GR 12: Relativistische Astrophysik

Zeit: Donnerstag 17:45–18:45 Raum: 30.45: 101

GR 12.1 Do 17:45 30.45: 101

Asteroseismology with fast rotating neutron stars — •Gaertig Erich and Kokkotas Kostas — Theoretische Astrophysik, Eberhard Karls Universität Tübingen

We investigate damping and growth times of the quadrupolar f-mode for rapidly rotating stars and a variety of different polytropic equations of state in the Cowling approximation.

This is the first study of the damping/growth time of this type of oscillations for fast rotating neutron stars in a relativistic treatment where the spacetime degrees of freedom of the perturbations are neglected.

We use these frequencies and damping/growth times to create robust empirical formulae which can be used for gravitational wave asteroseismology.

The estimation of the damping/growth time is based on the quadrupole formula and our results agree very well with Newtonian ones in the appropriate limit.

GR 12.2 Do 18:05 30.45: 101

On magnetars QPOs — Antonella Colaiuda and •Kostas Kokkotas — Universität Tübingen, Auf der Morgenstelle 10 C, 72076 Tübingen

We study axisymmetric perturbations of neutron star endowed with a strong magnetic field (magnetars), considering the coupled oscillations of the fluid core with the solid crust. We recover discrete oscillations based mainly in the crust and a continuum in the core, while we also discover a class of "discrete Alfvén modes". Our results can explain both the lower and the higher observed quasi periodical oscillations (QPOs) in SGR 1806-20 and SGR 1900+14 and put constrains on the mass, radius and crust thickness of the two magnetars.

GR 12.3 Do 18:25 30.45: 101

Relativistic accretion processes — •Philip Peterson[1] and Andrew King[2] — [1]Max-Planck Institute for Gravitational Physics (Albert-Einstein Institute) Hannover and QUEST, Leibniz University Hannover — [2]University of Leicester, Dep. of Physics and Astronomy

Black hole growth is an alien process and there is no intuitive analogy from our daily lives to help us understand it, but under such conditions a lot of interesting physics is going on. This contribution is an overview of some of the peculiarities of episodic black hole accretion, and goes into the effects this has on black hole growth and rotation. Near a rotating black hole the interaction of an accreting disk of gas with the frame dragging effect is discussed, and the consequences of these processes for astrophysics are also briefly covered.