only in infrared, radio and millimeter astronomy but in technical skills such as coding, data analytics, and data visualization that will train them for a wide range of future careers. I am an experienced advisor, having independently supervised 7 students and mentored many more undergraduate and graduate students. Students working with me have published papers and successfully applied to PhD programs and postdoctoral research positions. I am also committed to giving students research opportunities that feed their interest in science and connect them to a global research community. Working with me, students at UW-Madison will gain valuable international experience visiting and working with my collaborators in Europe and Asia. I further believe that student success also depends on their experience outside of the lab, and I devote significant time to building strong connections with students in my group, hosting team dinners and retreats in addition to regular group and one-on-one meetings.

As a professor at UW-Madison, I will work to foster an educational atmosphere where there is lively interaction between undergraduates, graduate students, and faculty. I will design my courses to give students the opportunity to model real-life research and professional practices, including participating in observations, writing and assessing scientific proposals, and debating topics like setting priorities for the next decade of astronomy research. I am particularly excited by the opportunity to teach astronomy and astrophysics courses in topics like radio astronomy, the ISMA and astrochemistry, and computational astrophysics. Having taught two courses per semester as a professor at San Jose State, I have a proven ability to balance teaching with a robust research program. I am excited to bring the energy and enthusiasm I have demonstrated in my research, mentoring, and teaching to the Astronomy department at the University of Wisconsin Madison.

Sincerely,

A handwritten signature in black ink, appearing to read 'Elisabeth Mills', with a stylized, flowing script.

Dr. Elisabeth A.C. Mills

Research Assistant Professor
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Brandeis University
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