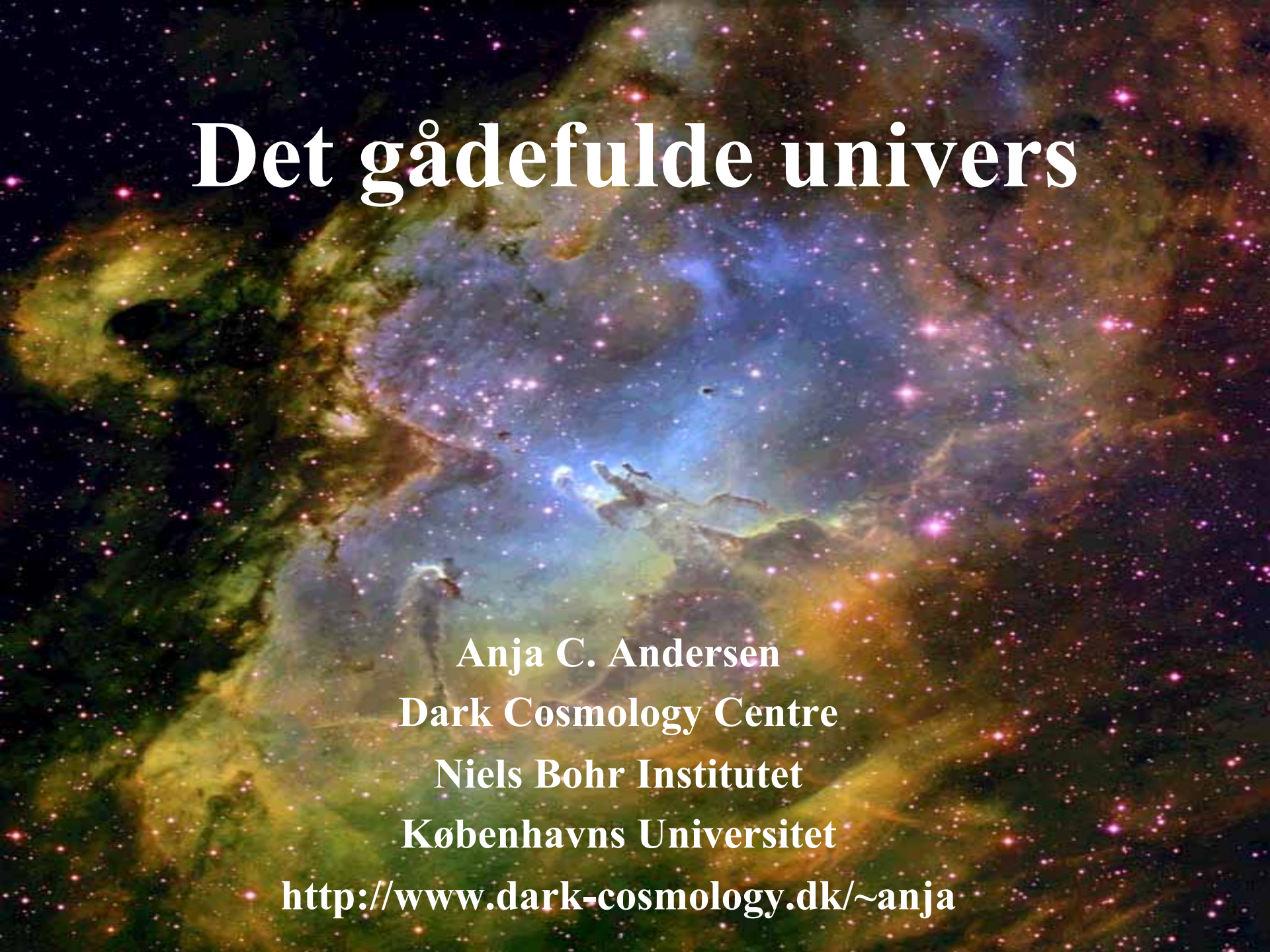
Det gådefulde univers



Anja C. Andersen

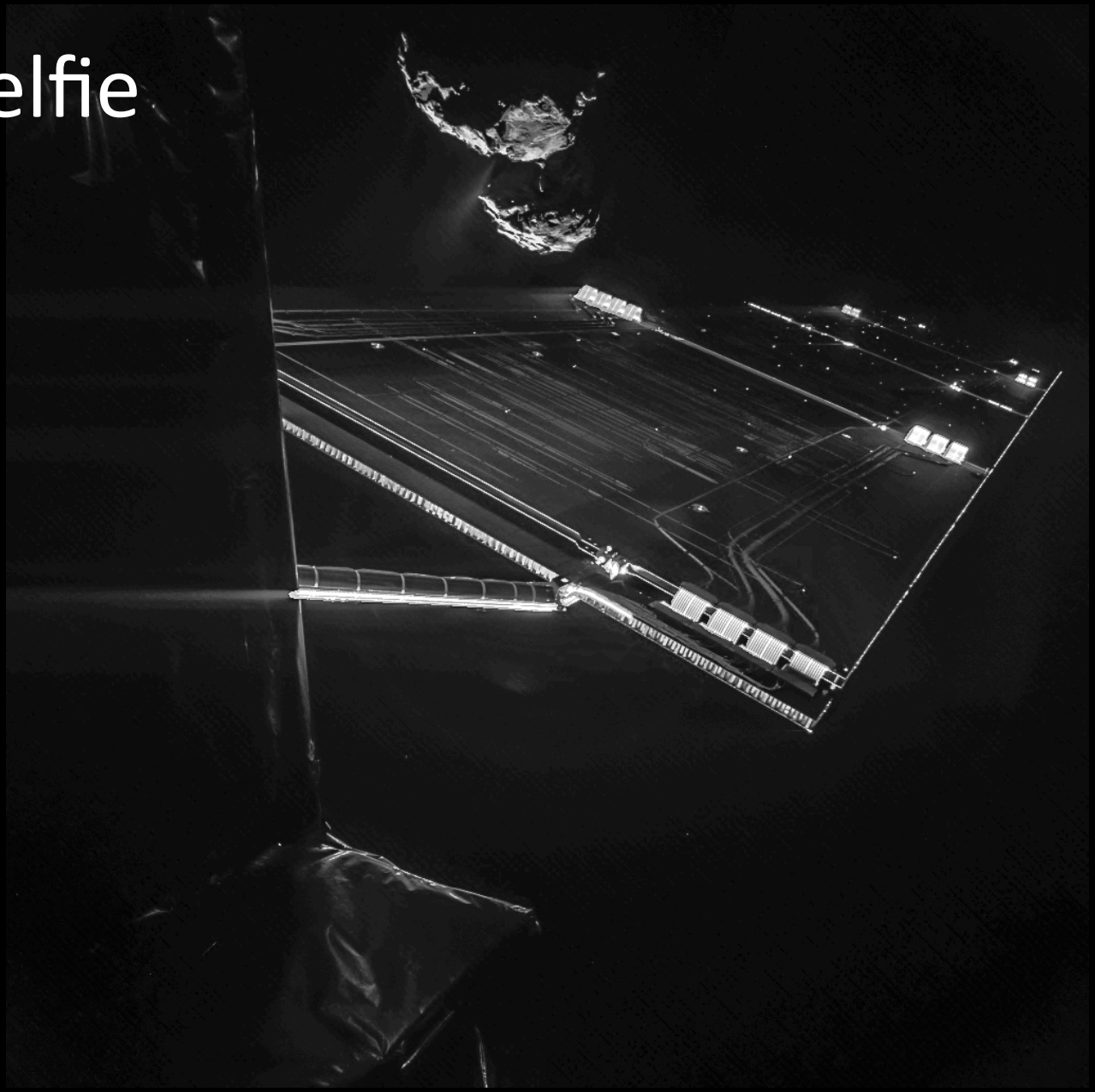
Dark Cosmology Centre

Niels Bohr Institutet

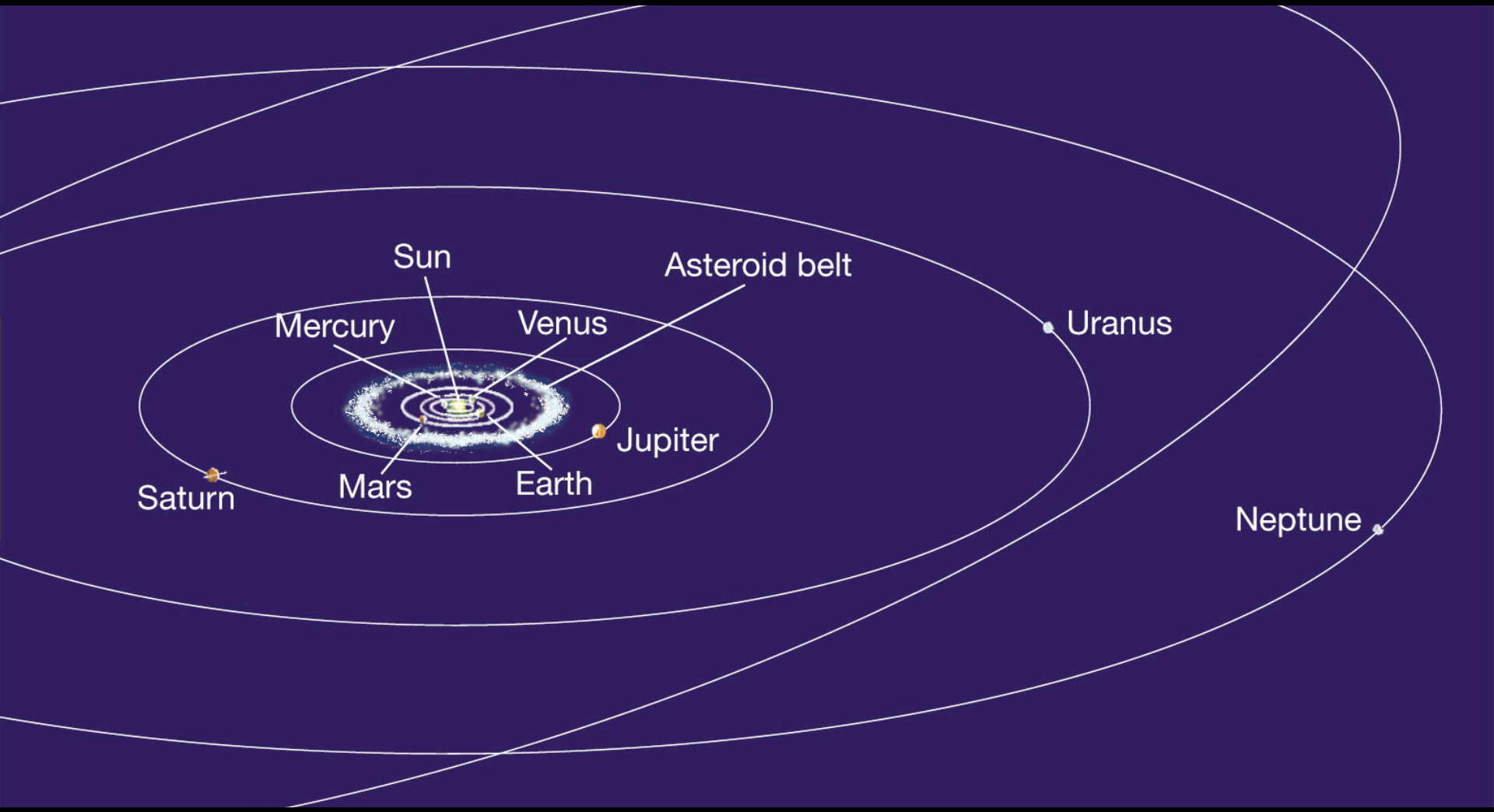
Københavns Universitet

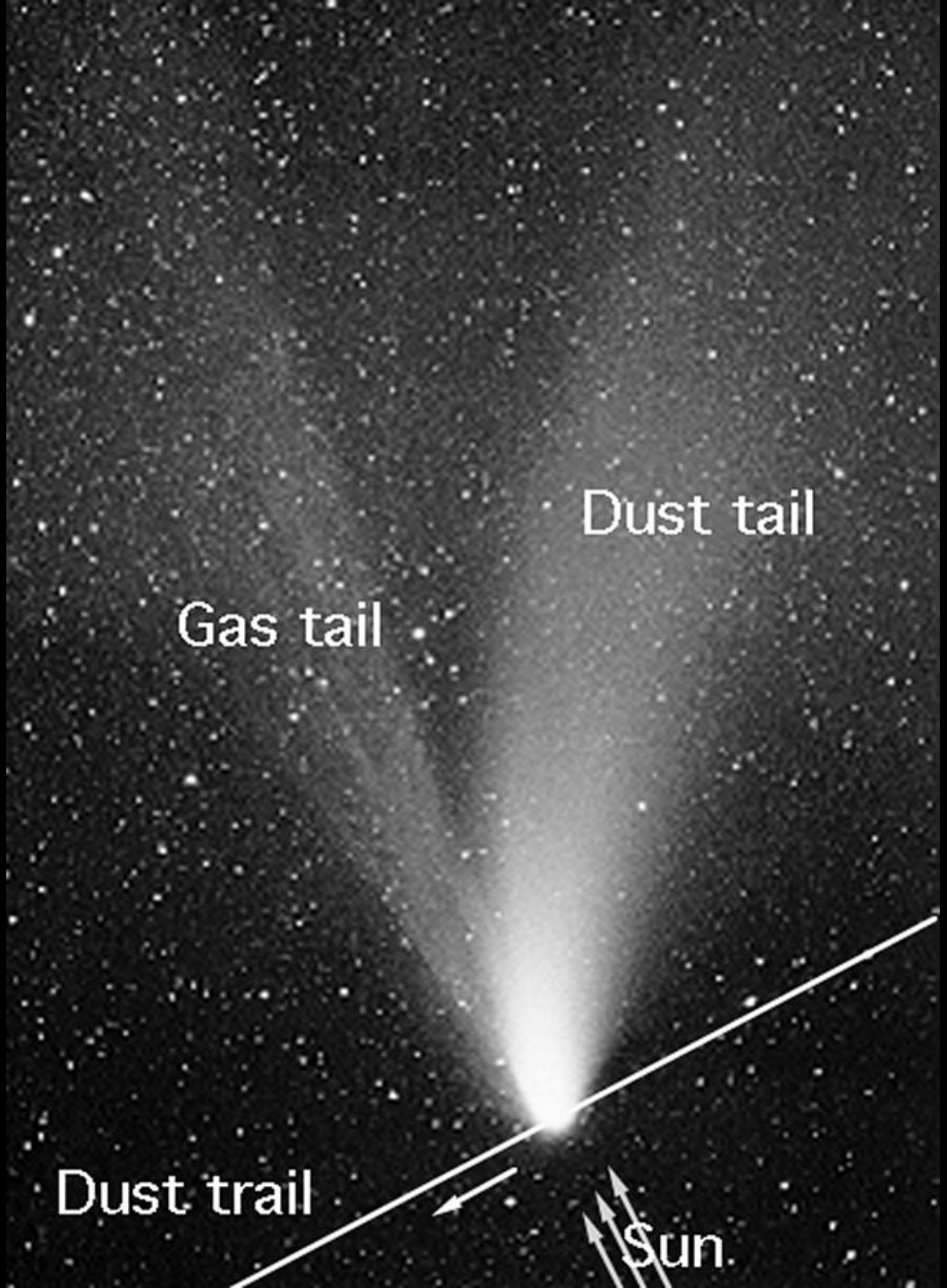
http://www.dark-cosmology.dk/~anja

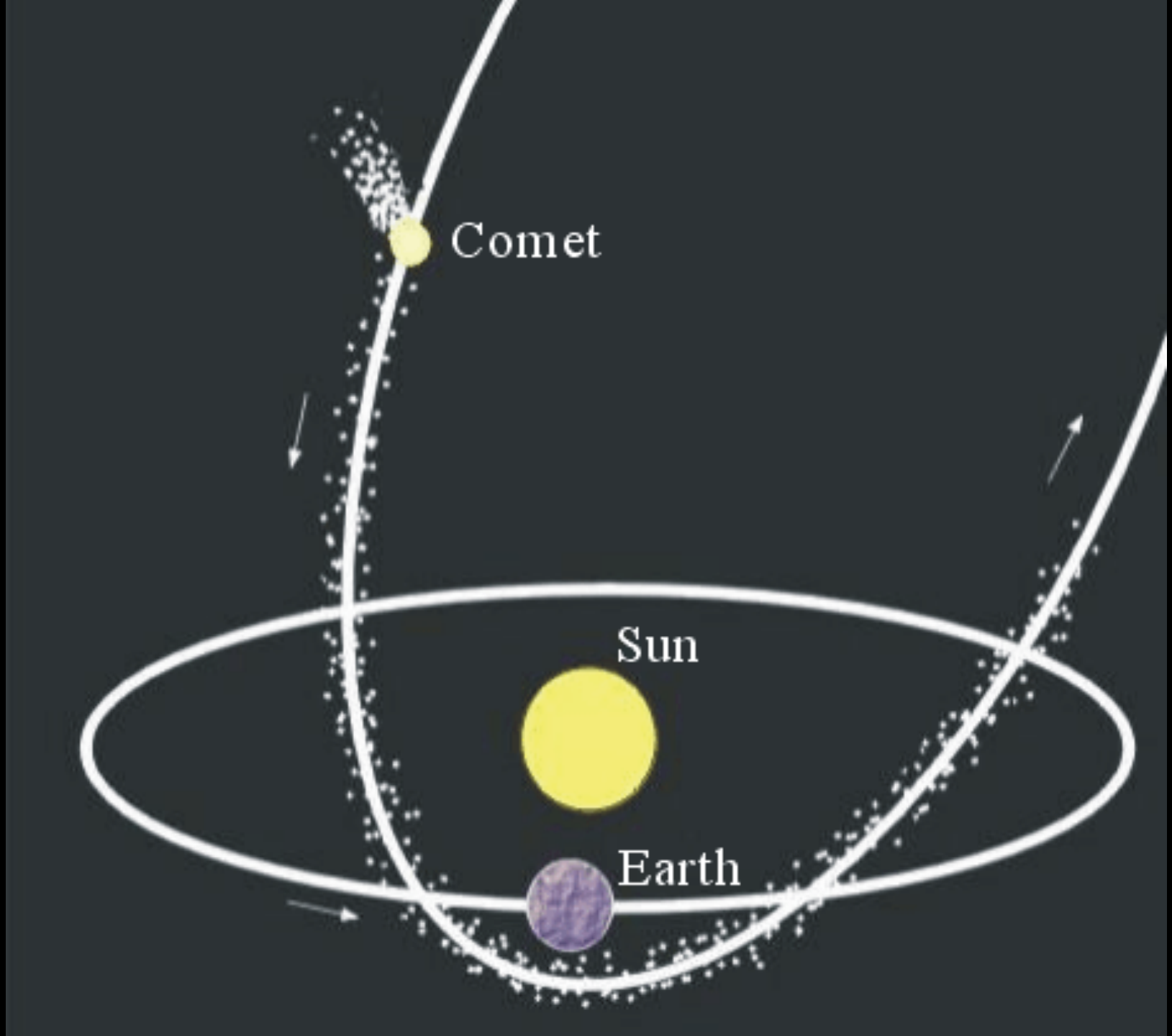
Rosetta selfie

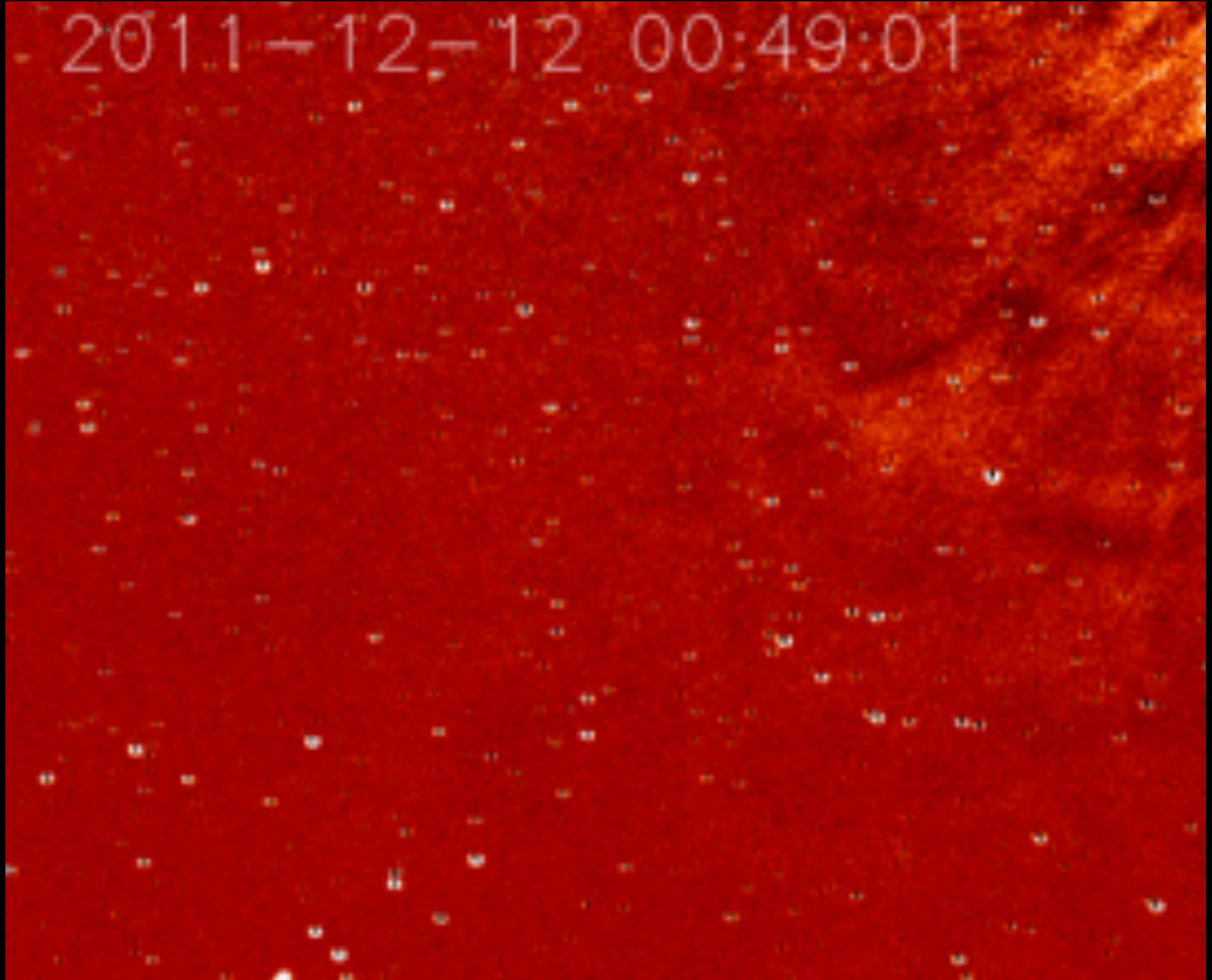


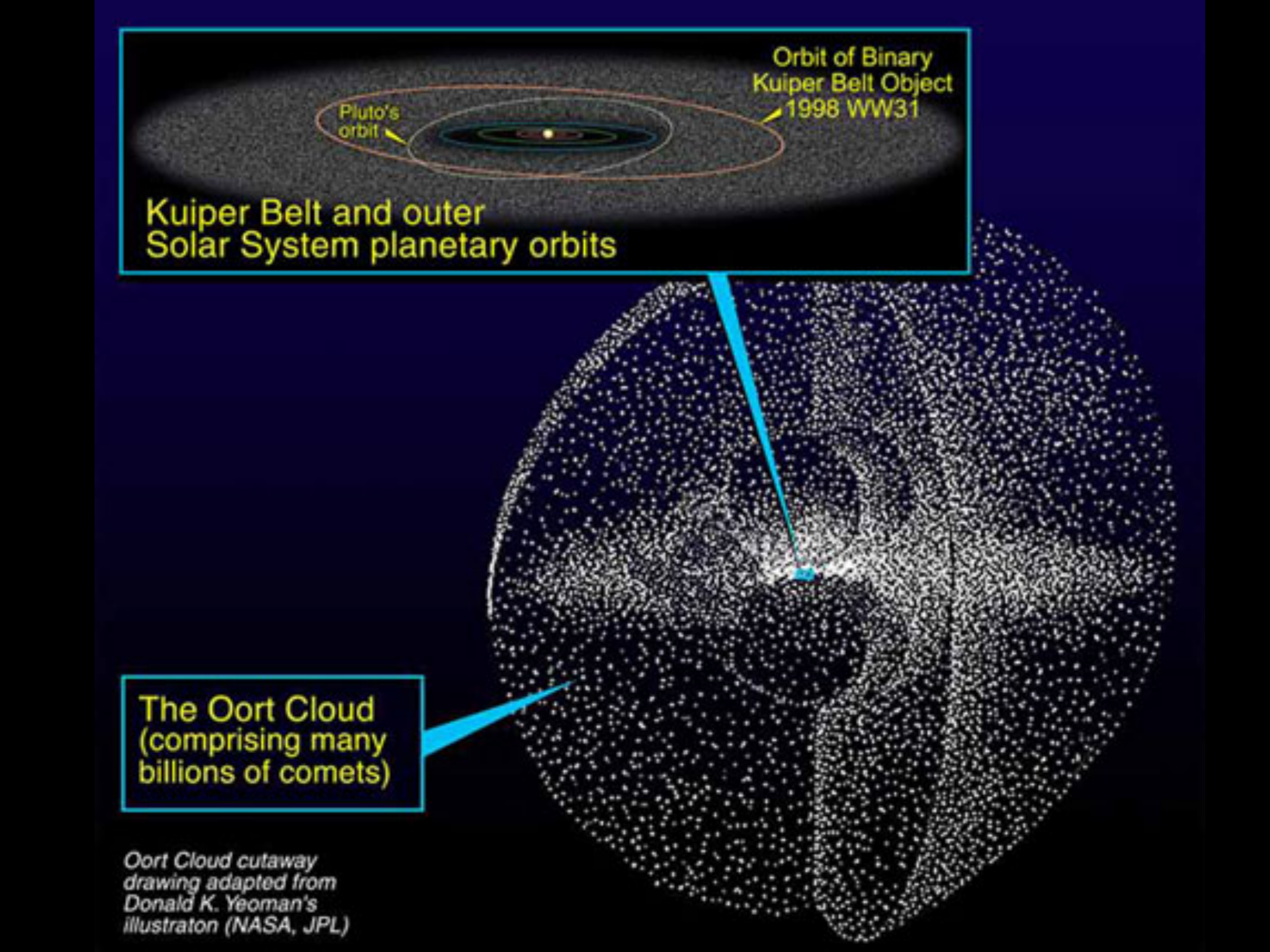
Rosetta and the team behind


Sun
Asteroid belt
Mercury
Venus
Uranus
Jupiter
Saturn
Mars
Earth
Neptune


Dust tail
Gas tail
Dust trail
Sun

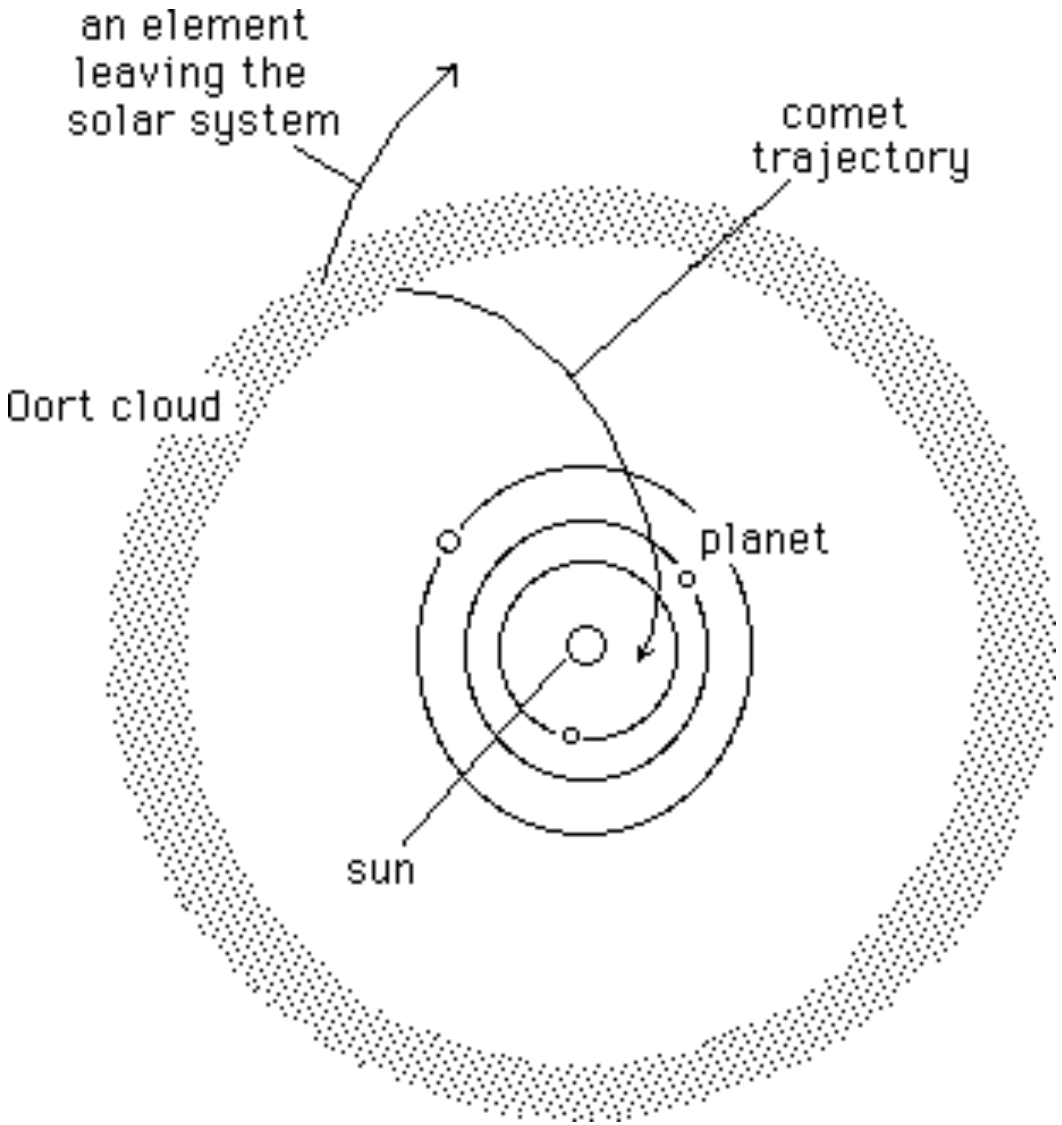

Comet
Sun
Earth

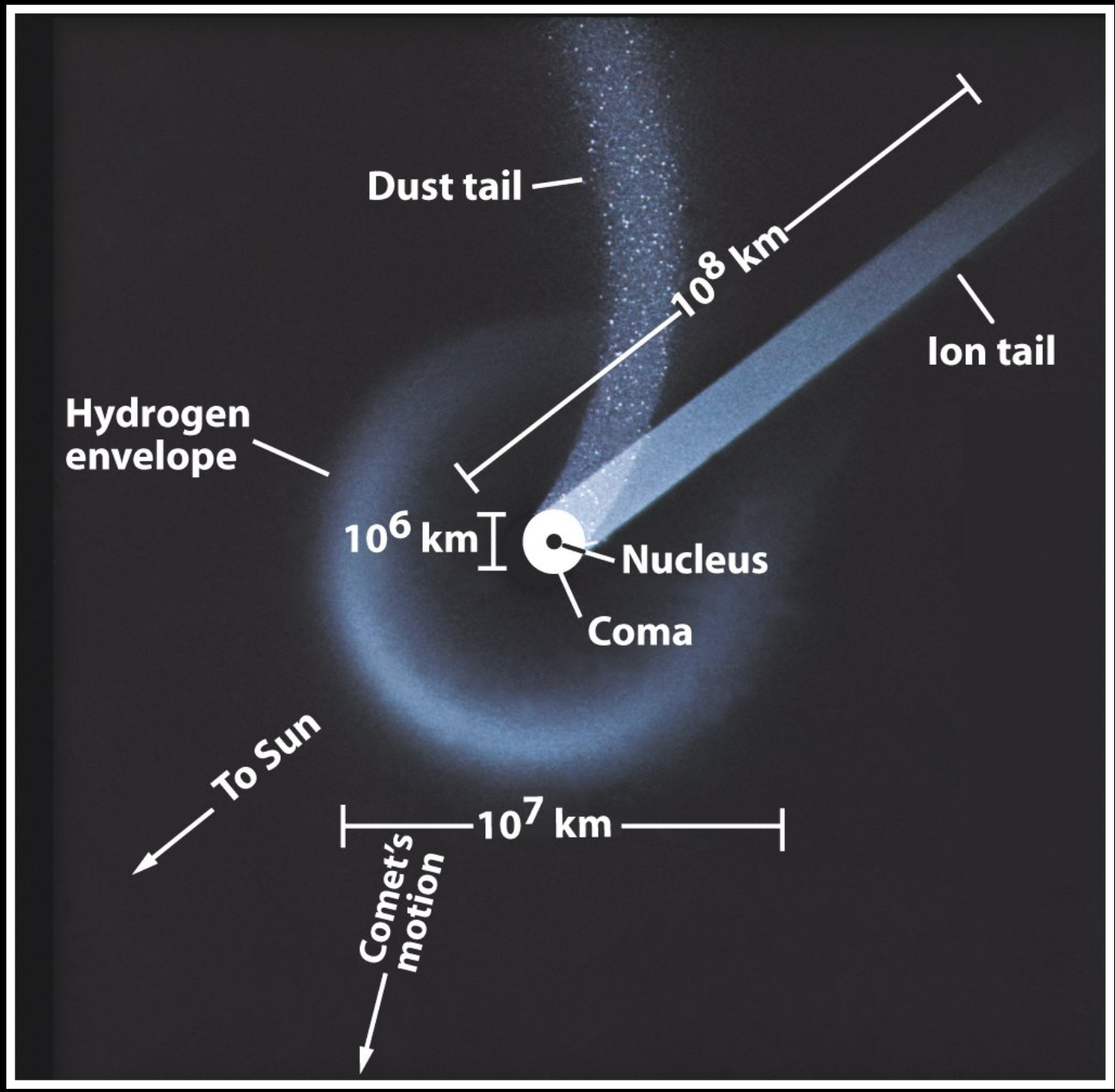

2011-12-12 00:49:01



Oort Cloud cutaway drawing adapted from Donald K. Yeoman's illustraton (NASA, JPL)

Fra Oort skyen mod Solen



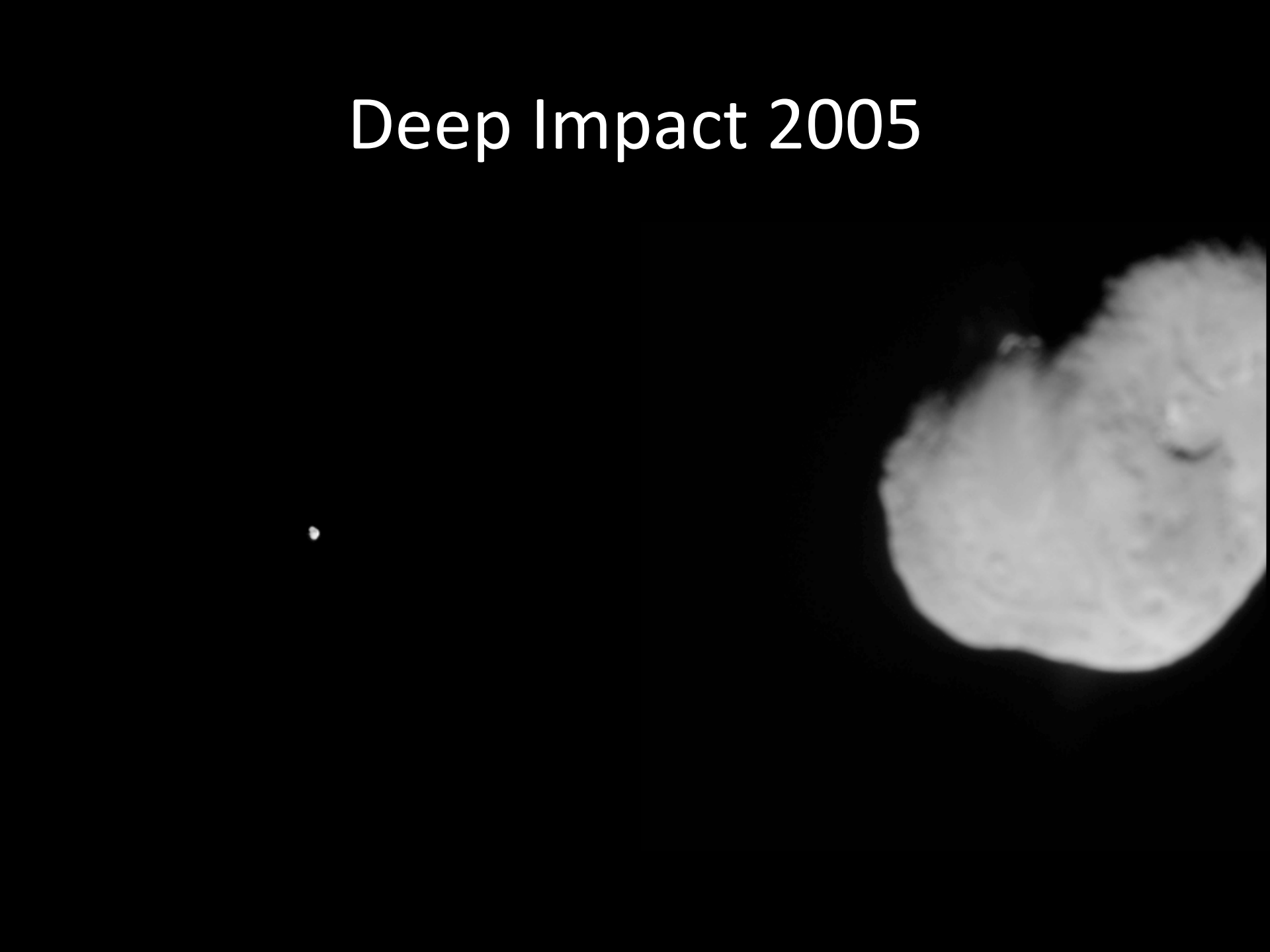

Dust tail
10^8 km
Ion tail
Hydrogen envelope
10^6 km
Nucleus
Coma
To Sun
10^7 km
Comet's motion

Kometkerner

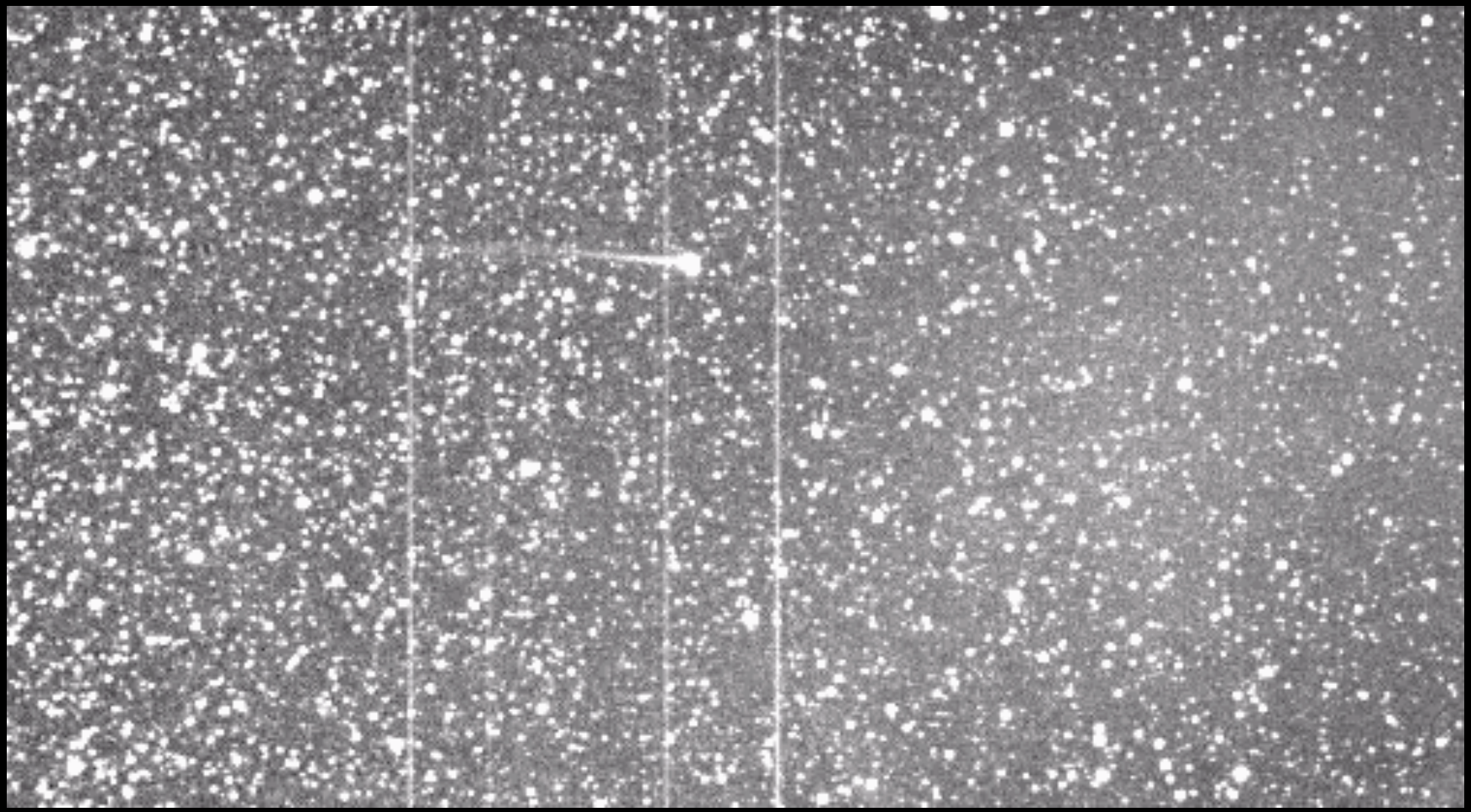
Giotto flyver forbi komet Halley i 1986

Stardust flyver forbi komet Wild2 i 2004

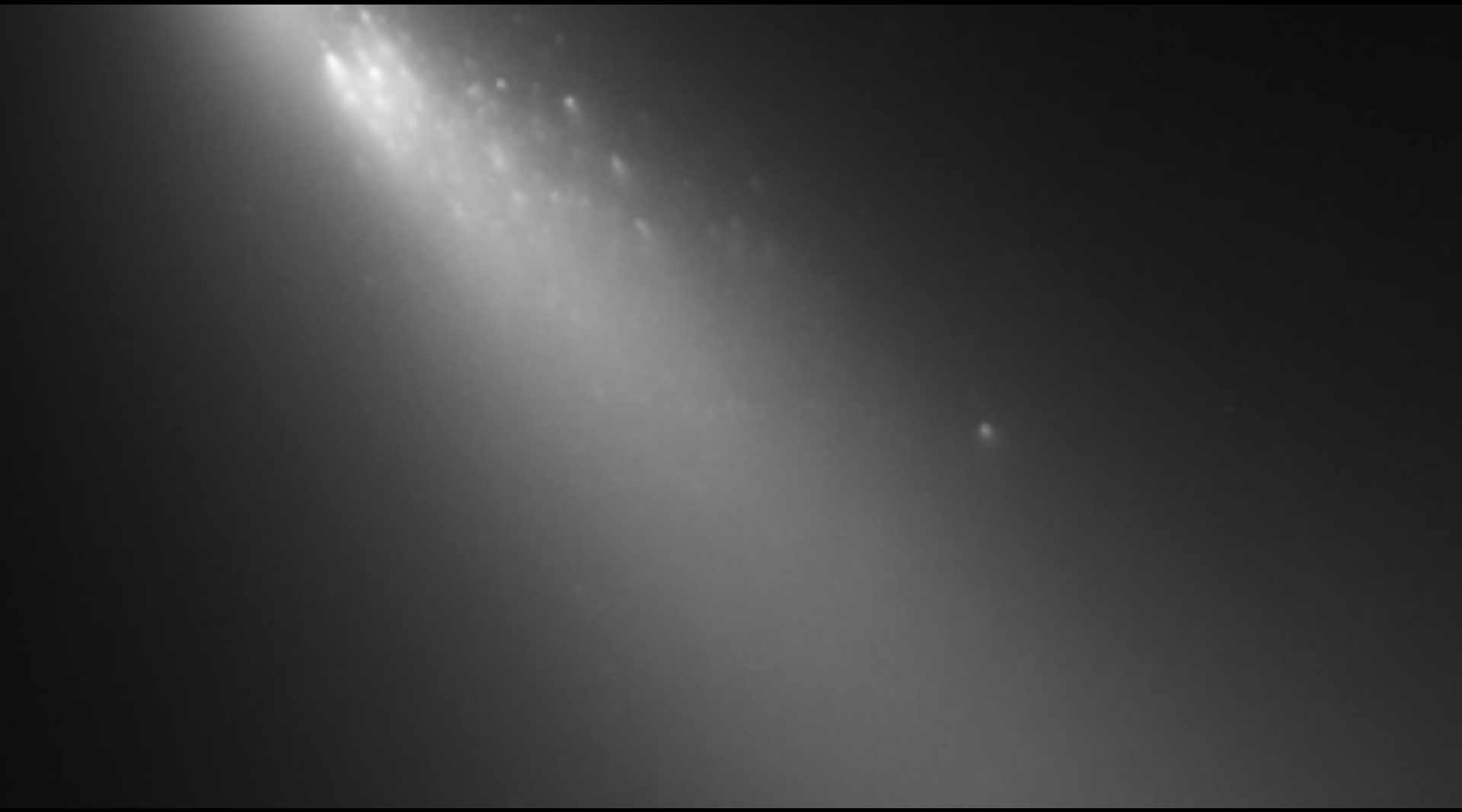
Deep Impact 2005



Komet Encke taber sin hale



Komet Schwassman-Wachmann3



Kometen P67/Churyumov-Gerasimenko

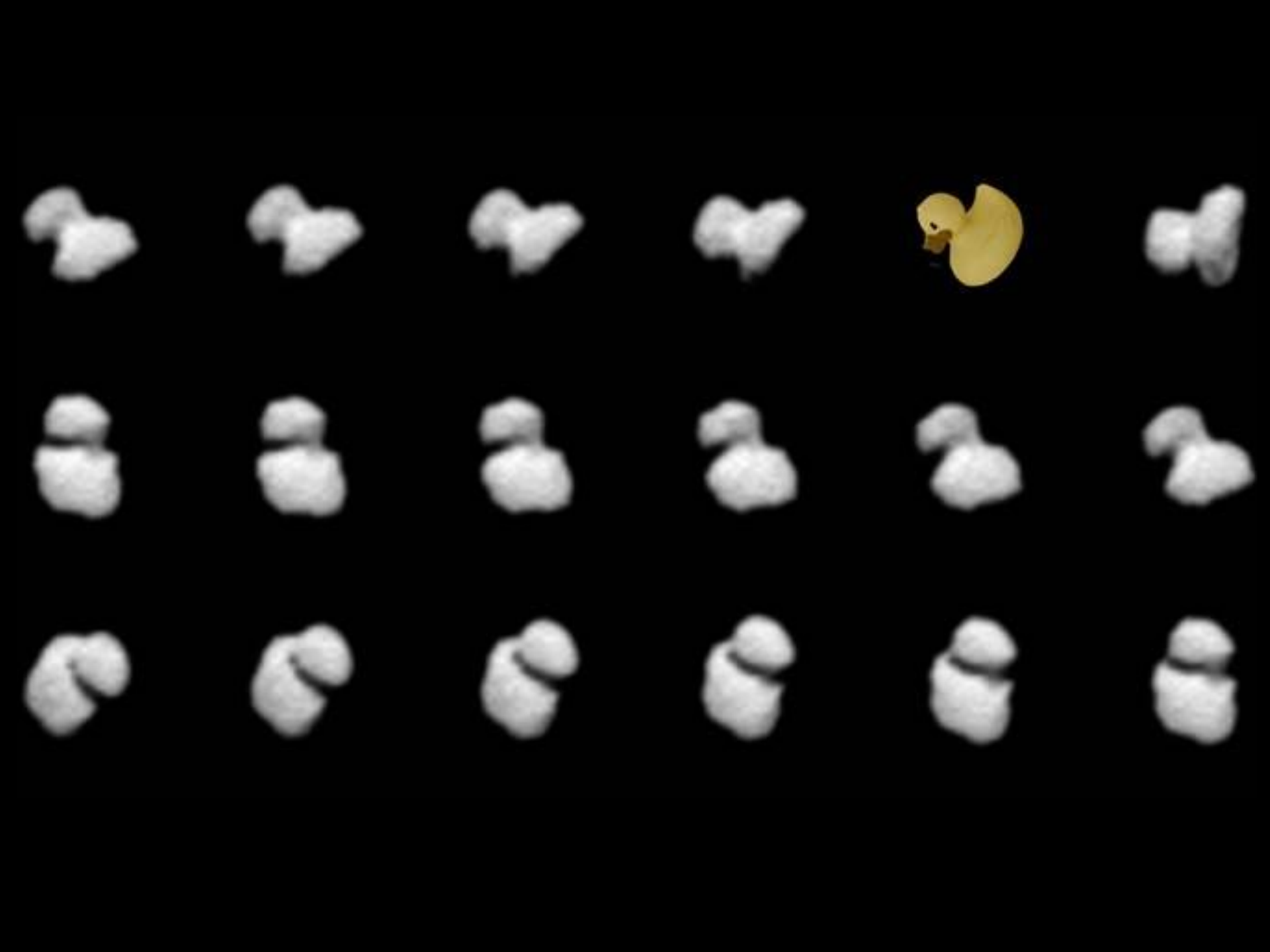
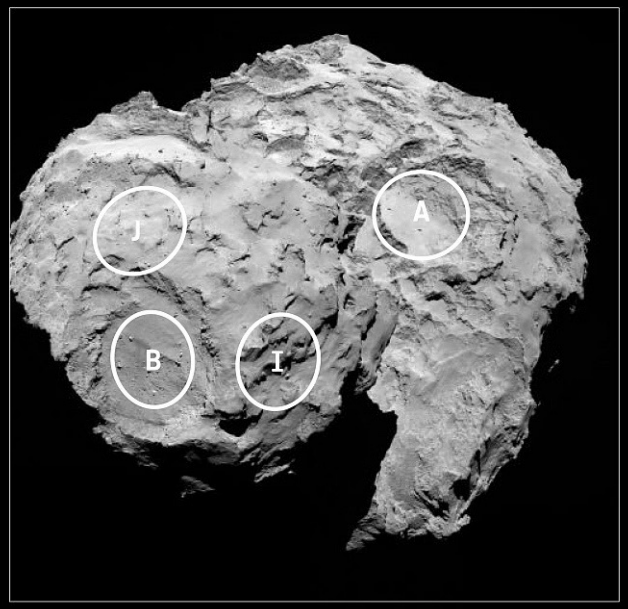
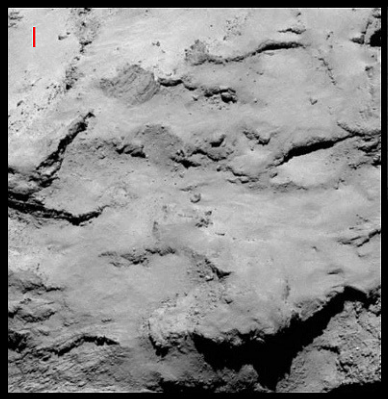
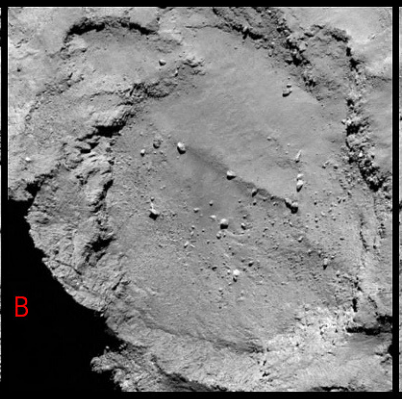
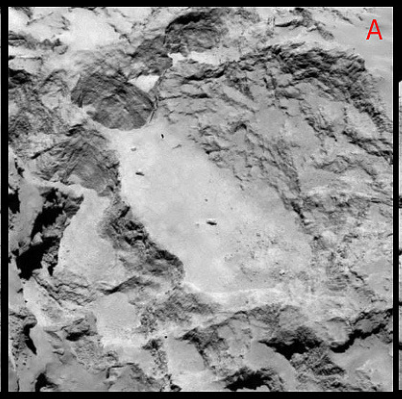


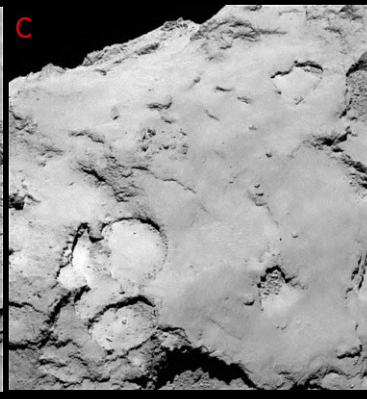

IMAGE PREPARED BY ESA





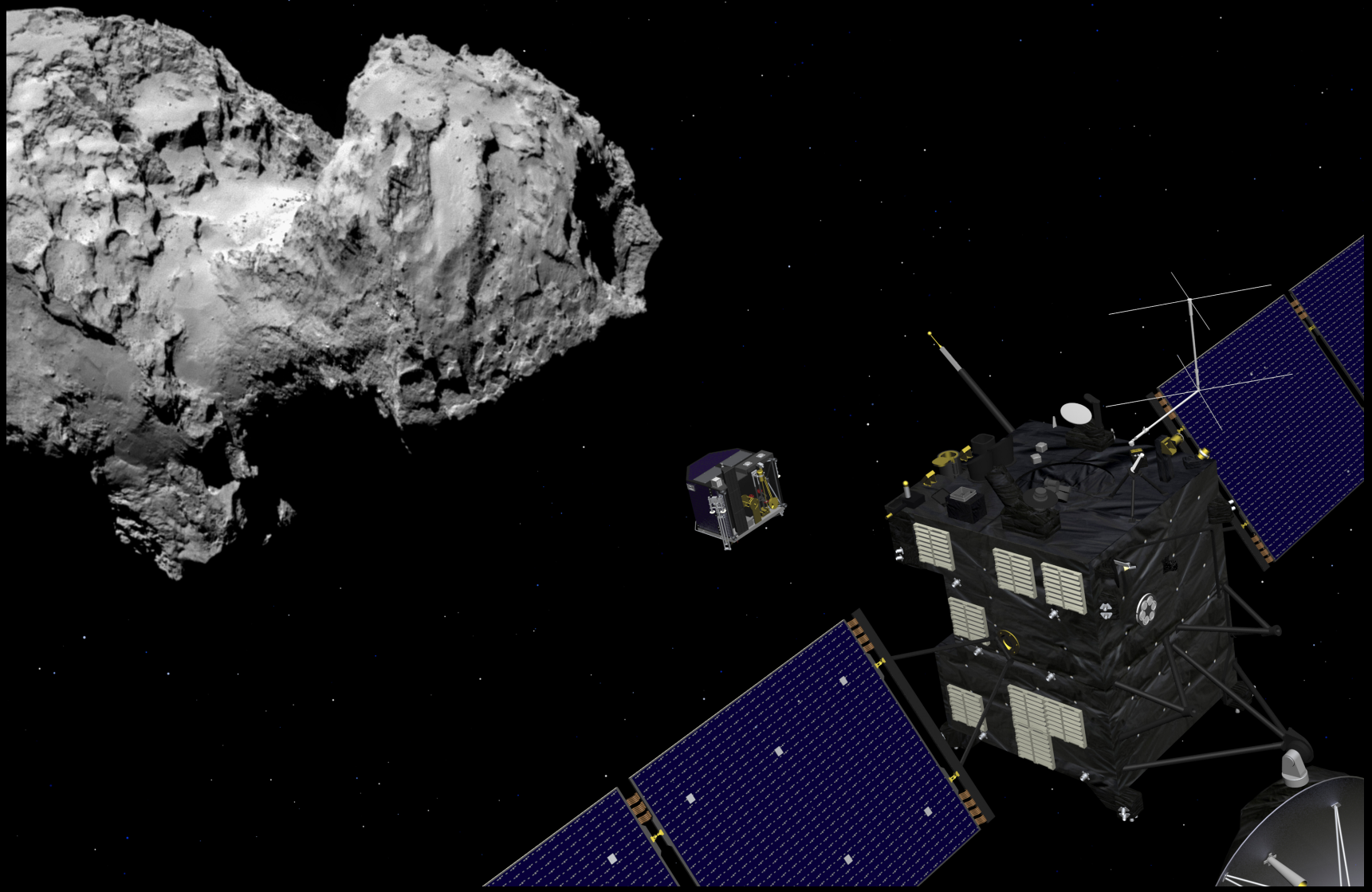


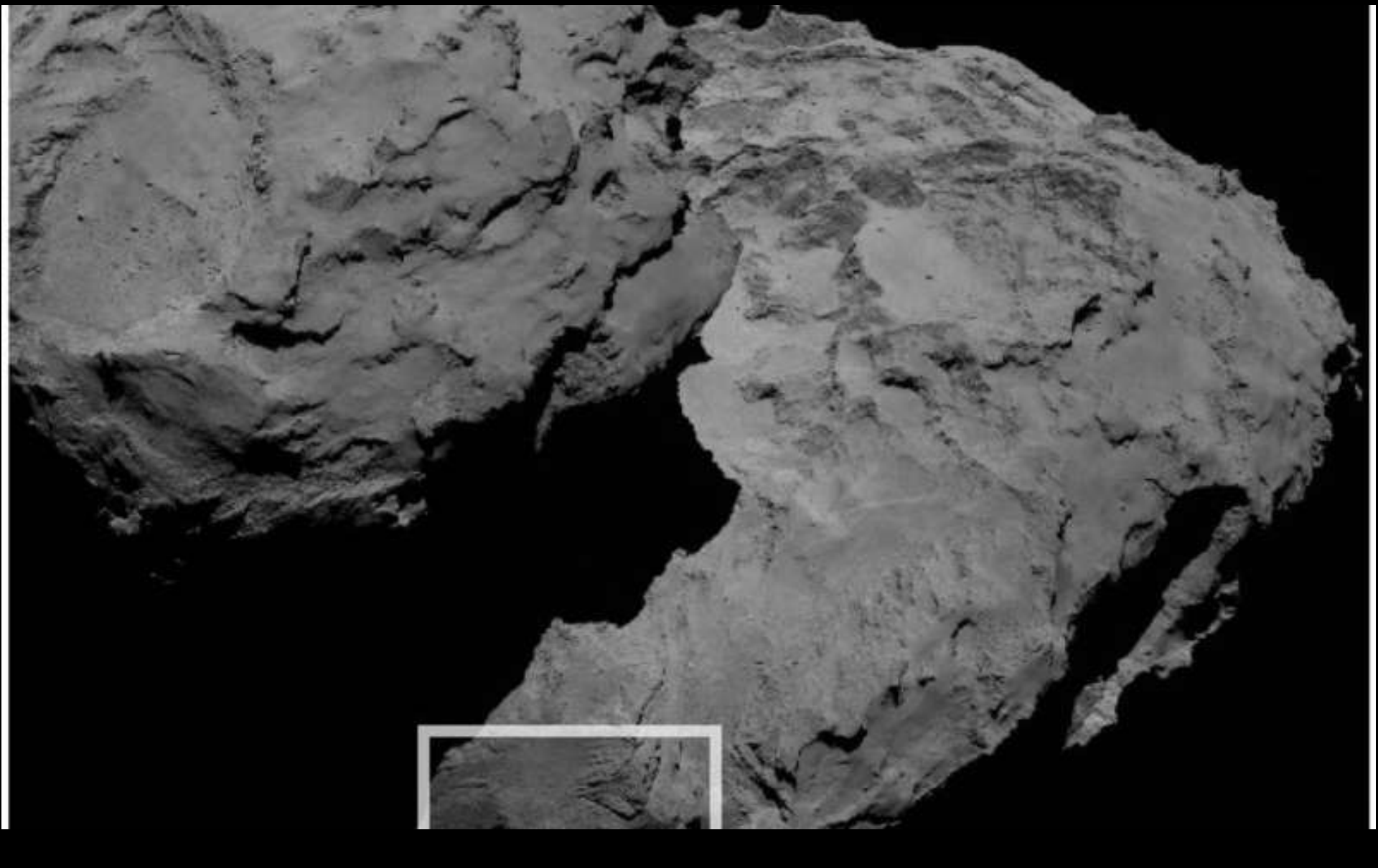




5 Philae Candidate Landing Sites

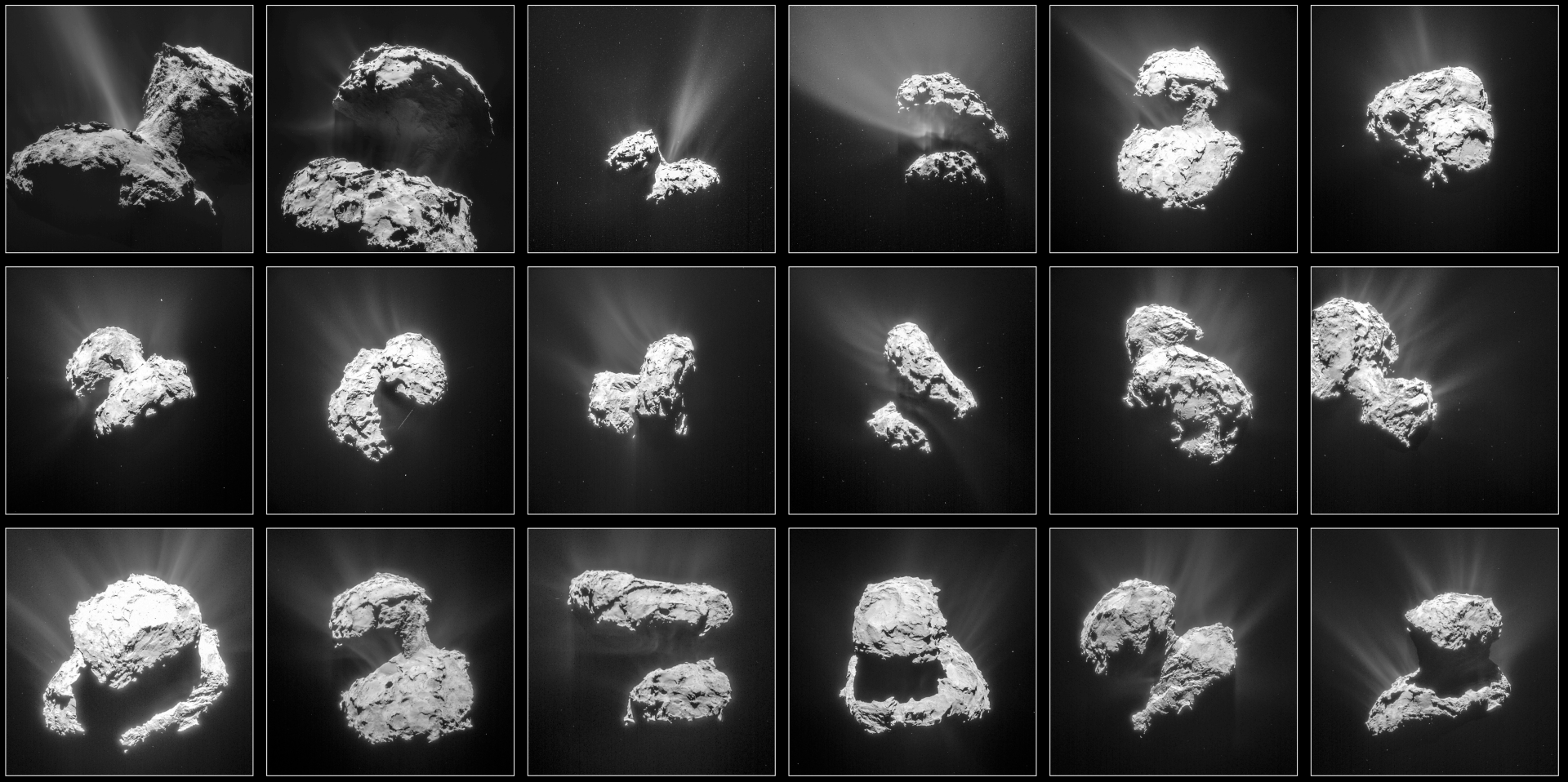
Credit: ESA/Rosetta/MPS for OSIRIS Team MPS/UPD/LAM/IAA/SSO/INTA/UPM/DASP/IDA Processing: Marco Di Lorenzo/Ken Kremer





Philae på P67/C-G

Kometen 67P/Churyumov-Gerasimenko

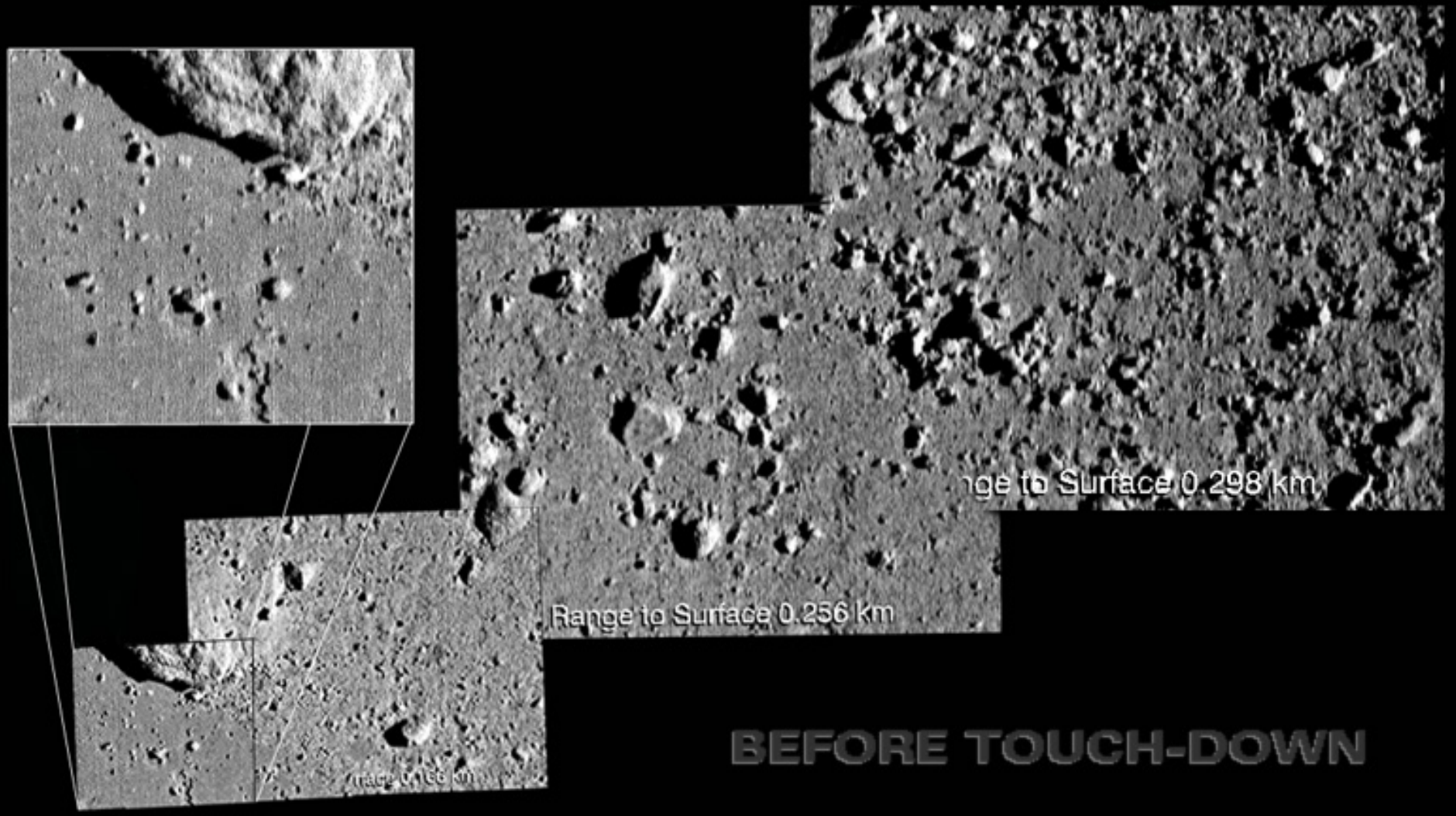


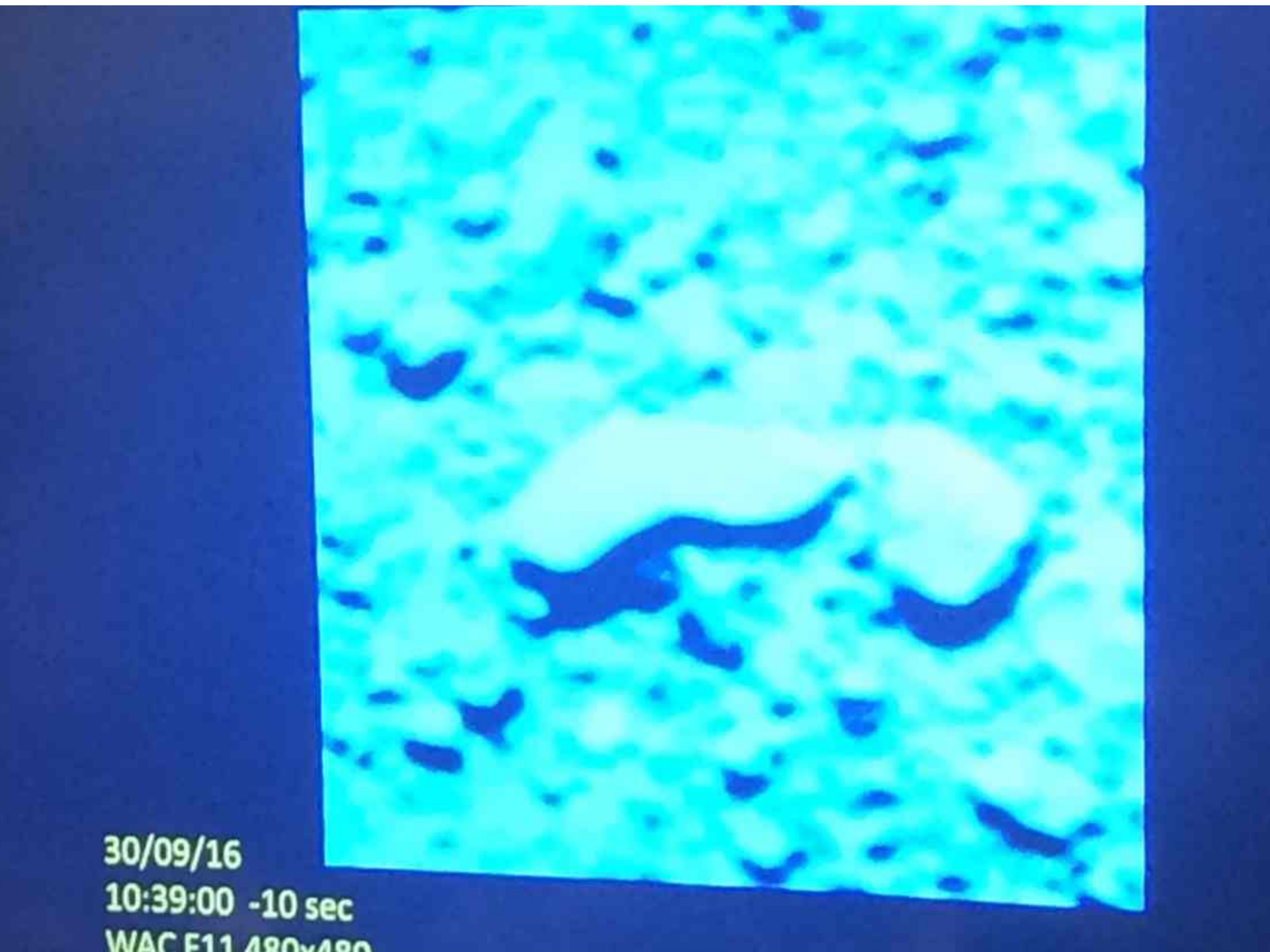
433 Eros

33 x 13 x 13 km

NEAR Shoemaker ankommer til Eros

NEAR lander på Eros February 2001



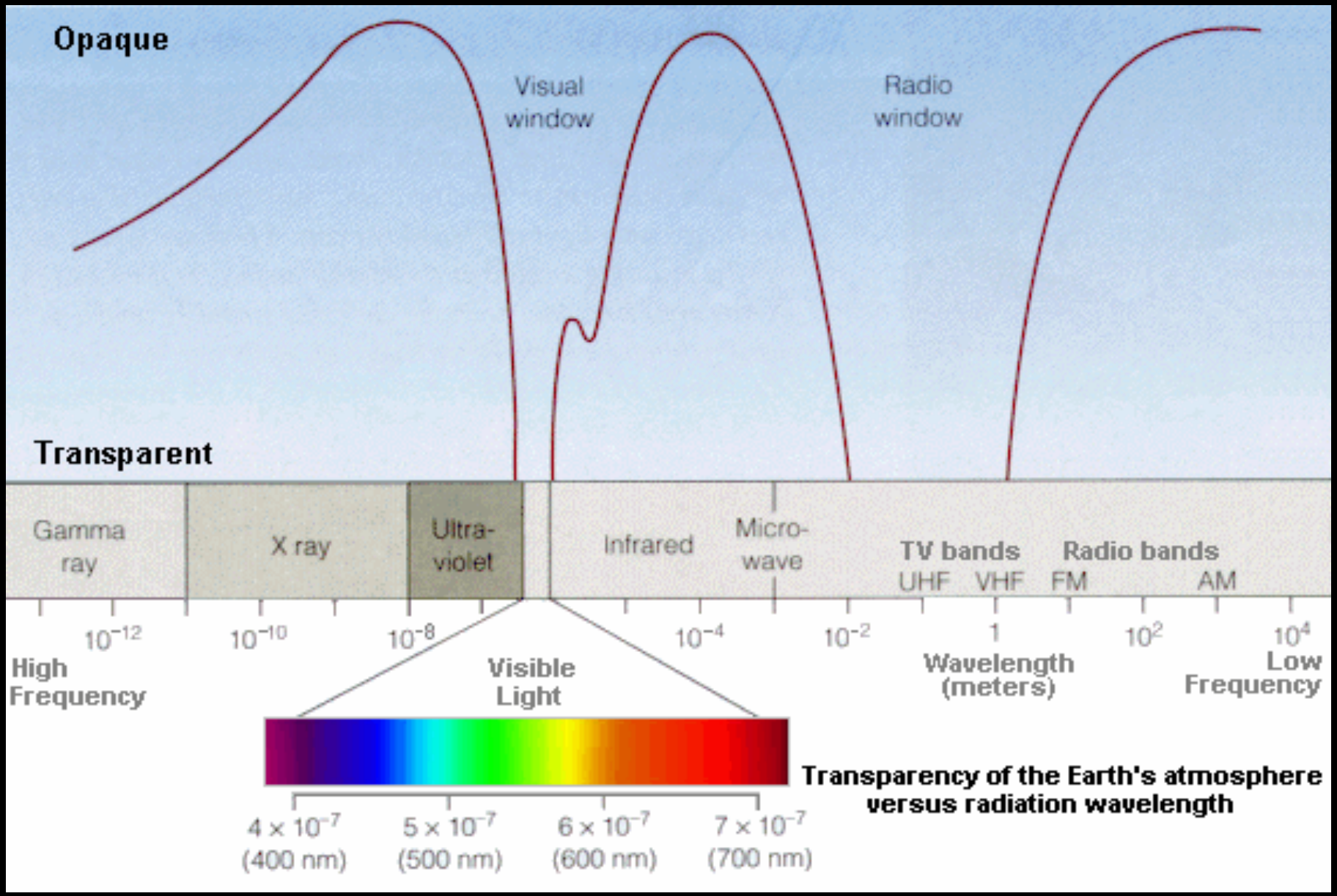

30/09/16
10:39:00 -10 sec
WAC F11 480x480

Pluto observationer over 30 år

Astronomi

Astronomer arbejder med at undersøge og forstå universet. Arbejdsredskaber er kikkerter, satellitter og computere.

Jordens atmosfæres gennemsigtighed



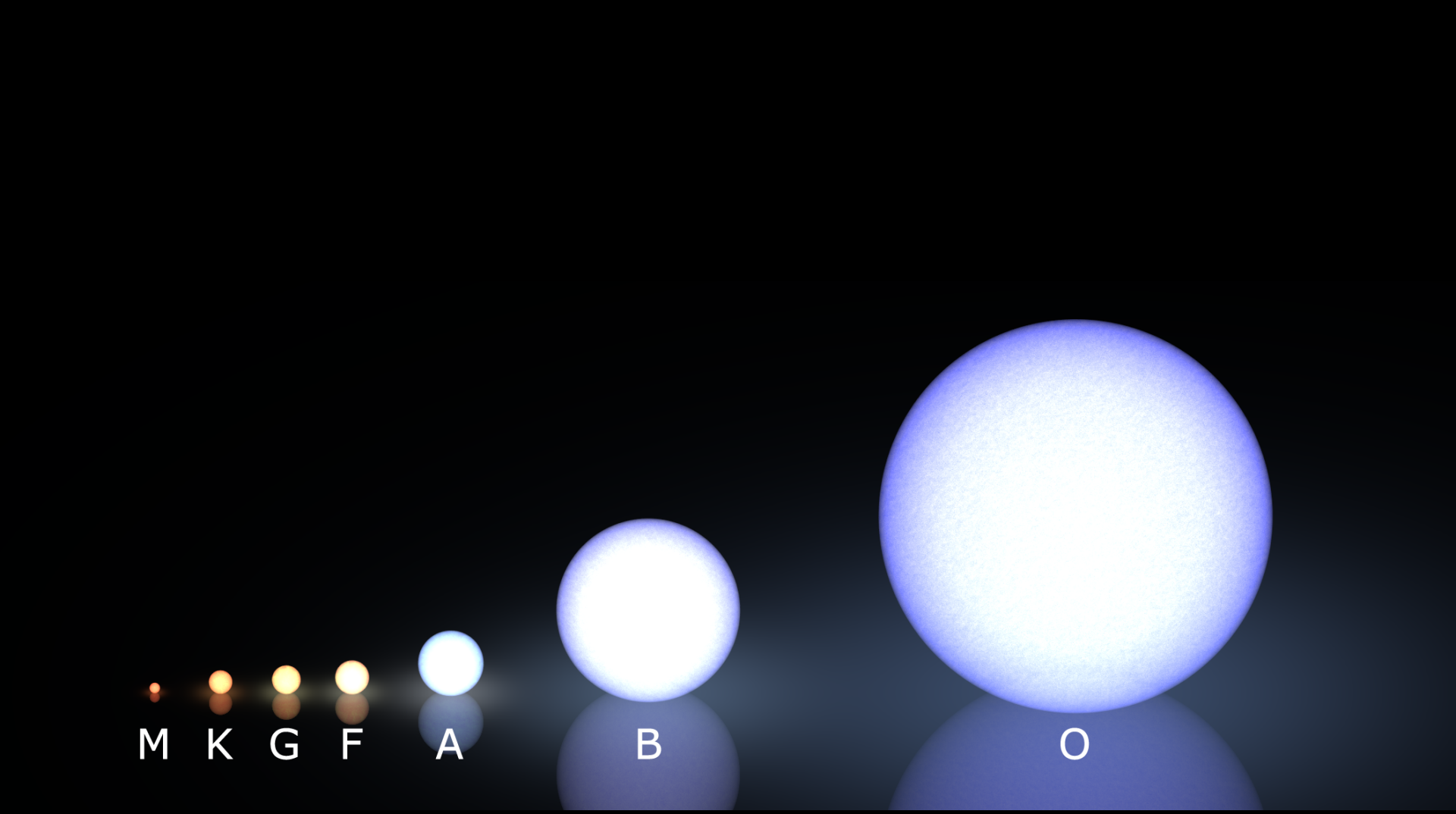

Ørnetågen


M16 i synligt lys

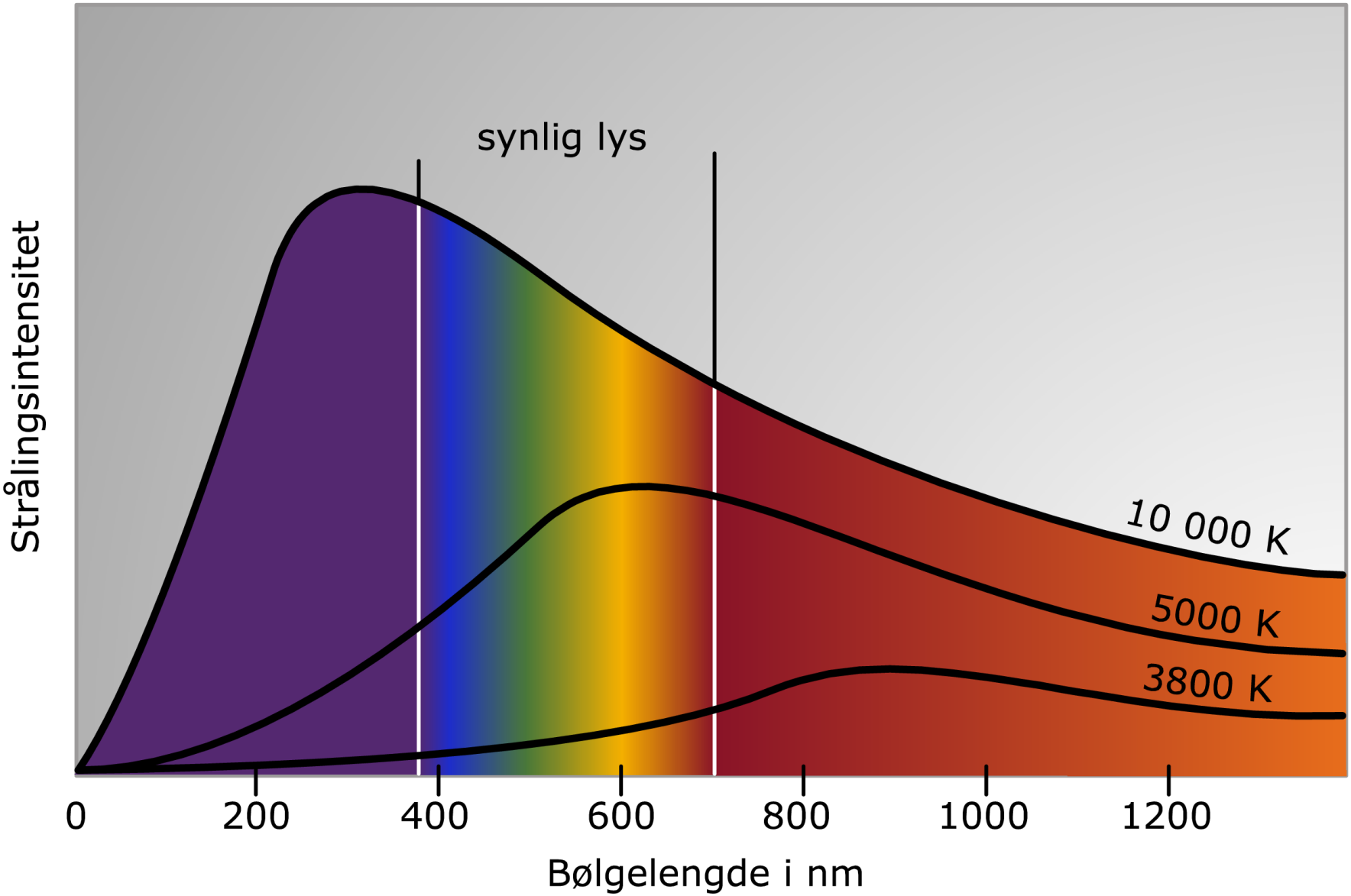

M16 i infrarødt lys

Mælkevejen

www.spacetelescope.org

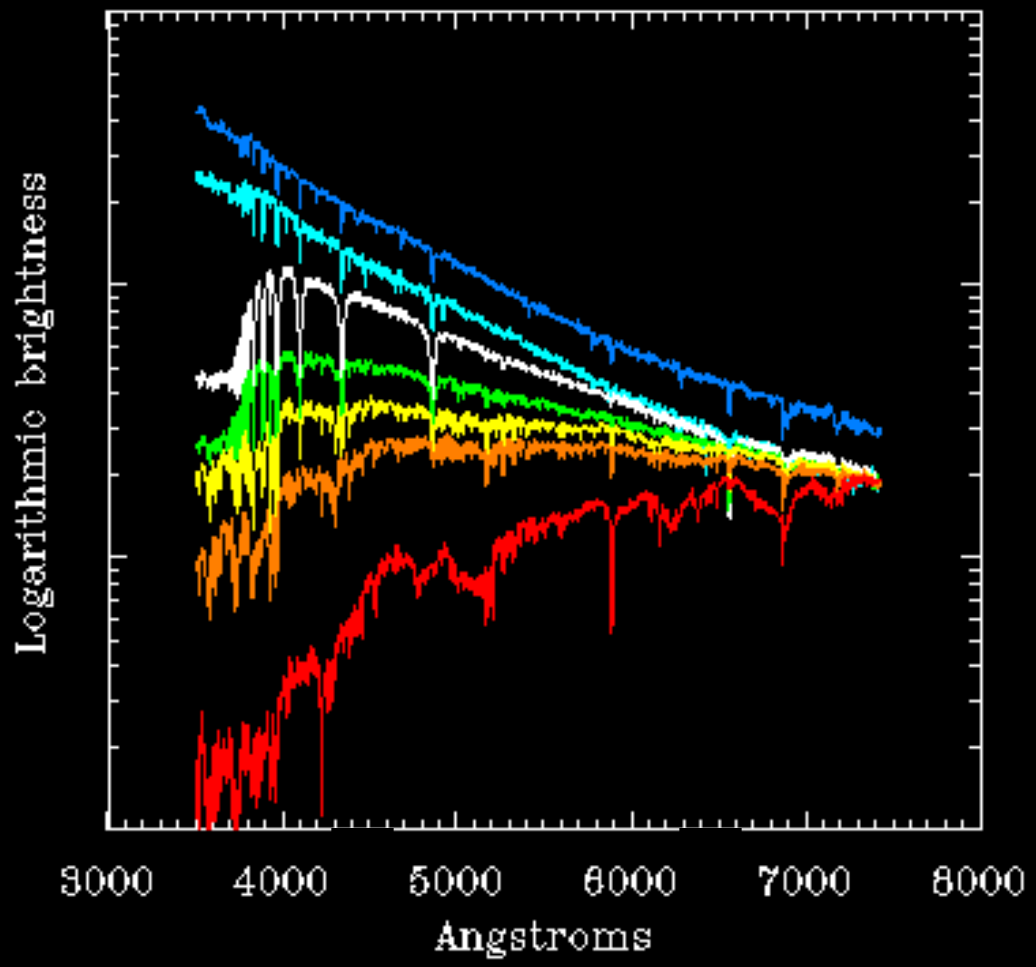

M
K
G
F
A
B
O

Planck kurve

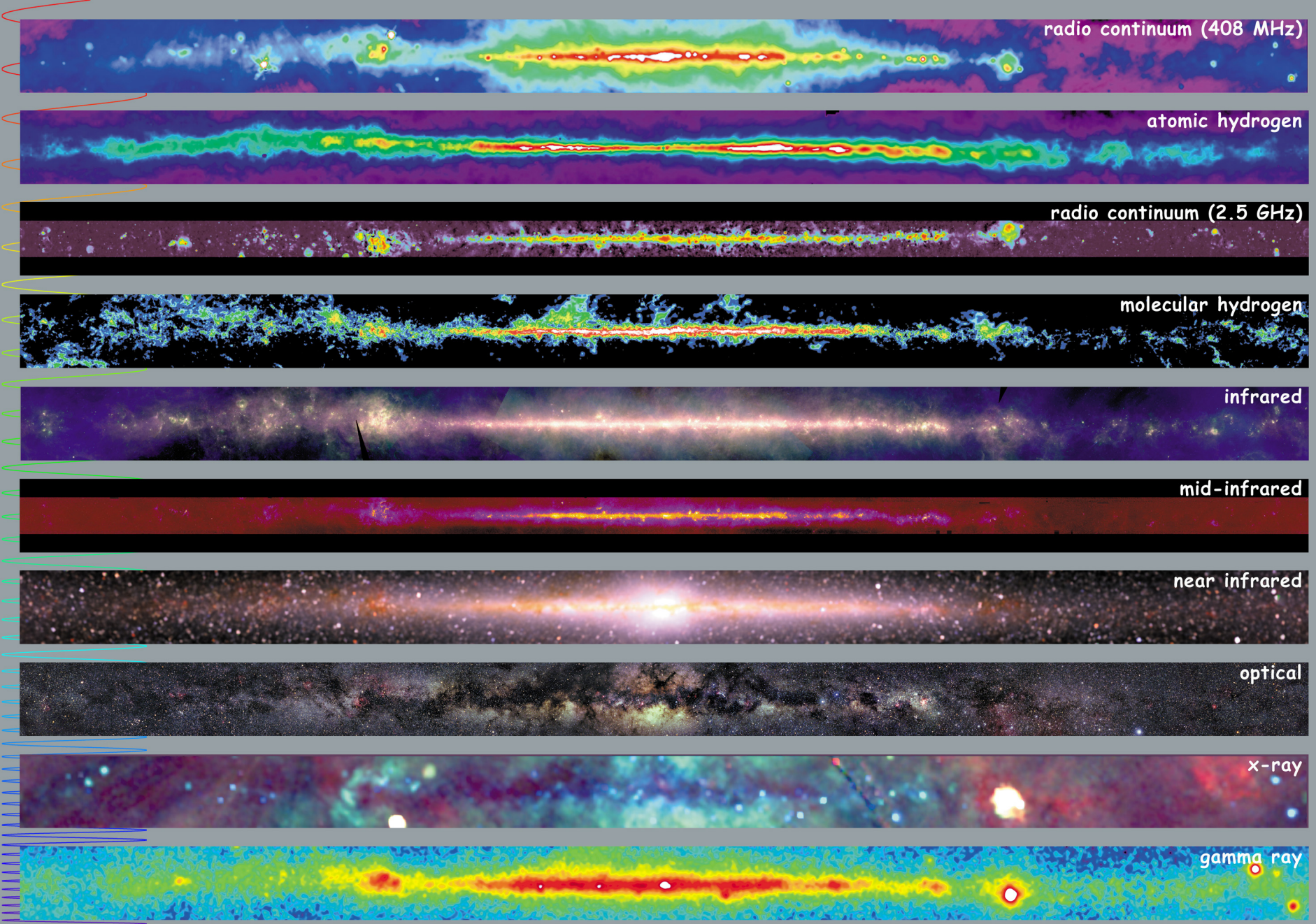


Bolometric luminosity/flux

+UV



+IR

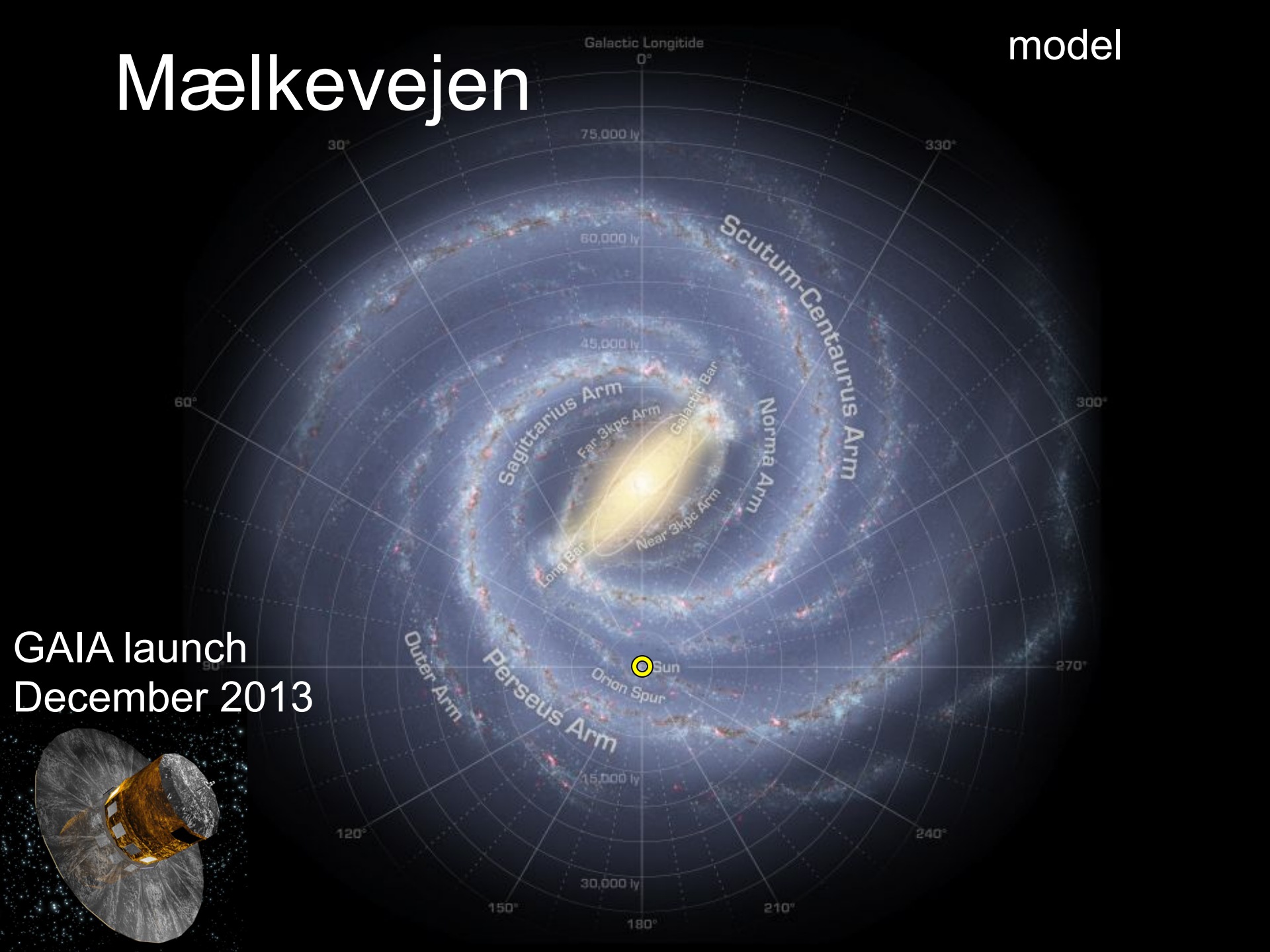


Multiwavelength Milky Way

http://adc.gsfc.nasa.gov/mw

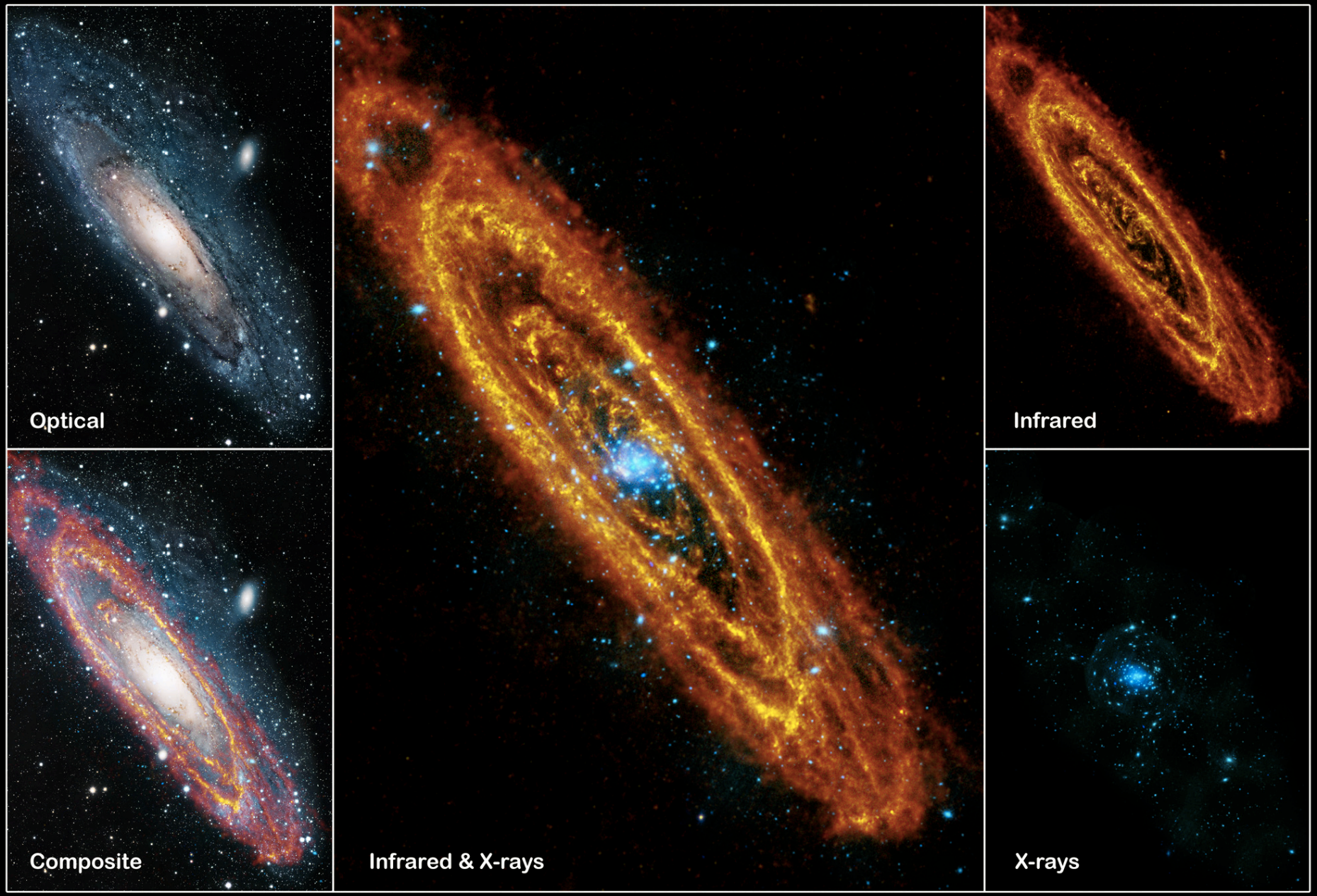
Mælkevejen

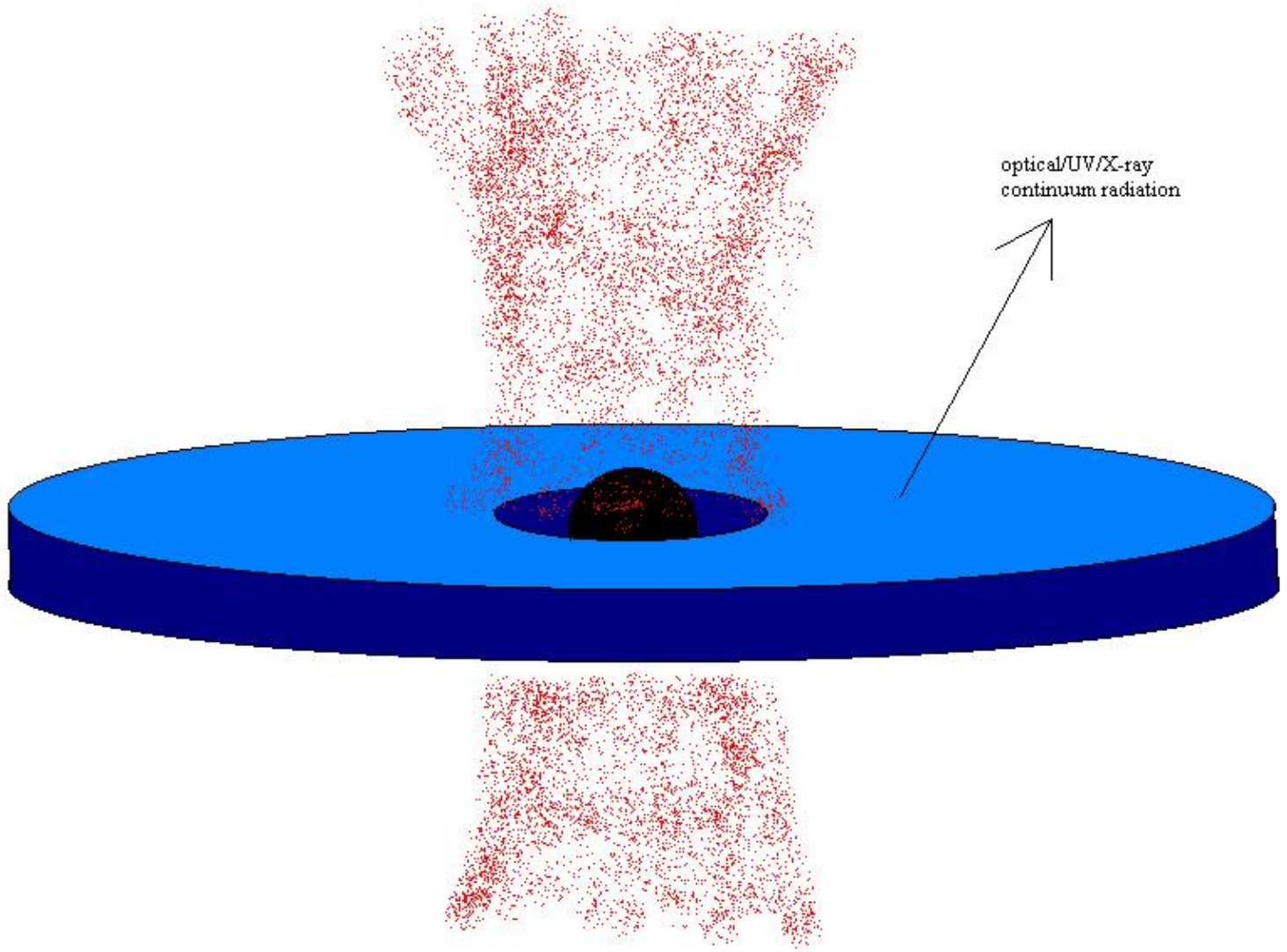
model

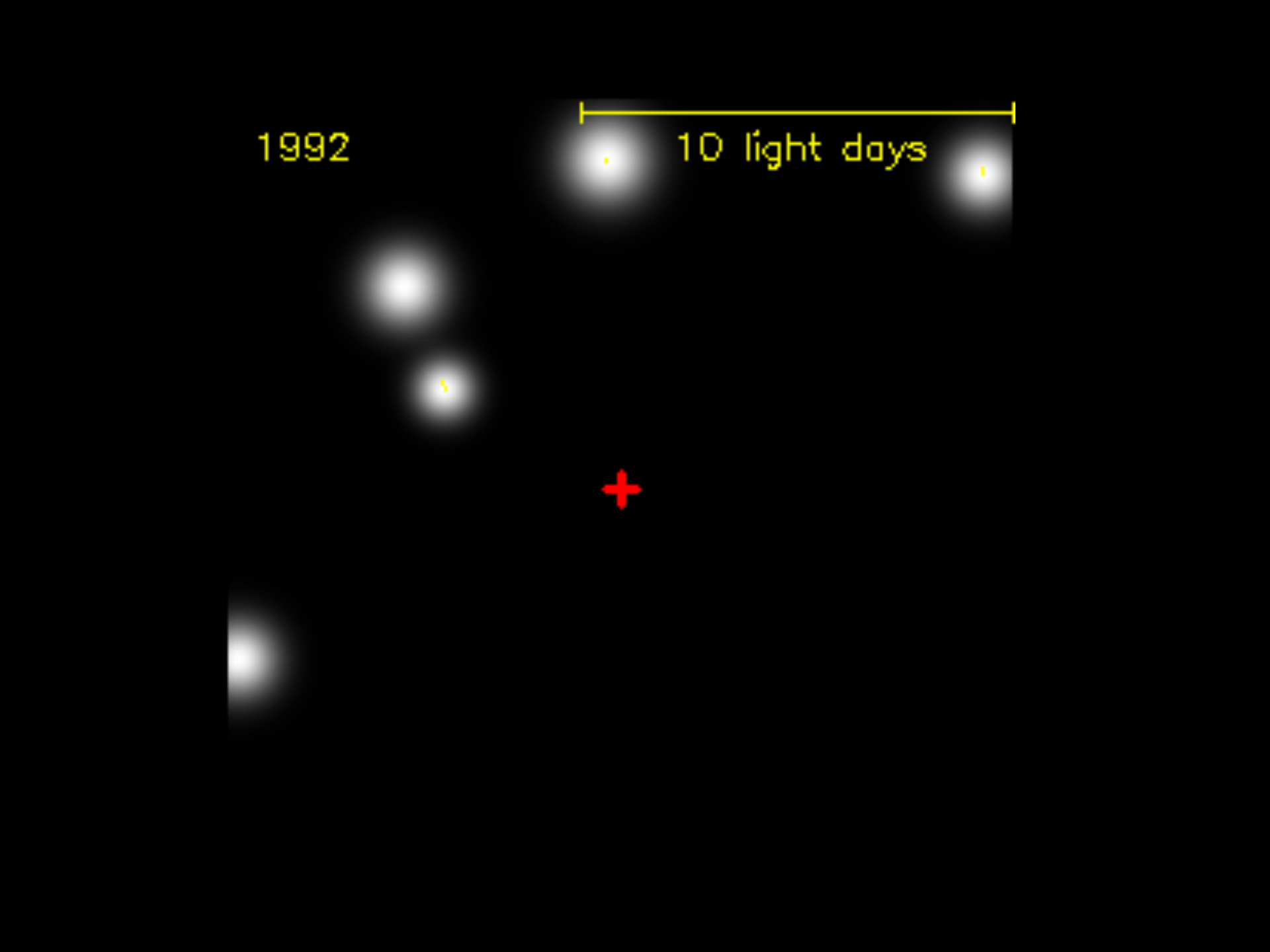


GAIA launch
December 2013

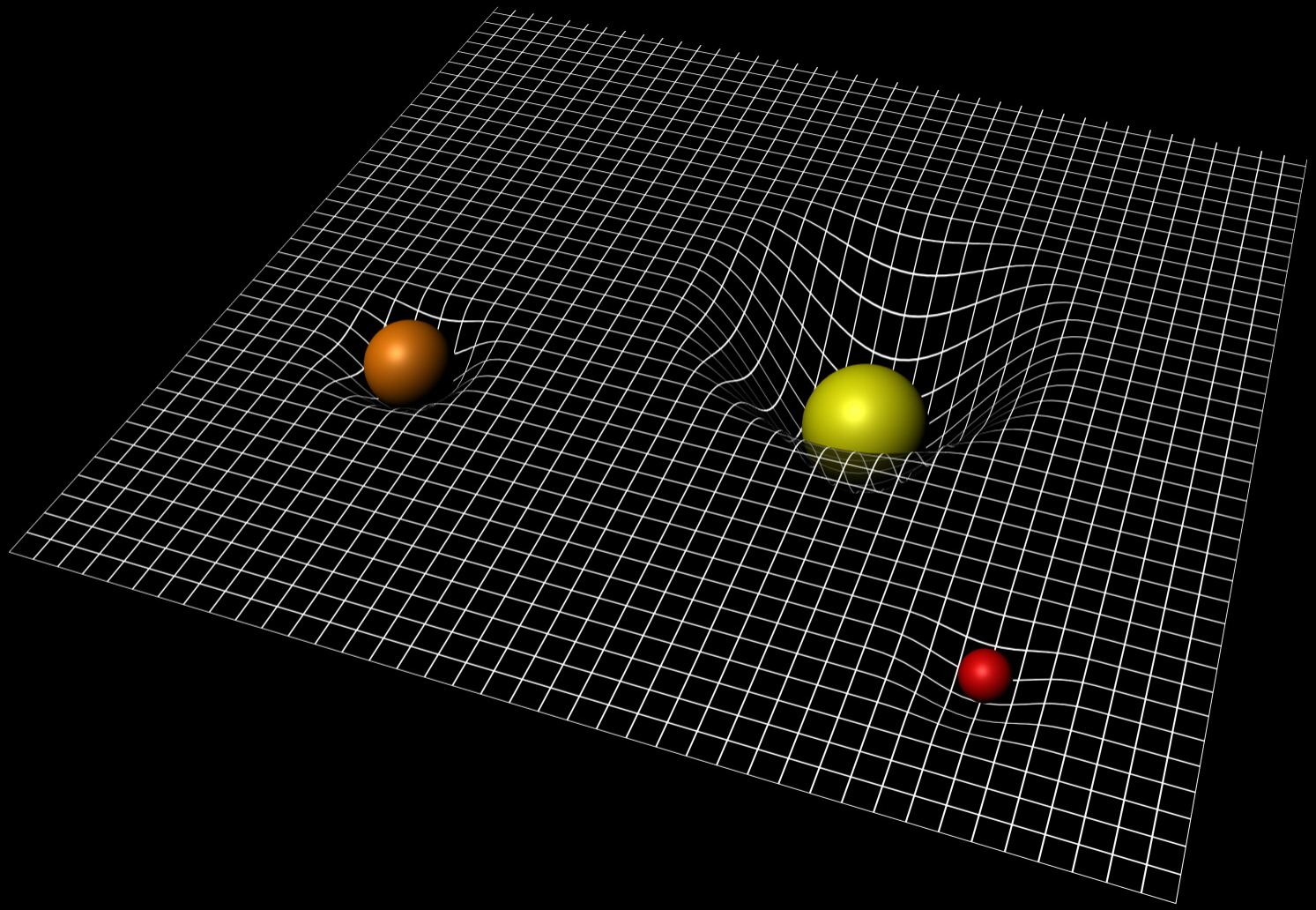
Andromeda galaksen


Optical
Infrared
Composite
Infrared & X-rays
X-rays

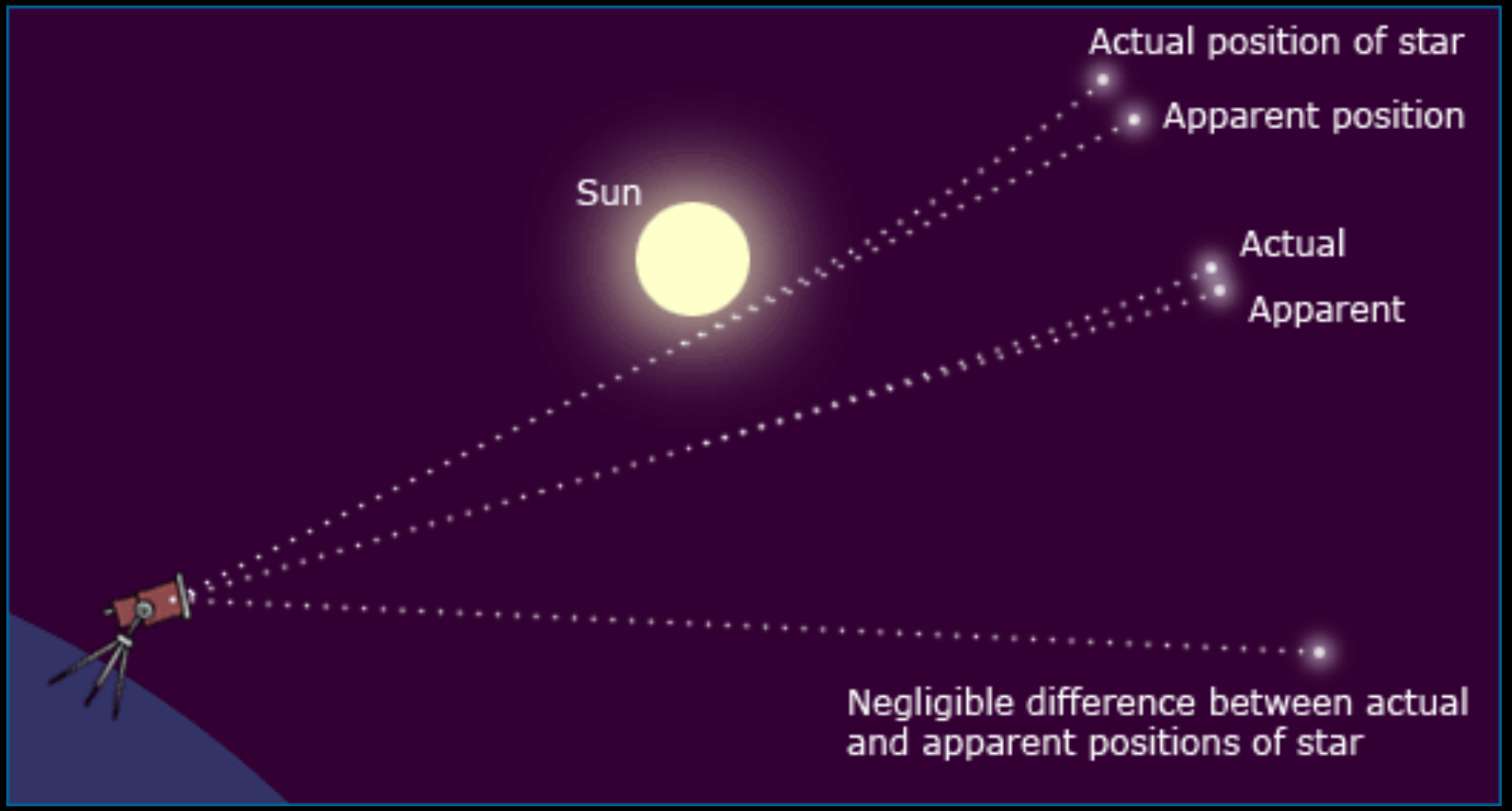

optical/UV/X-ray
continuum radiation


1992
10 light days

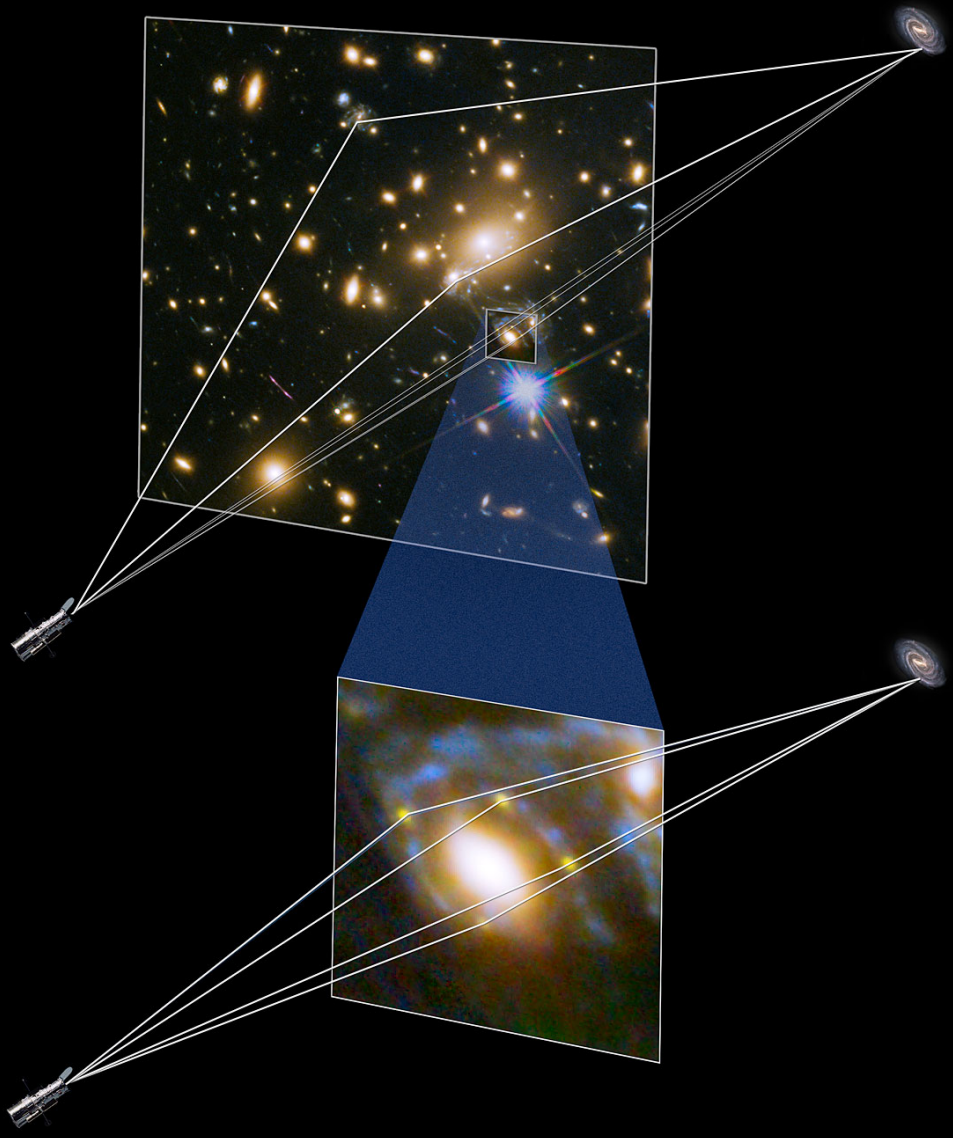
Rum-tids krumning

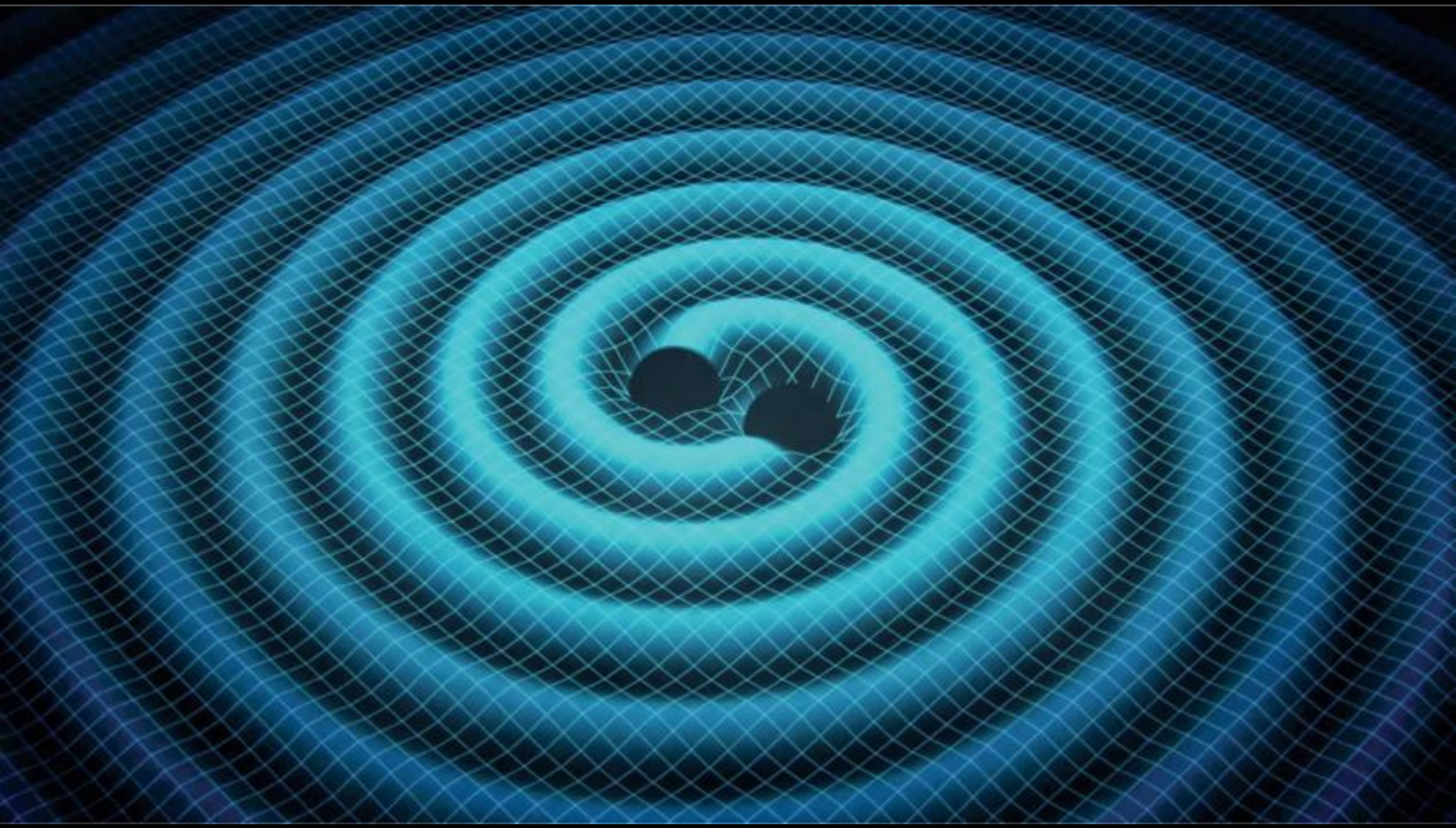


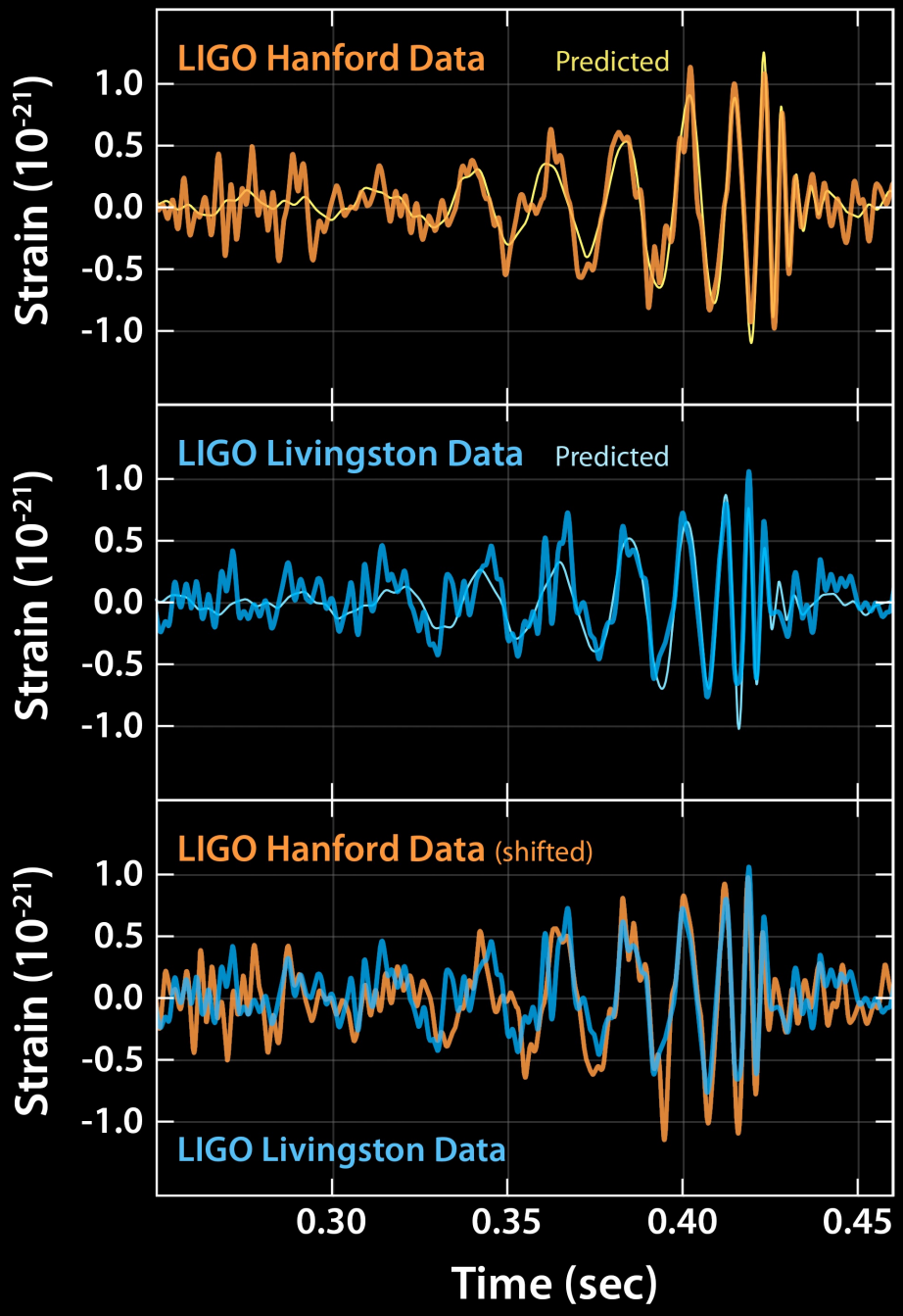
Albert Einstein foreslog i 1915 at rummet krummer.
Det blev påvist første gang i 1919 under en solformørkelse.



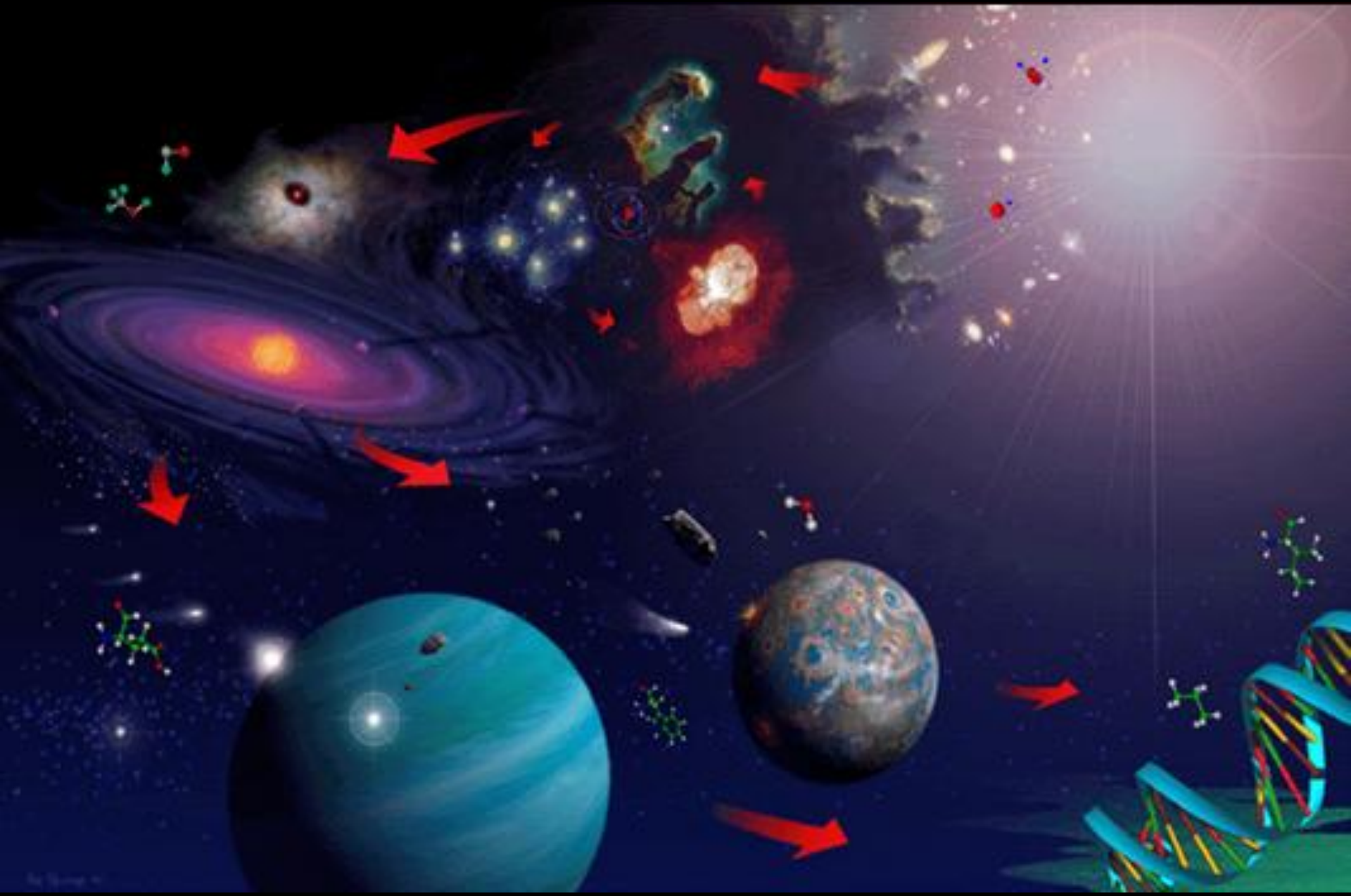
Supernova I fjern galakse





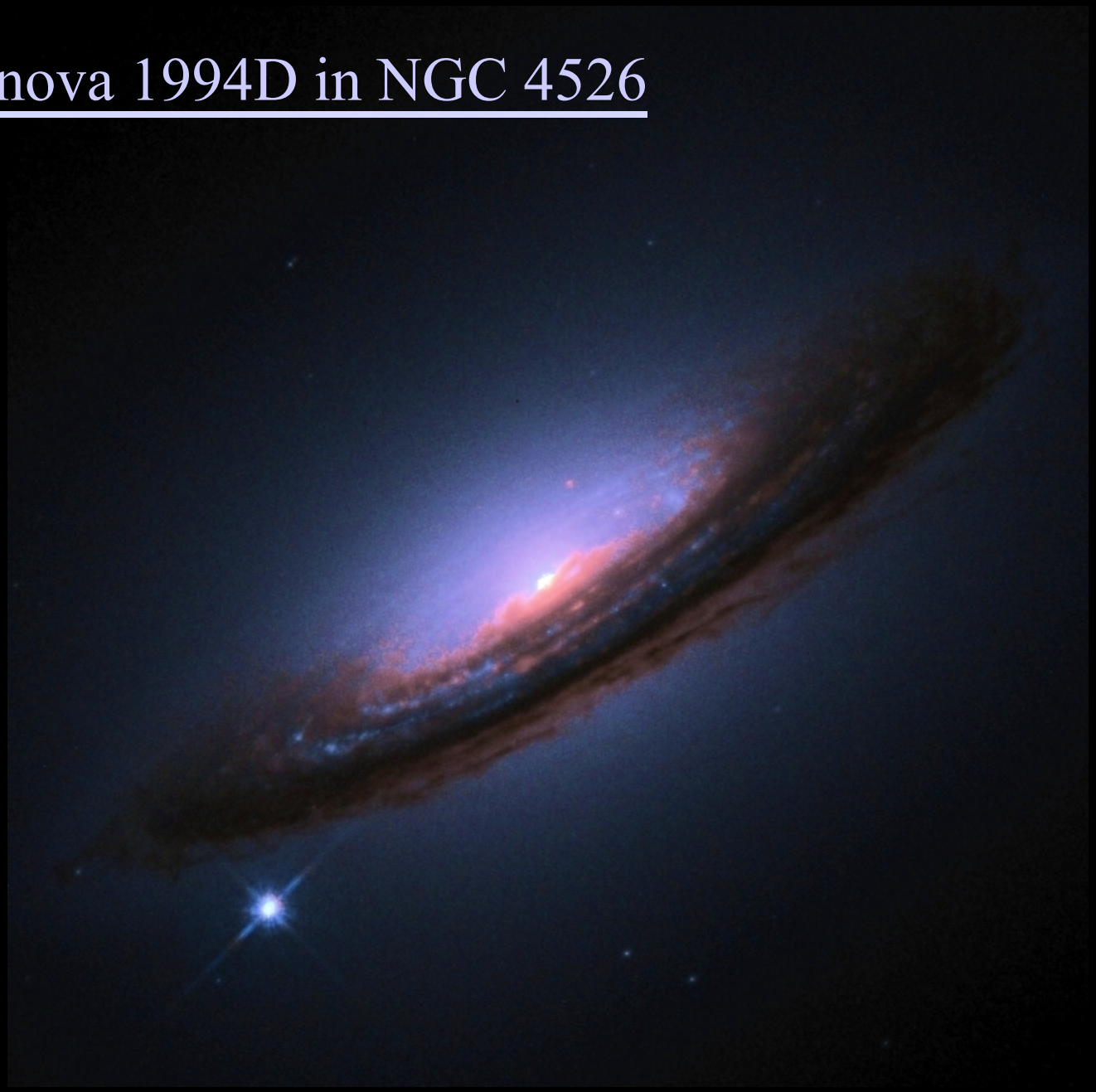

LIGO Hanford Data
Predicted
LIGO Livingston Data
Predicted
LIGO Hanford Data (shifted)
LIGO Livingston Data
Strain (10-21)
1.0
0.5
0.0
-0.5
-1.0
0.30
0.35
0.40
0.45
Time (sec)


Lyst til at høre mere om astronomi så besøg
http://www.dr.dk/P1/Rosenkjaer

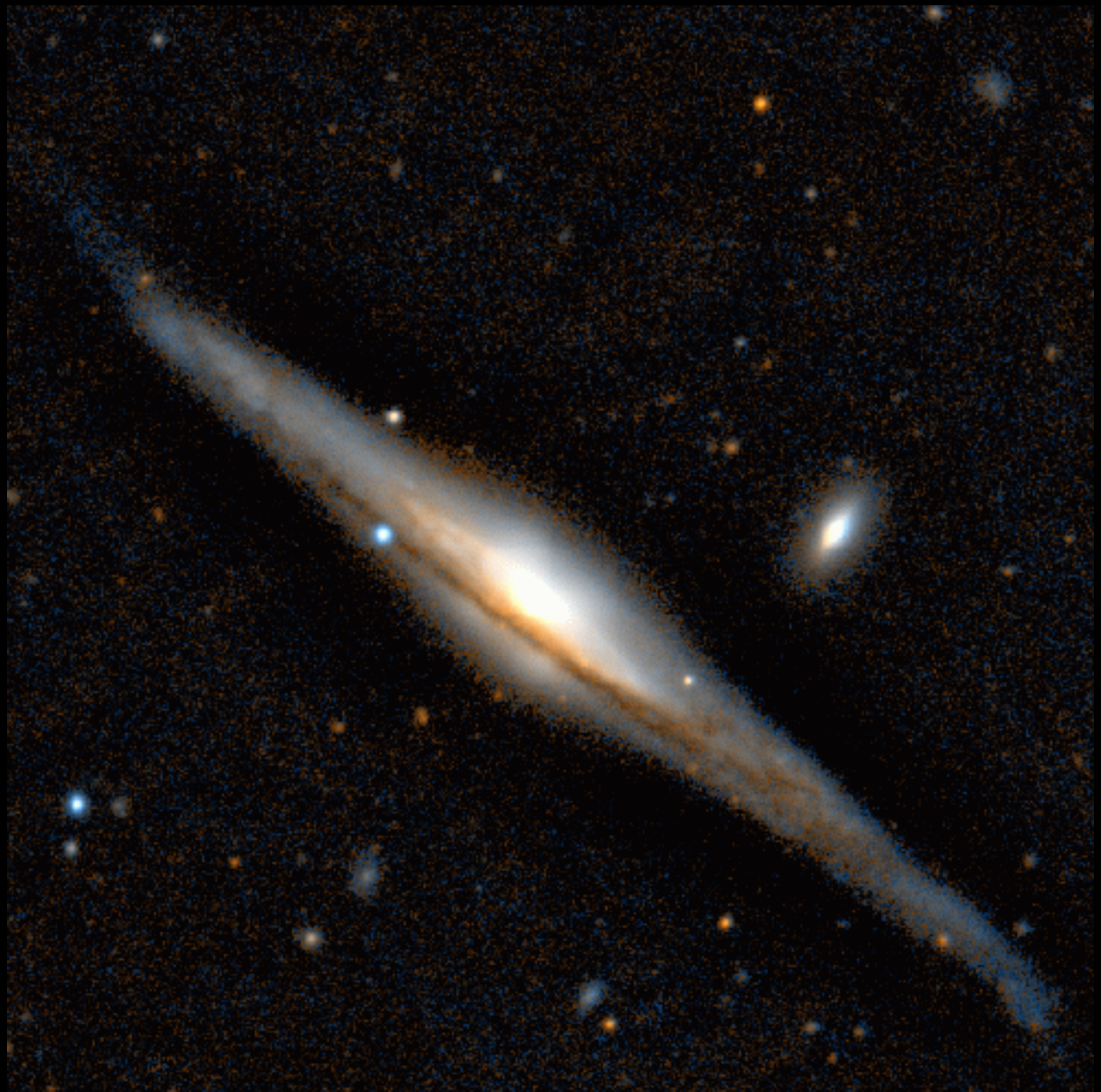


Supernovaeksplosion

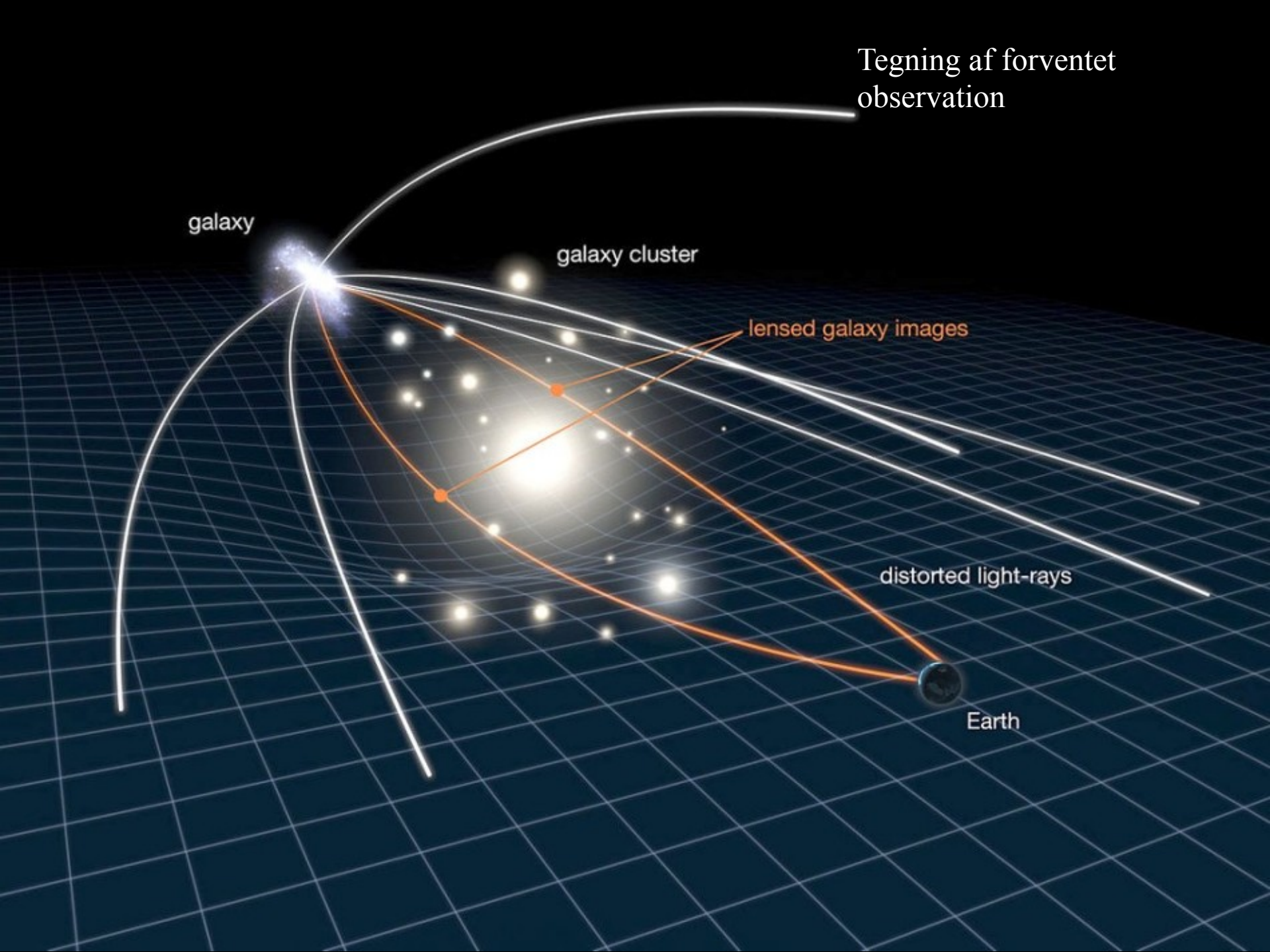
Supernova 1994D in NGC 4526

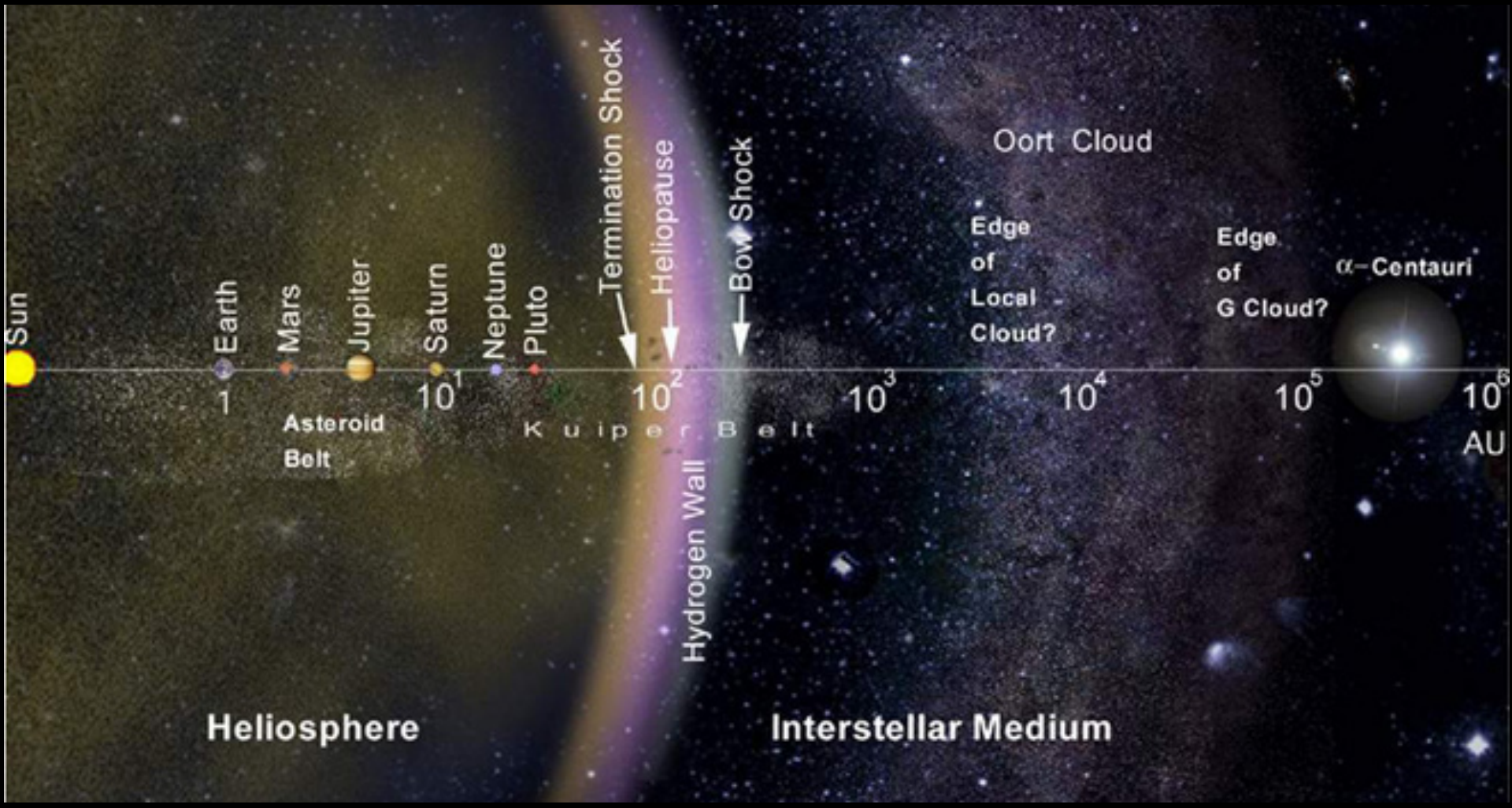


Supernova 2001cm in NGC 5965



Tegning af forventet observation

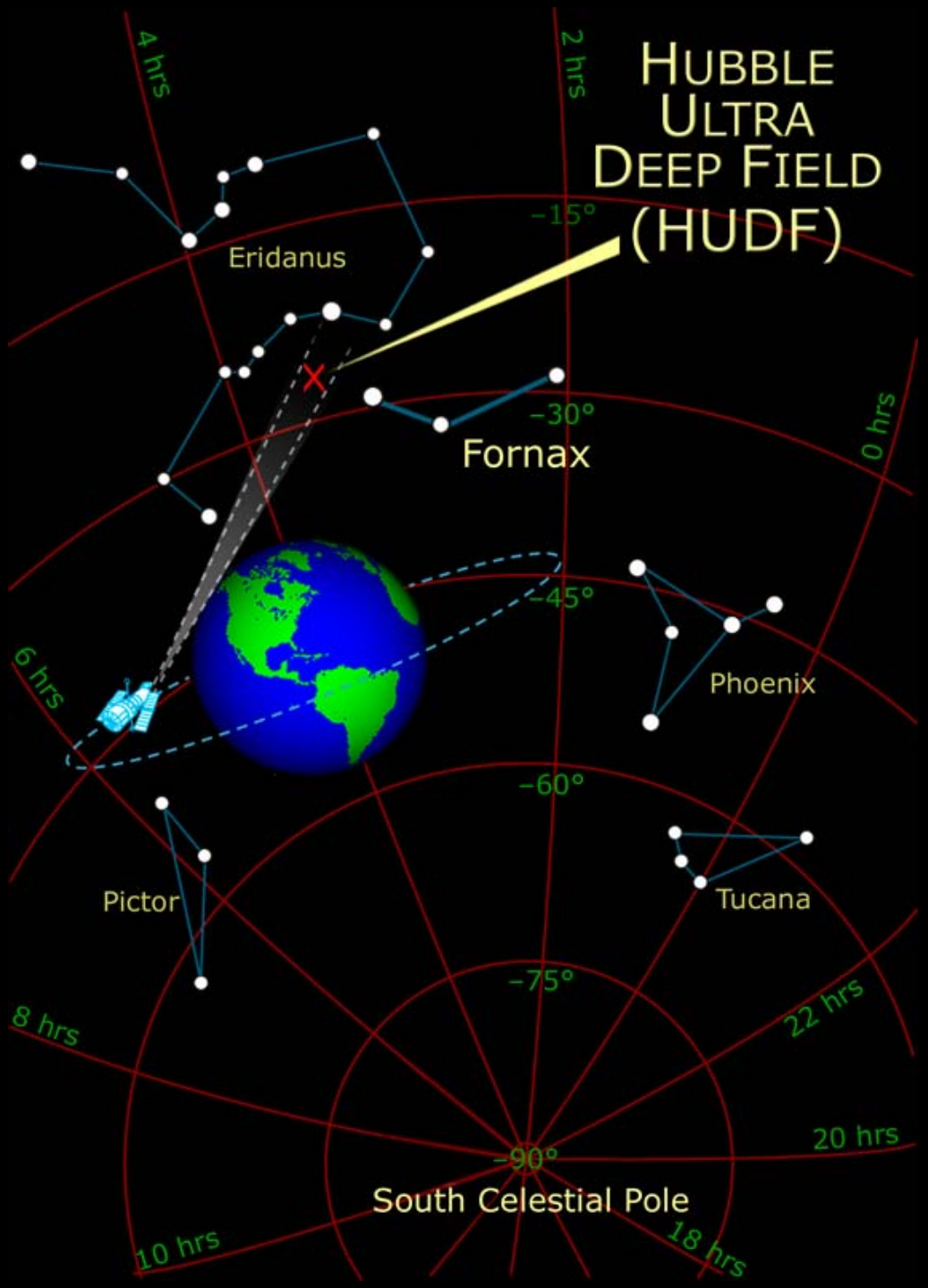



Sun
Earth
Mars
Jupiter
Saturn
Neptune
Pluto
Termination Shock
Heliopause
Bow Shock
Oort Cloud
Edge of Local Cloud?
Edge of G Cloud?
α–Centauri
1
10^1
10^2
10^3
10^4
10^5
10^6
AU
Asteroid Belt
K u i p e r B e l t
Hydrogen Wall
Heliosphere
Interstellar Medium

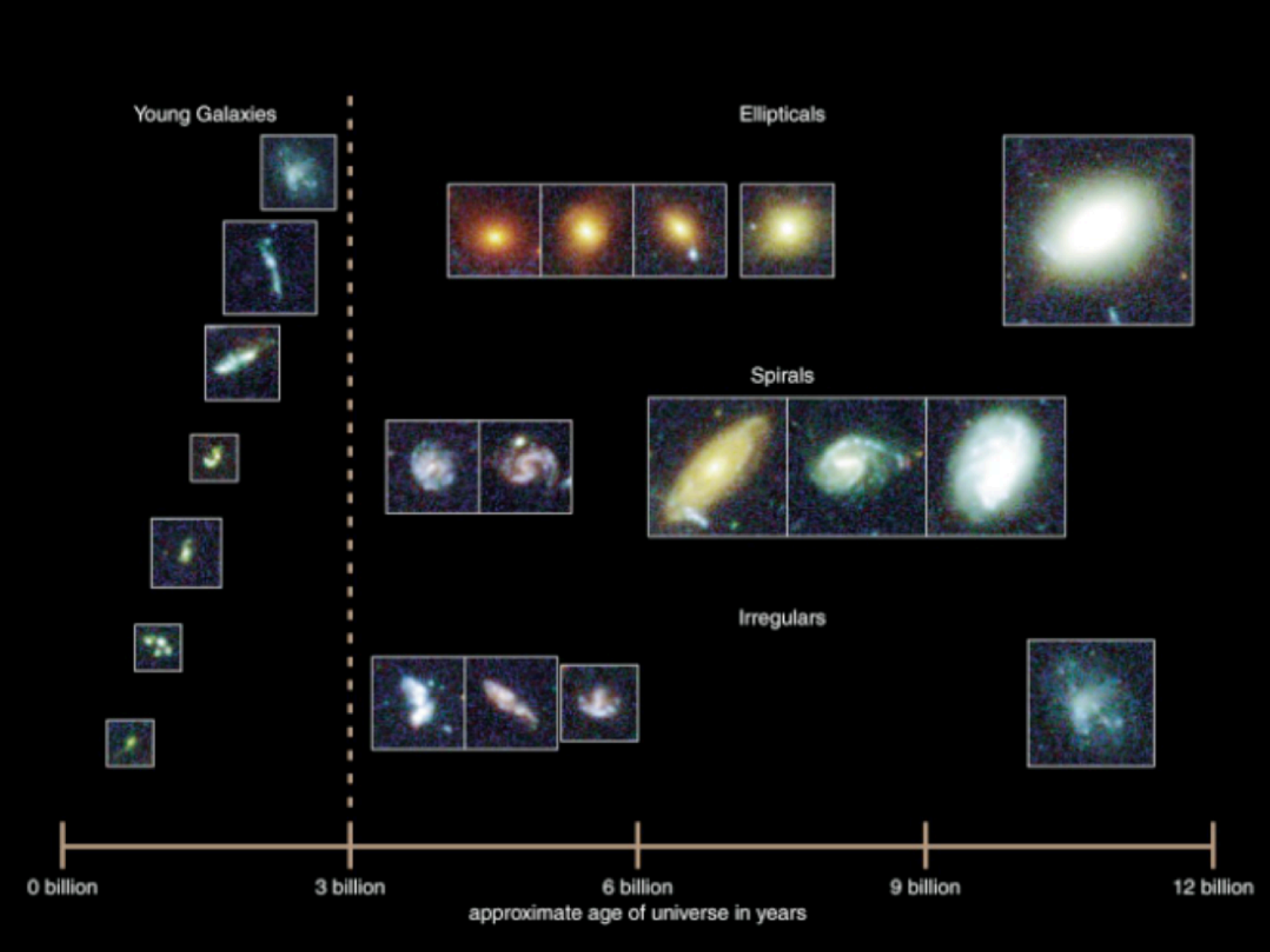
Hubble Ultra Deep Field:

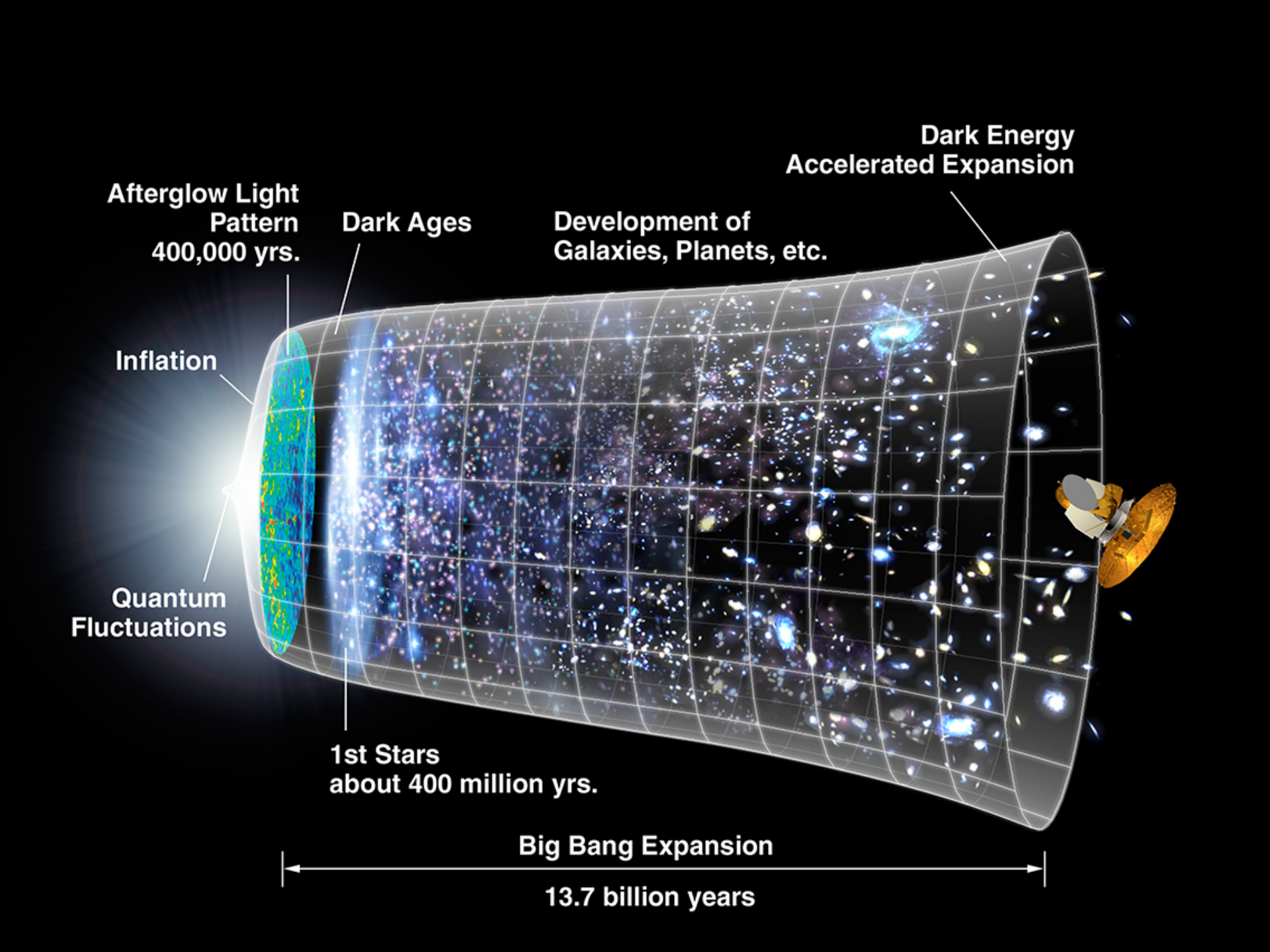
11 døgns eksponeringstid

en tidsmaskine!

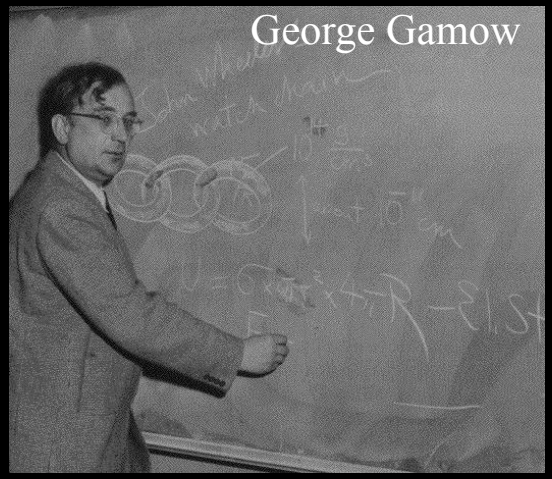


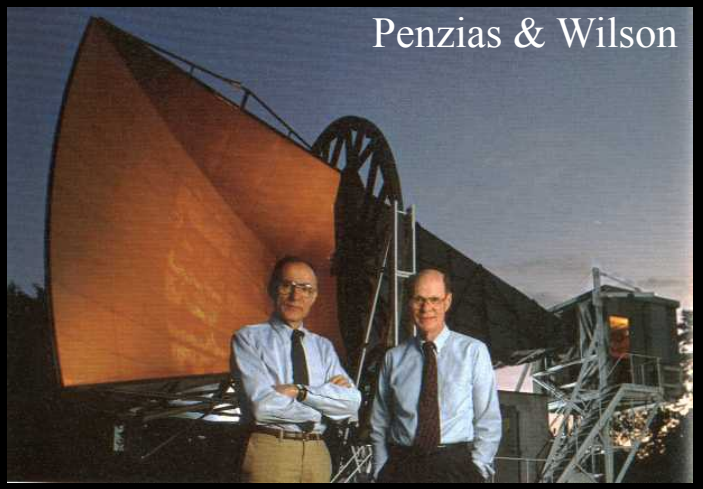
Hubble Ultra Deep Field:


Young Galaxies
Ellipticals
Spirals
Irregulars
0 billion
3 billion
6 billion
9 billion
12 billion
approximate age of universe in years

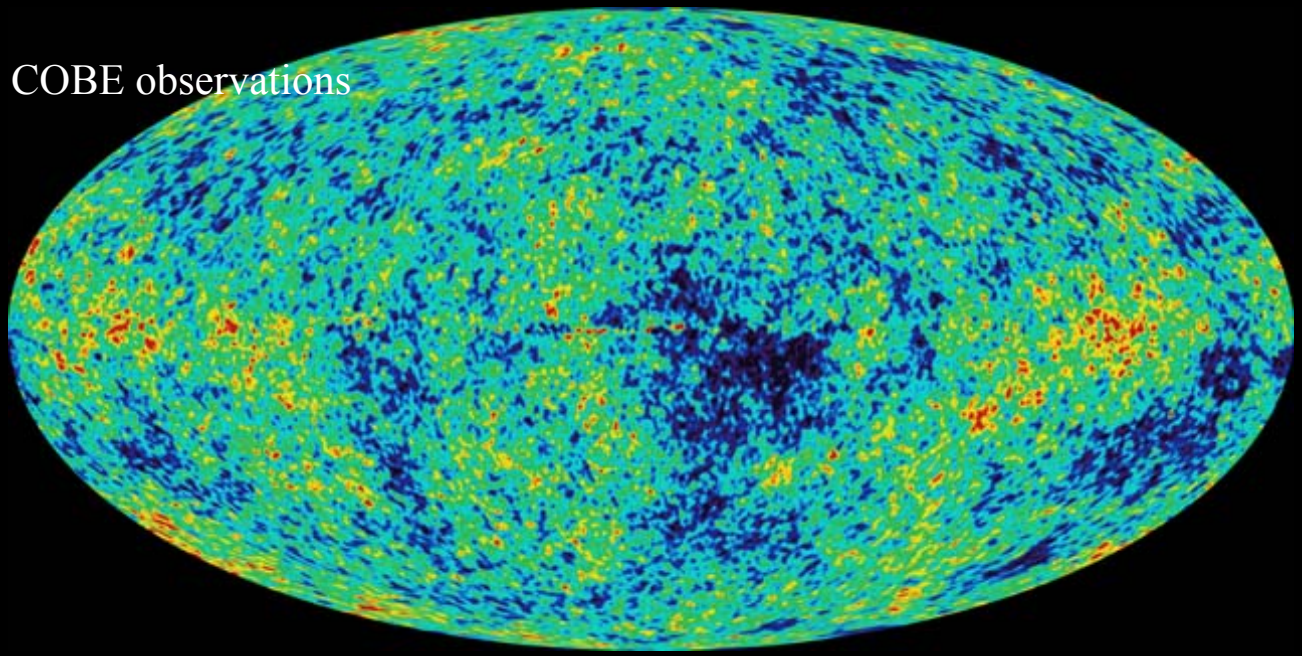

Dark Energy
Accelerated Expansion
Afterglow Light
Pattern
400,000 yrs.
Dark Ages
Development of
Galaxies, Planets, etc.
Inflation
Quantum
Fluctuations
1st Stars
about 400 million yrs.
Big Bang Expansion
13.7 billion years

Mikrobølge baggrundstårlingen

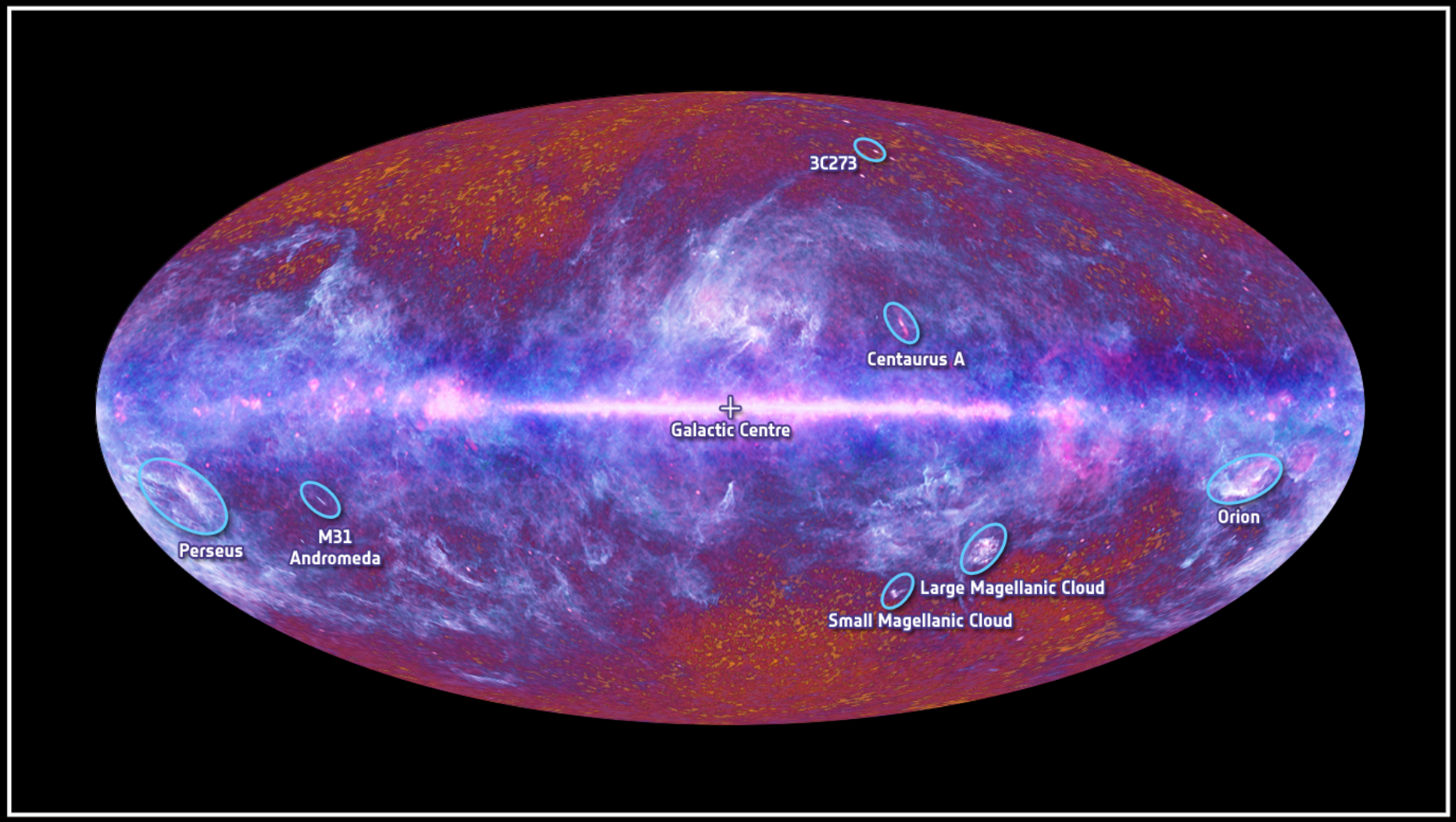

George Gamow


Penzias & Wilson

COBE observations

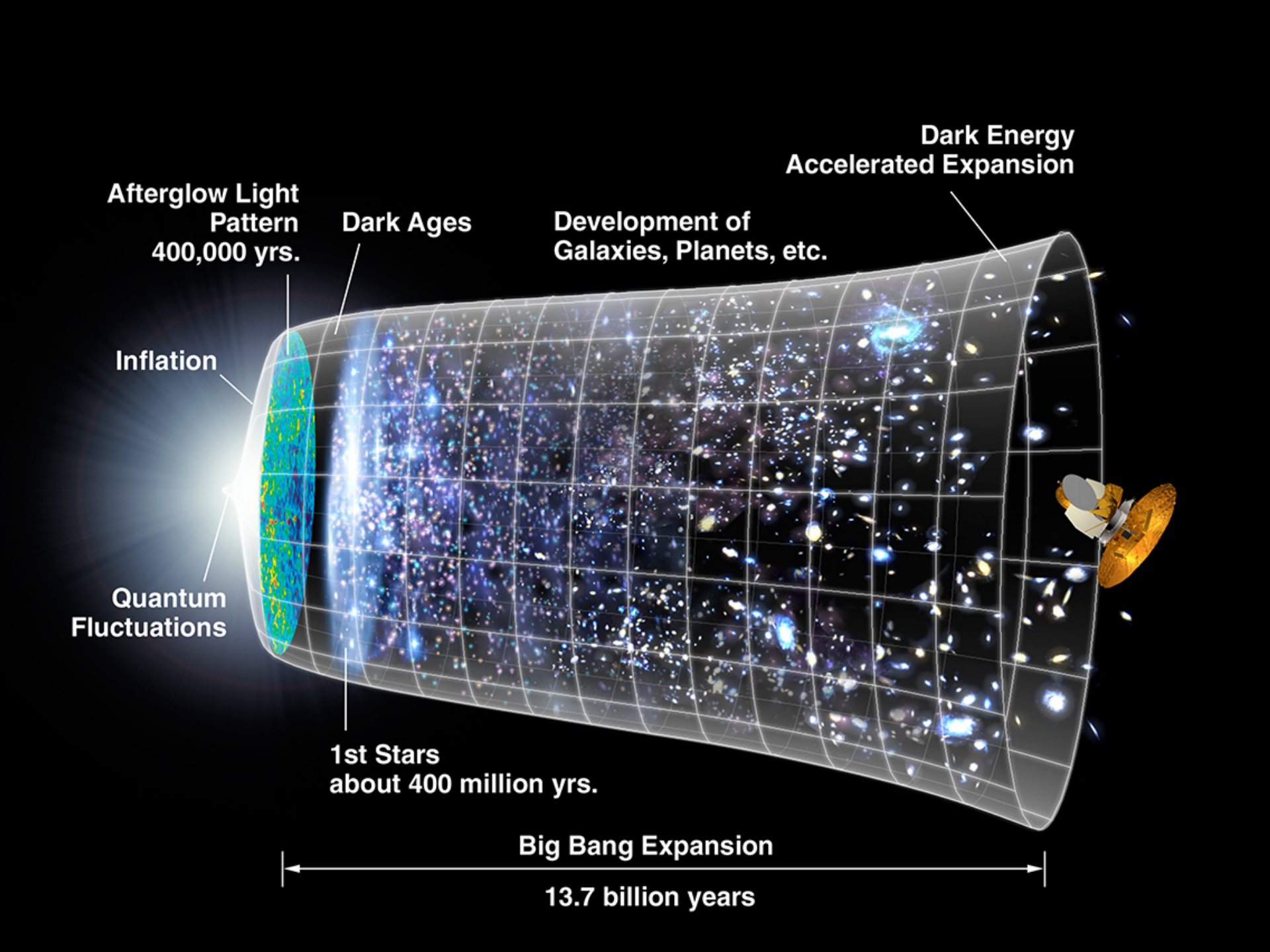


Forslået af George Gamow i 1946. Tilfældigt opdaget (serendipity) af Arno Penzias og Robert Wilson i 1964. Nobel pris i 1978.



The Planck one-year all-sky survey

esa


Dark Energy
Accelerated Expansion
Afterglow Light
Pattern
400,000 yrs.
Dark Ages
Development of
Galaxies, Planets, etc.
Inflation
Quantum
Fluctuations
1st Stars
about 400 million yrs.
Big Bang Expansion
13.7 billion years

Universets bestanddele