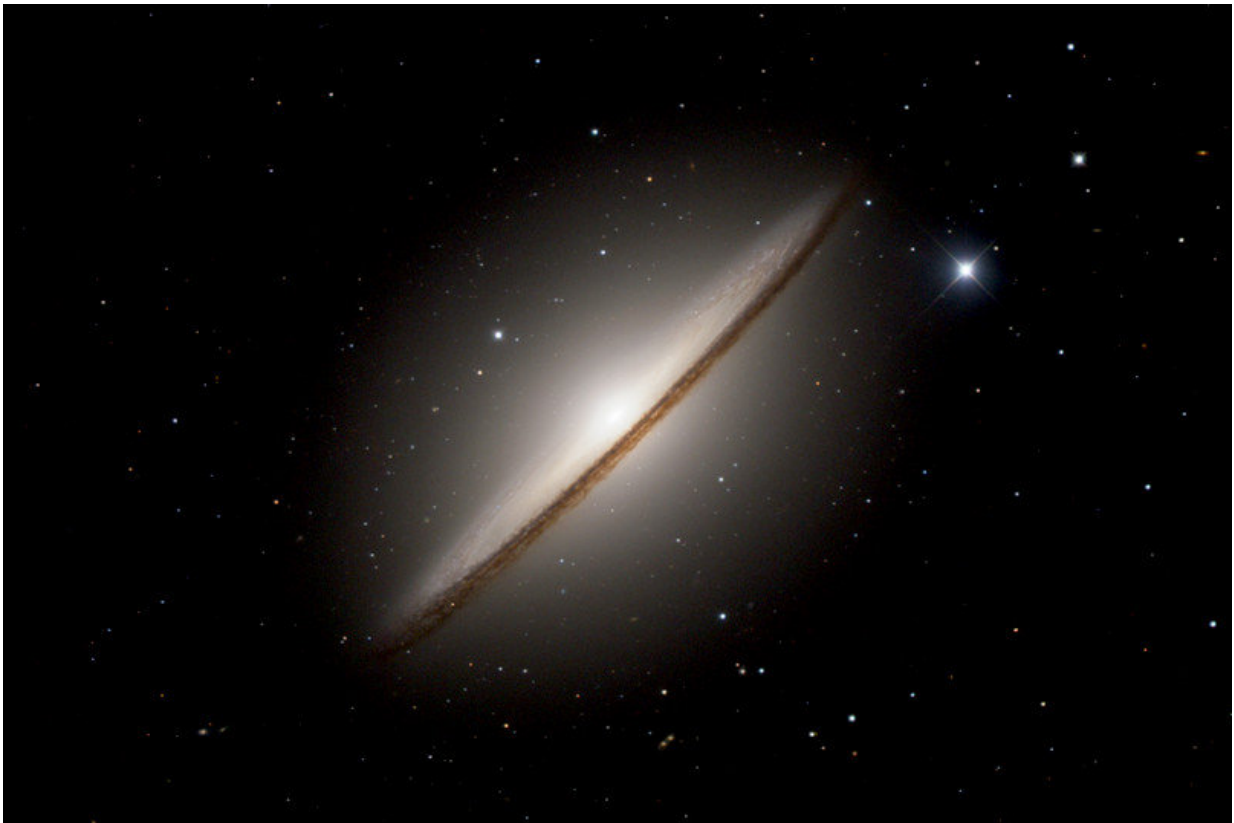


# Cosmic magnetic fields with astonishing order

April 5 2018

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Credit: ESO/IDA/Danish 1.5 m/R. Gendler and J.-E. Ovaldsen

Turbulent processes in galaxies generate vast magnetic fields that often present a regular structure on a large scale. These are the findings of a study conducted by astronomers at Ruhr-Universität Bochum under the

auspices of Prof Dr. Ralf-Jürgen Dettmar, which have been gathered following the analysis of data compiled with state-of-the-art radio telescopes. The Ruhr-Universität's science magazine Rubin published a report on the research project.

"Galaxies such as our Milky Way are relatively flat objects, which we should picture as discs," describes Dettmar. "It had previously been assumed that the magnetic fields are trapped within the disc." However, based on data gathered at the Jansky Very Large Array, a telescope facility in North America, the astronomers have proved that this is not the case. In the same way as the terrestrial [magnetic field](#) surrounds our planet, the [galactic magnetic field](#) stretches from the disc to the intergalactic medium, i.e. into the space between galaxies.

## **Supernovas generate magnetic fields**

Galactic magnetic fields are formed through numerous stellar explosions, the effects of which last for hundreds of millions of years. The energy bursts of all supernovas put together produce a galaxy's magnetic fields. Due to the fact that [stellar explosions](#) are chaotic processes, scientists had not expected them to generate a magnetic [field](#) with an orderly structure on a large scale. But this is exactly what they have now proved to be the case in several [galaxies](#) – even though the orderly structures did not manifest in every single object. The underlying mechanisms have not yet been fully understood.

It took digitalisation technology to enable analysis. Digitalisation has made it possible to combine the data of several radio antennas and, consequently, to perform measurements at greater sensitivity and in a broader frequency band than in the pre-digital era. The data upon which the current research is based were compiled in 2011 and 2012. Due to the huge data volume, it took several years to analyse them.

Provided by Ruhr-Universitaet-Bochum

Citation: Cosmic magnetic fields with astonishing order (2018, April 5) retrieved 10 April 2024 from <https://phys.org/news/2018-04-cosmic-magnetic-fields-astonishing.html>

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