

Chandra Tracks the Evolving Jet from M87's Black Hole

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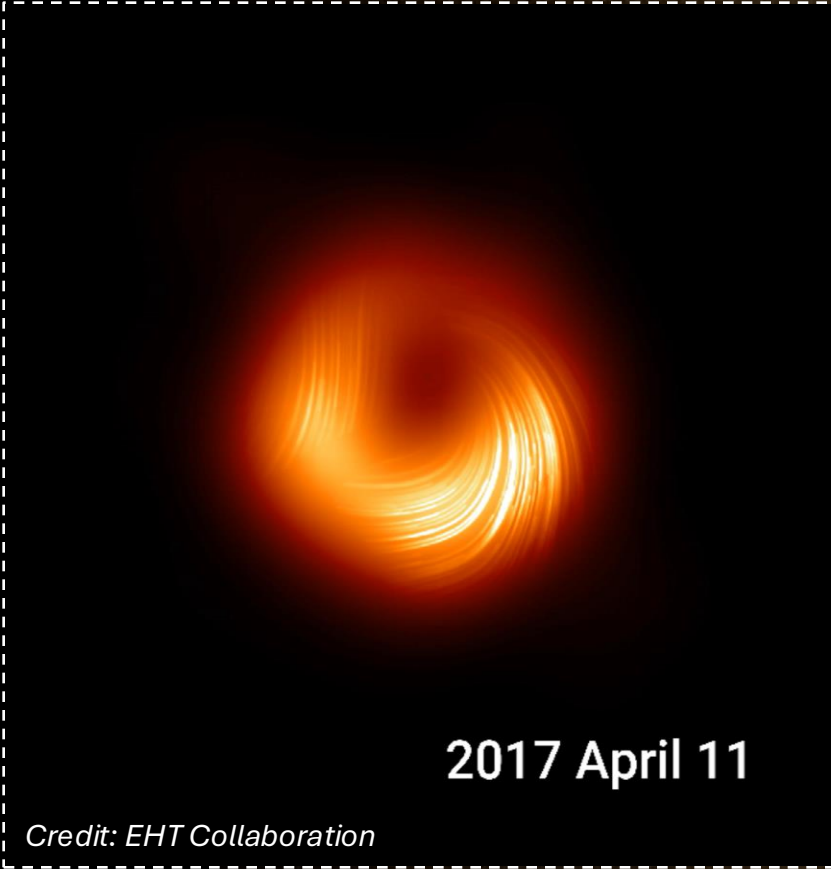
A new **X-ray movie** of M87's jet reveals its **motion**
and offers new insight into **particle acceleration**

Active Galactic Nucleus (AGN)

The image depicts an Active Galactic Nucleus (AGN) as a bright, glowing orange and yellow region. A prominent, narrow jet of light extends upwards from the center of the AGN. The background is a dark, starry space with numerous small, distant stars.

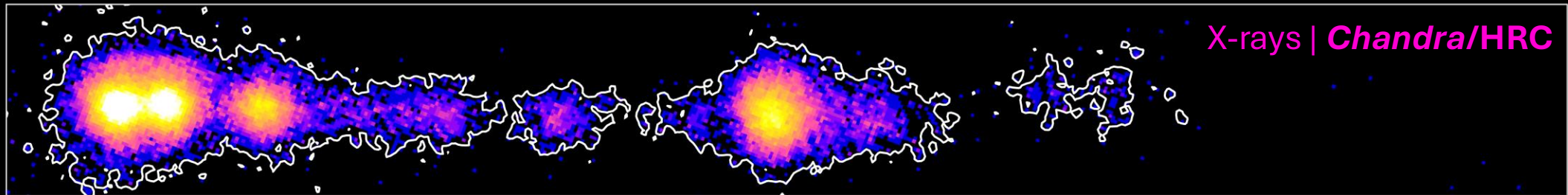
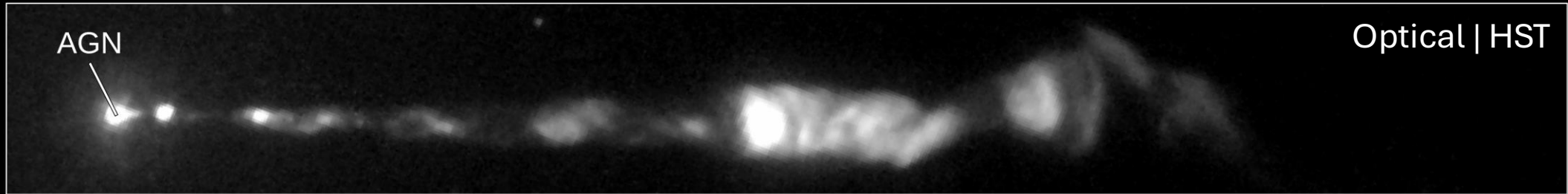
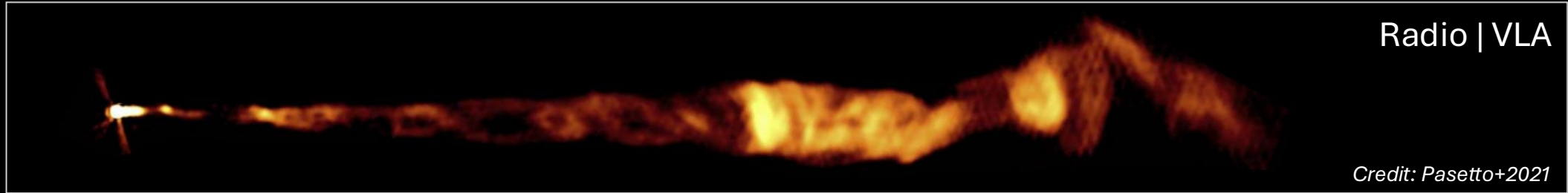
*Active **supermassive black holes** can power **relativistic jets** thousands of light-years long*

Active Galactic Nucleus in M87

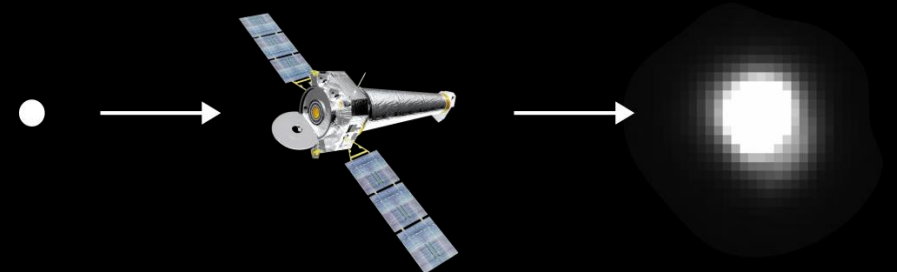


Credit: NASA, ESA, A. Lessing, E. Baltz (Stanford University), M. Shara (AMNH), J. DePasquale (STScI)

M87 Jet: From Radio to X-rays

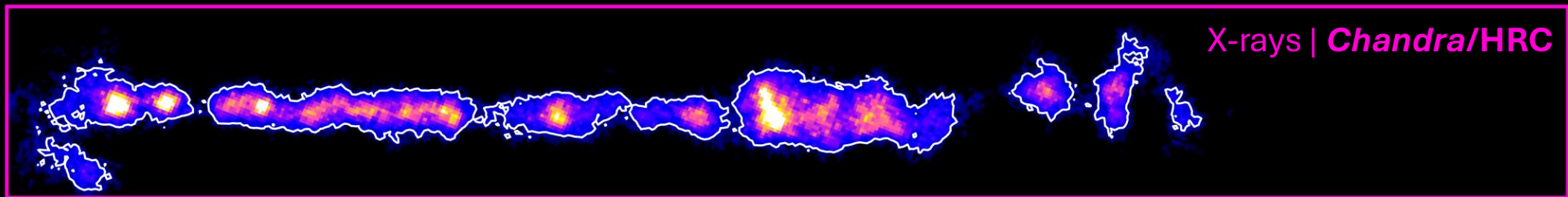
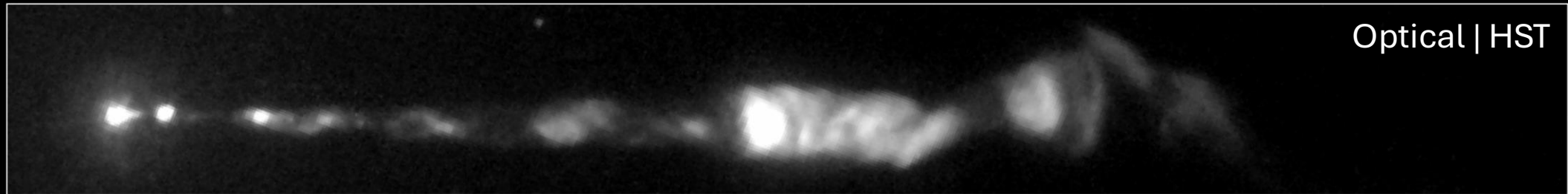
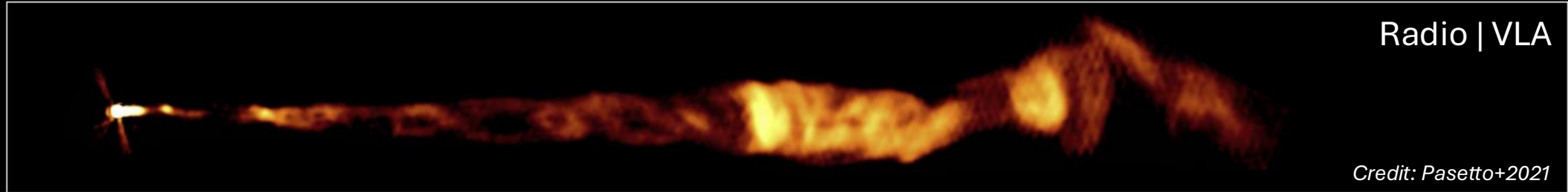


Chandra: best X-ray resolution available, but still blurred by the telescope's optics



X-rays Finally Catch Up

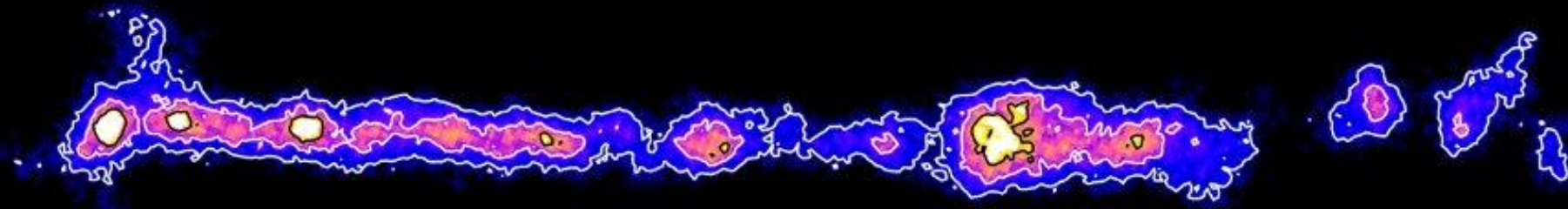
Using image reconstruction (*deconvolution*)



For the first time, X-rays reveal details comparable to those seen at other wavelengths

A 13-year movie of the evolving M87 jet

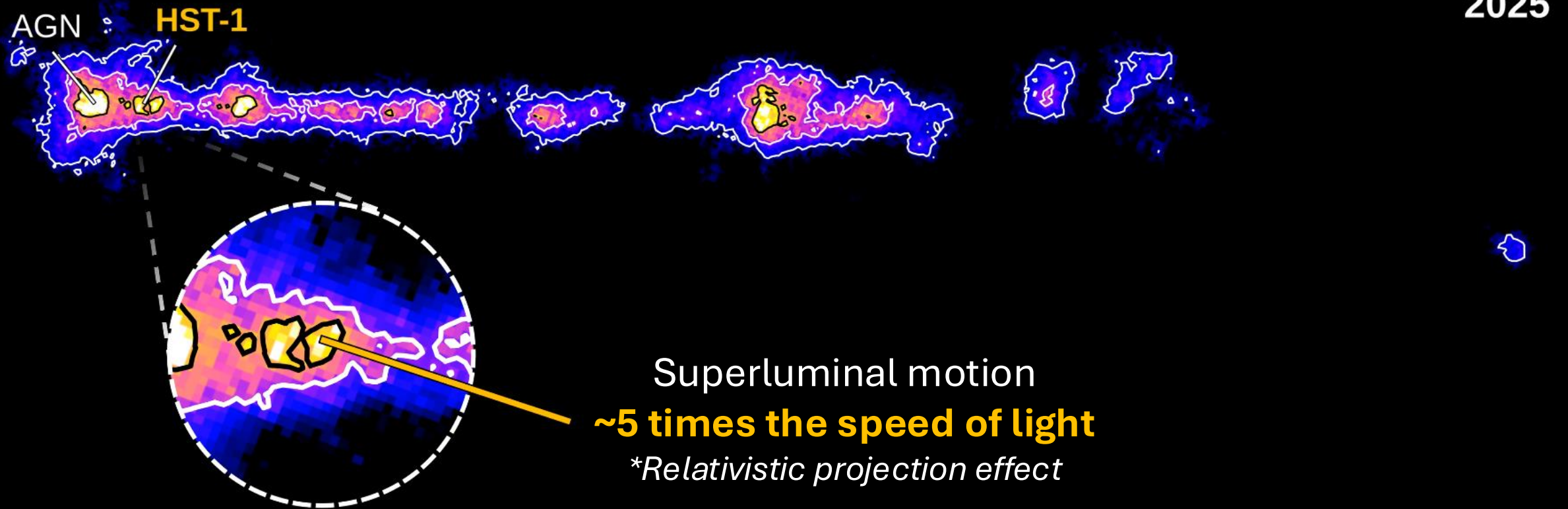
A new window on where the jet's **highest-energy particles** are being accelerated



2017

Proper motion

- X-ray proper motions measured since 2019
- Now consistent with other wavelengths
 - ***Different particle energies, similar underlying jet structure***



Summary

- **Sharpest X-ray view** of M87's jet
- X-rays now reveal **structures comparable to other wavelengths**
- Better constraints on **jet dynamics**
- **A step toward understanding particle acceleration in relativistic jets**



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release

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2012