

Astronomers unveil secrets of giant elliptical galaxies

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New findings of how giant elliptical galaxies move have been discovered by an international team of astronomers using the newly installed Multi Unit Spectroscopic Explorer (MUSE) at the European Southern Observatory's (ESO) Very Large Telescope (VLT) facility.

Elliptical galaxies have long been considered as essentially being made up of old [stars](#) that move randomly within them, like a swarm of bees. This has been challenged in many instances in the past ten-twenty years, but giant [elliptical galaxies](#) are still considered as a nearly round and non-rotating group of old stars by astronomers.

Dr. Marc Sarzi from the School of Physics, Astronomy and Mathematics at the University of Hertfordshire and his colleagues Eric Emsellem at ESO (Germany) and Davor Krajnović in Potsdam, observed the giant elliptical galaxy M87 (NGC4486) – the central galaxy in the Virgo cluster of galaxies – to find that it displays some bulk rotation, albeit of a very low amplitude.

Precision

The precision of MUSE allowed the team to reveal that the stars of M87 can move around its centre with average velocities of just 10-20 km/s. Equivalent to 36-72,000 km/h, this speed may seem very high, but for galaxies this is extremely slow.

Dr. Marc Sarzi explained: "For instance, the Sun and our closest stars in the disk of the Milky Way rotate together around the centre of the Galaxy at approximately 210-240 km/s. The individual stars of M87 can go even faster than this, but they generally travel in different directions at any given point of the galaxy so that coherently they rotate around the centre at a much slower pace."

Advancing understanding

He added: "By showing that a "simple" galaxy like M87 can be quite complicated in the eyes of the new MUSE spectrograph; this result demonstrates the potential of this new instrument for further advancing our understanding of [galaxies](#), and their formation."

The bulk motion of the stars of M87 seems to reverse half-way from the centre of this galaxy. Their work is published in the *Monthly Notices of the Royal Astronomical Society* and a pre-publication version of the paper is available on arXiv: arxiv.org/abs/1408.6844 .

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Provided by University of Hertfordshire

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