



Press Release of the German Astronomical Society (Astronomische Gesellschaft - AG)

Wednesday, February 5, 2014

Karl-Schwarzschild-Medal for Margaret J. Geller German Astronomical Society (AG) Honors a Pioneer in Mapping the Universe

*Astrophysicist **Margaret J. Geller** of the Harvard-Smithsonian Center for Astrophysics, Cambridge/Massachusetts, USA, will receive this year's **Karl Schwarzschild Medal of the German Astronomical Society** (Astronomische Gesellschaft - AG) – a high honor awarded for outstanding achievements of fundamental importance in astronomical research. Margaret J. Geller is well known for her work in the field of extragalactic astronomy and cosmology and is considered a pioneer in mapping the large scale structure of the universe.*

“Cosmic Web” and the “Great Wall”

It has been about 100 years since astronomer Edwin Hubble verified that many of the observed “nebulae” are not simply gas clouds in the Milky Way, but rather distant galaxies distributed in an expanding universe.

It was also found that many galaxies reside in groups or even clusters. A prominent example is our cosmic neighborhood, the “Local Group”, which hosts about 20 galaxies including the well-known Andromeda Galaxy and our own Milky Way as largest members. Other galaxy clusters have more than 1,000 members.

Nevertheless, many astronomers believed for a long time that the cosmological distribution of galaxies is more or less uniform when viewed on much larger scales, and therefore did not focus much attention on investigating this topic.

It was Margaret Geller and her colleague, John Huchra, of the Harvard-Smithsonian Center for Astrophysics who became the leaders in this effort.

By analyzing galaxy spectra to measure redshifts and thus distances to thousands of galaxies, Geller and Huchra were able to create for the first time a dense map of the three-dimensional distribution of galaxies for a significant volume of the universe. The result was astounding: The universe contains a “cosmic web of galaxies” with denser knots (clusters and superclusters) and voids (galaxy poor regions). And, in 1989, they identified the largest structure in the universe known so far, the so-called Great Wall. It is a web of galaxies with a length of more than 500 million light years.

Starting point for modern cosmological studies

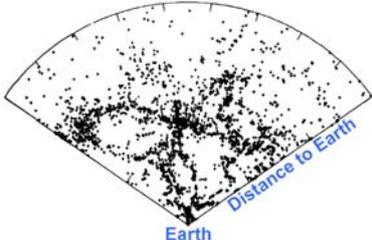
“This remarkable discovery marked the starting point for many modern observational survey programs like the famous Sloan Digital Sky Survey or today’s very impressive cosmological simulations with supercomputers”, says Andreas Burkert, president of the Astronomical Society. “The studies of Margaret Geller and her colleagues were the first step to understand that the large-scale structure of the Universe emerged from the small density fluctuations found in the cosmic microwave background radiation shortly after the big bang.”

To discover the structure of the universe and to put the pieces of this grand puzzle together, Margaret Geller’s research projects range from the structure of our own galaxy, the Milky Way, to fundamental studies of clusters of galaxies up to mapping the distribution of the mysterious, ubiquitous dark matter in the universe.

The Karl Schwarzschild medal for Margaret J. Geller will be awarded at the yearly Fall meeting of the German Astronomical Society, which will take place in Bamberg (Germany) from September 22 to 26, 2014.

The award is named after the German physicist and astronomer Karl Schwarzschild (1863-1916), one of the pioneers of modern astrophysics.

Images (full resolution available at www.astronomische-gesellschaft.org)

	<p>Image 1: Margaret J. Geller of the Harvard-Smithsonian Center for Astrophysics, Cambridge/Massachusetts, USA, will receive the Karl-Schwarzschild-Medal of the German Astronomical Society (AG) 2014.</p> <p>(Credit: Massimo Ramella)</p>
	<p>Image 2: A slice through the galaxy distribution in a particular section of the sky (after a figure of the original paper by M. J. Geller & J. P. Huchra, Science 246, 897 (1989)). It shows the “cosmic web of galaxies” and the “Great Wall”.</p>

Contact

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The German Astronomical Society (AG: www.astronomische-gesellschaft.de), founded in 1863, is a modern astronomical society with more than 800 members dedicated to the advancement of astronomy and astrophysics and the networking between astronomers. It represents German astronomers, organises scientific meetings, publishes journals, offers grants, recognises outstanding work through awards and places a high priority on the support of talented young scientists, public outreach and astronomy education in schools.

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