

1. Black hole types, observational evidence for black holes, Sgr A*, blackhole imaging, microlensing, black hole stellar transit, supermassive black hole binaries
2. Black holes and general relativity
 - a. Schwarzschild metric
 - b. Black hole horizon
 - c. Motion around a black hole
 - d. Extended black hole spacetime
3. Spherical accretion onto black holes
 - a. Eddington limit
 - b. Bondi accretion
4. Black hole disk accretion
 - a. Shakura-Sunyaev alpha-disk model
 - b. Radiatively inefficient accretion flow
5. Stellar mass black holes
 - a. Formation
 - b. X-ray binaries
 - c. Black hole accretion states
 - d. Black hole spin
6. Supermassive black holes
 - a. Formation
 - b. Soltan's argument
 - c. Mass function
7. Active galactic nuclei
 - a. Electromagnetic observables
 - b. Spectrum: continuum, broad and narrow spectral lines
 - c. Unified model of AGN
 - d. Mass measurement, reverberation technique
8. Supermassive black hole correlations and their physical interpretation
9. Gravitational wave astrophysics
 - a. LIGO/VIRGO observations
 - b. Astrophysical channels to form merging black hole binaries