
IVAN BOOTH, Memorial University

Black hole evolution and internal structure: constraints from the stability operator

For over 50 years apparent horizons have been the canonical examples of marginally outer trapped surfaces (MOTS). However, in the last few years it has come to be understood that they are not the only examples. In fact, most MOTS are not horizons but instead lurk deep inside black holes. Not only can they be used to better understand black hole internal structure but also these internal MOTS play key roles in dynamical events such as black hole mergers. Geometrically MOTS are close relatives of minimal surfaces from Riemannian geometry and the spectra of their analogous stability operators play a key role in determining their behaviour and properties. In this talk I will review some recent work with G.Cox and C.M.Okpala in which we define a generalized stability operator, study its properties, and then use analytical and numerical techniques to explore the implications for black hole geometry and evolution.