



X-RAY ASTRONOMY 2019

Current Challenges and New Frontiers in the Next Decade

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Tracing supermassive black hole feedback, from the event horizon up to cluster scales

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Observations performed in the last decades have shown that supermassive black holes (SMBHs) and cosmic structures are not separate elements of the Universe. While galaxies have sizes roughly ten orders of magnitude larger than SMBHs, black holes would not exist without matter feeding them, and cosmic structures would not be the same without feedback from SMBHs. Powerful winds/jets in active galactic nuclei (AGN) may be the basis of this co-evolution. Synergistic observations in the X-rays and other wavebands has been proven to be fundamental to map AGN winds from the event horizon up to galaxy scales, providing a promising avenue to study the multi-phase SMBH feeding and feedback processes. The combination of X-ray, optical/UV, IR, and mm observations of IRAS F11119+3257 allowed us to link the SMBH activity to molecular outflows that may be able to quench star formation. Follow-up studies on other ULIRGs and quasars show very promising results. Moreover, a spatially resolved, spectroscopic analysis of AGN in clusters may allow us to probe the multiphase medium ranging from galactic to up cluster scales. Revolutionary improvements are expected from upcoming X-ray space observatories, such as XARM and Athena, in synergy with other major space- and ground-based facilities, such as JWST, ALMA, E-ELT, SKA.

Topic

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