Thesis Proposal for the Master's Degree in Physics

Title: Turbulence and Super-Jets during Black Hole Collisions

Abstract: One of the challenges of modern physics is understanding the behavior of matter in the vicinity of compact objects, especially during the close encounters of supermassive black holes. To address this issue, it is necessary to adopt a multidisciplinary approach, including theory, models, and numerical simulations. The thesis aims to analyze magnetized fluids in the vicinity of such compact objects. In these prohibitive regions of the Universe, electric and magnetic fields are indeed strongly amplified, producing accretion disks and very powerful jets. We will perform theoretical and numerical modeling of these events, unveiling finally the complex behavior of matter in such extreme situations.

Supervisor(s): Prof. Sergio Servidio, Dr. Giuseppe Ficarra

E-mail(s): sergio.servidio@fis.unical.it

Laboratory where the thesis is carried out: Numerical Lab of the Astrophysics Group

Any participating external structures: None

Type of thesis: Theoretical research