New evidence for a Dark Galaxy

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New evidence that VIRGOHI 21, a mysterious cloud of hydrogen in the Virgo Cluster 50 million light-years from the Earth, is a Dark Galaxy was presented today at the American Astronomical Society meeting in Washington, D. C. by an international team led by astronomers from the National Science Foundation's Arecibo Observatory and from Cardiff University in the United Kingdom.

The new observations, made with the Westerbork Synthesis Radio Telescope in the Netherlands, show that the hydrogen gas in VIRGOHI 21 appears to be rotating, implying a dark galaxy with over ten billion times the mass of the Sun. Only one percent of this mass has been detected as neutral hydrogen – the rest appears to be dark matter.

But this is not all that the new data reveal. The results may also solve a long-standing puzzle about another nearby galaxy. NGC 4254 is lopsided, with one spiral arm much larger than the rest. This is usually caused by the influence of a companion galaxy, but none could be found until now – the team thinks VIRGOHI 21 is the culprit. Dr. Robert Minchin of Arecibo Observatory says; "The Dark Galaxy theory explains both the observations of VIRGOHI 21 and the mystery of NGC 4254."

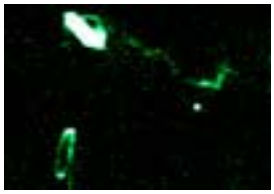
The team have looked at many other possible explanations, but have found that only the Dark Galaxy theory can explain all of the observations. As Professor Mike Disney of Cardiff University puts it, "The new observations make it even harder to escape the conclusion that VIRGOHI 21 is a Dark Galaxy."

The team hope that this will be the first of many such finds. "We're going to be searching for more Dark Galaxies with the new ALFA instrument at Arecibo Observatory," explains Dr. Jon Davies of Cardiff University. "We hope to find many more over the next few years – this is a very exciting time!"

NOTES FOR EDITORS:

1. The following images will available on the web in a variety of sizes up to 6 inches at 300 dpi at http://www.naic.edu/~rminchin/press as soon as the embargo expires on Thursday January 12, 2006 9:20 AM EST

CAPTION: Dark Galaxy VIRGOHI 21 has no starlight but radio waves from neutral hydrogen betray its existence. The contours superimposed on this optical image indicate how much gas was detected. This material was presented to the American Astronomical Society meeting in Washington, D. C. on January 12, 2006.
CREDIT: Arecibo Observatory / Cardiff University / Isaac Newton Telescope / Westerbork Synthesis Radio Telescope.



CAPTION: Neutral hydrogen gas streams between NGC 4254 (top left) and the Dark Galaxy VIRGOH1 21 (center right) in this image made from radio telescope observations at a wavelength of 21 centimeters. This interaction could explain the mystery of NGC 4254's peculiar lopsided shape. To the bottom left, a ring of gas can be seen around the galaxy NGC 4262. This material was presented to the American Astronomical Society meeting in Washington, D. C. on January 12, 2006.

CREDIT: Arecibo Observatory / Cardiff University / Westerbork Synthesis Radio Telescope.

2. Arecibo Observatory is part of the National Astronomy and Ionosphere Center, which is operated by Cornell University under a cooperative agreement with the National Science Foundation

3. The research was partly funded by PPARC – the Particle Physics and Astronomy Research Council. PPARC is the UK's strategic science investment agency. It funds research, education and public understanding in four broad areas of science – particle physics, astronomy, cosmology and space science. PPARC is government funded and provides research grants and studentships to scientists in British universities, gives researchers access to world-class facilities and funds the UK membership of international bodies such as the European Organisation for Nuclear Research, CERN, the European Space Agency and the European Southern Observatory. It also contributes money for the UK telescopes overseas on La Palma, Hawaii, Australia and in Chile, the UK Astronomy Technology Centre at the Royal Observatory, Edinburgh and the MERLIN/VLBI National Facility.

4. The Westerbork Synthesis Radio Telescope is operated by ASTRON (Netherlands Foundation for Research in Astronomy) with support from the Netherlands Foundation for Scientific Research (NWO).

5. The scientific paper "High resolution HI imaging of VIRGOHI 21 – a dark galaxy in the Virgo Cluster" was presented on 12th January 2006 at the 207th meeting of the American Astronomical Society held in Washington, D. C. Authors are Robert Minchin (Arecibo Observatory), Jon Davies, Mike Disney (Cardiff University), Andy Marble, Chris Impey (Steward Observatory), Peter Boyce, Diego Garcia, Marco Grossi (Cardiff University), Chris Jordan (Jodrell Bank Observatory), Hugh Lang, Sarah Roberts (Cardiff University), Sabina Sabatini (Osservatorio Astronomico di Roma), and Wim van Driel (Observatoire de Paris)

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