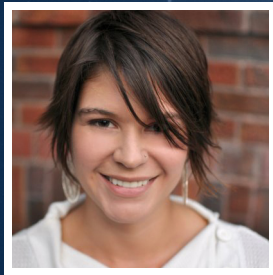


Solving the Small Scale Crisis of Galaxy Formation



Alyson Brooks
Assistant Professor, Physics & Astronomy

CURRENT RESEARCH

Ordinary matter holds the key to understanding our Galactic origins

Most of the matter in our Universe resides in "dark matter." There is nearly six times as much dark matter in the Universe than the ordinary matter that we are made of, and that makes up the visible part of galaxies like stars. For decades it has been assumed that, because there is so much more dark matter than ordinary matter, dark matter dominates the gravity in the Universe, and that wherever the dark matter is, ordinary matter must follow. This faulty assumption led theorists to make predictions for the formation of galaxies that have led to a number of discrepancies between galaxy formation theory and observations. These discrepancies have evaded solution for so many years that they have become known collectively as the "small scale crisis" of the Cold Dark Matter (CDM) model for galaxy formation.

Dr. Alyson Brooks, Assistant Professor of Physics and Astronomy at Rutgers University, is an observationally-oriented theoretical astrophysicist who uses high-resolution simulations of galaxies run on national supercomputers to make sense of the small scale crisis. With the hope of addressing the bigger question of "where did we come from?" her simulations explain how our galaxy formed and evolved and how we came to be located in this unique structure. Simulations include both ordinary matter (gas and stars) and dark matter and span the entire age of the Universe, roughly 13.7 billion years. Using sophisticated tools and measurement, Dr. Brooks has made an important discovery: gas and stellar physics can alter the dark matter structure of galaxies. This discovery has changed the view of galaxy formation with Dr. Brooks and her colleagues at the forefront of this revolution. In short, she and her team have shown...

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AFFILIATION



Rutgers University

EDUCATION

- Ph.D., in Astronomy, 2008 , University of Washington
- B.A., in Physics, 2000 , Macalester College

AWARDS

- 2015 Alfred P. Sloan Research Fellow in Physics
- Grainger Fellowship, U Wisconsin - Madison, 2011-2013
- Sherman Fairchild Fellowship in Theoretical Astrophysics, Caltech, 2008-2011
- Washington Space Grant Consortium Fellow, 2002-2003, and Spring 2008
- Sigma Xi Grant-in-Aid of Research, 2005

RESEARCH AREAS

Technology, Space, Materials Science / Physics, Space

FUNDING REQUEST

Your contributions will support the continued research of Dr. Alyson Brooks, of Rutgers University, as she creates simulations that allow the entire history of the galaxy to become available. While smaller donations of \$1K will be helpful in making steps forward for Dr. Brooks' lab, larger donations of \$50-70K/year will support one student assistant or postdoctoral scholar and donations of \$10-20K will maintain and upgrade the server that hosts the simulations. Help answer some of the most interesting questions about our universe by supporting Dr. Brooks and her students.