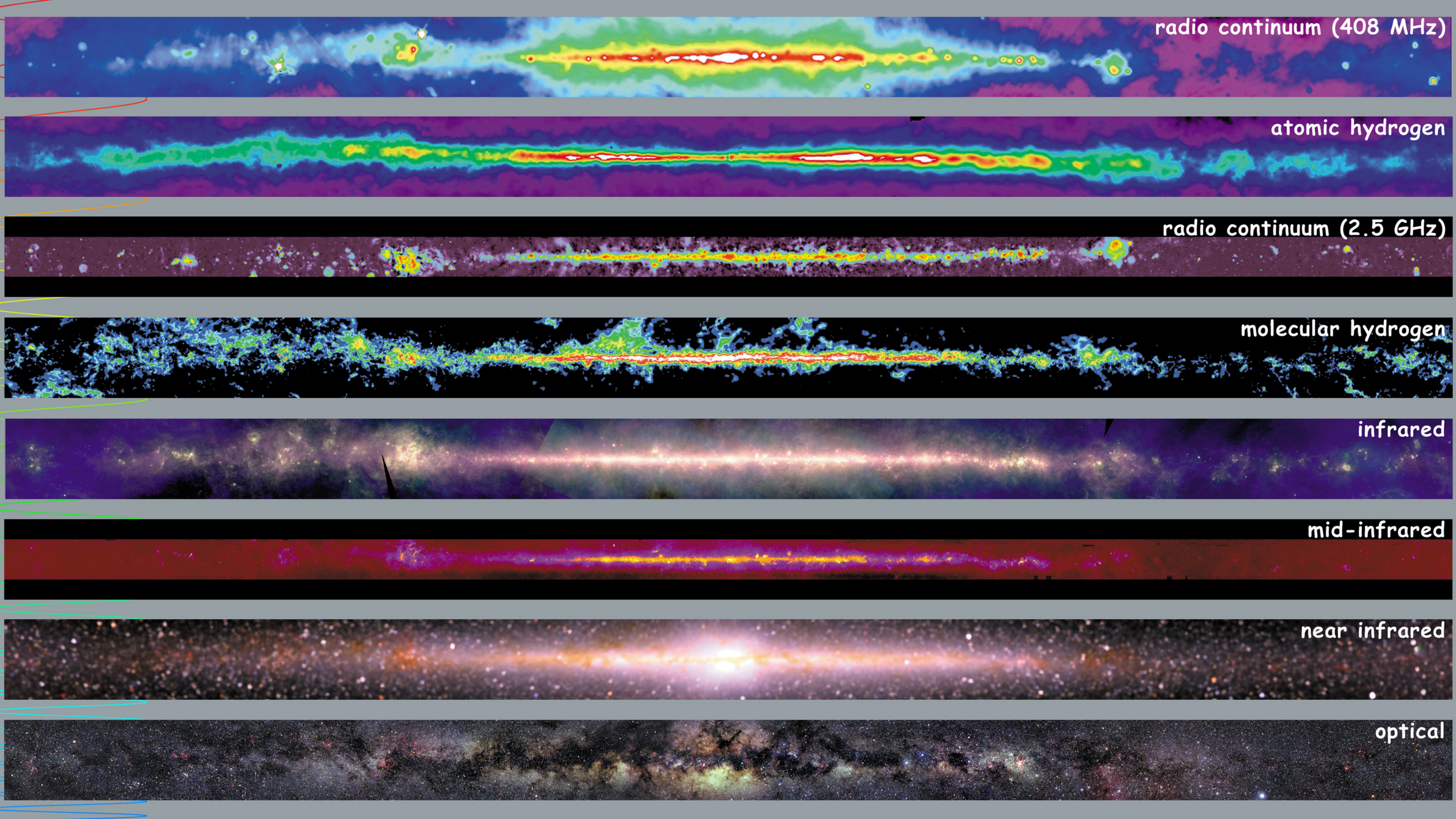
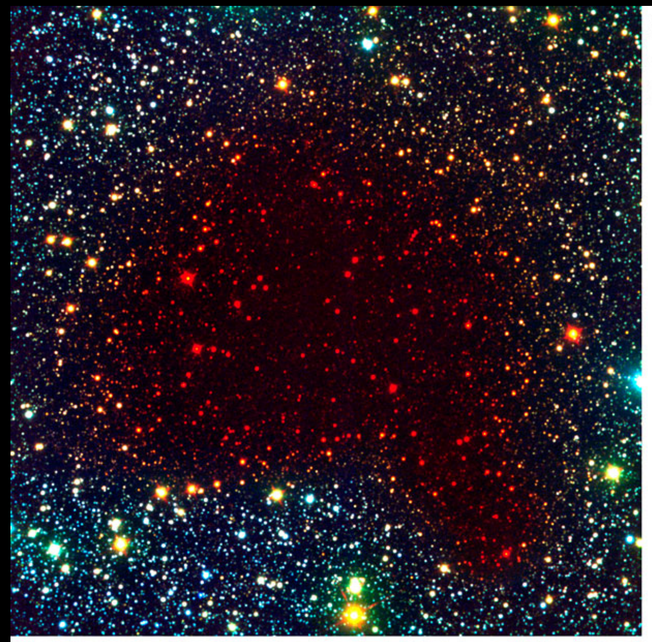
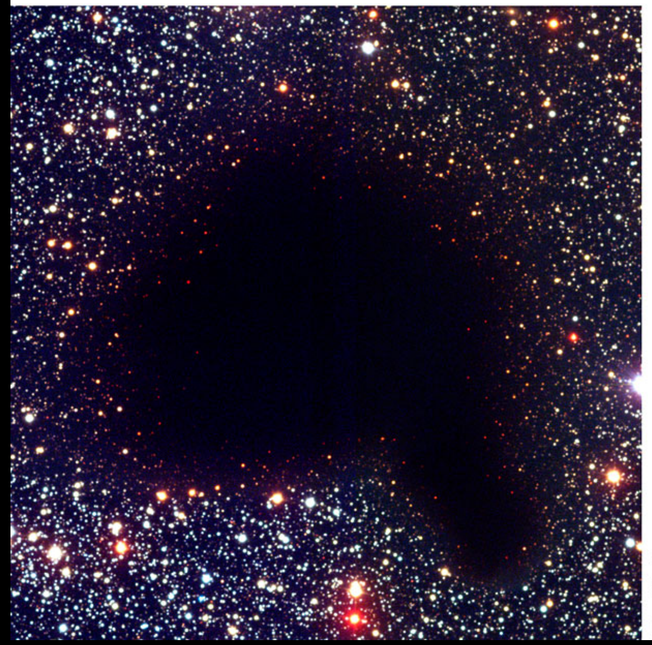

radio continuum (408 MHz)
atomic hydrogen
radio continuum (2.5 GHz)
molecular hydrogen
infrared
mid-infrared
near infrared
optical



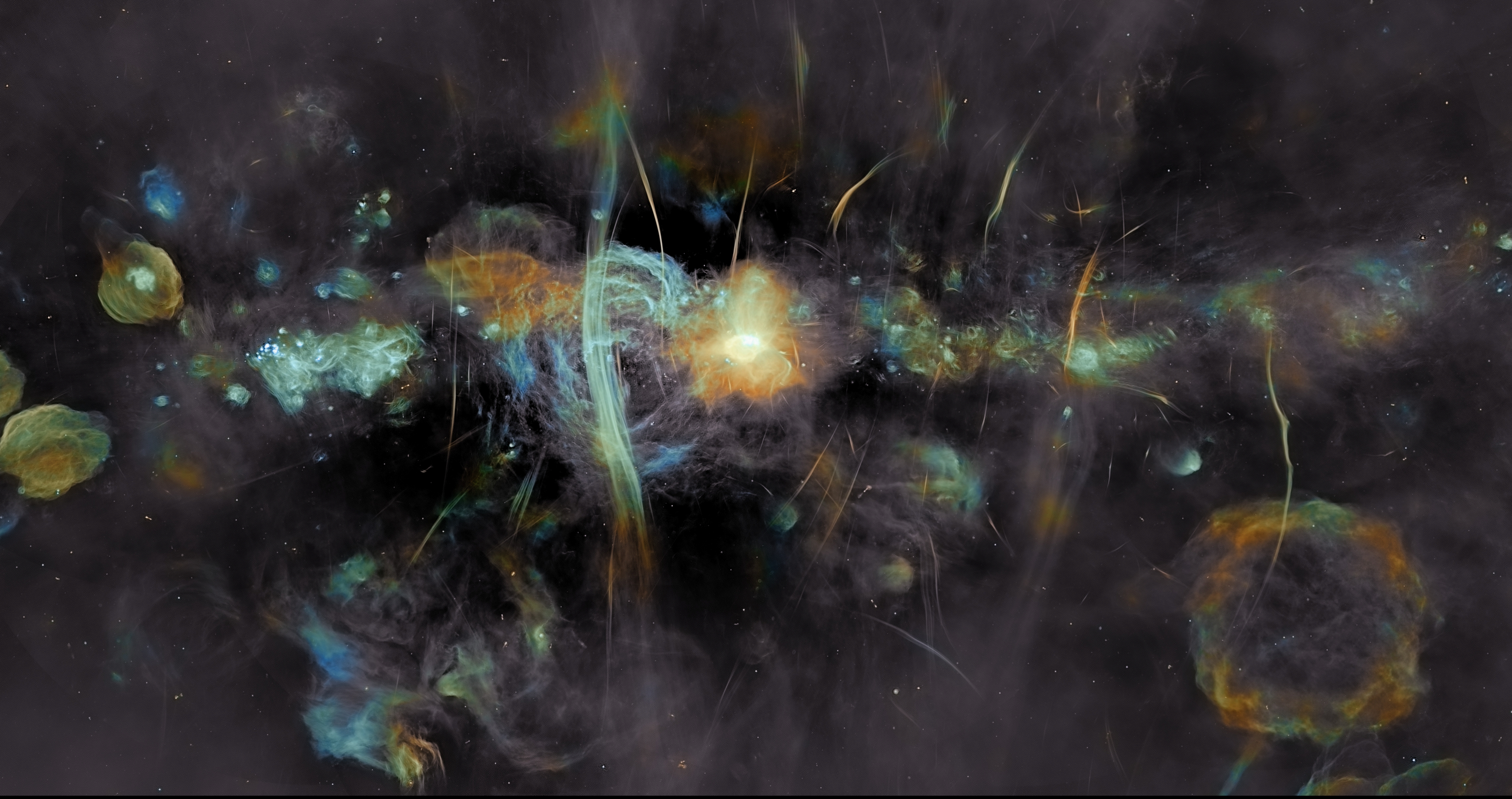


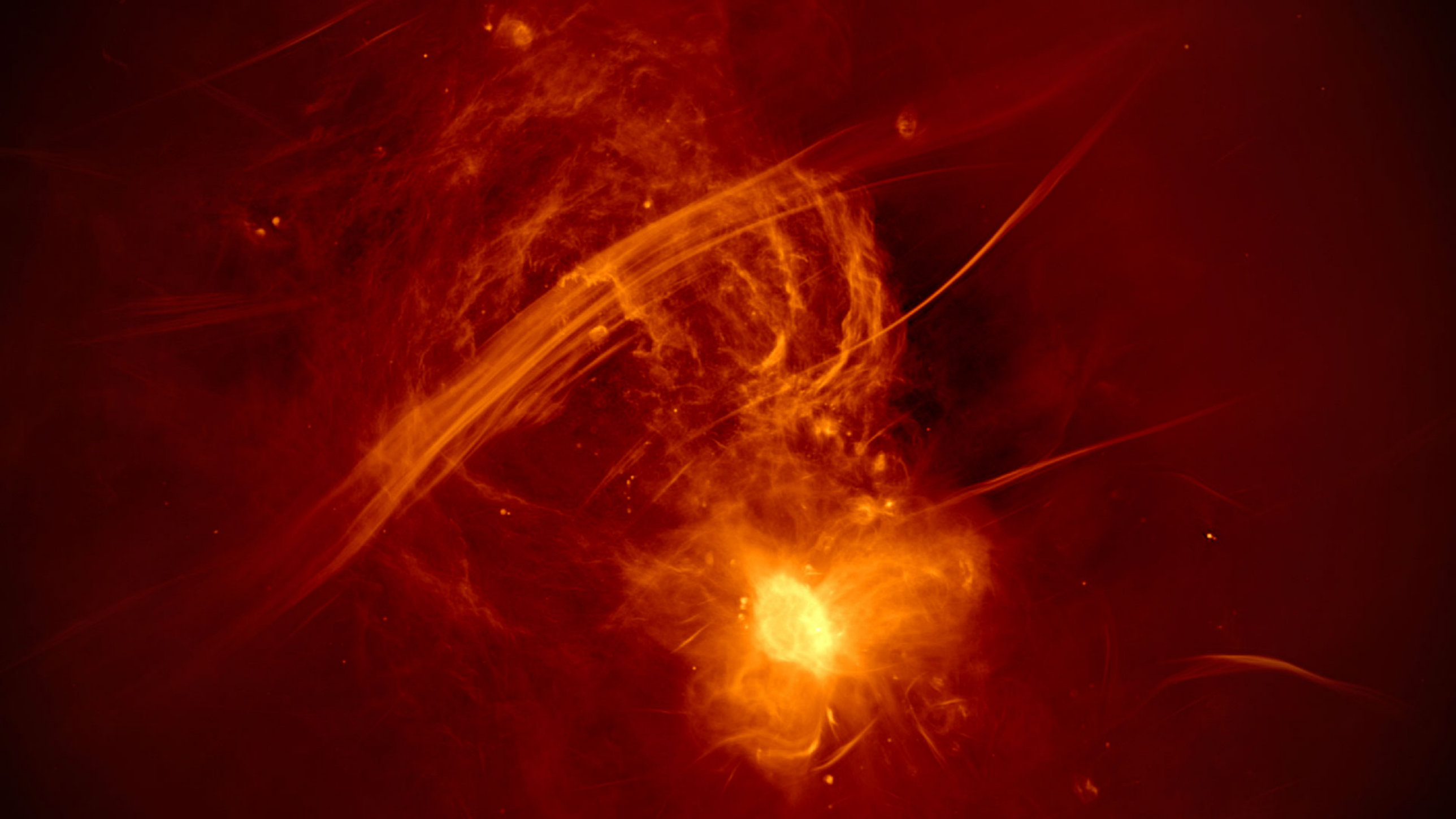
M16 ▪ Eagle Nebula

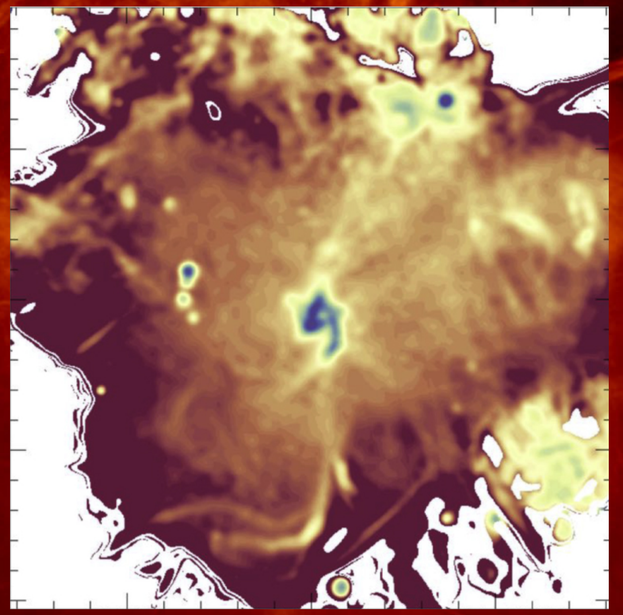
Hubble Space Telescope ▪ WFC3/UVIS/IR

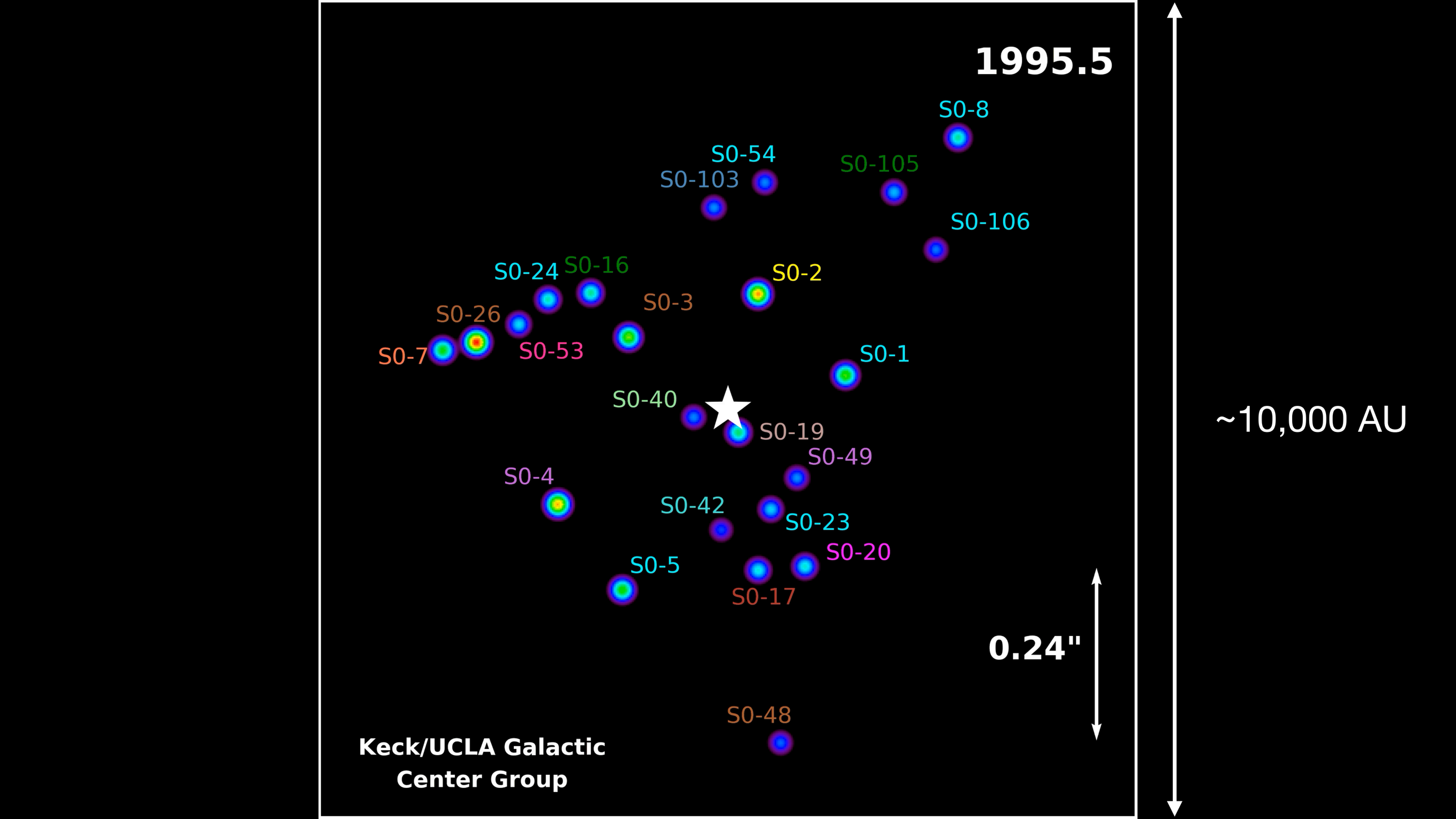
NASA and ESA

STScI-PRC15-01c


SARAO, Heywood et al. (2022) / J. C. Muñoz-Mateos
Spectral index
-1.8
-1.0
0
1.0






1995.5
S0-8
S0-54
S0-105
S0-103
S0-106
S0-24
S0-16
S0-2
S0-3
S0-26
S0-7
S0-53
S0-1
S0-40
S0-19
S0-49
S0-4
S0-42
S0-23
S0-20
S0-5
S0-17
S0-48
0.24"
~10,000 AU
Keck/UCLA Galactic
Center Group

All signs point to a supermassive black hole

Mass ~ 4 x 10^6 solar masses

How did it form?

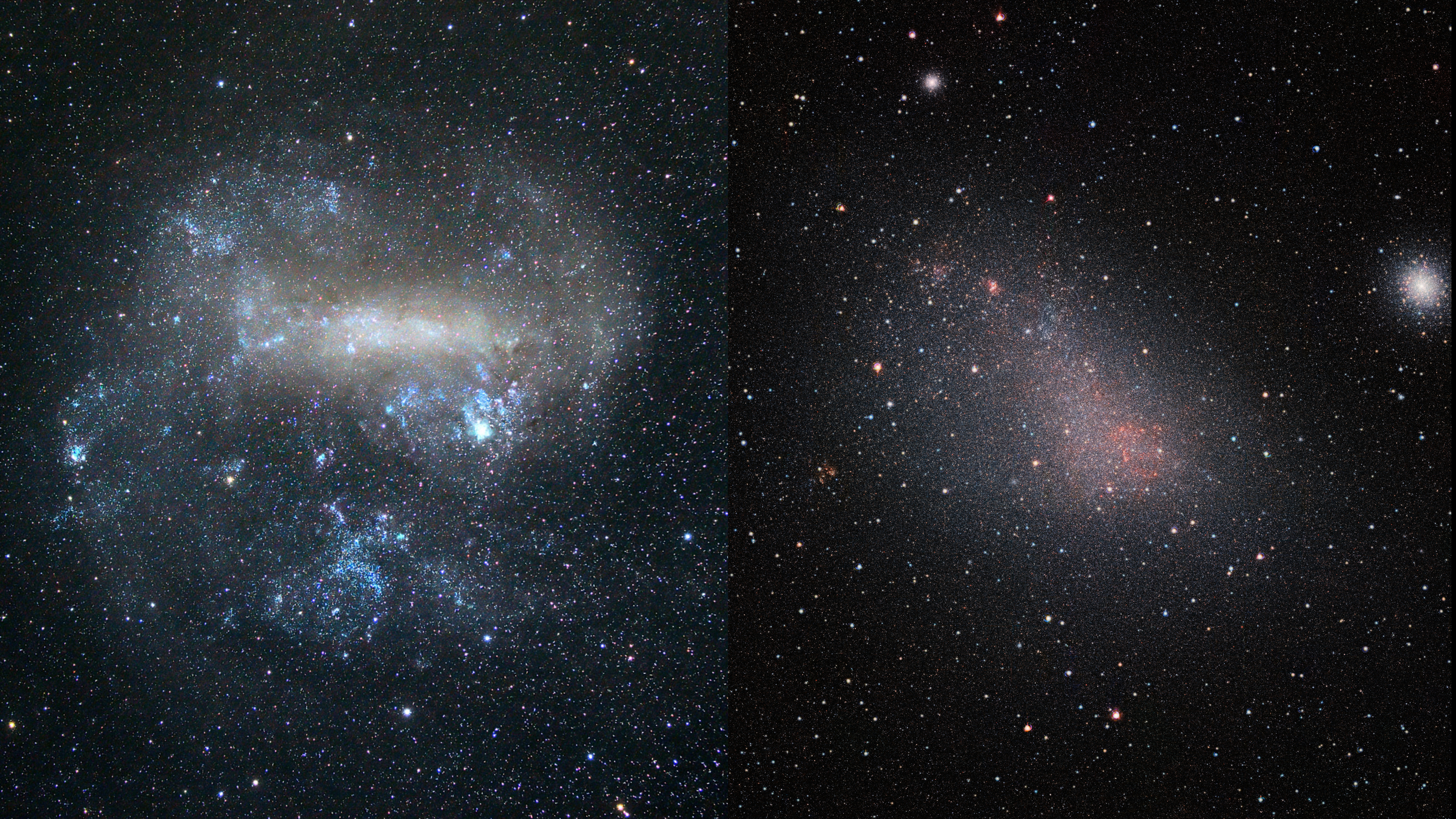
Has it gotten bigger?

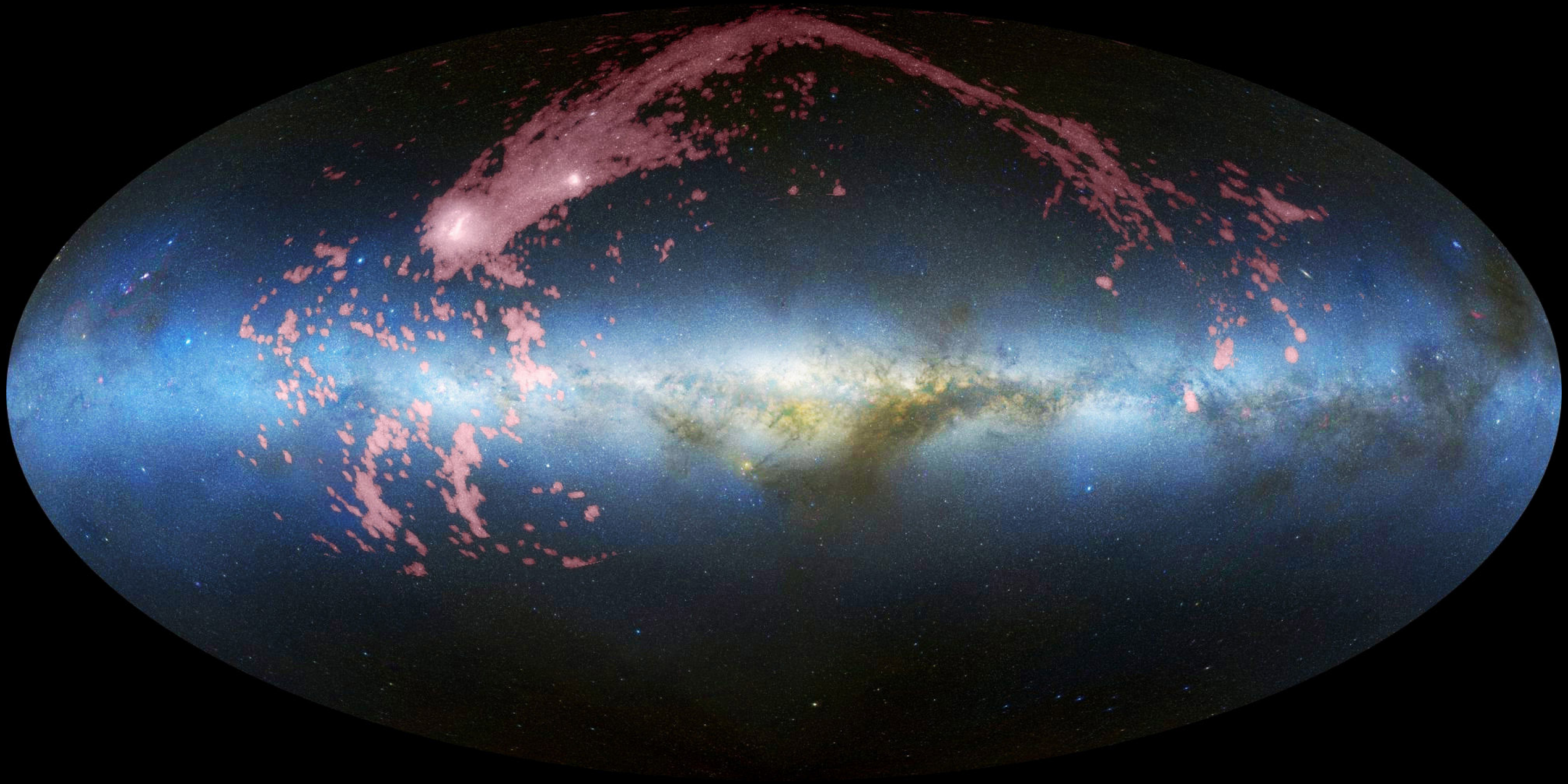
How does it affect the Galactic center?

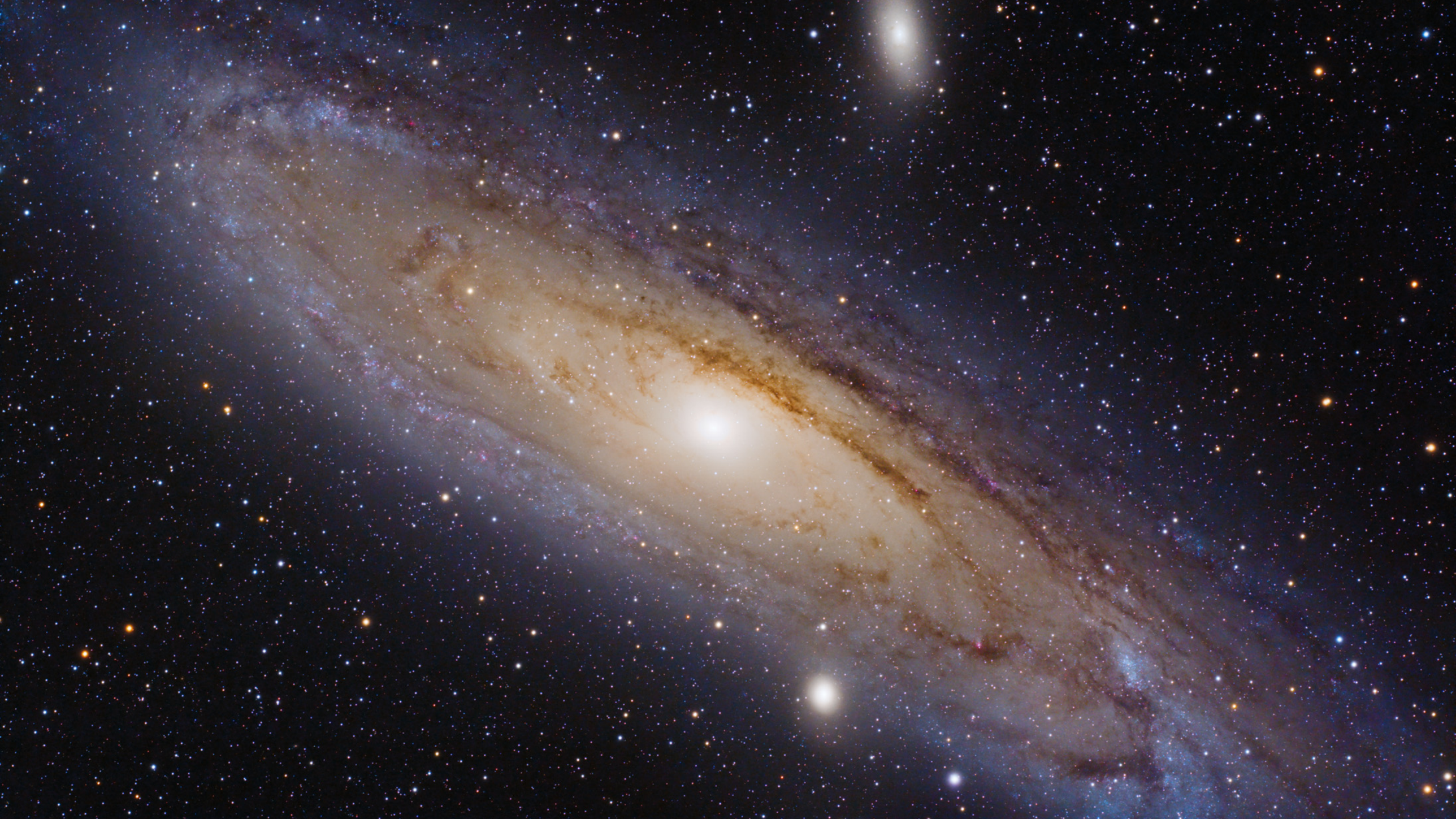
It's not "eating" now, what happens when it does?

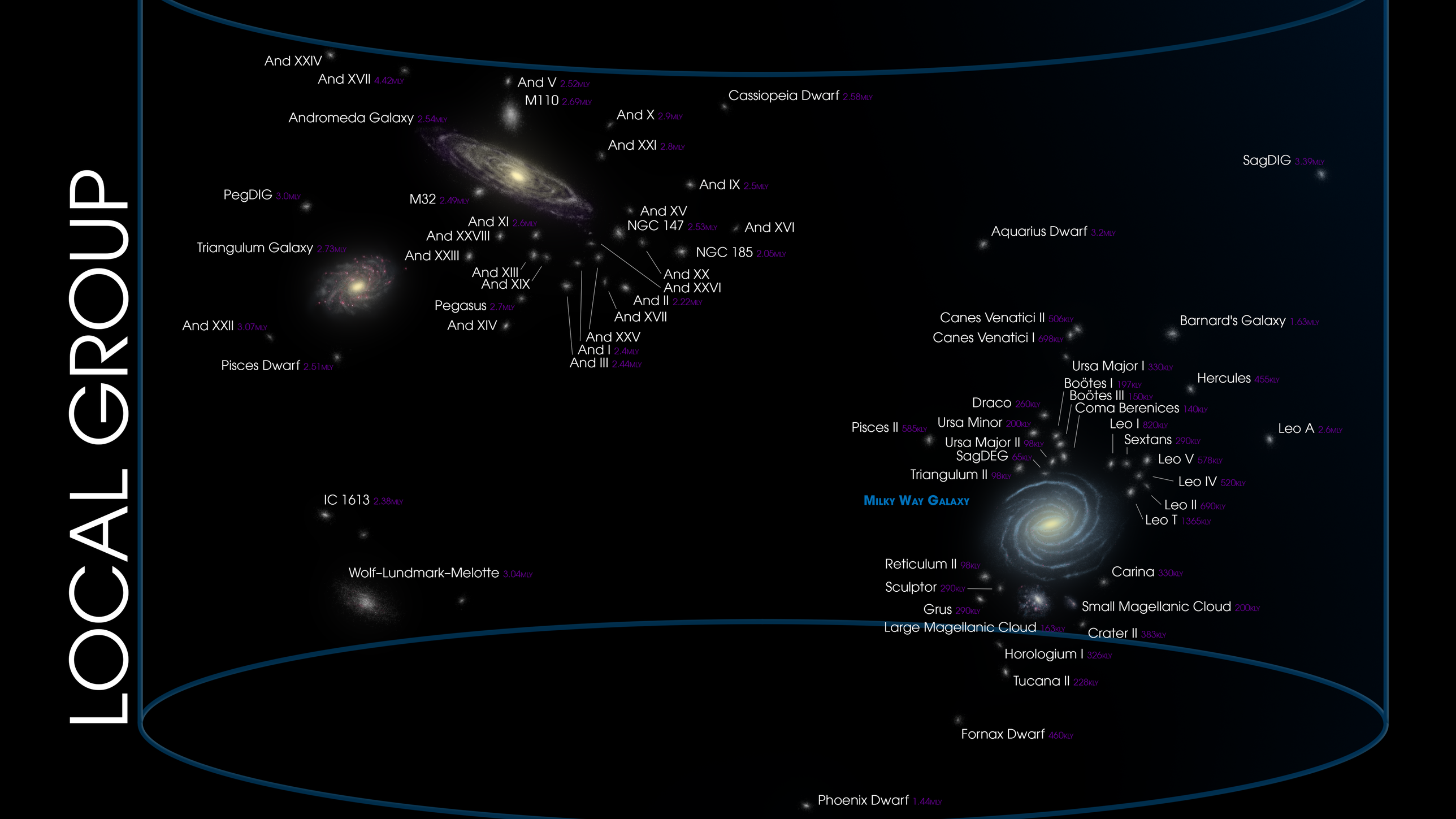
Is this common or rare?

Does every galaxy have one?








LOCAL GROUP
And XXIV
And XVII 4.42MLY
And V 2.52MLY
M110 2.69MLY
Cassiopeia Dwarf 2.58MLY
Andromeda Galaxy 2.54MLY
And X 2.9MLY
And XXI 2.8MLY
SagDIG 3.39MLY
And IX 2.5MLY
PegDIG 3.0MLY
M32 2.49MLY
And XV
NGC 147 2.53MLY
And XVI
And XI 2.6MLY
And XXVIII
Aquarius Dwarf 3.2MLY
Triangulum Galaxy 2.73MLY
And XXIII
NGC 185 2.05MLY
And XX
And XXVI
And XIII
And XIX
And II 2.22MLY
Pegasus 2.7MLY
And XVII
Canes Venatici II 506KLY
Barnard's Galaxy 1.63MLY
And XXII 3.07MLY
And XIV
Canes Venatici I 698KLY
And XXV
And I 2.4MLY
Pisces Dwarf 2.51MLY
And III 2.44MLY
Ursa Major I 330KLY
Hercules 455KLY
Boötes I 197KLY
Boötes III 150KLY
Draco 260KLY
Coma Berenices 140KLY
Pisces II 585KLY
Ursa Minor 200KLY
Leo I 820KLY
Leo A 2.6MLY
Ursa Major II 98KLY
Sextans 290KLY
SagDEG 65KLY
Leo V 578KLY
Triangulum II 98KLY
Leo IV 520KLY
IC 1613 2.38MLY
MILKY WAY GALAXY
Leo II 690KLY
Leo T 1365KLY
Reticulum II 98KLY
Carina 330KLY
Wolf–Lundmark–Melotte 3.04MLY
Sculptor 290KLY
Grus 290KLY
Small Magellanic Cloud 200KLY
Large Magellanic Cloud 163KLY
Crater II 383KLY
Horologium I 326KLY
Tucana II 228KLY
Fornax Dwarf 460KLY
Phoenix Dwarf 1.44MLY


4.229 billion years

Illustration Sequence of the Milky Way and Andromeda Galaxy Colliding

NASA, ESA, Z. Levay and R. van der Marel (STScI), T. Hallas, and A. Mellinger ▪ STScI-PRC12-20b