The black hole stability problem within spherical symmetry

Instructor: Yannis Angelopoulos, yannis@bimsa.cn
Instructor Office Hours: Can be arranged through personal communication
Lectures: Mondays and Wednesdays at BIMSA and through zoom (TBD)
Zoom info:
References: *Lectures on black holes and linear waves*, Dafermos-Rodnianski,
A proof of Price's law for the collapse of a self-gravitating scalar field, Dafermos-Rodnianski,
Nonlinear stability of extremal Reissner–Nordström black holes in spherical symmetry, Angelopoulos-Kehle-Unger
Topics: Linear analysis of spherically symmetric waves on spherically symmetric black hole spacetimes,
The Einstein-Maxwell-scalar field (EMSF) equations in spherical symmetry,
The stability problem for black holes for the EMSF system in spherical symmetry (main body of the course),
Further topics: scattering constructions of black holes, trapped surfaces formation for the EMSF system in spherical symmetry
Prerequisites: The course will be self-contained but it is suggested to students who took the course "Linear and nonlinear wave equations — with applications to general relativity" in fall 2025 at YMSC
Homework: Non-mandatory. Exercises and even open problems will be mentioned during the lectures.