

S12a eROSITA view of an extremely infrared-luminous AGN at  $z = 1.87$ 

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We present the X-ray properties of WISE J090924.01+000211.1 (WISEJ0909+0002), an extremely luminous infrared (IR) galaxy (ELIRG) at  $z_{\text{spec}} = 1.871$  in the *eROSITA* Final Equatorial-Depth Survey (eFEDS). WISEJ0909+0002 is a WISE 22  $\mu\text{m}$  source, located in the GAMA-09 field, which was detected by *eROSITA* during the performance and verification phase. The corresponding optical spectrum indicates that this object is a type-1 active galactic nucleus (AGN). Observations from *eROSITA* combined with *Chandra* and *XMM-Newton* archival data indicate a very luminous ( $L(2\text{--}10\text{ keV}) = (2.1 \pm 0.2) \times 10^{45}\text{ erg s}^{-1}$ ) unobscured AGN with a power-law photon index of  $\Gamma = 1.73_{-0.15}^{+0.16}$  and an absorption hydrogen column density of  $\log N_{\text{H}} < 21.0\text{ cm}^{-2}$ . The IR luminosity is estimated to be  $L_{\text{IR}} = (1.79 \pm 0.09) \times 10^{14} L_{\odot}$  from spectral energy distribution modeling based on 22 photometric data points (X-ray to far-IR) with X-CIGALE, which confirmed that WISEJ0909+0002 is an ELIRG. A remarkably high  $L_{\text{IR}}$  despite very low  $N_{\text{H}}$  would indicate that we are witnessing a short-lived phase in which hydrogen gas along the line of sight is blown outward, whereas warm and hot dust heated by AGNs still exists. As a consequence of the *eROSITA* All-Sky Survey,  $6.8_{-5.6}^{+16} \times 10^2$  such X-ray-bright ELIRGs are expected to be discovered in the entire extragalactic sky ( $|b| > 10^\circ$ ). This can potentially be the key population to constrain the bright end of IR luminosity functions (Toba et al. 2021, A&A, 649, L11).