



ΓΕΝΙΚΟ ΣΕΜΙΝΑΡΙΟ ΤΜΗΜΑΤΟΣ ΦΥΣΙΚΗΣ

PHYSICS COLLOQUIUM

Thursday, 22 March 2012

17:00 -18:00

3rd Floor Seminar Room

"Black Holes in Bright Nuclei"

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Abstract

Detailed dynamical studies the past 10-20 years have revealed the presence of "dark", compact regions in the center of our own Galaxy, and that of a few nearby galaxies, with a mass larger than a few million, or tens of millions, solar masses. This result strongly suggests the presence of super massive "black holes" in the center of these, and perhaps of all, galaxies. If matter "falls" in these objects, we expect to detect intense radiation from them, and in fact, we know that at least $\sim 10\%$ of all galaxies host a bright, luminous nucleus, which could be powered by the release of gravitational energy as matter accretes onto a "super-massive" black hole. These "active" nuclei (AGN), emit copious amount of energy at all frequencies from radio wavelengths up to gamma rays, and their spectra are rich in emission lines in the optical, UV, and the X-ray regime of the electromagnetic spectrum. In X-rays, above 2 keV, emission lines from neutral and/or ionized iron dominate. In some cases, their shape appears to be very broad and highly asymmetric. One interpretation attributes the iron line shape to general relativity effects that we expect to affect the photons as they escape from regions close to the central black hole. However, other explanations are also possible. I will present some preliminary results from the study of the flux variability of the iron lines in AGN, which might be able to help us understand whether they originate in the inner region of the accretion discs around the central black holes, or not.