Contribution ID: **58**

Type: **not specified**

Three evolutionary paths for magnetar oscillations

Wednesday, 26 March 2014 18:20 (20 minutes)

Quasi-periodic oscillations have been seen in the light curves following several magnetar giant flares. These oscillations are of great interest as they probably provide our first ever view of the normal modes of oscillation of neutron stars. The state-of-the-art lies in the study of the oscillations of elastic-magnetic stellar models, mainly with a view to relating the observed frequencies to the structure and composition of the star itself. We advance this programme by considering several new physical mechanisms that are likely to be important for magnetar oscillations. These relate to the superfluid/superconducting nature of the stellar interior, and the damping of the modes, both through internal dissipation mechanisms and the launching of waves into the magnetosphere. We make simple order-of-magnitude estimates to show that both the frequencies and the damping time of magnetar oscillations can evolve in time, identifying three distinct 'pathways' that can be followed, depending upon the initial magnitude of the mode excitation. These results are interesting as they show that the information buried in magnetar QPOs may be even richer than previously thought, and motivate more careful examination of magnetar light curves, to search for signatures of the different types of evolution that we have identified.

Author: GLAMPEDAKIS, Kostas

Presenter: GLAMPEDAKIS, Kostas

Session Classification: Evening session - Parallel A