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The spectral signatures of BHs versus NS

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Titarchuk, Lev (University of Ferrara, Italy and Seifina, Elena (GAISH, MSU, Russia

In 2017 the work on the Comptonization (Sunyaev-Titarchuk) seen in the X-ray spectra of astrophysical sources was a candidate for the Nobel Prize in Physics. In this talk I provide all the details of the exciting prehistory of this topic and precise details of this discovery. The solution of this problem and its subsequent development and application to the spectra of accreting neutron star (NS) and black hole (BH) binaries reveals a lot of information on these objects. In particular, now we can unambiguously distinguish between a NS and a BH (Galactic or extragalactic) using correlations of their spectral indices vs mass accretion rate (or QPO frequency). I further demonstrate how we can determine a BH mass using this correlation

Primary author: Prof. TITARCHUK, Lev (University of Ferrara, Ferrara, Italy)

Presenter: Prof. TITARCHUK, Lev (University of Ferrara, Ferrara, Italy)

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