

Simulating curved spacetimes in superfluid helium

Thursday 10 April 2025 10:00 (20 minutes)

I will present a newly established, Nottingham-based experimental platform for simulating rotating curved spacetimes in superfluid helium - a quantum liquid with vanishing viscosity. The effective curved spacetime, induced by the most extensive quantum vortex flows ever created, is probed via micrometre-scale surface waves. These reveal intricate wave-vortex interactions, including the occurrence of bound states and black-hole ringdown signals. Through black-hole spectroscopy, we link these signals with the inherent presence of boundaries in our experiment, highlighting the versatility of quantum liquids for testing spectral stability and simulating both rotating curved spacetimes and their astrophysical environments.

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