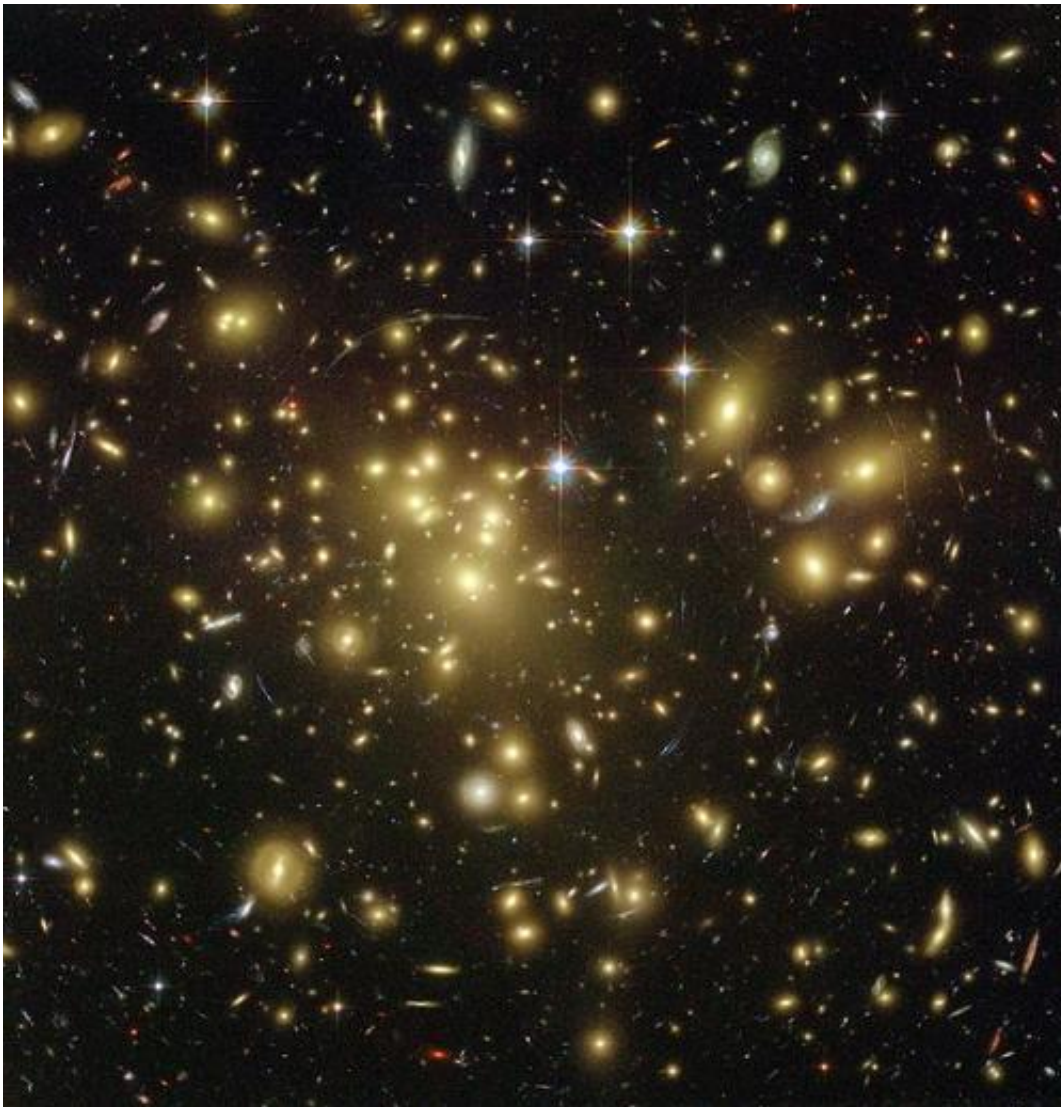


Dark matter scientists on brink of discovering elusive particles

February 13 2016



A massive cluster of yellowish galaxies, seemingly caught in a red and blue spider web of eerily distorted background galaxies, makes for a spellbinding picture from the new Advanced Camera for Surveys aboard NASA's Hubble

Space Telescope. To make this unprecedented image of the cosmos, Hubble peered straight through the center of one of the most massive galaxy clusters known, called Abell 1689. The gravity of the cluster's trillion stars — plus dark matter — acts as a 2-million-light-year-wide lens in space. This gravitational lens bends and magnifies the light of the galaxies located far behind it. Some of the faintest objects in the picture are probably over 13 billion light-years away (redshift value 6). Strong gravitational lensing as observed by the Hubble Space Telescope in Abell 1689 indicates the presence of dark matter. Credit: NASA, N. Benitez (JHU), T. Broadhurst (Racah Institute of Physics/The Hebrew University), H. Ford (JHU), M. Clampin (STScI), G. Hartig (STScI), G. Illingworth (UCO/Lick Observatory), the ACS Science Team and ESA

Technological advances are ushering in a new era of understanding in the search for fundamental physical particles - including dark matter - scientists will tell a public event.

Researchers are using analysis of deep space observations together with experiments far underground to hunt for [dark matter](#) - an elusive material which, together with [dark energy](#), is thought to account for about 95 per cent of the universe.

Scientists will tell a public symposium in Washington, DC how current theories and experiment point to the existence of dark matter, but how it is little understood by scientists. Its discovery would be a fundamental development in understanding the physical universe, a meeting of the American Association for the Advancement of Science (AAAS) will hear.

Professor Alex Murphy, of the University of Edinburgh's School of Physics and Astronomy, will describe ongoing global collaborations by scientists around the world to detect and define the nature of dark matter. These include astronomy studies to examine its effect on galaxies

and light in space, and experiments deep underground that seek to detect it by minimising interference from other particles.

The most sensitive of these experiments is Large Underground Xenon, or LUX, detector - which is located a mile [underground](#) in South Dakota, US. Recent improvements have increased the device's chances of identifying sub-atomic particles called WIMPs - weakly interacting [massive particles](#) - which are believed to be the main component of dark matter.

Professor Murphy said: "Technology has enabled us to ramp up our search for this fundamental material, and its place in the physical realm."

Professor Murphy will explain the research at a symposium entitled Astroparticle Physics: Understanding Mysteries of the Universe on 3pm, Saturday 13 February at the Marriot Wardman Park, Washington DC. He will be joined by Professor Angela Olinto of the University of Chicago and Professor Eun-Suk Seo of the University of Maryland.

Provided by University of Edinburgh

Citation: Dark matter scientists on brink of discovering elusive particles (2016, February 13) retrieved 25 April 2024 from

<https://phys.org/news/2016-02-dark-scientists-brink-elusive-particles.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.