

Understanding AGN evolution with large (X-ray) surveys: current constraints and prospects for eROSITA (INVITED)

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In the past 50 years, astronomers have used X-ray surveys to tackle fundamental questions for structure formation such as: How did supermassive black holes form and grow in the nuclei of galaxies? Why are their physical properties today so tightly linked to those of their hosts? What was the impact on the surrounding structures of the copious energy release, either in radiative or mechanical form, associated to the growth of such black holes in active galactic nuclei (AGN)? I will show how state of the art observations with multi-wavelength surveys have been used to give at least partial answers to some of these questions, and discuss the current knowledge of the history of black hole accretion.

The next generation of wide-area, sensitive X-ray surveys designed to map the hot and energetic Universe will be heralded by eROSITA (extended ROentgen Survey with an Imaging Telescope Array), the core instrument on the Russian-German Spektrum-Roentgen-Gamma (SRG) mission, scheduled for launch in 2019. eROSITA will perform a deep survey of the entire X-ray sky, and will be about 30 times more sensitive than ROSAT in the soft energy band (0.5-2 keV), while in the hard band (2-8 keV) it will provide the first ever true imaging survey of the full sky. eROSITA is expected to yield a sample of around 3 million active galactic nuclei, which is bound to revolutionize our view of the evolution of supermassive black holes and their impact on the process of structure formation in the Universe.

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