مرصد القطامية الفلكي : المدرسة العربية المتقدمة السادسة للفيزياء الفلكية : 26 أكتوبر 2026

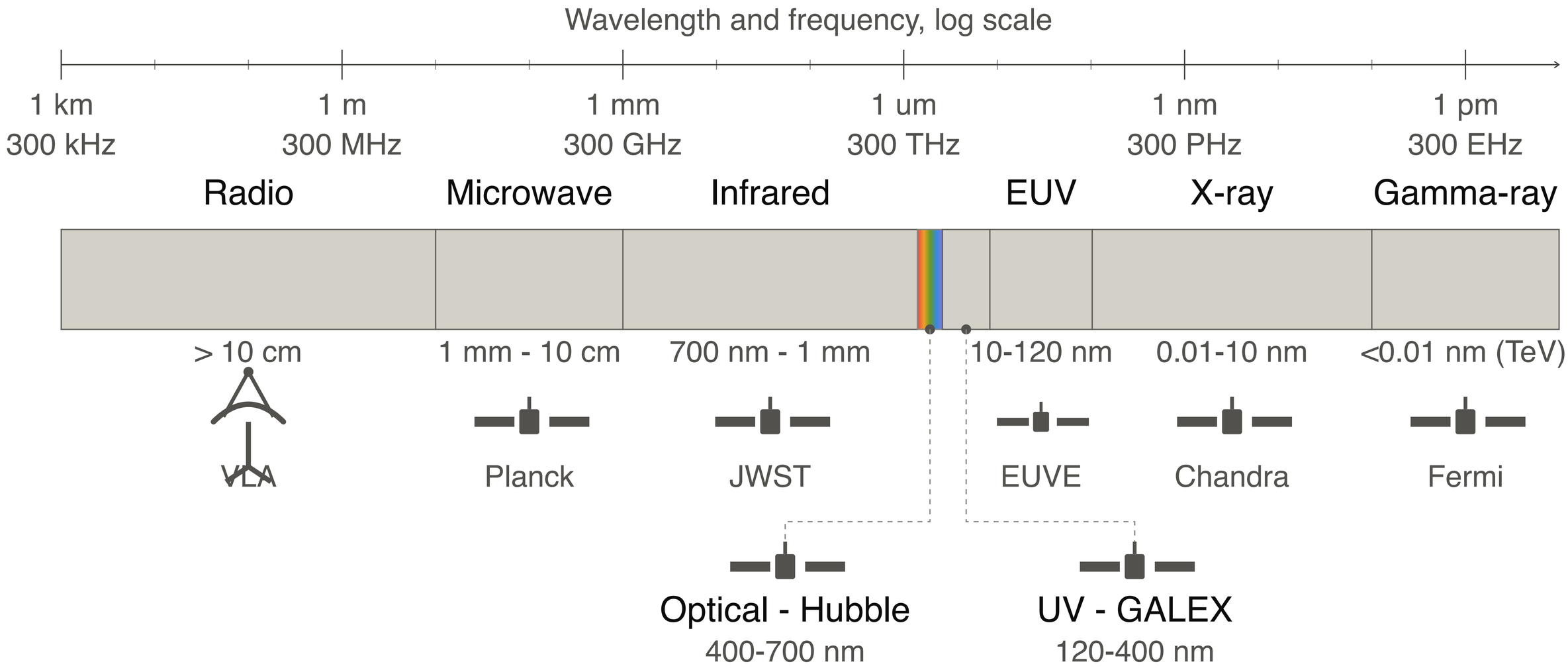
X-ray Astronomy with *Chandra*

VINAY KASHYAP (CfA/CXC Calibration Scientist)

فينايكاشياب

2026 October 26 : VI Advanced Arab Astrophysics School : Kottamia Astronomical Observatory

The Electromagnetic Spectrum



claude.ai

1 um
00 THz

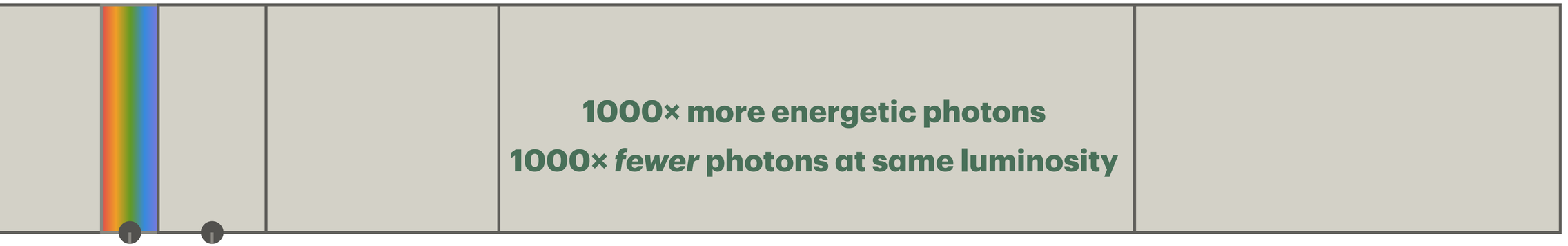
1 nm
300 PHz

1 pm
300 EHz

EUV

X-ray

Gamma-ray



10-120 nm

0.01-10 nm

<0.01 nm (TeV)

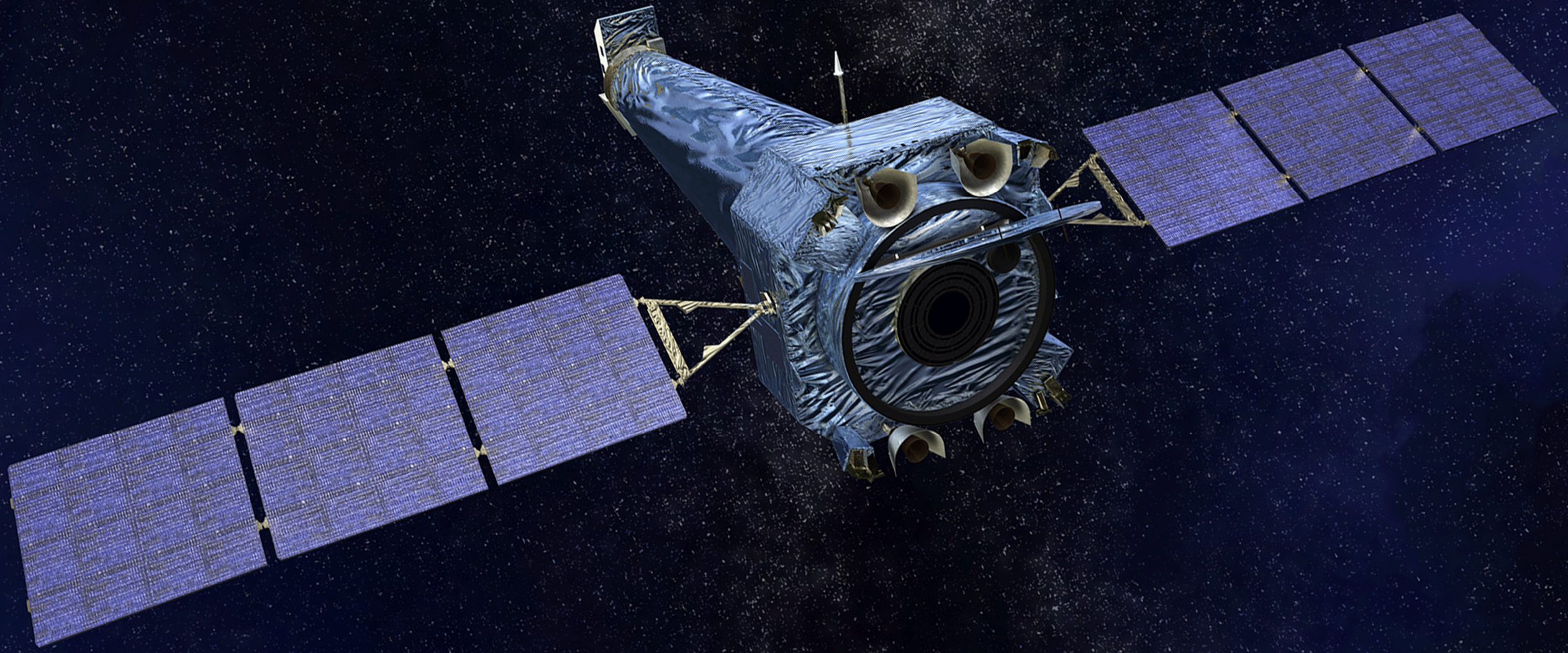
EUVE

Chandra

Fermi

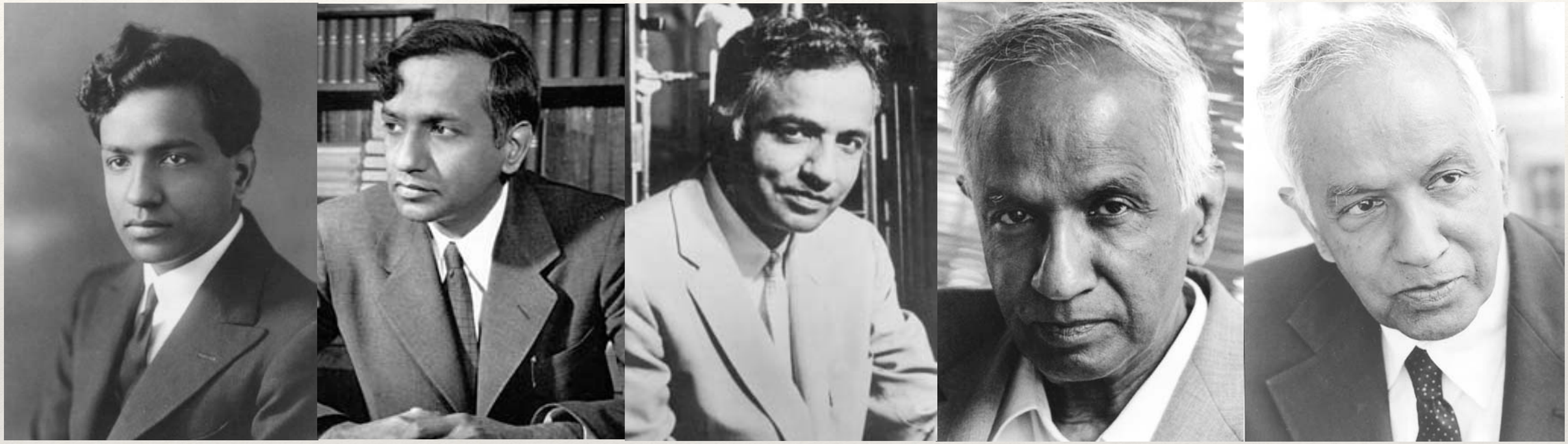
claude.ai

One of NASA's Great Observatories along with *Compton*, *Hubble*, and *Spitzer*.



Launched 23 July 1999 on Space Shuttle *Columbia* into a highly elliptical high-altitude orbit.

THE *CHANDRA* ADVANCED X-RAY ASTRONOMY FACILITY



Subramanyan Chandrasekhar

19/10/1910 – 21/8/1995

◊ **Introduction to the Study of Stellar Structure (1939)** ◊ **Principles of Stellar Dynamics (1942)**
◊ **Radiative Transfer (1950)** ◊ **Hydrodynamic and Hydromagnetic Stability (1961)**
◊ **Ellipsoidal Figures of Equilibrium (1968)** ◊ **The Mathematical Theory of Black Holes (1983)**
◊ **Newton's *Principia* (1994)**

LAUNCH! JULY 23 1999



LAUNCH! JULY 23 1999






DEPLOYMENT

DEPLOYMENT



THE LAST TIME ANYONE LAID EYES ON CHANDRA

THE LAST TIME ANYONE LAID EYES ON CHANDRA

Although.. July 17, 2024

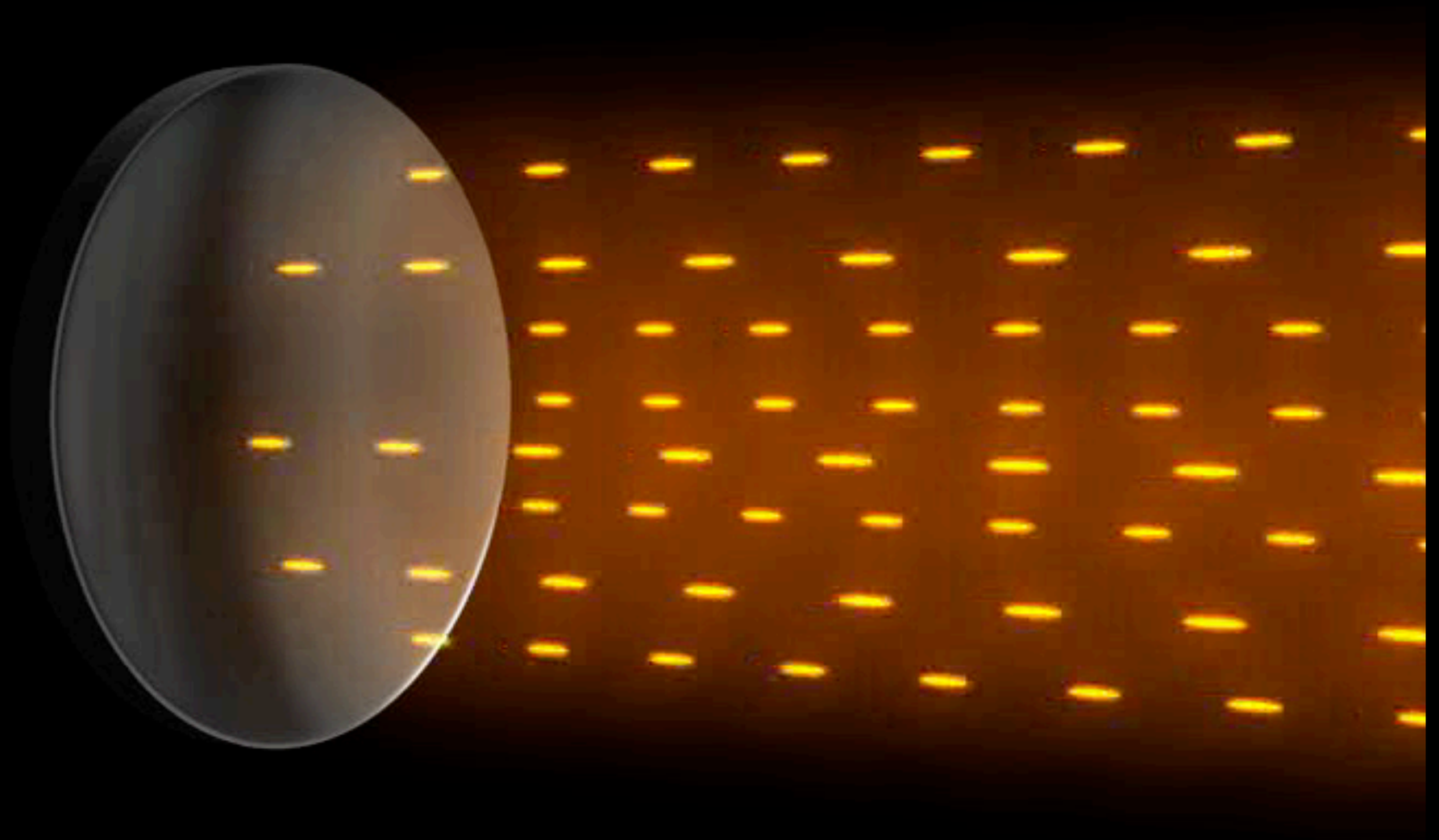
Credit: Scott Tilley

Scott has been tracking Chandra over the years through radio observations and said Chandra's "orbit is well placed for optical observations of an object in deep space, which is what I'm building my system to track." He notes this video of Chandra zooming by represents several hours of data with 5-second-duration frames, and at 120x speed-up.





FOCUSING X-RAYS

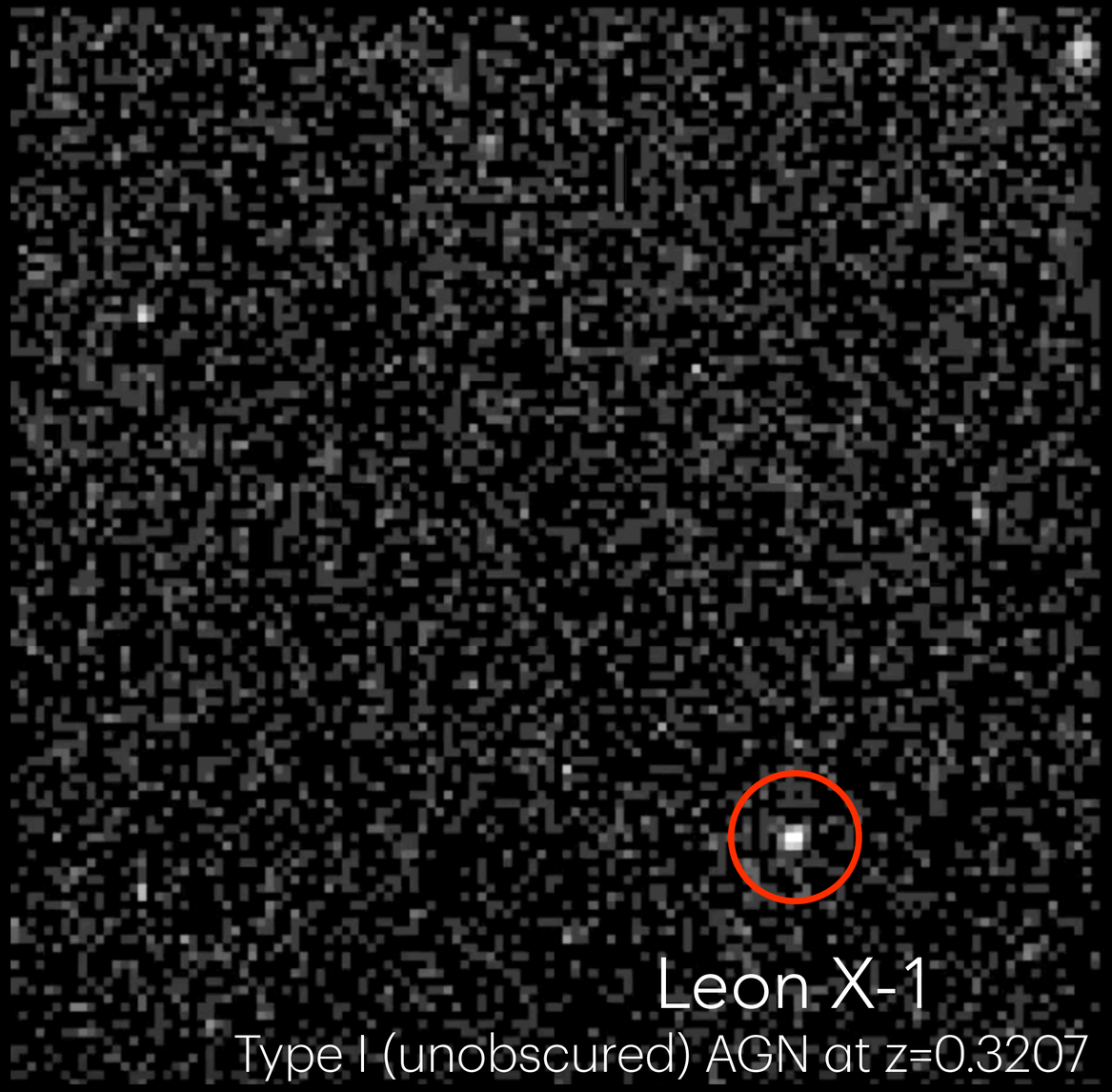


THE SMOOTHEST MIRRORS EVER BUILT



J. Drake

FIRST LIGHT... AUGUST 12 1999



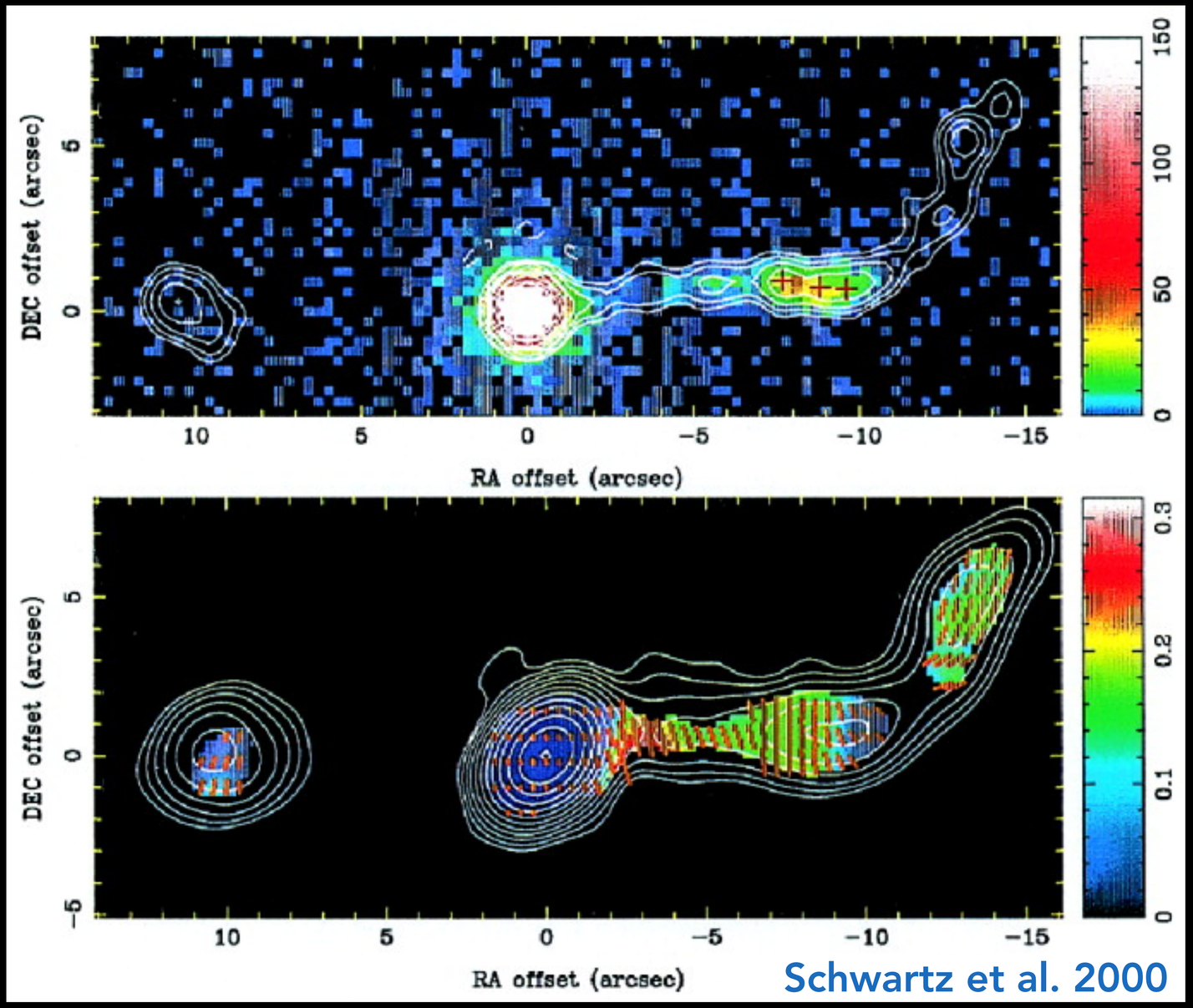
Leon X-1

Type I (unobscured) AGN at z=0.3207



Weisskopf et al. 2006

FIRST FOCUS LIGHT…PKS 0637–752



A quasar chosen for being a point source to test focus

9" jet (100 kpc)

LX ≈ $10^{44.5}$ erg s^{-1}

No X-rays beyond the bend at changed polarization

Not IC/CMB

(no *Fermi* γ-ray detection)

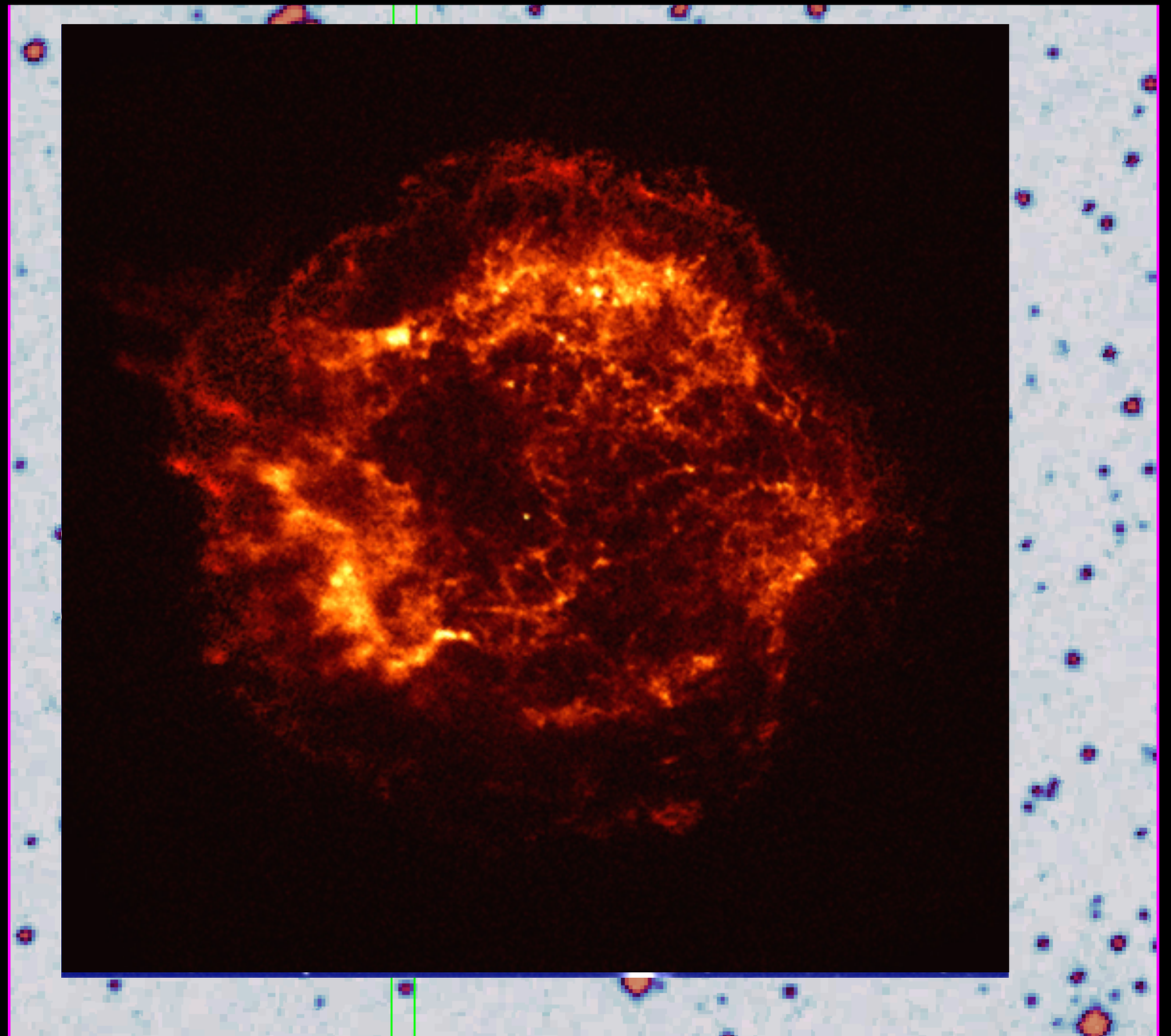
Synchrotron from 2nd e^- population (Meyer+2015)

FIRST TARGETED LIGHT …CASSIOPEIA A

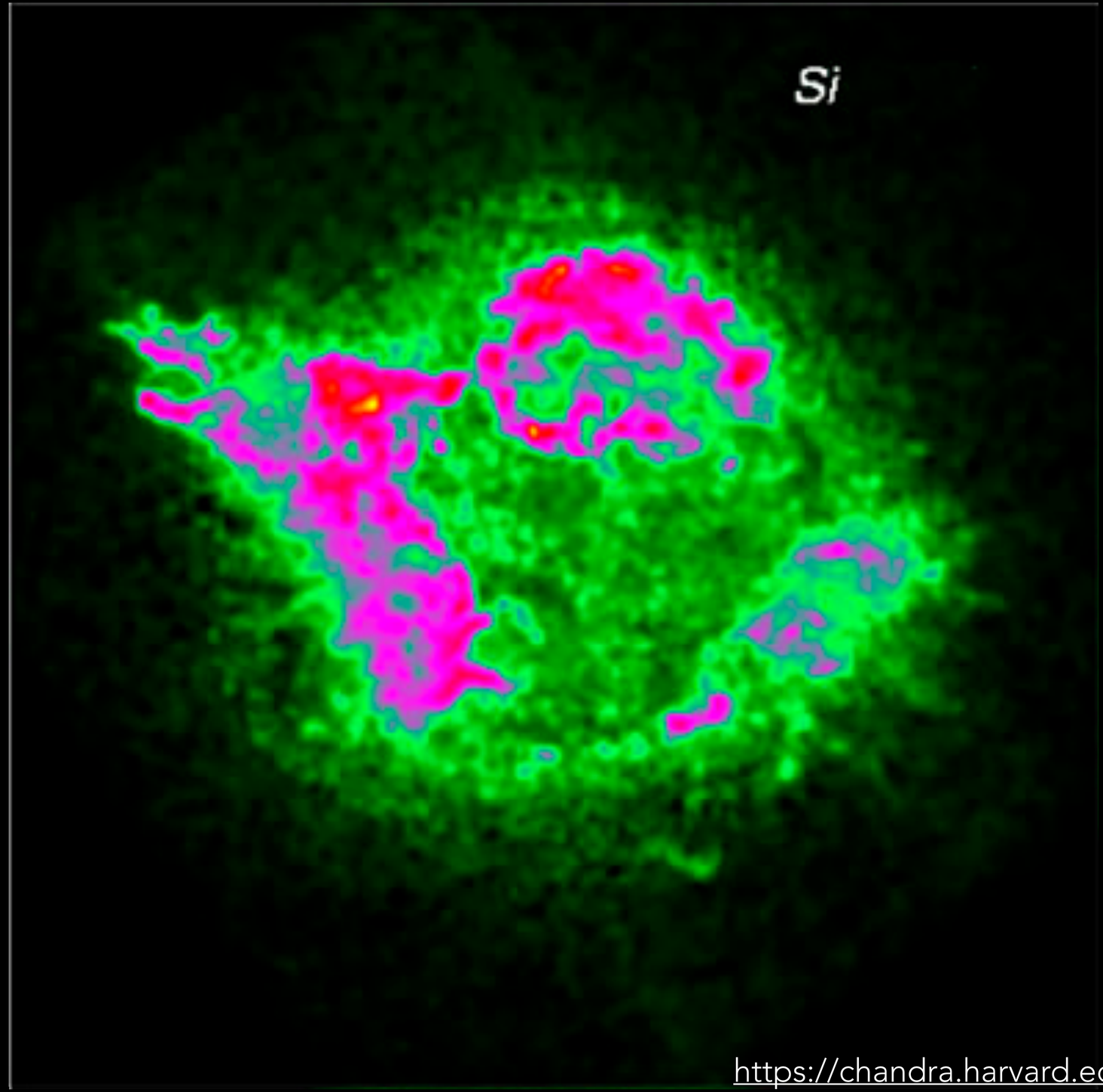
DSS

Hubble

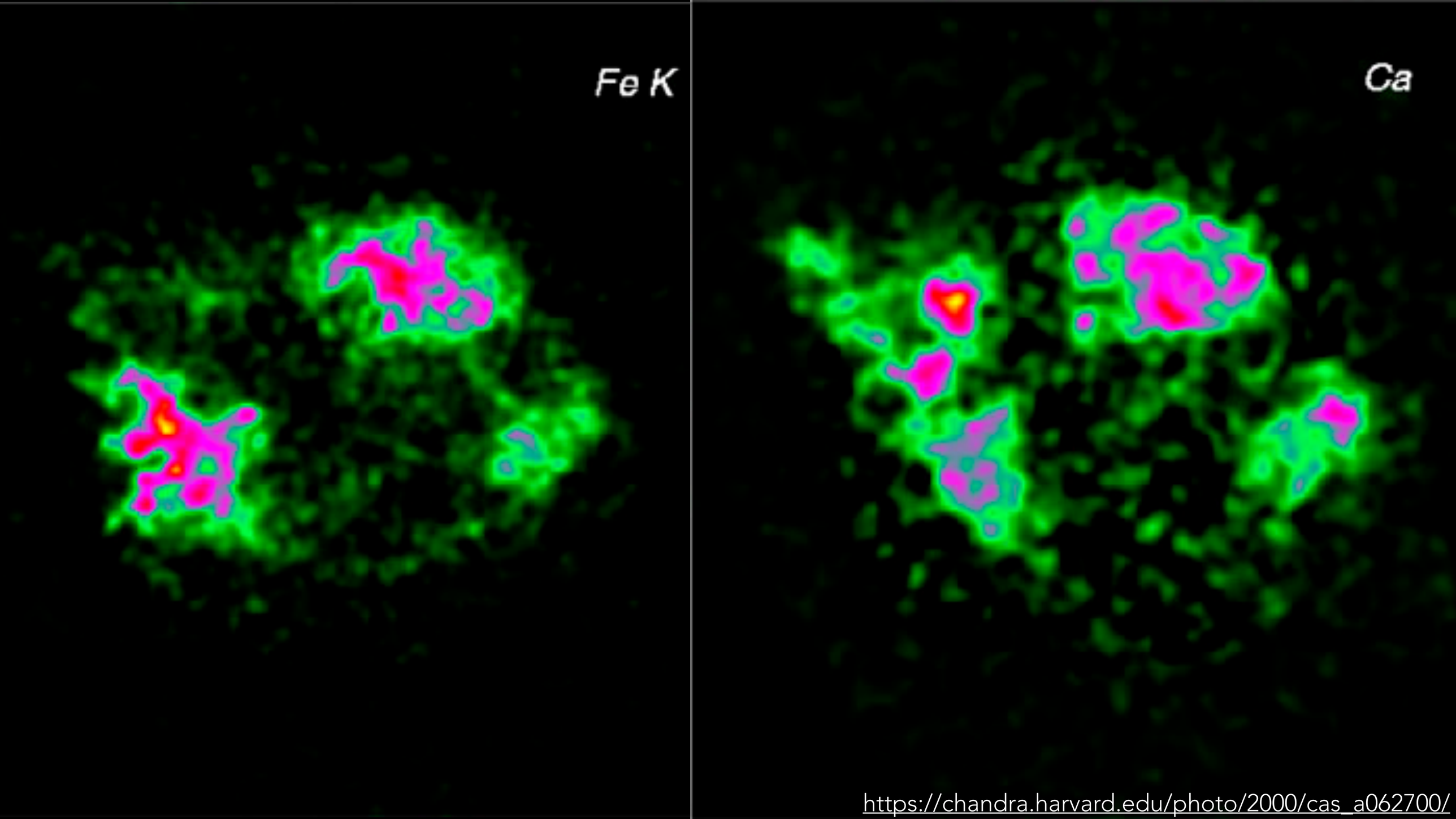
Chandra



https://chandra.harvard.edu/photo/1999/0237/



https://chandra.harvard.edu/photo/2000/cas_a062700/



https://chandra.harvard.edu/photo/2000/cas_a062700/

On to CIAO!