

JANUARY 2021



RESEARCH

THE FERMI SPACE TELESCOPE OBSERVES THE FIRST ERUPTION OF AN EXTRAGALACTIC MAGNETAR

Three studies published in Nature, Nature Astronomy, and The Astrophysical Journal Letters throw light on the origin of some Gamma Ray Bursts (GRB). Analysing the data obtained by European

and American space probes following the detection of a GRB on 15 April 2020, the three studies trace the event back to the eruption of a magnetar: a neutron star with a very intense magnetic field, positioned in proximity to the Milky Way. The two detectors onboard NASA Fermi Gamma-Ray Space Telescope have also contributed to the measurement. These are the Gamma-Ray Burst Monitor (GBM) and the Large Area Telescope (LAT), an international collaboration in which INFN is an important member alongside the National Institute for Astrophysics (INAF) and the Italian Space Agency (ASI).

The characterisation of GRB 200415A (the name assigned to the event), and the accurate identification of its origin within galaxy NGC 253's disc, in the Sculptor constellation, were made possible thanks to the analysis and correlation of the data obtained by the space probes of the InterPlanetary Network (IPN) gamma ray burst location system. In particular, the study of data collected by GBM and LAT were essential for correctly classifying GRB 200415A in the context of the magnetar-type sources. While the first tool made it possible to highlight the peculiarities of the event's energy spectrum, which was completely different to that associated with gamma ray bursts generated by the fusion of neutron stars, the second detector enabled the identification of the signal's origin.