

PerAPS

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DIPARTIMENTO
DI FISICA E GEOLOGIA



Energy extracted from Black Holes via magnetic reconnection

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Magnetic reconnection is a ubiquitous astrophysical phenomenon, with several astronomical observations and numerical simulations increasingly providing evidence of interesting dynamic effects around black holes. In this talk, I discuss how magnetic reconnection can extract rotational energy from a spinning black hole via a Penrose process mediated by plasmoids that are produced at reconnection sites. Our approach is meant to determine the physical conditions that make a plasmoid-driven Penrose process energetically viable and does not rely on ad-hoc prescriptions for the kinematics of the plasma around an astrophysical black hole. I will present a concrete example by considering a magnetized accretion disc, whose portion penetrating the ergosphere, which we dub "ergobelt", naturally provides a site to self-consistently compute the occurrence of reconnection and to estimate the energetics of a plasmoid-driven Penrose process.