Invited lecture

A PHOTOIONIZATION METHOD FOR BLACK HOLE MASS ESTIMATION

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Determining the masses of the central compact objects believed to power all active galactic nuclei is relevant to our understanding of their evolution and of their inner workings. Keys to present-day mass estimates are the assumption of line broadening due to virial motion of the emitting gas, and a correlation between distance of the broad-line emitting region from the central compact object and active nucleus luminosity. I discuss the merit and the limitations of an alternative method based on the knowledge of the physical conditions of the broad line gas derived after an appropriate multi-component analysis of the line profiles. This "photoionization method", applied to UV intermediate-ionization lines shifted in the visual band appears to be promising for at least a sizable population of high-z quasars.

Invited lecture

MICROLENSING BASED STUDIES OF THE UNRESOLVED STRUCTURE OF AGN AND THE COMPOSITION OF LENS GALAXIES

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Multiple images of quasars formed by gravitational lensing are typically seen through the lens galaxy. The granulation of the galaxy in stars or other compact objects induces local (microscopic) but strong fluctuations in the gravitational potential that subdivide each image in several micro-images changing the expected flux of the image (flux anomalies). This phenomenon, quasar microlensing, allows to study both the unresolved structure of the source and the composition of the lens galaxy. In particular, we will present some studies of microlensing statistics useful to measure the quasar source size and the mass of microlenses in the lens galaxy.