X-RAY ASTRONOMY 2019
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The unusual suspects. A new population of X-ray weak quasars at high redshift.

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We have recently obtained deep XMM-Newton observations of 30 bright quasars, selected in the optical from the SDSS-DR7 to be representative of the most luminous, intrinsically blue quasars at high redshift ($3.0 < z < 3.3$). Despite the uniform selection in terms of optical/UV spectral properties and the narrow range of luminosity, black-hole mass and accretion rate probed by our sample, two distinct populations surprisingly emerge from the X-ray analysis: about two thirds of the targets perfectly follow the well-established, non-linear UV vs. X-ray luminosity relation, while the remaining one third lie significantly below the expectations. The X-ray spectra of the latter sources are flatter and show no evidence of absorption, suggesting a different disc/coronal state. As our sample picks the kind of objects where radiative feedback is supposed to be most intense, we argue that intrinsically X-ray weak quasars (i.e. emitting much less in the X-rays than dictated by the X/UV relation) are currently undergoing a blow-out phase, during which a substantial fraction of the gravitational energy is dissipated to drive a powerful accretion-disc wind, thus starving the corona. This result provides novel insights into the nature and incidence of X-ray weakness in quasars, and its physical link to the most critical phases of galaxy evolution.

Topic

Active Galactic Nuclei: accretion physics and evolution across cosmic time

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