

Cosmic thread that binds us revealed

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Simulated view of the interconnecting filaments between galaxies. Credit: Michael Boylan-Kolchin, University of California Irvine

(PhysOrg.com) -- Astronomers at The Australian National University have found evidence for the textile that forms the fabric of the Universe.

In findings published in the October [Astrophysical Journal](#), the researchers discovered proof of a vast filament of material that connects our [Milky Way galaxy](#) to nearby clusters of galaxies, which are similarly interconnected to the rest of the Universe.

The team included Dr. Stefan Keller, Dr. Dougal Mackey and Professor Gary Da Costa from the Research School of [Astronomy and Astrophysics](#) at ANU.

"By examining the positions of ancient groupings of stars, called globular clusters, we found that the clusters form a narrow plane around the Milky Way rather than being scattered across the sky," Dr. Keller said.

"Furthermore, the Milky Way's entourage of small satellites are seen to inhabit the same plane.

"What we have discovered is evidence for the cosmic thread that connects us to the vast expanse of the Universe.

"The filament of star clusters and small galaxies around the Milky Way is like the umbilical cord that fed our Galaxy during its youth."

Dr. Keller said there were two types of matter that made up the Universe - the dominant, enigmatic dark matter and ordinary matter in the form of galaxies, stars and planets.

"A consequence of the Big Bang and the dominance of dark matter is that ordinary matter is driven, like foam on the crest of a wave, into vast interconnected sheets and filaments stretched over enormous cosmic voids - much like the structure of a kitchen sponge," he said.

"Unlike a sponge, however, gravity draws the material over these interconnecting filaments towards the largest lumps of matter, and our findings show that the globular clusters and satellite galaxies of the Milky Way trace this cosmic filament.

"Globular clusters are systems of hundreds of thousands of ancient stars tightly packed in a ball. In our picture, most of these star clusters are the central cores of small galaxies that have been drawn along the [filament](#) by gravity.

"Once these small galaxies got too close the Milky Way the majority of

stars were stripped away and added to our galaxy, leaving only their cores.

"It is thought that the Milky Way has grown to its current size by the consumption of hundreds of such smaller galaxies over cosmic time."

Provided by Australian National University

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