Applied and Computational Mathematics Seminar

Title: Self-force Regularization in Regge-Wheeler-type Gauges

Speaker: Jonathan Thompson (Cardiff University)

Date: Mon 16th September 2019 at 1:00PM

Location: Seminar Room SCN 1.25

Abstract: Knowledge of the gravitational self-force felt by a compact object inspiraling into a supermassive black hole will be vital for the construction of phase-accurate gravitational waveforms used for LISA. Calculating the self-force over the thousands of orbits necessary during the inspiral is an expensive hurdle quickly approaching the costs of numerical relativity simulations. One avenue toward increasing computational efficiency may be to work in gauges better suited to fast numerical computation of the metric perturbation produced by the compact object, from which the self-force is calculated. We investigate the steps required to regularize the self-force in gauges where the metric perturbation arises from the integration of a single one-dimensional wave equation; the most common of these gauges is the Regge-Wheeler gauge.

https://maths.ucd.ie/ACMSeminars/1920/thompson.html