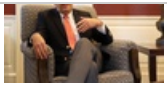
FAS Dean Gay Calls for 'Institutional



Bacow Says He 'Respects' Right t

D
H

More Dark Matter Questions

By Nikita Kansra, Contributing Writer
October 19, 2011

Matthew G. Walker, Hubble Fellow at the Harvard-Smithsonian Center for Astrophysics, recently published findings that challenge the standard cosmological model of dark matter in galaxies.

He found—along with co-author Jorge Peñarrubia of the University of Cambridge—that dark matter exists in a smooth distribution, rather than in a dense concentration within galaxies. These findings, recently published by The Astrophysical Journal, were part of an observational study that examined two dwarf galaxies with a high proportion of dark matter.

Dark matter, which is undetectable except for its gravitational pull, has fascinated scientists for decades. Some scientists believe the material binds components of the universe together and determines the structure and evolution of galaxies.

"It wouldn't be surprising if dark matter turns out to be more complicated than people expected," said Harvard Ph.D. student Andrew S. Friedman. "Results like this indicate that something is missing."

Current simulations of dark matter predict that cold dark matter particles conglomerate at the center of galaxies. These simulations do not include the presence of stars, gas, and other particles in galaxies.

"There are many computer simulations about dark matter," Walker said. "I took an observational approach and compared what I saw to the simulations."

Walker and Peñarrubia studied the Fornax and Sculptor dwarf galaxies, which sport low stellar contents and high concentrations of dark matter.

"These galaxies contain between 90 to 99 percent dark matter and can be compared relatively straightforwardly with simulations," Walker said.

The scientists found that dark matter existed in a relatively even distribution, rather than in a dense grouping, across vast regions within the galaxies.

These findings suggest that normal matter may influence dark matter more than predicted or that dark matter particles may not be as cold as previously believed.

MOST READ

1. What the Hell Happened: John Oliver's Secret Lawsuit
2. Does Cambridge Have a Hate Crime Problem?
3. Harvard Departments Check Grad Student Strike Status, Prompting Union Backlash
4. One Killed, One Injured in Harvard Square Car Crash
5. Harvard Grad Union Strike Causes Delivery Delays Across Campus

“I think this should be taken as an observational result,” Walker said. “The burden is on the simulations and theories.”

Walker believes that astrophysicists should work to bridge the gap between observational findings and computer simulations.

“I need to observe more galaxies with different types of stars and different levels of stellar content to see if stars are responsible for this discrepancy,” Walker said.

Other astrophysicists agree that more research is necessary before making conclusions about dark matter.

“Cold dark matter has been relatively successful in explaining how galaxies like our Milky Way rotate,” said Michael Wood-Vasey, a scientist at the Harvard Center for Astrophysics. “But we need to understand more.”

Want to keep up with breaking news? Subscribe to our email newsletter.

READ MORE IN NEWS

Huffington Post Blogger Mona Mowafi Says Egypt Revolt Likely to Succeed ⟩

TAGS COLLEGE SCIENCE

RECOMMENDED ARTICLES

ON ASTRONOMY
"If technology continues to improve as it has since the turn of this century, then we would have a three-D

Shapley Explores Extent of Cosmos
Ten billion billion universes similar to the Milky Way have been sampled and comprise only a small part of creation,

Dr. Cannon Reveals Galaxies Ten Blocks From Harvard Sq.
The following article was written expressly for the Crimson by Dr. Annie J. Cannon, Curator of Astronomical Photographs at the

Dwarf Galaxies' Existence Explained
A study published in July by a Harvard-Smithsonian Center postdoctoral student has uncovered important clues about the disputed explanation for ...

Star Nearly As Old As Universe Found
The discovery of a dwarf galaxy star nearly as old as the universe has provided a missing link in supporting the “cannibalistic” theory of galaxy formation, according to a study led by Harvard researcher Anna Frebel that was published in the journal “Nature” this month.

Leading Cosmology Professor Dies at 61
Professor of Cosmology John P. Huchra died Friday. He was 61.