

## The restless nature of AGN: 10 years later



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# Investigating high- $\lambda_{\text{Edd}}$ accretion with X-HESS: a new XMM-Newton sample of serendipitous highly accreting AGN

The Eddington ratio  $\lambda_{\text{Edd}}$ , is the key parameter that describes the accretion mode of active galactic nuclei (AGN). Among the different modes, high- $\lambda_{\text{Edd}}$  accretion is particularly fascinating because of its implications in the context of accretion physics, as well as AGN feedback. However, due to their relative paucity in the local Universe ( $z < 0.1$ ), only a limited number of AGN accreting in the high- $\lambda_{\text{Edd}}$  regime can benefit of currently available dedicated observations, especially at higher  $z$ . To tackle this issue we exploit the vast database of XMM-Newton serendipitous observations to create a new, large sample of highly accreting AGN named as XMM-Newton High-Eddington Serendipitous AGN Sample (X-HESS). X-HESS includes 143 observations of 61 AGN,  $\sim 40\%$  of which disposing of multi-epoch observations, disclosing the unprecedented possibility to study not only the spectral but also variability features of high- $\lambda_{\text{Edd}}$  AGN in much broader intervals of redshift, black hole mass, bolometric luminosity and  $\lambda_{\text{Edd}}$  with respect to the bulk of pre-existing AGN samples. Approximately two-thirds of the X-HESS observations are complemented with simultaneous OM measurements. Thanks to the high-quality XMM-Newton observations we probe a large variety of correlations between the X-ray spectral, variability, optical/UV and physical properties of high- $\lambda_{\text{Edd}}$  AGN, extending the dynamical range of previously reported relations towards poorly explored intervals.

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