

Invited Lecture

EXPLORING RADIO-LOUD QUASARS WITH OPTICAL-UV SPECTROSCOPY

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The mystery of why only 8 remains with us since their discovery in 1963. We have been exploring ways of more precisely defining the radio-loud (RL) parent population in the context of 4DE1 space. The best defined RL population (showing double-lobe structure) show a restricted range of optical/UV spectroscopic properties suggesting that they show below average Eddington ratios and above average black hole masses. The 4DE1 context also shows us that claims of a RL population of narrow line Seyfert 1 (NLSy1) sources is spurious.

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REVIEWING LINE SHIFTS IN QUASARS

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We have recently passed the 50th anniversary of the discovery of quasars. A short time after their discovery, as their numbers increased, we began to find velocity discrepancies between different lines (broad/narrow emission as well as broad/narrow absorption) in the same sources. We have even found them in X-ray lines. This can make estimation of an individual source rest frame quite uncertain. It also raises the question of cause. Three classes of mechanisms have been discussed over the years: Doppler, gravitation and scattering. When none of the above will do, non-Doppler shifts of unknown origin have been proposed – although this explanation is now out of favour. We review some of the most studied kinds of line shifts observed in optical, UV and X-ray spectra of quasars along with ideas about their origin.