ANGLO-AUSTRALIAN OBSERVATORY

Media assistance: Helen Sim +61-(0)2-9372-4251
+61-(0)419-635-905
hsim@aao.gov.au

MEDIA RELEASE

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'GALAXY GENOME' PROJECT SET TO ROLL

Move over, Craig Venter! Thanks to funding from the Australian Research Council, through its new Super Science Fellowships program, Australia's national optical observatory is launching the Galaxy Genome Project: an ambitious program to create the definitive resource for studying galaxy evolution, the large-scale structure of the universe, and cosmology.

"What the Human Genome Project did for biology, we'll be doing for astronomy," said Professor Matthew Colless, Director of the Anglo-Australian Observatory, Australia's national centre for optical astronomy.

The AAO has been awarded four of the ARC's new Super Science Fellowships to take this work forward, one starting in 2010 and three in 2011. Each Fellowship is worth $278 400 over three years. The successful applicants for the first round of Fellowships were announced by Senator Kim Carr, Minister for Science, yesterday [Thursday 8 April].

Just as people are characterised by their genomes, a galaxy is characterised by the spectrum of its emitted light.

The Galaxy Genome Project will combine 700 000 spectra from on-going and completed surveys done with the AAO's telescopes with 900 000 spectra from the next generation of surveys, to create the largest sample ever obtained by a single observatory—1.6 million spectra.

"This will increase by 50% the total number of galaxy spectra ever measured," said Associate Professor Andrew Hopkins, Head of AAT Science at the Anglo-Australian Observatory.

"We will create the primary and most thorough point of reference for all future studies of galaxy evolution."

The AAT data will be combined with observations from new facilities such as the ANU's new SkyMapper telescope at Siding Spring Observatory in NSW, and the Australian SKA Pathfinder radio telescope, now being built by CSIRO in Western Australia.

"The Galaxy Genome Project will increase the scientific productivity and impact of all these major Australian investments," Professor Colless said.

The project will also increase the international profile of Australian astronomy and enhance the prospects of Australian scientific and technical involvement in next-generation astronomical facilities such as the Square Kilometre Array (SKA), an international radio telescope, and the Giant Magellan Telescope (GMT), one of the next-generation "extremely large" optical telescopes or ELTs.

Galaxy spectra reveal not only the redshifts (and hence distances) of galaxies, but also their dynamical state, their current and past rates of star formation, the degree to which they are obscured by dust, the abundances of elements in their stars and interstellar gas, and the total mass of stars and of dark matter. These are the keys to understanding galaxies' origins and histories.

The Galaxy Genome Project has two phases. The first involves the consolidation of two complementary surveys, the Six-Degree Field Galaxy Survey (6dFGS) and the first stage of the Galaxy and Mass Assembly (GAMA) project.

6dFGS is a survey done with the AAO's 1.2-m UK Schmidt Telescope. The most detailed survey to date of galaxies in the nearby Universe, it has recorded the positions of 125 000 galaxies over more than 80% of the Southern sky, out to about two thousand million light-years (235 Mpc) from Earth, with a volume and sampling five times larger than that of any previous survey.

GAMA-I, being carried out with the 3.9-m Anglo-Australian Telescope, is obtaining 1000 galaxy spectra per square degree, an order of magnitude higher density than the ground-breaking Sloan Digital Sky Survey and 2dFGRS (Two-Degree Field Galaxy Redshift Survey), over an area of sky a hundred times larger than that of the most sensitive spectroscopic surveys to date. GAMA-I thus allows the first large and systematic investigation of galaxy properties reaching down to the smallest galaxies.

The second phase of the Galaxy Genome Project involves a continuation of GAMA, to triple the area of sky it covers, and a major new survey using the UK Schmidt Telescope called TAIPAN (Transforming Astronomical Imaging surveys through Polychromatic Analysis of Nebulae). TAIPAN will build on and extend the 6dFGS, adding 500 000 new spectra.

The 3.9-m Anglo-Australian Telescope is the largest optical telescope in Australia, and one of the world's most productive.

The Anglo-Australian Observatory operates the AAT and the 1.2-m UK Schmidt Telescope, both located at Siding Spring Observatory in NSW. As its name suggests, it was created as a bi-national facility for UK and Australian astronomers. On 1 July this year it will become a wholly Australian institution, and be incorporated into the Commonwealth Department of Innovation, Industry, Science and Research. The organisation will continue to be known as the AAO—now standing for the **Australian Astronomical Observatory**.

More information

Professor Matthew Colless, Director, Anglo-Australian Observatory (in Sydney, Australia) Tel: +61 2 9372 4812

Associate Professor Andrew Hopkins, Head of AAT Science, Anglo-Australian Observatory (currently at Siding Spring Observatory) Tel: + 61 2 6842 6291

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