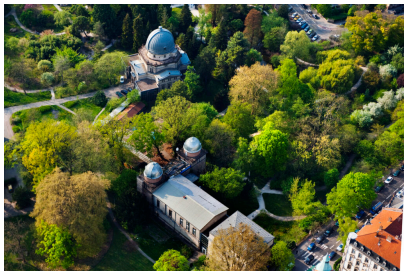

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Asteroseismology of a proto-neutron star including accretion flows

Monday 27 October 2025 14:30 (25 minutes)

Core-collapse supernovae (CCSNe) are one of the most anticipated future gravitational wave (GW) sources. The GW emission is dominated by the oscillation modes of the newly born proto-neutron star (PNS) and the stalled accretion shock. I am going to present a new general relativistic framework for computing the oscillation modes of a PNS, including, for the first time, an accretion flow and a surrounding stalled accretion shock. The oscillations can be described by a system of partial differential equations, which can be solved as an eigenvalue problem. In that frame, the eigenvalues are the characteristic frequencies of the oscillation modes. In this work, I have implemented spectral methods as the eigenvalue solver. By doing so, we can explore the PNS oscillation modes and especially those related to the standing-accretion-shock instability (SASI). In that way, we include some of the missing ingredients towards a more realistic PNS asteroseismology.

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