



# X-RAY ASTRONOMY 2019

*Current Challenges and New Frontiers in the Next Decade*

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## Exploring the Diversity of Type 1 Active Galactic Nuclei Identified in SDSS-IV/SPIDERS

*Friday, 13 September 2019 19:02 (2 minutes)*

We present a statistical analysis of the optical properties of an X-ray selected Type 1 AGN sample using high signal-to-noise ratio ( $S/N > 20$ ) spectra of the counterparts of the ROSAT/2RX sources in the footprint of the SDSS-IV/SPIDERS (Spectroscopic IDentification of eROSITA Sources) programme. The sample of 2100 source is a factor of 4-18 larger than samples used in previous studies of this type. It significantly extends the probed redshift and luminosity ranges ( $z \sim 0.01 - 0.80$  and  $L_{0.1-2.4 \text{ keV}} 1.9 \times 10^{41} - 9.9 \times 10^{45} \text{ erg/s}$ ).

By means of a Principal Component Analysis, we derive Eigenvector (EV) 1 and 2 in an eleven dimensional optical and X-ray parameter space. The validity of the correlations of the Eddington ratio  $L/L_{\text{Edd}}$  with EV1 and the black hole mass with EV2 are strongly confirmed up to the redshift and luminosity ranges probed in this work.

Investigating the asymmetry of the broad  $H\beta$  lines, we show that the redshift of a very broad component, possibly stemming from the Very Broad Line Region, is a strong marker of diversity in our sample.

Furthermore, we report an intriguing difference in the relation between the equivalent width of the FeII emission and the continuum emission for the red- and blue-asymmetric  $H\beta$  emitting populations, and show that this contrasting behaviour is consistent with a flattened, stratified model of the Broad Line Region, in which the FeII emitting region is shielded from the central source.

### Topic

Active Galactic Nuclei: accretion physics and evolution across cosmic time

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