

## Bollettino Settimanale

Lunedì 2 Dicembre 2013	Martedì 3 Dicembre 2013	Mercoledì 4 Dicembre 2013	Giovedì 5 Dicembre 2013	Venerdì 6 Dicembre 2013
			<p><b>AULA CONVERSI ORE 16.00 SEMINARIO DI ASTROFISICA</b></p> <p><b>Explaining observations of rapidly rotating neutron stars in LMXBs</b></p> <p><i>Elena Kantor (I.O.F.F.E. Institute, St. Petersburg, Russia)</i></p> <p>We consider an instability of rapidly rotating neutron stars in low-mass X-ray binaries (LMXBs) with respect to excitation of r-modes (which are analogous to Earth's Rossby waves controlled by the Coriolis force). We argue that finite temperature effects in the superfluid core of a neutron star lead to a resonance coupling and enhanced damping (and hence stability) of oscillation modes at certain stellar temperatures. We demonstrate that neutron stars with high spin frequency spend a substantial amount of time at these 'resonance' temperatures. This finding ! allows us to explain puzzling observations of hot rapidly rotating neutron stars in LMXBs and to impose a new theoretical limit on the neutron star spin frequency, explaining the cut-off spin frequency ~730 Hz, following from the statistical analysis of accreting millisecond X-ray pulsars. Besides explaining the observations, our model provides a new tool to constrain superdense matter properties comparing measured and theoretically predicted resonance temperatures.</p>	<p><b>AULA 4 ORE 14.00 SEMINARIO DI STRUTTURA DELLA MATERIA</b></p> <p><b>Random lasers</b></p> <p><i>Hui Cao (Yale University)</i></p> <p>The random laser differs from other types of laser in that its cavity is formed not by mirrors but by multiple scattering in a disordered gain medium. Over the course of the past decade, random lasers have generated significant interest among researchers because their characteristics can lead to unique applications. I will give an overview of the random laser. Starting with a historical review, I will describe the major developments in the past decade and our current understanding of the random laser.</p>