



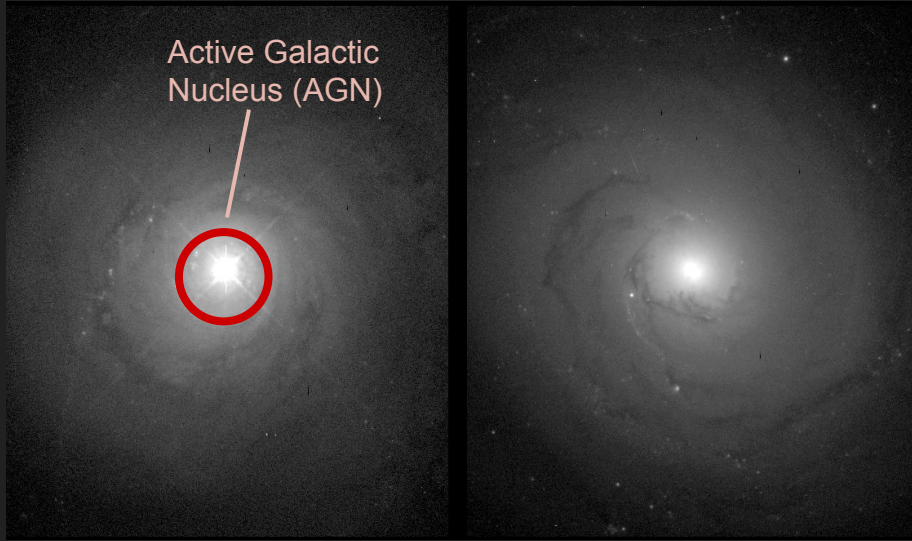
# Witnessing the Birth of a New Plasma Jet from a Supermassive Black Hole

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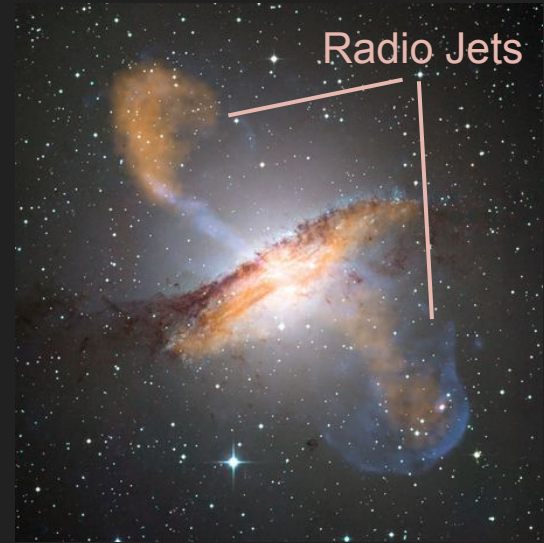
AAS Press Briefing | 13 January 2025

# Active Galaxies and their evolution with time



**Active Galaxy**  
(~ 5-10% of galaxies)

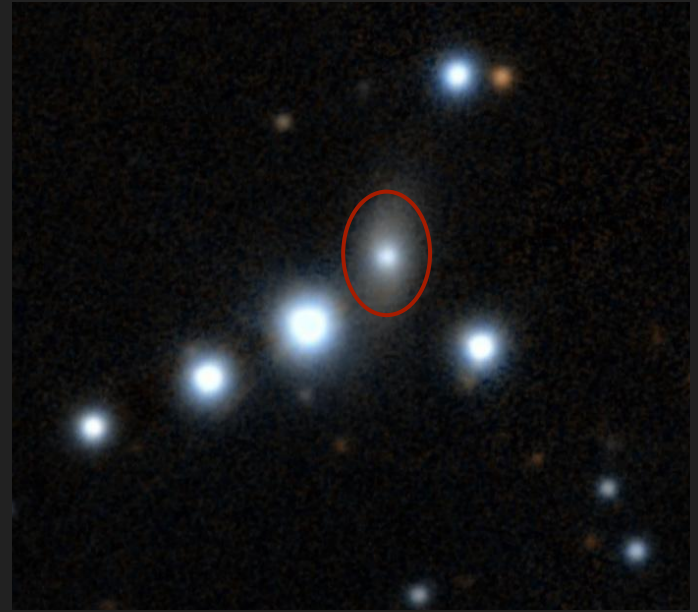
Normal Galaxy



Active Galaxy with **Radio Jet**  
(10% of AGN)

AGN (and jet) lifetimes are on the order of 10-100 million years

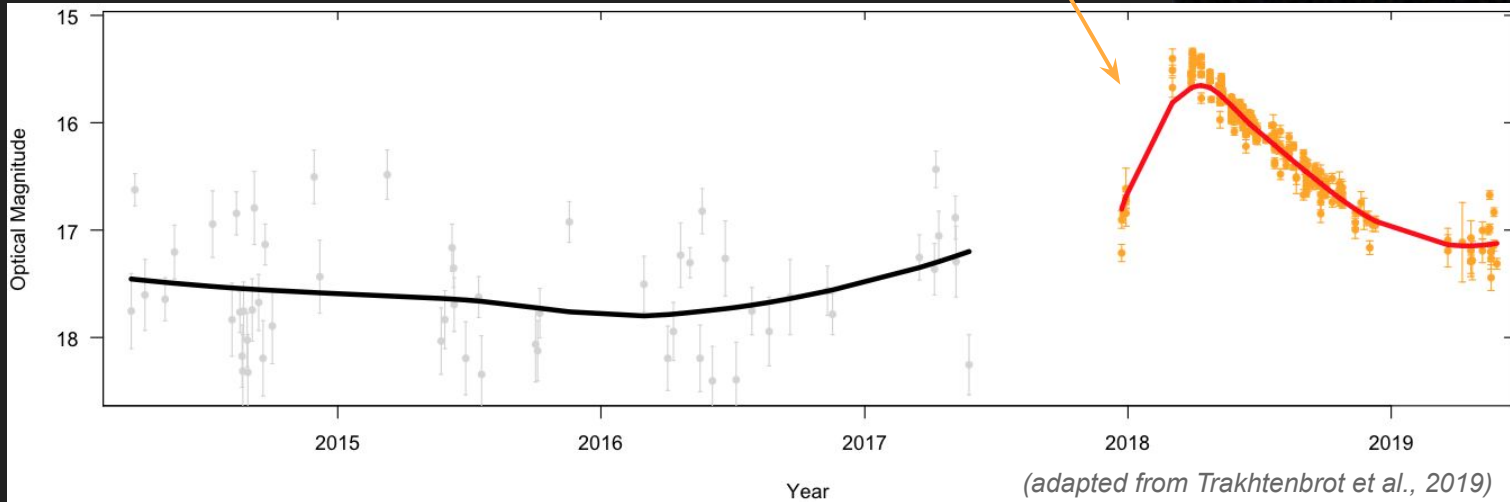
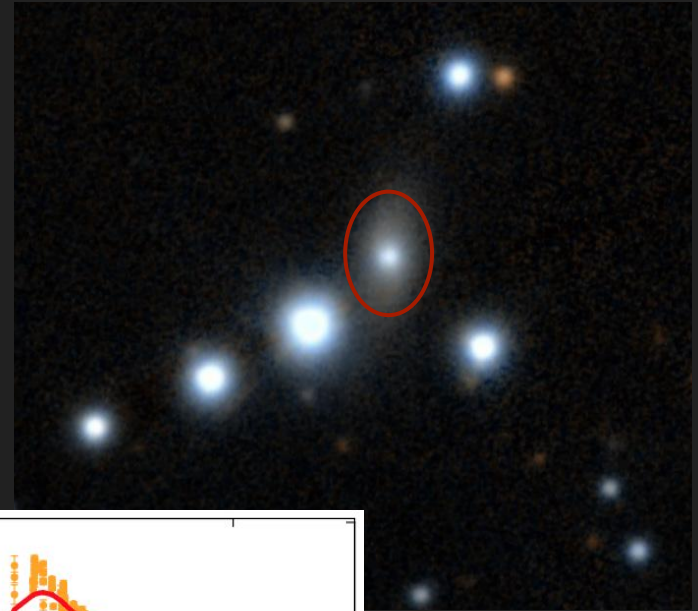
“Changing-Look” AGN: 1ES 1927+654



# “Changing-Look” AGN: 1ES 1927+654

Suddenly became 100 times brighter in 2018

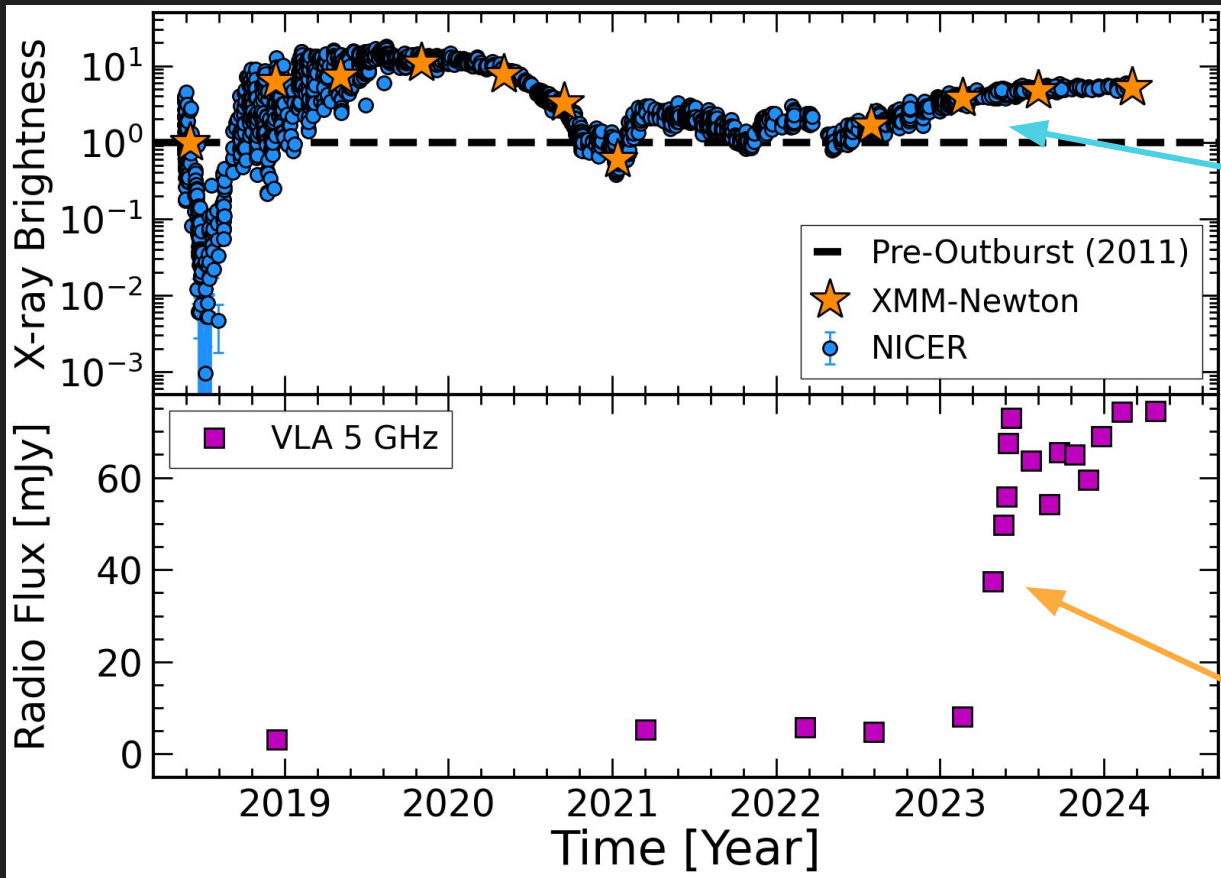
Possible Tidal Disruption Event (TDE)?



(adapted from Trakhtenbrot et al., 2019)

TDE occur when a star or gas cloud strays near a SMBH and accretes onto black hole, producing a flare.

# 1ES 1927+654 - long-term X-ray and radio monitoring



*X-ray Emission began rising again in late 2022*



*Radio-band monitoring with the VLBA shows an exponential increase*

# 1ES 1927+654 - long-term X-ray and radio monitoring

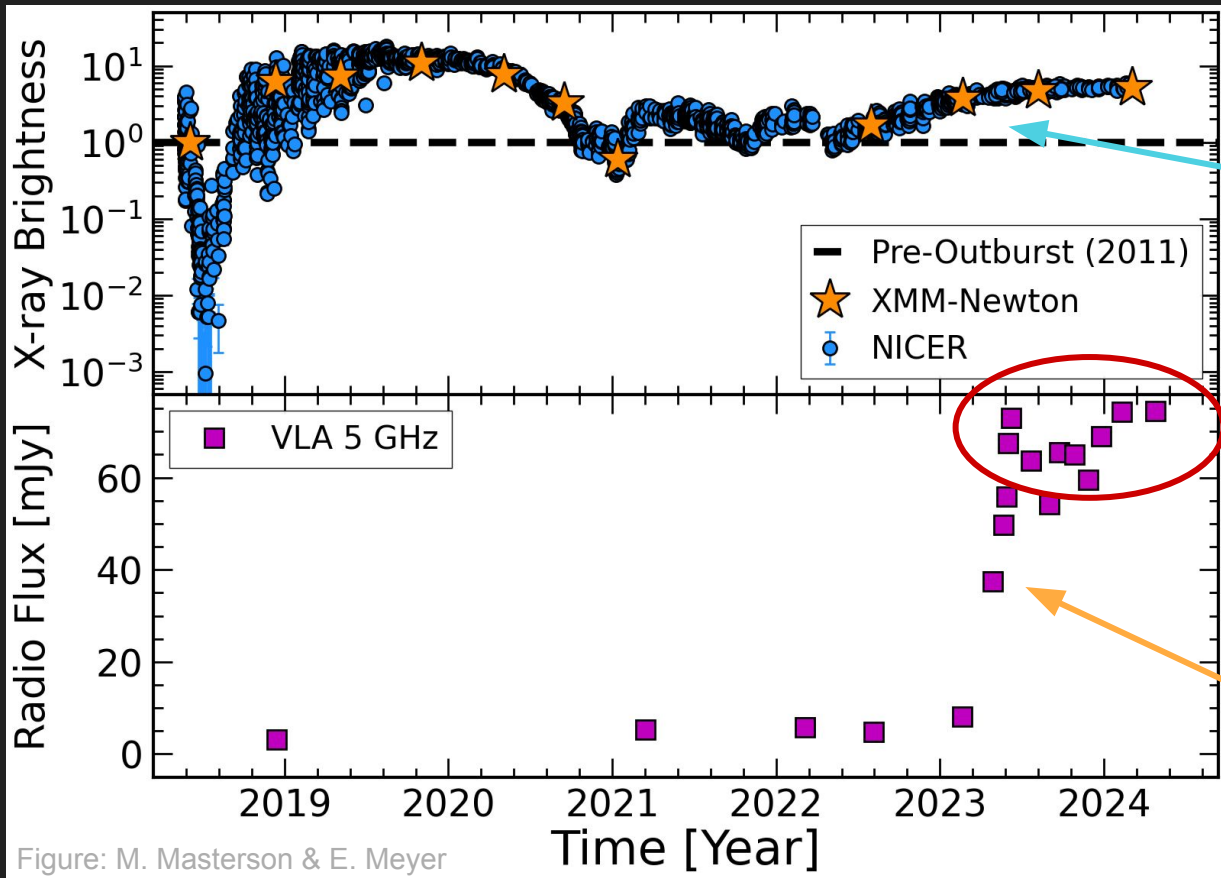


Figure: M. Masterson & E. Meyer



*X-ray Emission began rising again in late 2022*

*Now 60x brighter in radio!*



2023-06-08

X

0.2 parsecs  
0.65 light-years

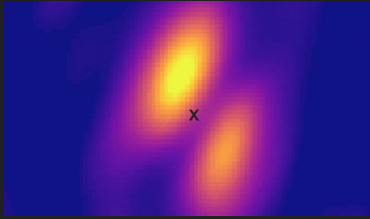
1ES 1927+654

High-resolution radio imaging  
taken by the VLBA over 1 year

Shows the emergence of two  
'blobs' on either side of the  
super-massive black hole  
(location marked by 'X')

*The blobs are outflowing hot gas  
moving at an estimated 33% of  
the speed of light.*

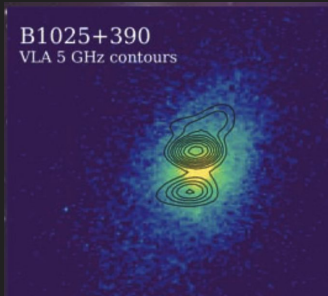
# Summary



Nearby Active Galaxy [1ES 1927+654](#) has turned on a **radio-emitting plasma jet** moving at  $\sim 30\%$  the speed of light. (Never observed in real time before!)



The newly formed jet may be related to a tidal disruption-like event that occurred in 2018.



The radio jet may be a newborn “compact symmetric object” – short-lived ( $< 1000$  yr) jets triggered by a tidal disruption event.



Publication:  
Meyer et al., 2025, ApJ Letters  
<https://iopscience.iop.org/article/10.3847/2041-8213/ad8651>

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