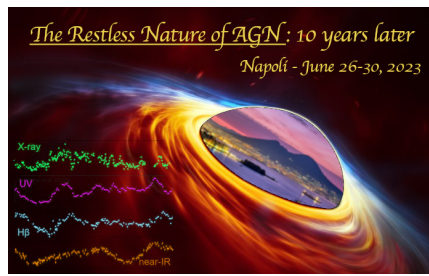


The restless nature of AGN: 10 years later



Contribution ID : 106

Type : Contributed talk

STAR-X: a next-generation X-ray and UV explorer to study the restless nature of AGN

Wednesday, 28 June 2023 13:15 (15)

The Survey and Time-domain Astrophysical Research eXplorer (STAR-X; <http://star-x.xraydeep.org>) is a Medium Explorer class mission recently selected for a competitive NASA Phase A study. It comprises a wide-field, high-throughput, high-angular-resolution X-ray Telescope (XRT) and a complementary UV Telescope (UVT) on an agile spacecraft bus. STAR-X will conduct high-cadence, deep-and-wide surveys, and respond rapidly to transient events discovered by other observatories such as LIGO, Rubin/LSST, Roman/WFIRST, and SKA.

The science theme for the mission is “to study the fast, furious and forming Universe.” In this talk I will first present an overview of the mission concept and observing capabilities, and then focus on the key “furious” science pillar, which will explore feeding and growth of massive black holes through sensitive, time-domain studies.

STAR-X will uniquely probe the physics of rapid accretion that allowed the formation of the first supermassive black holes, and will catch transient, extreme black hole feeding events, such as Tidal Disruption Events (TDEs). Critically, STAR-X will discover TDEs in the X-ray band, providing direct evidence for newborn accretion disks. Also, by monitoring their X-ray and associated UV emission, STAR-X will constrain the timescales of disk formation and their evolution. Finally, STAR-X will perform detailed reverberation mapping of AGN distributed over a broad range of Eddington ratios, revealing how the accretion flow geometry depends on the accretion rate.

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Session Classification : Current and Future Surveys