



- RAY ASTRONOMY 2019

Current Challenges and New Frontiers in the Next Decade

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The X-ray properties of the $z \sim 6$ quasars

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More than 200 quasars (QSOs) with spectroscopic redshift $z > 6$ have been discovered so far.

Multi-wavelength observations showed that these objects are evolved systems with large black hole masses ($10^8 - 10^{10} M_\odot$), and that their broad-band spectral energy distributions (SEDs) and rest-frame UV spectra have not significantly evolved over cosmic time.

The formation of their Super Massive Black Holes in less than 1 Gyr is still a challenge for theory, with many simulations claiming they formed at the center of primordial overdense regions.

I will present a study of all the 29 $z \sim 6$ QSOs observed so far in the X-rays, showing that the X-ray spectral properties of high- z QSOs do not differ significantly from those of QSOs at lower- z .

I will also present the results from a deep 500 ks Chandra observation of the field around $z=6.31$ QSO SDSS J1030+0524, which shows the best evidence of an overdense region around a $z \sim 6$ QSO. This is the deepest X-ray observation ever achieved for such a distant QSO. Comparing our results with those from previous XMM observation we found a hardening of the X-ray spectrum and a decrease of the flux by a factor 2.5. This is the first evidence of a variable QSO at such high redshift. I will discuss possible interpretations for the observed variability and discuss prospects for future X-ray observations of distant QSOs.

Topic

Active Galactic Nuclei: accretion physics and evolution across cosmic time

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