

Gravitational Collider Physics

Monday, 11 November 2019 14:10 (15 minutes)

Gravitational wave astronomy will play a transformative role in astrophysics; can it do the same for particle physics? An ultralight bosonic field will extract mass and angular momentum from a rapidly spinning black hole, forming a gravitationally bound condensate reminiscent of the hydrogen atom. This “gravitational atom” will have nontrivial dynamics if it is part of a binary inspiral. I will argue that these dynamics can be described as a series of “scattering” events, quantified by an S-matrix, during which there can be large corrections to the inspiral trajectory and thus the resulting gravitational wave signal. These corrections can then be used to infer the mass and spin of the boson, turning binary inspirals into ultralight particle detectors.

Primary author: STOUT, John (University of Amsterdam)

Co-authors: BAUMANN, Daniel; CHIA, Horng Sheng; PORTO, Rafael (DESY)

Presenter: STOUT, John (University of Amsterdam)

Session Classification: Short talks