New Ultra-Diffuse Galaxy Discovered Near NGC 3785

Astronomers have discovered a new ultra-diffuse galaxy forming about 430 million light years from Earth in the Leo constellation. This galaxy emerges at the end of a tidal tail—an elongated stream of stars and interstellar gas—linked to galaxy NGC 3785. This significant finding enhances our understanding of galaxy evolution, likely driven by gravitational interactions between NGC 3785 and a neighboring galaxy.

NGC 3785: The Longest Tidal Tail to Date

NGC 3785 boasts the longest tidal tail discovered to date, formed by "tidal forces" that occur when two galaxies interact closely, pulling material away from each other during a merger.

Researchers from the Indian Institute of Astrophysics (IIA) uncovered this formation during a detailed study of NGC 3785. Their investigation revealed the remarkable length of the tidal tail, which extends 1.27 million light years, a record-setting measurement by Ph.D. student Chandan Watts through advanced image processing techniques.

The extensive tidal tail not only impresses with its length but also provides valuable insights into the formation of ultra-diffuse galaxies (UDGs). At its tip, scientists found a nascent ultra-diffuse galaxy forming—an exciting discovery attributed to the gravitational interactions with NGC 3785.

Sudhanshu Barway, a faculty member at IIA, noted, “This tail's extraordinary length and the presence of star-forming clumps along its span make it a unique case for understanding how faint and diffuse galaxies come into existence.”

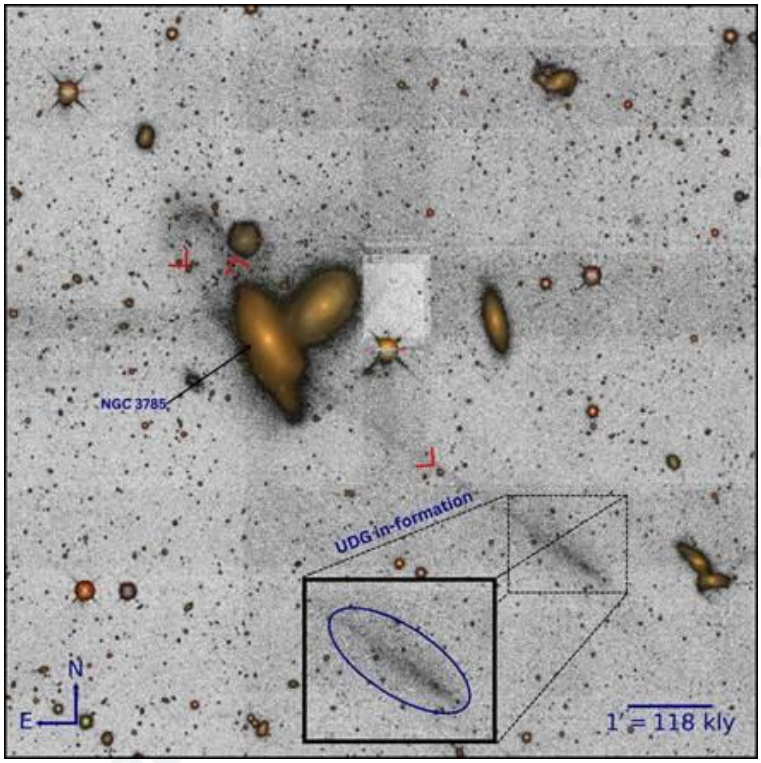
Chandan adds, "The tidal tail offers a glimpse into how galaxies like ultra-diffuse ones, characterized by very low surface brightness, come into being."

Galaxy Interactions and New Structures

This discovery emphasizes the fascinating processes of galaxy interactions and how they create new structures. The findings will enhance our understanding of low surface brightness features, often missed by traditional surveys due to their faintness. Upcoming missions, like the Euclid Space Telescope and the Rubin Observatory's Legacy Survey of Space and Time (LSST), will be crucial in detecting such faint tidal features, thanks to their advanced sensitivity.

The research appears in the November issue of the European journal, Astronomy & Astrophysics Letters, authored by Chandan Watts from IIA and Pondicherry University, Dr. Sudhanshu Barway from IIA, Dr. Omkar Bait from SKA, U.K., and Dr. Yogesh Wadadekar from the National Centre for Radio Astrophysics in Pune.

This exciting discovery not only deepens our knowledge of galaxy formation but also opens new avenues for exploring the universe's vast mysteries.



The enhanced tail features of NGC 3785 are shown in a reversed grey scale image. The regions of high brightness are shown in color to highlight the different features. The longest known tidal tail can be seen extending towards the bottom right from NGC 3785, culminating in the Ultra Diffuse Galaxy (UDG) in formation.

Reference

Press Information Bureau: Nascent galaxy discovered in formation at the end of the longest tidal tail of NGC 3785 galaxy

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