

GR 4: General Relativity

Time: Tuesday 11:00–12:30

Location: GR-H2

Invited Talk

GR 4.1 Tue 11:00 GR-H2

Pseudospectrum and black hole quasi-normal mode (in)stability — ●RODRIGO PANOSSO MACEDO — University of Southampton

Black hole spectroscopy is as a powerful approach to extract space-time information from gravitational wave observed signals. However, quasinormal mode (QNM) spectral instability under high wave-number perturbations has been recently shown to be a common classical general relativistic phenomenon. I will discuss these recent results on the stability of QNM in asymptotically flat black hole spacetimes by means of a pseudospectrum analysis.

Invited Talk

GR 4.2 Tue 11:45 GR-H2

Observable Signatures of Quantized Gravity in Quantum Optical Experiments — ●DENNIS RÄTZEL — Institut für Physik, Hum-

boldt Universität zu Berlin, Newtonstraße 15, 12489 Berlin, Germany

For nearly a century there has been an apparent tension between known laws of physics. The classical theory of General Relativity describes all macroscopic gravitational phenomena, while Quantum Theory is the basis for the description of matter at the microscopic scale. Yet, so far there has been no consensus on how, or even if, they can fit together. A final and conclusive answer to the question of whether gravity ought to be quantized must be based on empirical evidence.

In this talk, I will discuss the search for observable signatures of quantized gravity in quantum optics by means of two examples of gravitationally interacting quantum systems: photons in a polarization-entangled state and small masses in spatial superposition states. I will present experimental proposals and discuss their feasibility and what can be learned from them in principle.