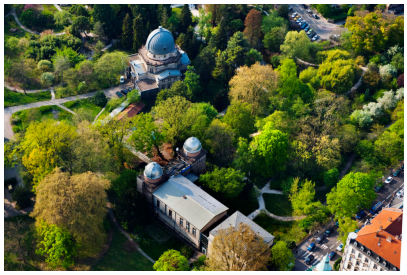

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# Quasinormal g-modes of twin neutron stars

*Tuesday 28 October 2025 17:05 (25 minutes)*

We investigate the non-radial gravity-pulsation discontinuity mode (g-mode) in neutron stars with a strong 1st-order phase transition, dubbed twin stars. For this, we consider the standard four categories and employ the constant-speed-of-sound parametrization which accounts for the QCD transition. We find that depending on the category, the relations between g-mode frequencies and gravitational masses as well as tidal deformabilities display a highly distinct behavior across the twin star categories that appear within the slow hadron-quark conversion regime. This distinct phenomenology provides smoking-gun evidence to clearly distinguish and further classify twin stars using upcoming gravitational-wave data. Finally, we derive two types of unifying oscillatory relations: a) g-mode frequencies versus the normalized energy density jump for each category and b) a novel universal one encompassing the four categories.

**Presenter:** JIMÉNEZ APAZA, José Carlos