Applied and Computational Mathematics Seminar

Title: Semiclassical evolution of black holes with inner horizons

Speaker: Valentin Boyanov (Instituto Superior Técnico)

Date: Wed 19th March 2025 at 10:00AM

Location: (See abstract)

Abstract: This seminar will take place in Science East E1.19.

I will begin by giving an overview of the known instabilities associated with black hole geometries which have an inner apparent horizon, both in classical and semiclassical gravity. Particularly, I will focus on the difference in these instabilities between the cases of eternal black holes and dynamically formed ones. I will then present results on the full non-linear evolution of a dynamically formed charged spherical black hole, including the Polyakov approximation to the renormalised stress-energy tensor of a quantum scalar field as the semiclassical component. The result of this evolution involves the full evaporation of the trapped region, with both an inward motion of the outer horizon and an outward motion of the inner horizon. Additionally, a long-lived anti-trapped region appears in the wake of the evaporation.