

## Physics of Black-Hole Accretion Flow

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We overview the theory of black hole accretion disks or flows. Two sites are usually considered to be the places where astrophysical black holes can be found: X-ray binaries and active galactic nuclei. Since black holes cannot emit radiation, the present black hole observation aims to detect electromagnetic radiation

from accreting gas. In the first half we introduce three basic accretion disk models: standard disk, optically thin, advection-dominated accretion flows (ADAFs), and optically thick ADAFs, and discuss their observational appearance in relation to the typical observed spectra. In the second part we summarize the properties of observed complex variability and discuss its implications with special emphasis on the magnetic field activity in accretion disks.