



X-RAY ASTRONOMY 2019

Current Challenges and New Frontiers in the Next Decade

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Understanding AGN feedback with XRISM and ATHENA

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There is strong evidence for a link between the growth of supermassive black holes (SMBHs) and their host galaxies. Active galactic nuclei (AGN) powered by accretion onto SMBHs release a huge amount of energy in the surrounding medium in the form of radiation, winds and jets. This phenomenon also known as AGN feedback has been invoked to regulate the growth of SMBHs and their host galaxies as well as to establish a balance between cooling and heating in the extragalactic intracluster medium. This corresponds to two modes of AGN feedback that operate at different regimes of accretion onto the black hole (radiative mode at high and kinetic mode at low Eddington rates, respectively) and are thought to remove and heat the gas which otherwise would cool down and form new stars as well as feeding the SMBH. There has been significant progress in this field, particularly thanks to the contribution of X-ray missions such as XMM-Newton, Chandra, Suzaku and - despite its brief life - Hitomi, but still many crucial questions remain unanswered. What are the duty cycles of AGN winds? Can we distinguish between magnetic and radiation launching mechanisms? Can we estimate the net accretion rate onto the SMBH? How fast can black holes accrete matter? What are the exact means by which energy is released and propagated throughout the surrounding medium? In this talk I will show how we can tackle these unknowns through the new X-ray missions XRISM and ATHENA, focussing on the corresponding mission requirements.

Topic

Future missions

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