ACTIVE GALAXIES

# Dead AGN walking

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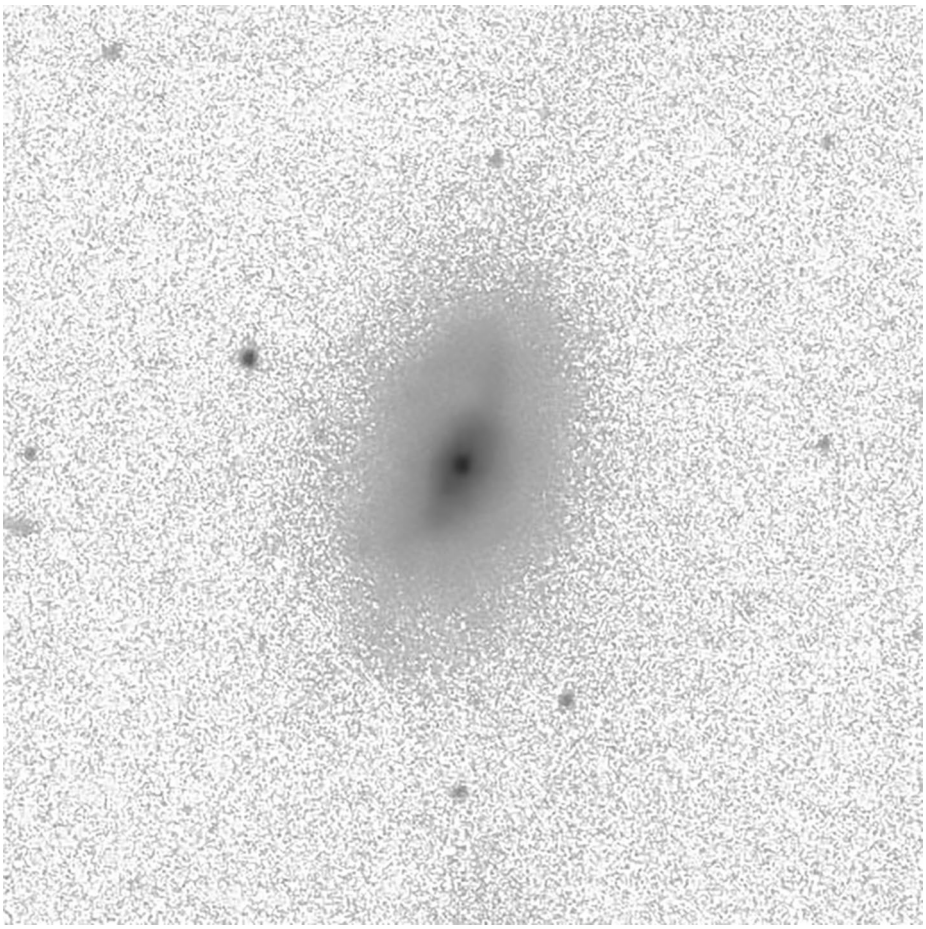

Credit: reproduced from B. Rothberg and R. D. Joseph *Astron. J.* **128**, 2098–2143 (2004); AAS/IOP

In recent years, it has become apparent that not only are active galactic nuclei (AGNs) variable across the electromagnetic spectrum, but some of them flicker out and into existence, indicating the quenching or onset of accretion in these objects. Kohei Ichikawa and collaborators study the peculiar case of Arp 187 (pictured), an infrared-bright galaxy that shows evidence of AGN activity on kiloparsec scales but with a nucleus that appears quiescent.

Arp 187 is a merger remnant that hosts a supermassive ($>10^8\ M_\odot$) black hole at its centre. Previous optical, infrared and X-ray spectroscopic studies indicated that the system shut off its nuclear activity some 10,000 years ago. Ichikawa et al. use the NuSTAR telescope to acquire the most stringent constraint of the hard X-ray luminosity of Arp 187 of $\sim 10^{41}$ erg s$^{-1}$, which translates to a bolometric luminosity of $\sim 10^{42-43}$ erg s$^{-1}$ (depending on its dust obscuration). Given the historical AGN luminosity of $\sim 10^{46}$ erg s$^{-1}$ (inferred from the ionized gas optical emission), the luminosity must have declined by a factor of $10^3$ within $10^4$ years.

The authors consider a few different scenarios to explain this puzzling rapid decline. The lifetime of the kiloparsec-scale ionized gas emission renders a classical tidal disruption event implausible. The accretion of a giant molecular cloud, while possible, has only been observed for Sgr A*, a much lighter supermassive black hole. Ichikawa et al. instead favour the presence of a sharply truncated accretion disk due to the onset of a starburst event that led to the rapid consumption of the nuclear gas reservoirs of the galaxy and led to the observed AGN luminosity plunge.

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