

# Why Galaxies Matter



Marla Geha  
Professor, Astronomy & Physics

## CURRENT RESEARCH

### Studying the galaxies to get a better sense of our universe

How do galaxies form? What is the nature of dark matter? Dr. Marla Geha uses the Universe's smallest galaxies to answer these questions. Over 90% of the mass in the Universe is in the form of dark matter, yet its exact form is unknown. Our home galaxy, the Milky Way, is surrounded by two dozen smaller satellite galaxies. Satellite galaxies are proving pivotal in determining the properties of dark matter. Studying galaxies like the Milky Way will provide critical new understanding of galaxy formation and of the nature of dark matter. By studying our sibling galaxies, we learn more about our own. Dr. Marla Geha and her team at Yale University are using the smallest galaxies in the Universe to answer its largest questions.

The properties of satellite galaxies provide critical clues to how galaxies form and can test the nature of dark matter. However, the number of Milky Way satellite galaxies and their properties do not fully agree with well-established cosmological models. While it is possible that these models are incorrect, it is equally plausible that the Milky Way satellite population is not representative of a typical Milky Way-mass galaxy. Expanding the number of Milky Way-like galaxies with known satellites is required to properly assess these discrepancies, but is observationally challenging.

Using the world's largest telescope, Dr. Geha is leading a team whose goal is to spectroscopically identify satellite systems around 100 galaxies analogous to the Milky Way. They will determine whether the Milky Way's satellite population is typical of galaxies at this mass scale, or if the Milky Way is itself an outlier.

- Dr. Geha has begun this long term (1-3 year) project to...

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## AFFILIATION



Yale University

## EDUCATION

- Ph.D., in Astronomy and Astrophysics, 1998, University of California, Santa Cruz
- M.S., in Astrophysics, 1997, New Mexico State University
- B.S., in Applied Physics and Electrical Engineering, 1995, Cornell University

## AWARDS

- Guggenheim Fellowship, 2015
- Sloan Fellowship, 2009

## RESEARCH AREAS

Technology, Space, Space

## FUNDING REQUEST

Dr. Geha's research has consistently produced new and interesting results every six months. This is correlated to her access to telescopes, which are assigned in 3-5 night blocks in six month intervals and require a large travel budget. Donations will be directed towards training personnel, undergraduates, graduate students and postdoctoral researchers in observing methods and travel costs. Please inquire about opportunities for donors to participate and witness these majestic stellar phenomena personally.