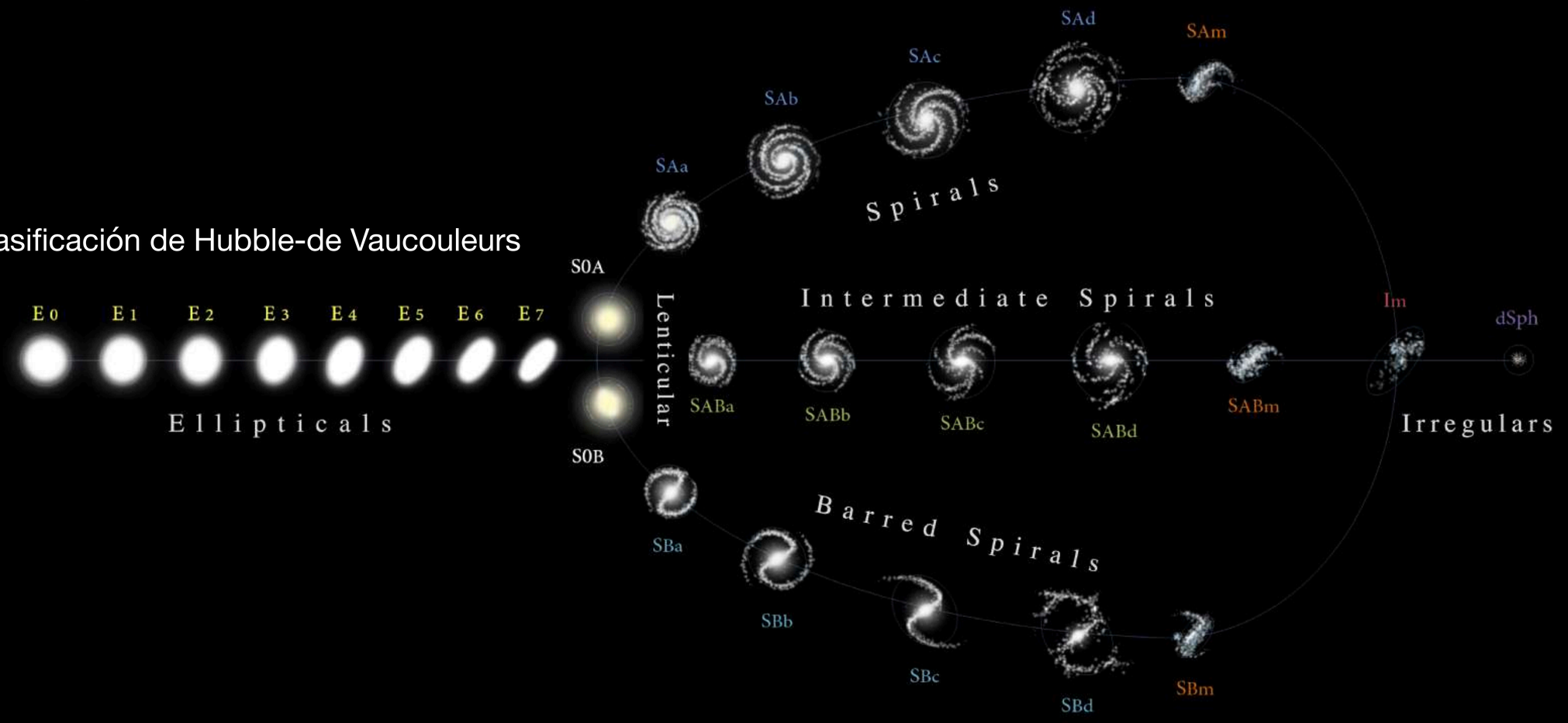
Introducción a la Astrofísica 2025
El zoológico astronómico: ¿Qué hay allá afuera?

Clase 11: Galaxias Activas y Agujeros Negros Supermasivos

Departamento de Física USACH

Hemos visto que las galaxias pueden ser clasificadas en “espirales”, “elípticas”, “irregulares”, “lenticulares”, “peculiares”, “enanas”, etc..

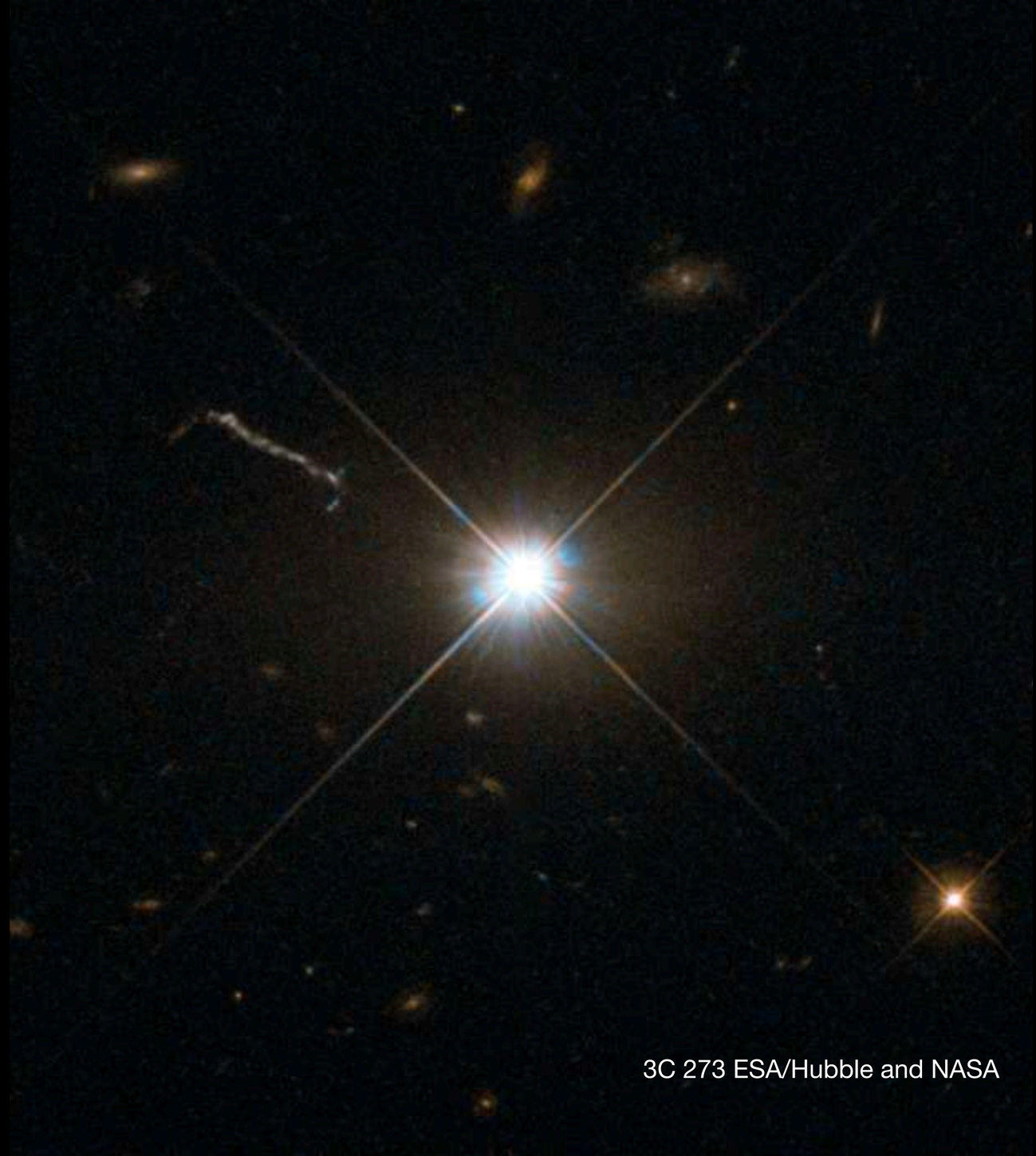
Clasificación de Hubble-de Vaucouleurs



Estas son clasificaciones que se basan en forma u morfología de las galaxias.

Las galaxias también se pueden clasificar por su **comportamiento**!

Quasars = “quasi-stellar objects”



3C 273 ESA/Hubble and NASA

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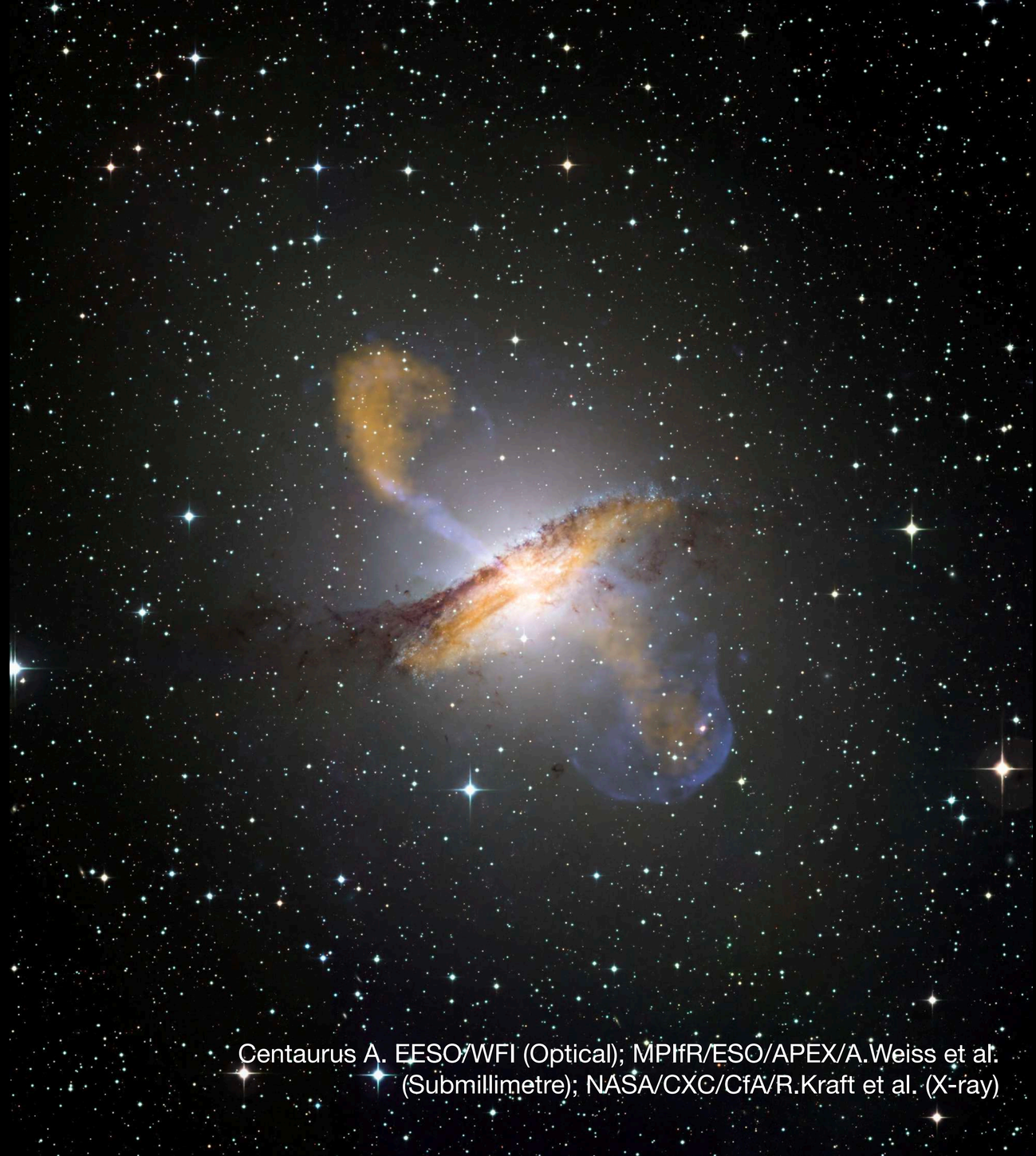
Seyfert galaxies?



Centaurus A. EESO/WFI (Optical); MPIfR/ESO/APEX/A.Weiss et al. (Submillimetre); NASA/CXC/CfA/R.Kraft et al. (X-ray)

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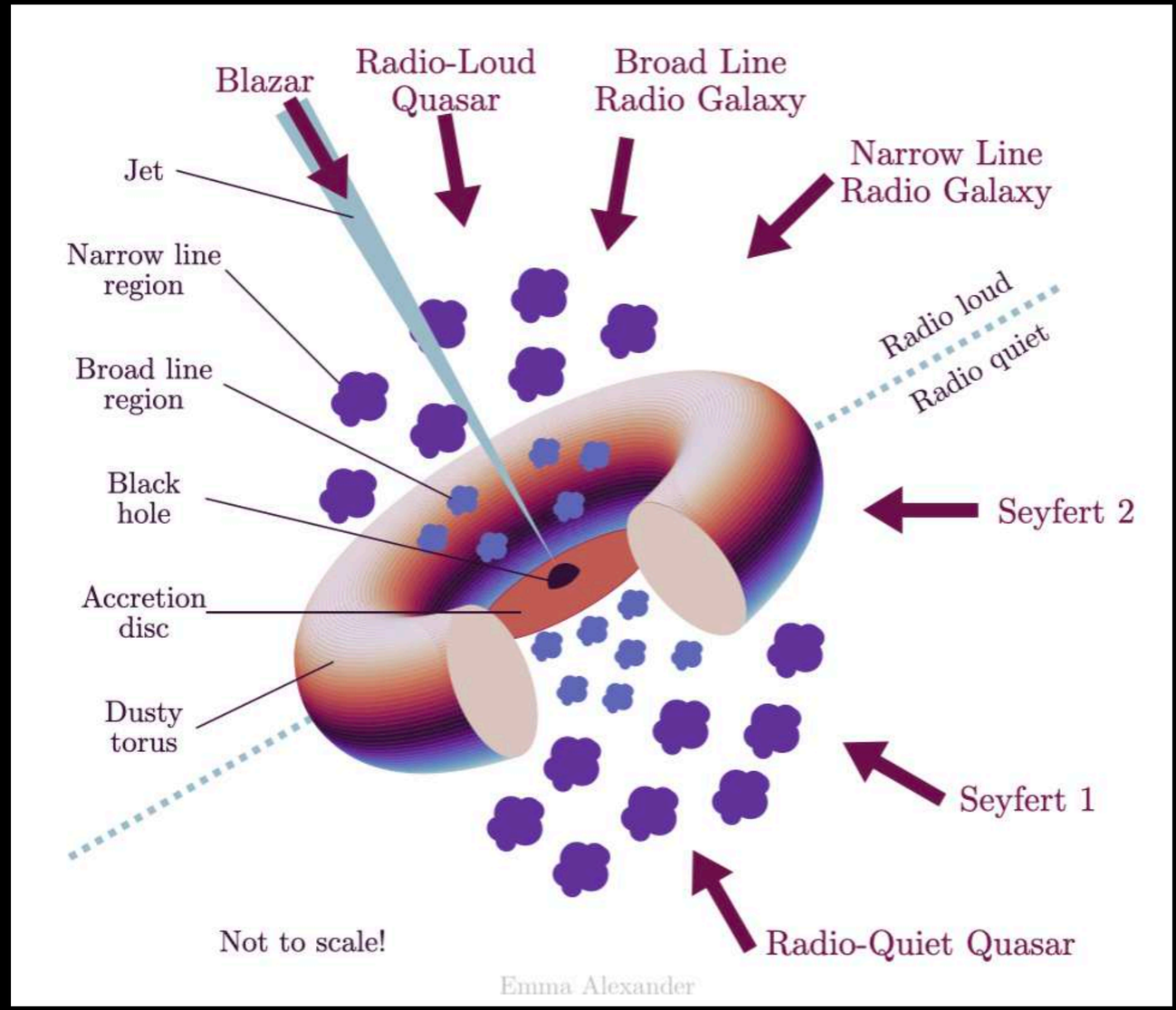
Seyfert galaxies?

AGNs - The unified model



Quasars = “quasi-stellar objects”

Seyfert galaxies?

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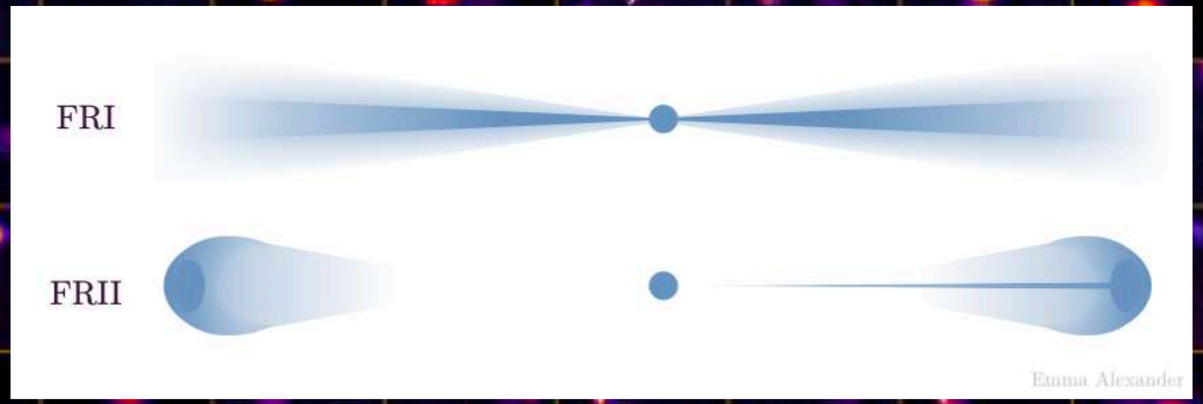
Radio galaxies (FR classification)



NRAO

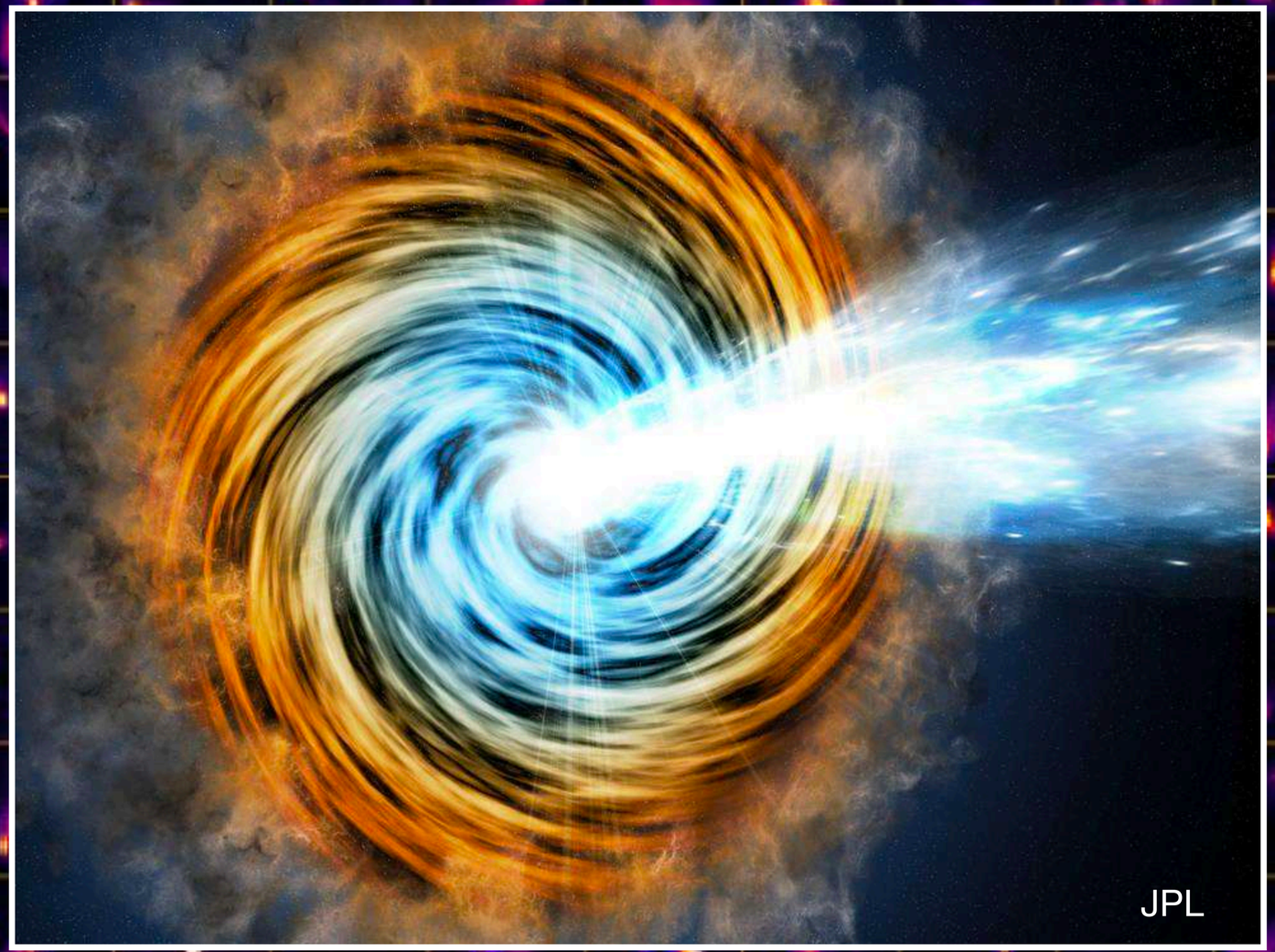
Quasars = “quasi-stellar objects”

Seyfert galaxies?

AGNs - The unified model

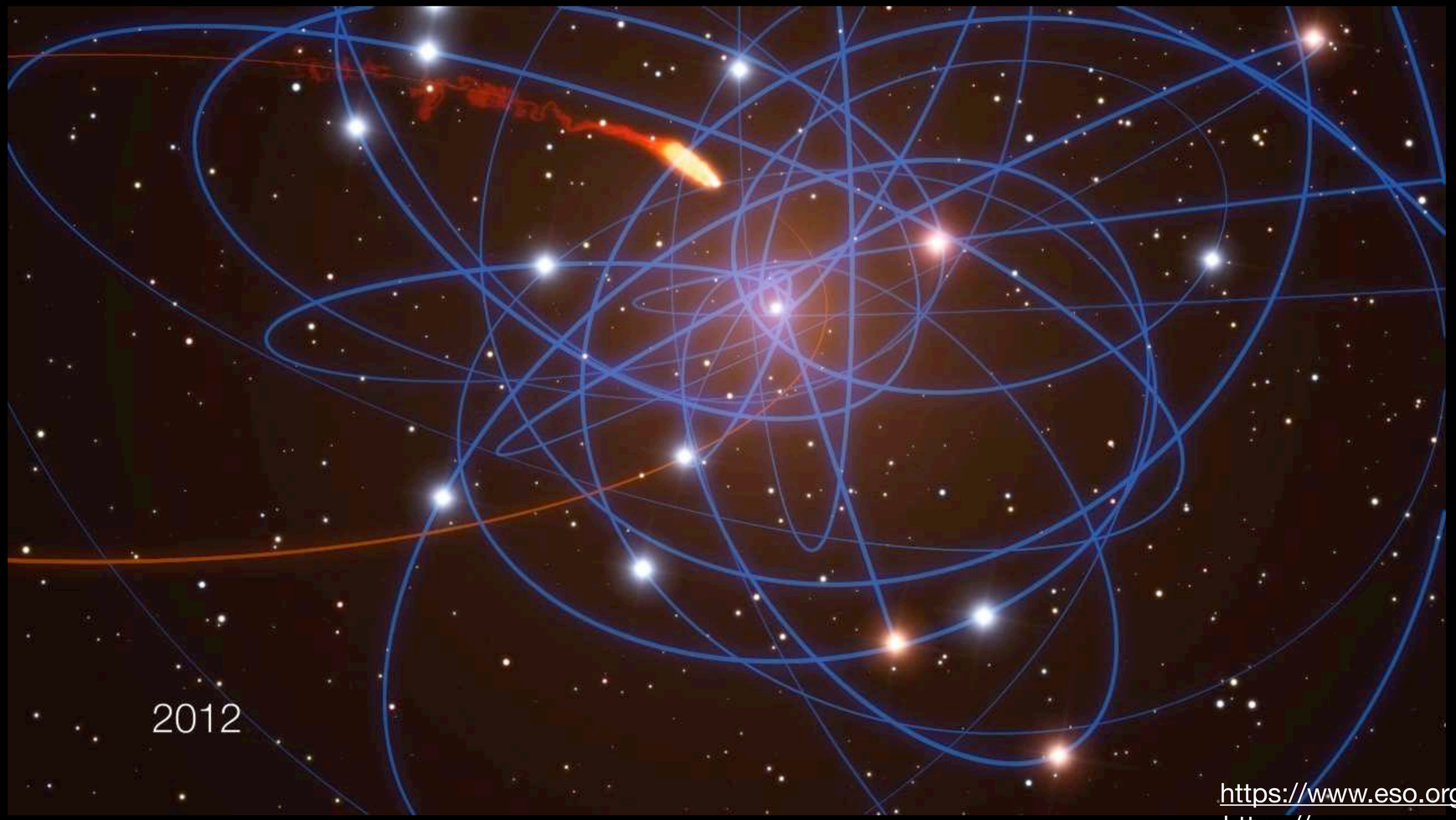
Radio galaxies (FR classification)

Blazars

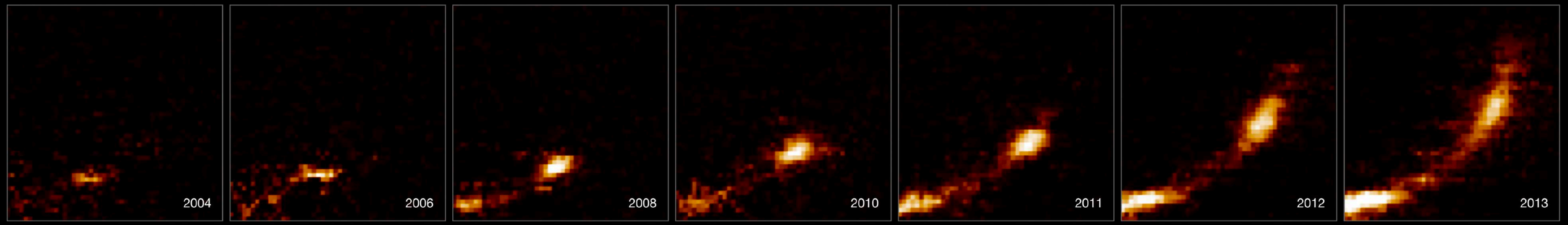


¿Es nuestra galaxia la Vía Láctea una galaxia activa?

Composite by Judy Schmidt



https://www.eso.org/public/videos/eso1151e/
https://www.eso.org/public/videos/eso1151f/



Visualization: NASA, ESA, and F. Summers (STScI);
Simulation: NASA, ESA, G. Besla (Columbia University), and R. van der Marel (STScI)


Rogelio Bernal Andreo
DeepSkyColors.com

https://iopscience.iop.org/journal/2041-8205/page/Focus_on_First_Sgr_A_Results

THE ASTROPHYSICAL JOURNAL LETTERS

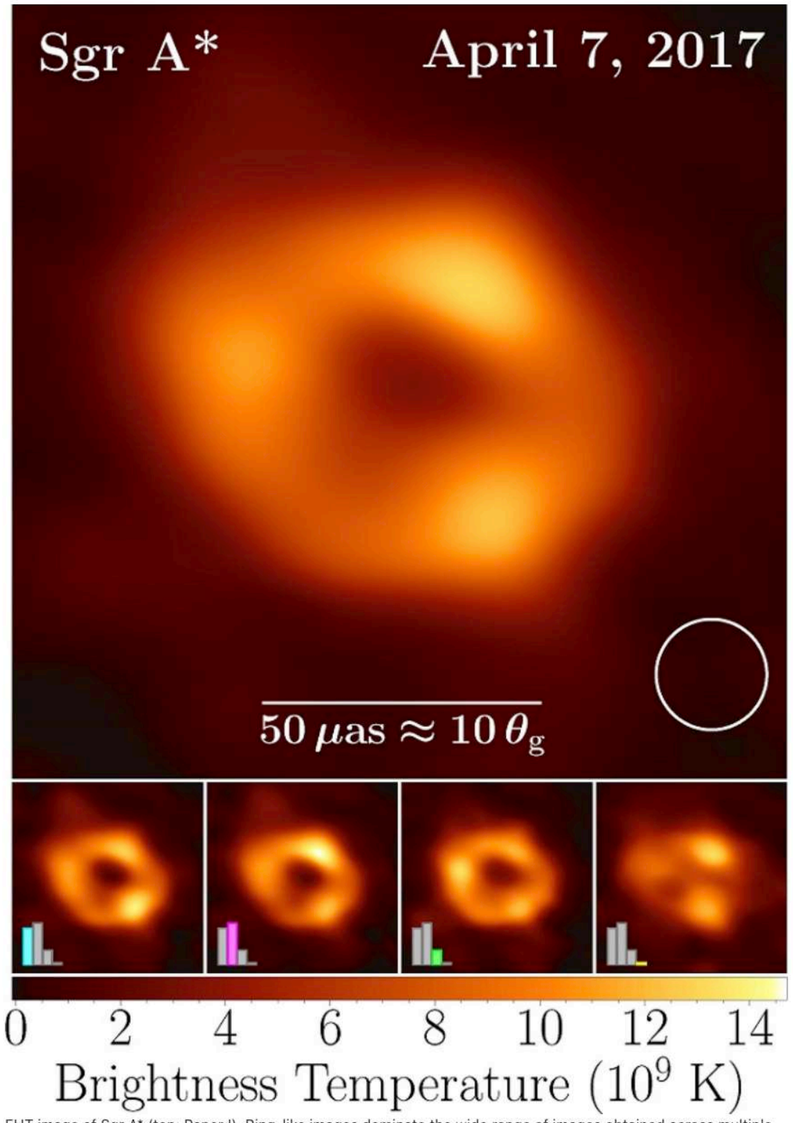
Focus on First Sgr A* Results from the Event Horizon Telescope

Geoffrey C. Bower (Project Scientist) for the Event Horizon Telescope Collaboration

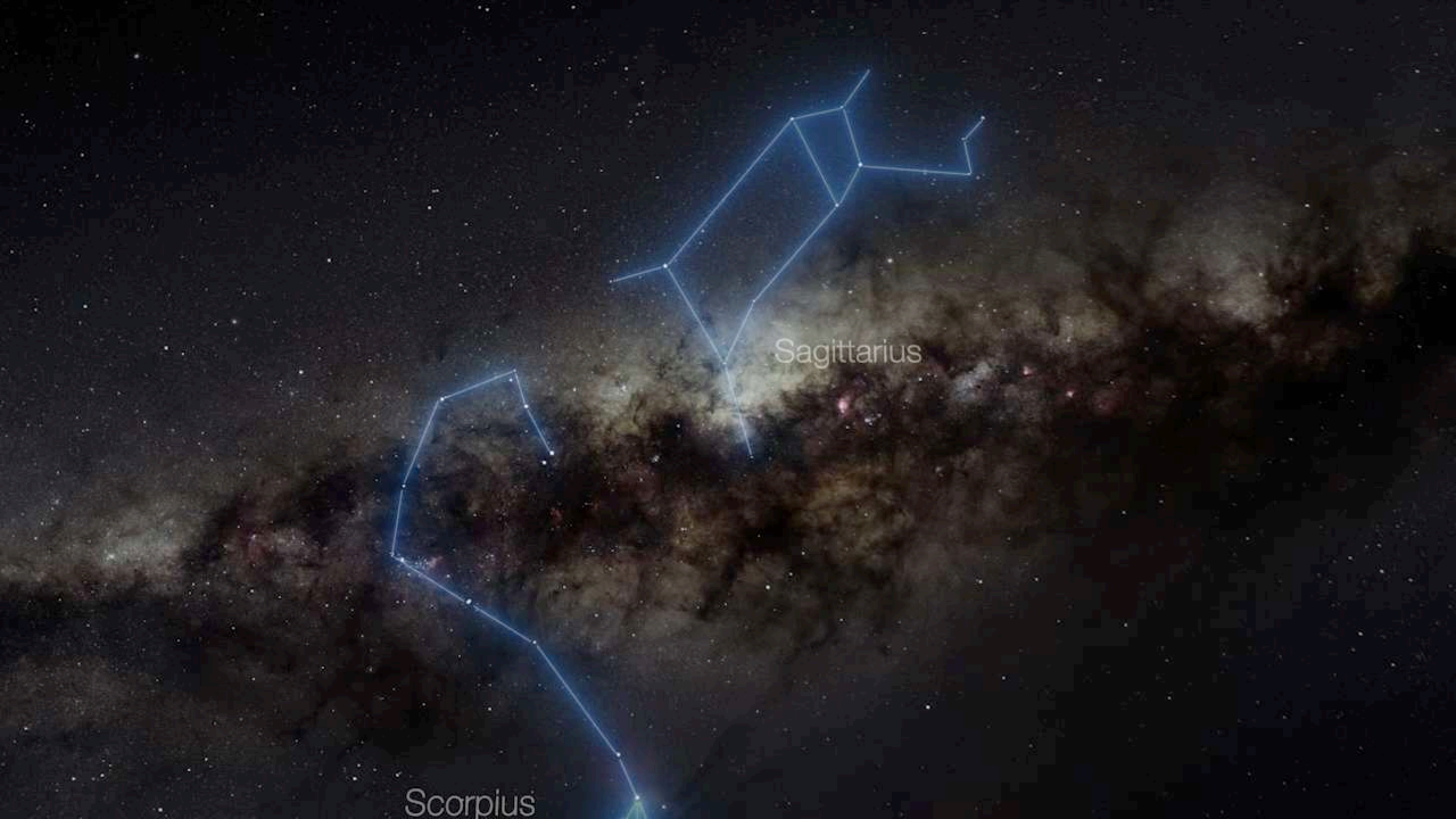
May 2022

We present the first image of the Galactic Center black hole, Sagittarius A*. Identified nearly 50 years ago as the nearest supermassive black hole candidate and among the most studied astrophysical objects, Sgr A* is the ultimate laboratory for black hole astrophysics. In six papers, the Event Horizon Telescope Collaboration presents observations, images, and analysis that spark new insights into accretion, outflow, and gravitational physics on scales not accessible through any other observation. These results are the culmination of a multi-year effort by the EHTC and a decades-long journey by the astronomy community to approach the event horizon through high-resolution imaging.

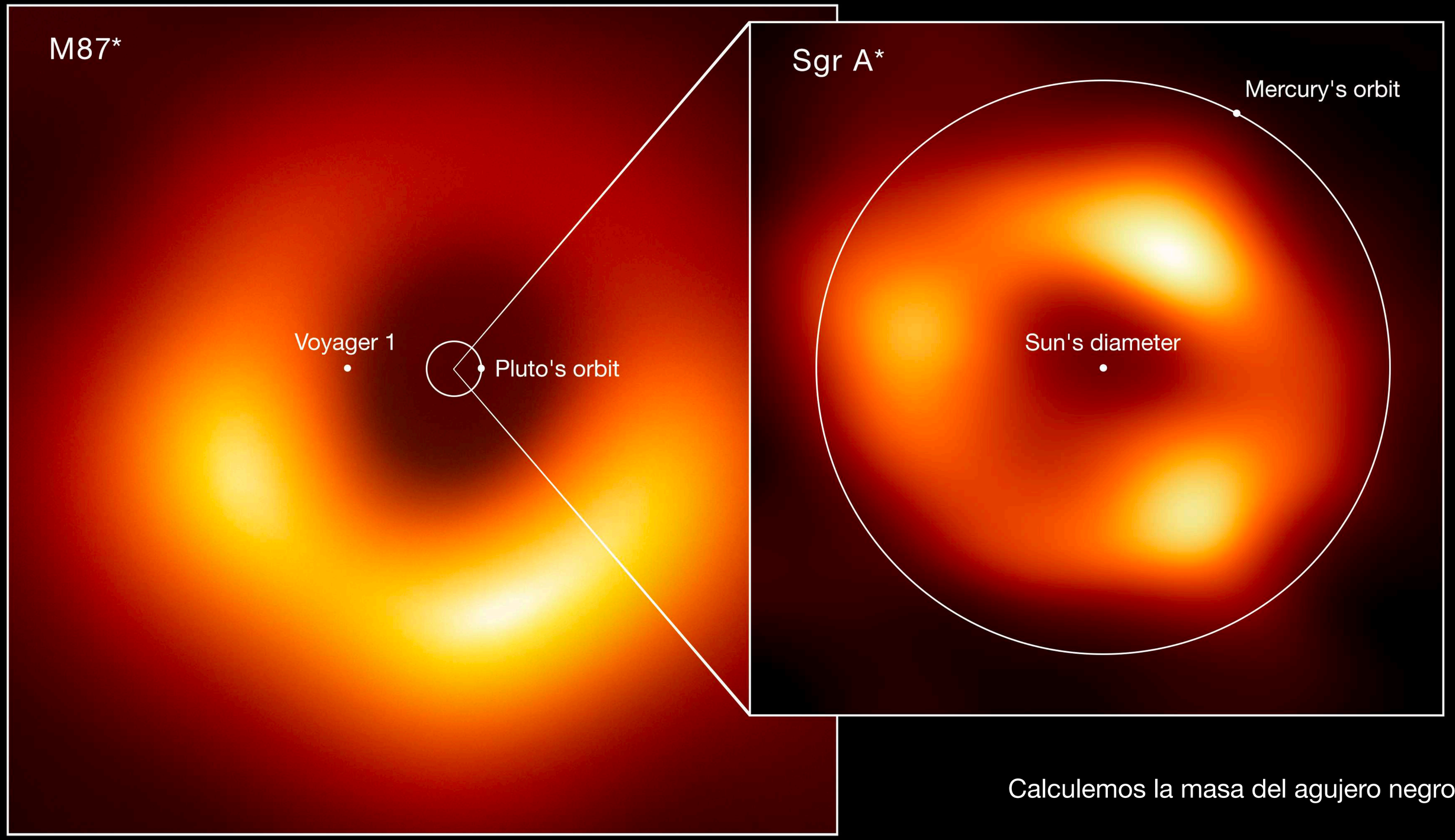
The Sgr A* image (Figure 1) reveals the same ring-like structure and shadow seen in the M87* black hole. The observed ring is the result of lensed emission with a diameter precisely predicted by general relativity using only the mass and distance of the black hole. By a cosmic coincidence, the observed Sgr A* angular diameter differs only slightly from that of M87*, which is 1500 times more massive and 2000 times more distant. Together, the



EHT image of Sgr A* (top, Paper I). Ring-like images dominate the wide range of images obtained across multiple


Sagittarius
Scorpius


Radio light



Calculemos la masa del agujero negro!