



X-RAY ASTRONOMY 2019

Current Challenges and New Frontiers in the Next Decade

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Self-regulation between multiphase AGN outflows and hot halo rain

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Feeding and feedback tied to SMBHs play central role in the cosmic evolution of galaxies. The self-regulated AGN cycle is matter of intense debate. I review key numerical and observational results of how SMBHs are coupled to the multiphase gaseous halos, linking the inner gravitational radius to the galactic scale, and vice versa. The turbulent galactic halo radiatively cools through a multiphase condensation rain of warm filaments and molecular clouds. In the nuclear region, the recurrent collisions between the clouds and filaments boost the SMBH accretion rate via Chaotic Cold Accretion (CCA). The CCA rapid variability triggers powerful ultrafast AGN outflows near the SMBH horizon, which propagate outwards and form entrained multiphase winds at the kpc scale. I highlight the key imprints of AGN feeding and outflow feedback and how the different phases are interconnected in terms of both kinematics and thermodynamics.

Topic

Active Galactic Nuclei: accretion physics and evolution across cosmic time

Affiliation

Princeton University

Primary author: GASPARI, Massimo (Princeton University)

Presenter: GASPARI, Massimo (Princeton University)

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