Seminarium Zakładu Fizyki Teoretycznej

Departament Badań Podstawowych
Narodowego Centrum Badań Jądrowych

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NCBJ, sala 404, **Pasteura 7**

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"Imaging the black hole M87*"

ABSTRACT:

Messier 87 is a nearby large elliptical galaxy located at the heart of the Virgo Galaxy Cluster. It is a prime example of an active galaxy, equipped with a relativistic jet, and very bright across all bands from the MHz-scale radio to the TeV-scale gamma rays. In the nucleus of M87 there is evidence for a very massive black hole containing a few billion solar masses. The black hole accretes large amounts of gas, resulting in its extreme heating and very luminous multi-band emission, in the presence of strong magnetic fields it can also launch relativistic jets. Accreting black holes belong to the brightest cosmic sources of radiation, but their innermost environments are typically unresolved. Due to its large mass and relatively short distance, the black hole of M87 happens to be one of the largest black holes in terms of angular size. A resolution of 20 micro-arc-seconds is required to resolve its image. This has been recently achieved by the Event Horizon Telescope project, which combined multiple millimeter telescopes observing at the wavelength of 1.3 mm into a global interferometer. The core of the millimeter source called M87* has indeed been resolved into a circular photon ring of diameter 42 micro-arc-seconds with a dark center. This observation allows to independently estimate the mass and general rotation sense of the M87 black hole. However, the exact value of black hole spin has not been determined, and it is not even clear whether the orientation of the black hole spin vector is consistent with the direction of the large-scale jet.

Serdecznie zapraszamy,

M. Kowal, W. Piechocki, J. Skalski, L. Szymanowski