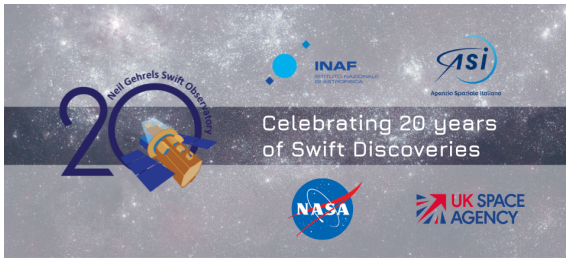

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Giant Flares from extragalactic magnetars

Wednesday 26 March 2025 15:00 (15 minutes)

Magnetars, isolated neutron stars powered mainly by magnetic energy, are characterized by variability spanning a broad interval in dynamic range and duration, from short bursts of a few milliseconds to outbursts lasting several months or even years. The most extreme variability events are the giant flares, which can be observed also from magnetars at extragalactic distances (farther than the Magellanic Clouds).

Although it is difficult to distinguish extragalactic magnetar giant flares (MGFs) from short GRBs, a few such events have been identified. This small sample has recently increased with the precise localization of 231115A in the starburst galaxy M82, and with the discovery of other candidates such as 200415A and 180128A in NGC 253, and 070222 in M83. Thanks to this increased sample it is now possible to derive tighter constraints on the rate of occurrence of giant flares, an important information to understand the evolution and dissipation of magnetic field in these extreme neutron stars.

In this talk I will review the most recent observational and theoretical advances on galactic and extragalactic MGFs, including the constraints derived from a systematic search of MGFs in the Virgo cluster of galaxies and the very recent discovery of another MGF candidate with INTEGRAL.

Primary author: Dr MEREGHETTI, Sandro (Istituto Nazionale di Astrofisica (INAF))

Presenter: Dr MEREGHETTI, Sandro (Istituto Nazionale di Astrofisica (INAF))

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