

**Relativistic Hydrodynamics: Geometric Analysis  
Meets Observational Astrophysics**

Shabnam Beheshti

*Queen Mary University of London*

s.beheshti@qmul.ac.uk

Relativistic hydrodynamics describes the motion of fluids in regimes including flow velocities close to the speed of light (e.g., relativistic plasmas) and fluids interacting with strong gravitational fields (e.g. neutron star mergers, black hole accretion disks). Mathematical research in this area serves as an essential tool in high-energy nuclear physics, cosmology, and astrophysics, offering opportunities for strong interplay between mathematical analysis, numerical simulation, theoretical and experimental physics. In this talk, I shall survey recent progress on well-posedness theorems for relativistic viscous hydrodynamics and discuss related open problems in both mathematics and astrophysics.