



Press Releases

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**Huge star streams, resulting from the death of dwarf galaxies, surround the outer regions of two spiral galaxies**

**Ghosts of galaxies**



**An international team of astronomers has identified huge star streams in the outskirts of two nearby spiral galaxies. For the first time, they have obtained a panoramic overview of an example of galactic cannibalism similar to that involving the Sagittarius dwarf galaxy in the vicinity of the Milky Way.**



The detection of these immense stellar fossils confirms the predictions of the cold dark matter model of cosmology, which proposes that present-day grand design spiral galaxies were formed from the merging of less massive stellar systems.

The first of these debris structures surrounds the galaxy NGC 5907, located 40 million light-years from Earth and formed from the destruction of one of its dwarf satellite galaxies at least four thousand million years ago. According to the research team, the dwarf galaxy has lost the greater part of its mass in the form of stars, star clusters and dark matter, all of which has become strewn out along its orbit, giving rise to a complicated assembly of criss-crossing galactic fossils whose radius exceeds 150 000 light-years.

“Our results provide a fresh insight into this spectacular phenomenon surrounding spiral galaxies and show that haloes contain fossil dwarf galaxies, thus providing us with a unique opportunity to study the final stages in the assembly of galaxies like ours,” maintains David Martínez, a researcher at the Instituto de Astrofísica de Canarias (IAC) leading the team that carried out the observations.

The astronomers’ search has not been able to find the main bodies of the devoured galaxies, which leads them to conclude that they have by now been completely destroyed. “These star streams are very difficult to detect and have a very low density of stars,” comments Martínez. “It is this that gives them their ghostly aspect. Hence, being related with the death of a dwarf galaxy, they may be considered as the ghosts of now vanished galaxies.”

The team has discovered another huge, tenuous stream in the shape of a loop in the galaxy NGC 4013, almost 50 million light-years away in the constellation Ursa Major. Its ghostly trail stretches more than 80 000 light-years from the nucleus and is made up of old, metal-poor stars. Although its three-dimensional geometry is unknown, it possesses a structure very similar to that of the Monoceros tidal stream, a ring of stars surrounding the Milky Way that was formed through the destruction of a dwarf galaxy three thousand million years ago.

Jorge Peñarrubia, a theoretical astrophysicist at the University of Victoria (Canada) and member of the team, specializes in modelling these star streams. According to Peñarrubia, “fitting theoretical models to these star streams enables us to reconstruct their history and describe one of the most mysterious and controversial components of galaxies: dark matter.”

**Astrophotographers join the chase**

For the job of seeking out and detecting the streams, the team has enlisted the help of the renowned astrophotographer R. Jay Gabany, whose contribution towards obtaining the images “has been decisive,” says Martínez, “a fact that underlines yet again the great contribution made by amateurs.”

For years, R. Jay Gabany has obtained spectacular colour images of the deep sky with small robotic telescopes in New Mexico and Australia. His images have been published in the best popular astronomy magazines in the world. His work on this project demonstrates the potential contribution of amateur astronomers to XXI century astronomy. With the new technologies, they are capable of participating in highly competitive scientific projects at an international level.

Further information at: <http://www.cosmotography.com>