Physics Seminar: Noa Zilberman
Wednesday, April 29 · 2:00 – 3:00pm, room 313

Title: The quantum energy outflux emerging from a collapsing shell

Abstract: When a compact object collapses to form a black hole, quantum field theory predicts the emission of an energy outflux to future null infinity, which later relaxes to Hawking radiation. Within the semiclassical framework, we derive a simple, closed form, analytical expression for the energy outflux emitted from a spherical thin null shell collapsing to form a black hole. In particular, this energy outflux vanishes (quadratically in r-2M) as the shell approaches the horizon. This result refutes claims that the Hawking energy outflux originates from the collapsing body, showing instead that it develops in a broad strong-field region. Additionally, this vanishing implies that semiclassical backreaction cannot prevent or significantly affect the classical process of gravitational collapse and horizon formation (as sometimes claimed). This talk is based on the joint work arXiv:2503.00622 with Amos Ori.