



ΓΕΝΙΚΟ ΣΕΜΙΝΑΡΙΟ ΤΜΗΜΑΤΟΣ ΦΥΣΙΚΗΣ

PHYSICS COLLOQUIUM

Thursday, 16 February 2012

17:00 -18:00

3rd Floor Seminar Room

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Jets from black holes

Abstract

Black-hole X-ray binaries are binaries containing a black hole and a normal star. As the normal star evolves, it fills its Roche lobe, and matter is spilled over to the black hole. Due to its angular momentum, the accreting matter does not fall in radially, but it forms an accretion disk. Naively thinking, all the matter in the accretion disk should fall into the black hole. Yet, a significant fraction of it is ejected in the form of a collimated jet. It is generally accepted that long-scale magnetic fields are responsible for this ejection. A Cosmic Battery that generates such fields in accretion disks around compact stars will be described. Using this battery, it will be explained why the accretion disk sometimes ejects a jet and other times it does not. Once a jet is ejected, it will be shown that a simple jet model can explain the observed energy spectrum, the time-lag between hard and soft X-rays, and the characteristic frequencies of variability. These three quantities are correlated and impose very stringent constraints on any model.