

Project Name:

Searching for Radio Signals from Magnetars

Project Summary:

Magnetars are neutron stars which have magnetic field strengths that can be two to three orders of magnitude stronger than those of typical neutron stars — which are mainly visible as radio pulsars. They are also known to exhibit extremely high-energy outbursts in X-rays and gamma rays that are so energetic they cannot be explained by the rotation powered emission seen in typical pulsars. This indicates that alternative emission mechanisms, such as extreme magnetic field decay, are occurring. Out of about 30 magnetars known to exist, only a handful currently exhibit radio emission (<http://www.physics.mcgill.ca/~pulsar/magnetar/main.html>). This radio emission is similar to that of typical pulsars, but also exhibits some important differences e.g. sporadic bursts, large variation of pulse profile morphology, flat emission spectra etc. Through comparison of the properties of radio pulsations from magnetars, and from normal pulsars, the connection between these two neutron star classes can be fully elucidated. Utilising the unprecedented sensitivity of FAST we propose to periodically observe known, and recently detected, magnetars in search of their radio signals.

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