ISAPP 2012 lecure

HE3 : Accreting black holes and neutron stars: gravitational waves, gamma

1. Classical Hydrodynamics
   1.1 Bondi-Hoyle Accretion
   1.2 The missing accretion-rate problem and the role of magnetic fields
   1.3 MHD simulations
   1.4 Application to well-known systems, such as the supermassive black hole Sgr A* at the galactic center

2. Accretion disks in weakly accreting black holes
   2.1 One-temperature versus two-temperature
   2.2 Advection dominated flows
   2.3 The Bardeen-Petterson effect and disk precession
   2.4 Stochastic particle acceleration and the expulsion of relativistic plasma/jets
   2.5 Superluminal motion
   2.6 Imaging of the event horizon in black hole systems

3. Accreting Neutron Stars and Black Holes in Binaries
   3.1 The Roche geometry
   3.2 Disk formation
   3.3 The role of magnetic fields
   3.4 X-ray bursts
   3.5 Pair creation in the inner disk region
   3.6 Formation of jets in black-hole binaries such as 1E1740