

ASTROPHYSICS SEMINAR

Friday, 14 November 2008 at 14:00

Hunting for Magnetars in binary systems

The case of Supergiant Fast X-ray Transients

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Abstract. In this presentation I'll summarize some aspects of the wind accretion theory in high mass X-ray binaries hosting a magnetic neutron star and a supergiant companion. In particular, I'll concentrate on the different types of interaction between the inflowing wind matter and the neutron star magnetosphere that are relevant when accretion of matter onto the neutron star surface is largely inhibited; these include the inhibition through the centrifugal and magnetic barriers. I'll show that very large luminosity swings ($\sim 10^4$ or more on time scales as short as hours) can result from transitions across different regimes.

The activity displayed by supergiant fast X-ray transients (SFXTs), a new class of high mass X-ray binaries in our galaxy recently discovered with INTEGRAL, has often been interpreted in terms of direct accretion onto a neutron star immersed in an extremely clumpy stellar wind. I'll show here that the transitions across the magnetic and/or centrifugal barriers can explain the variability properties of these sources as a results of relatively modest variations in the stellar wind velocity and/or density.

According to this interpretation I'll argue that supergiant fast X-ray transients which display very large luminosity swings and host a slowly spinning neutron star are expected to be characterized by magnetar-like fields, irrespective of whether the magnetic or the centrifugal barrier applies. Supergiant fast X-ray transients might thus provide a new opportunity to detect and study magnetars in binary systems. Finally, I'll also discuss some of the latest results from a recent observational campaign carried out with XMM-Newton on a number of SFXT sources.

Additional Information

The seminars are given in the ISDC "Pavillon" building
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