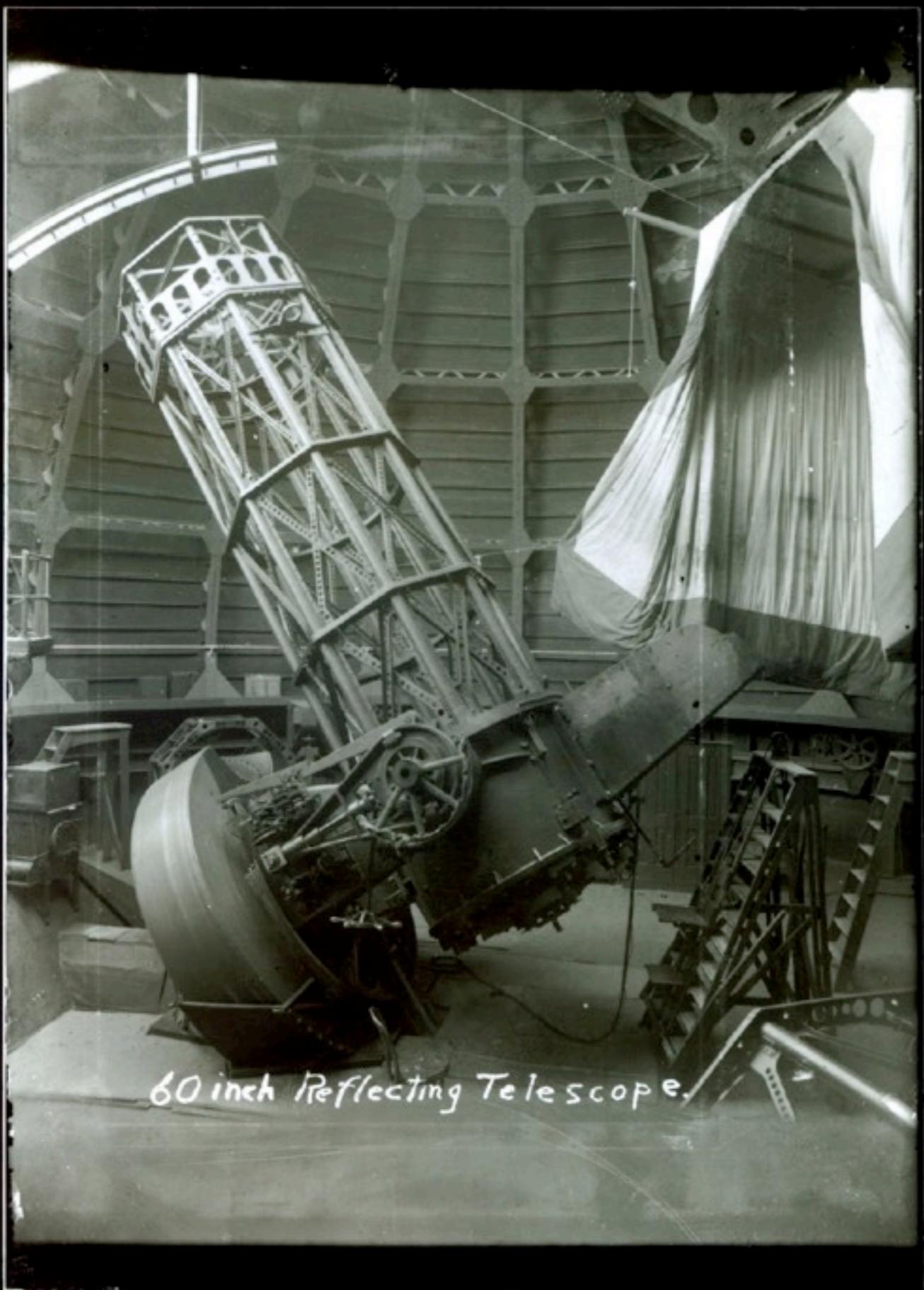


Yerkes Observatory, Williams Bay, WI
40 inch telescope (1893), world's largest refractor

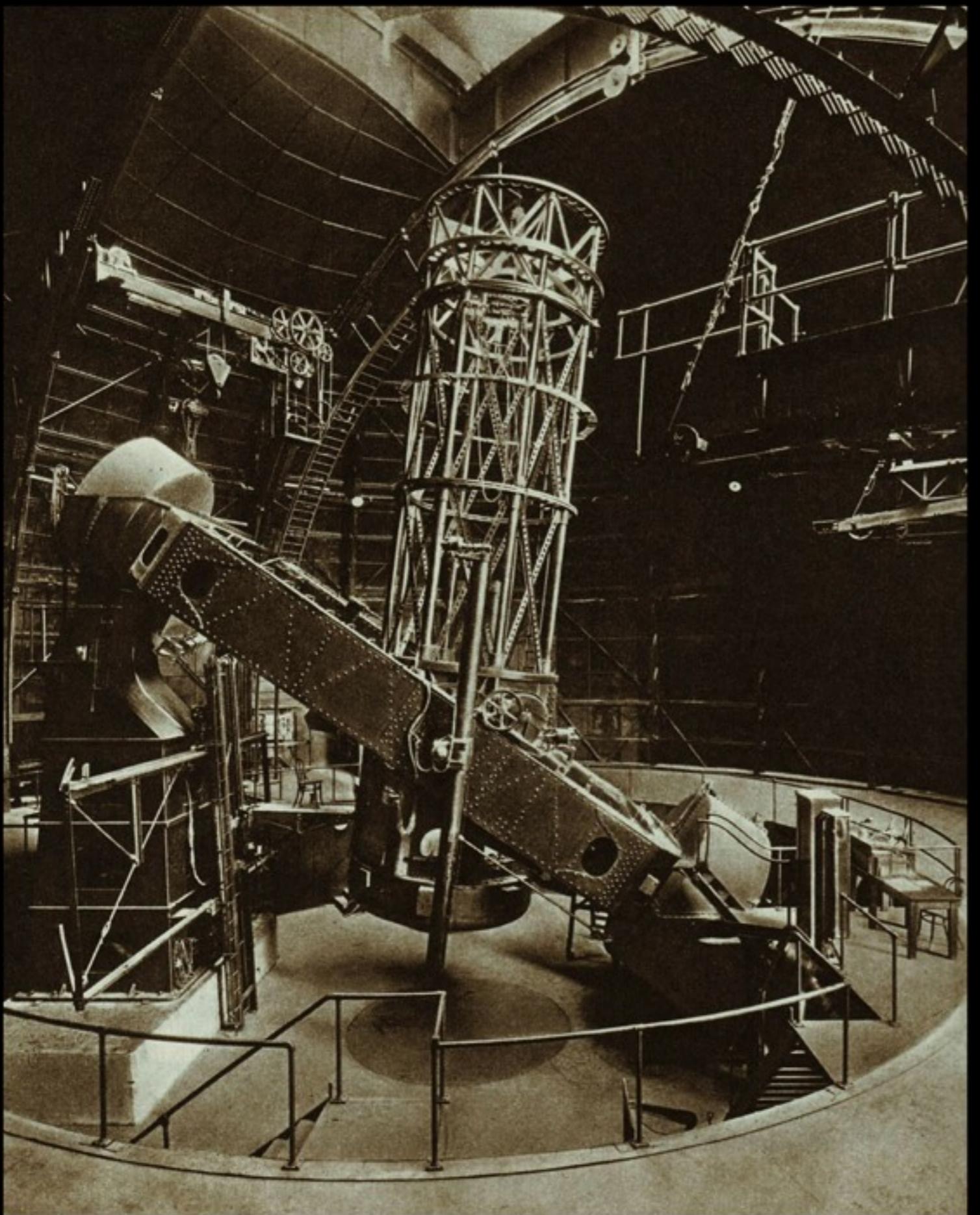




60 inch reflecting telescope, Mt Wilson, CA

Built by George Ellery Hale in 1908 – world's largest telescope at the time

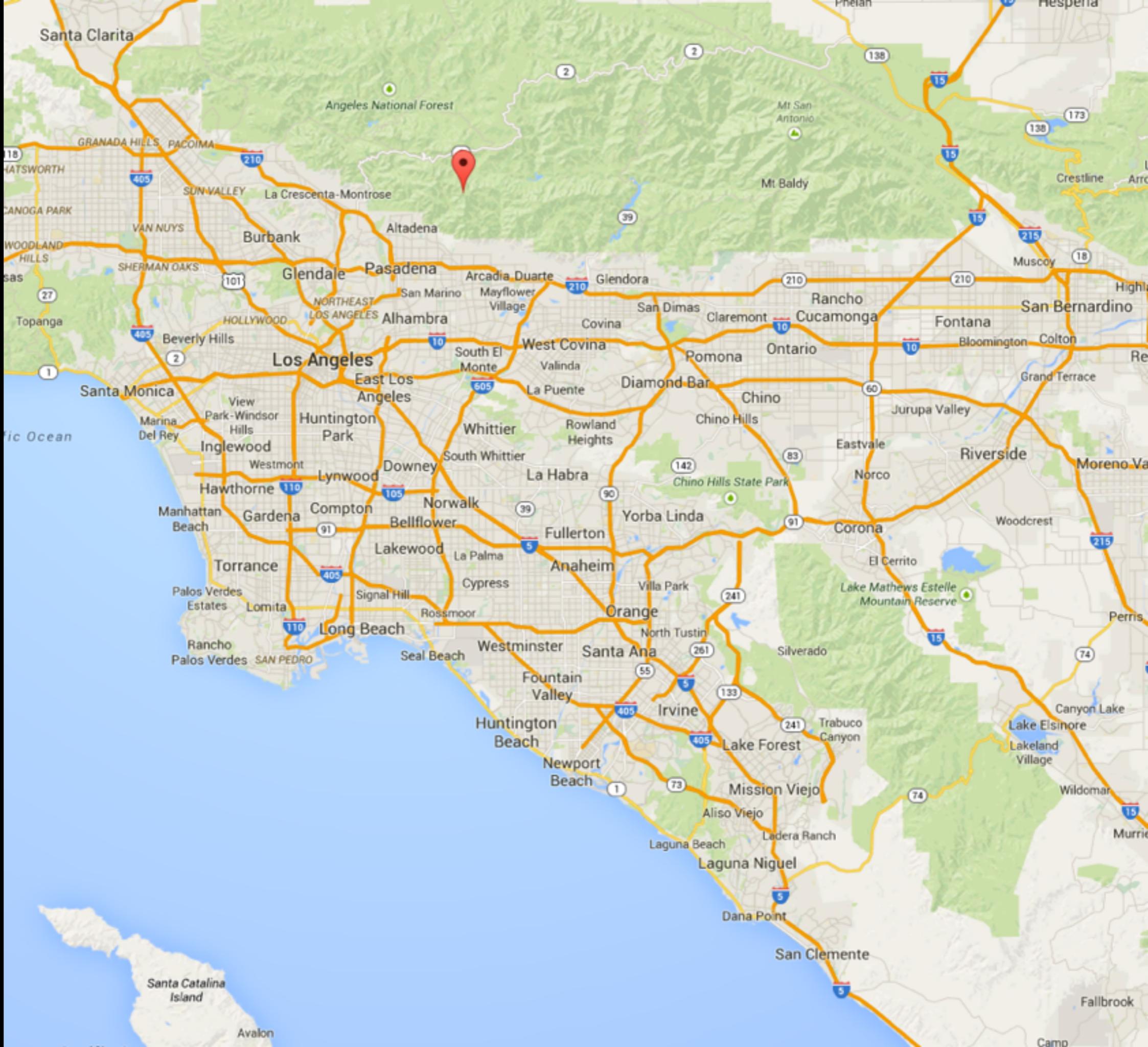
large lenses, held at the edges, sag from gravity, so the largest telescopes are reflectors and have been for the last century

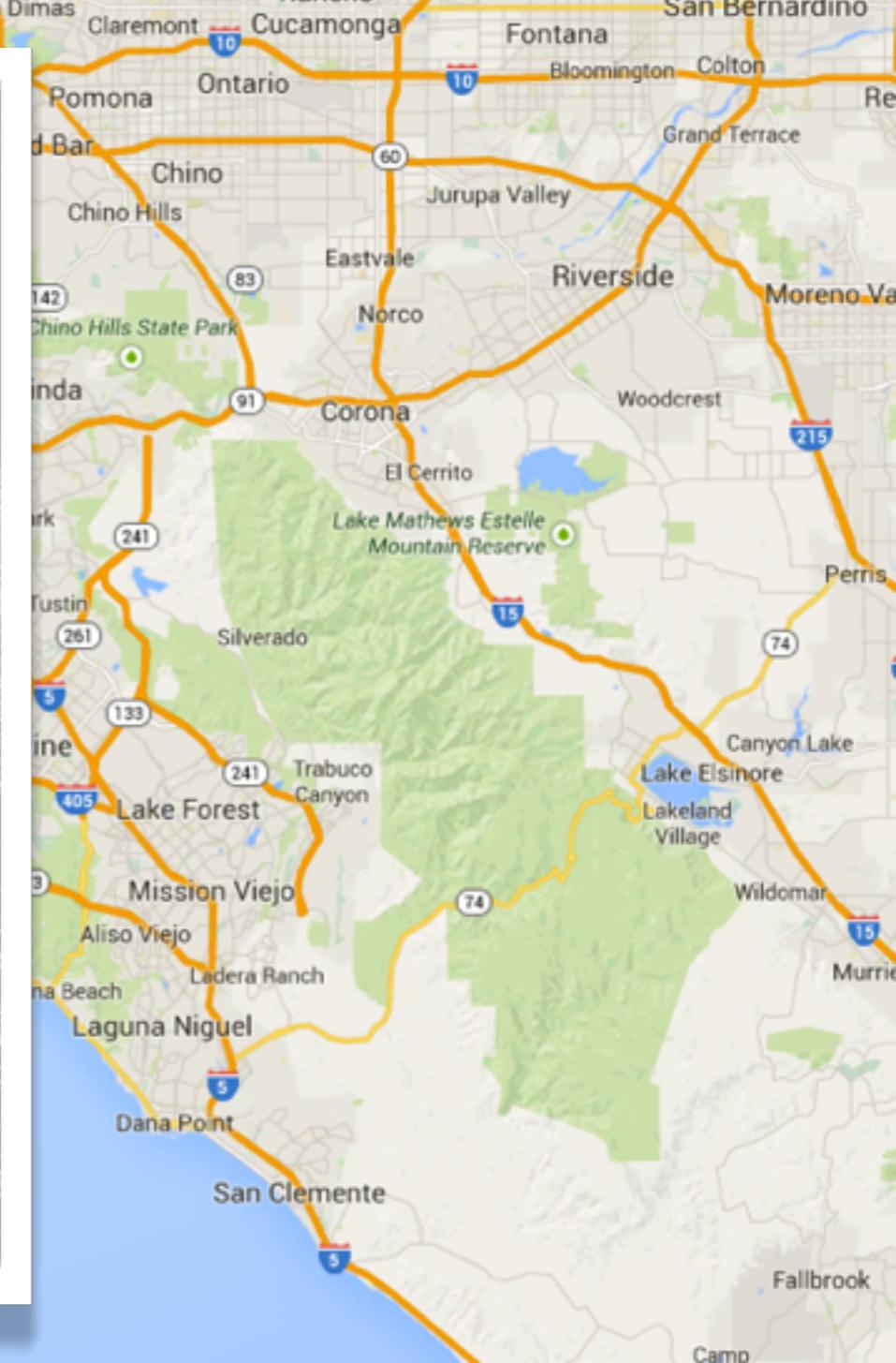
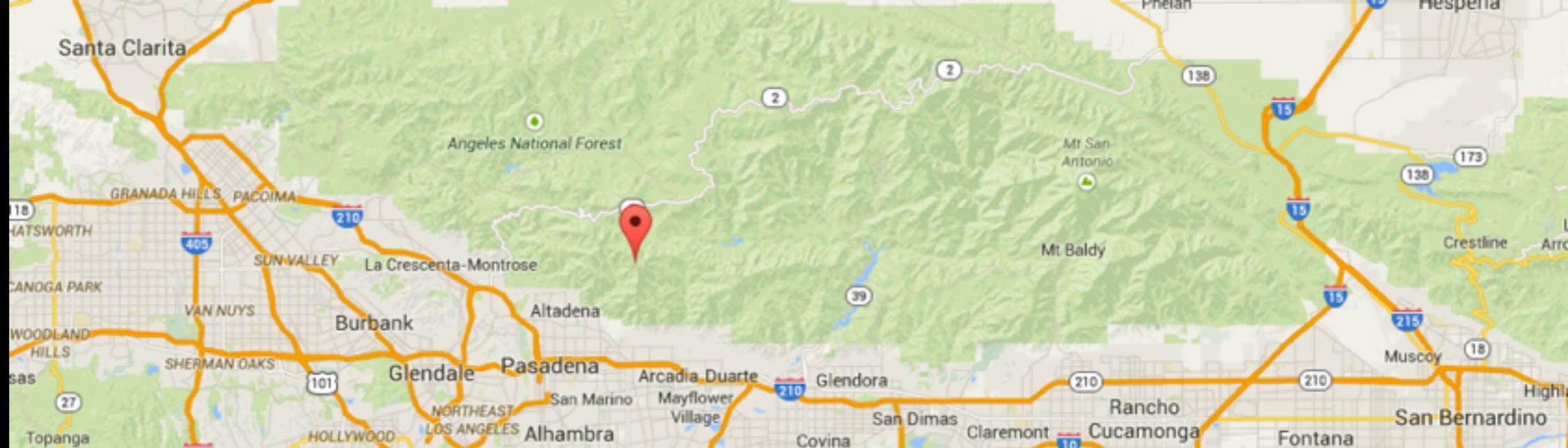


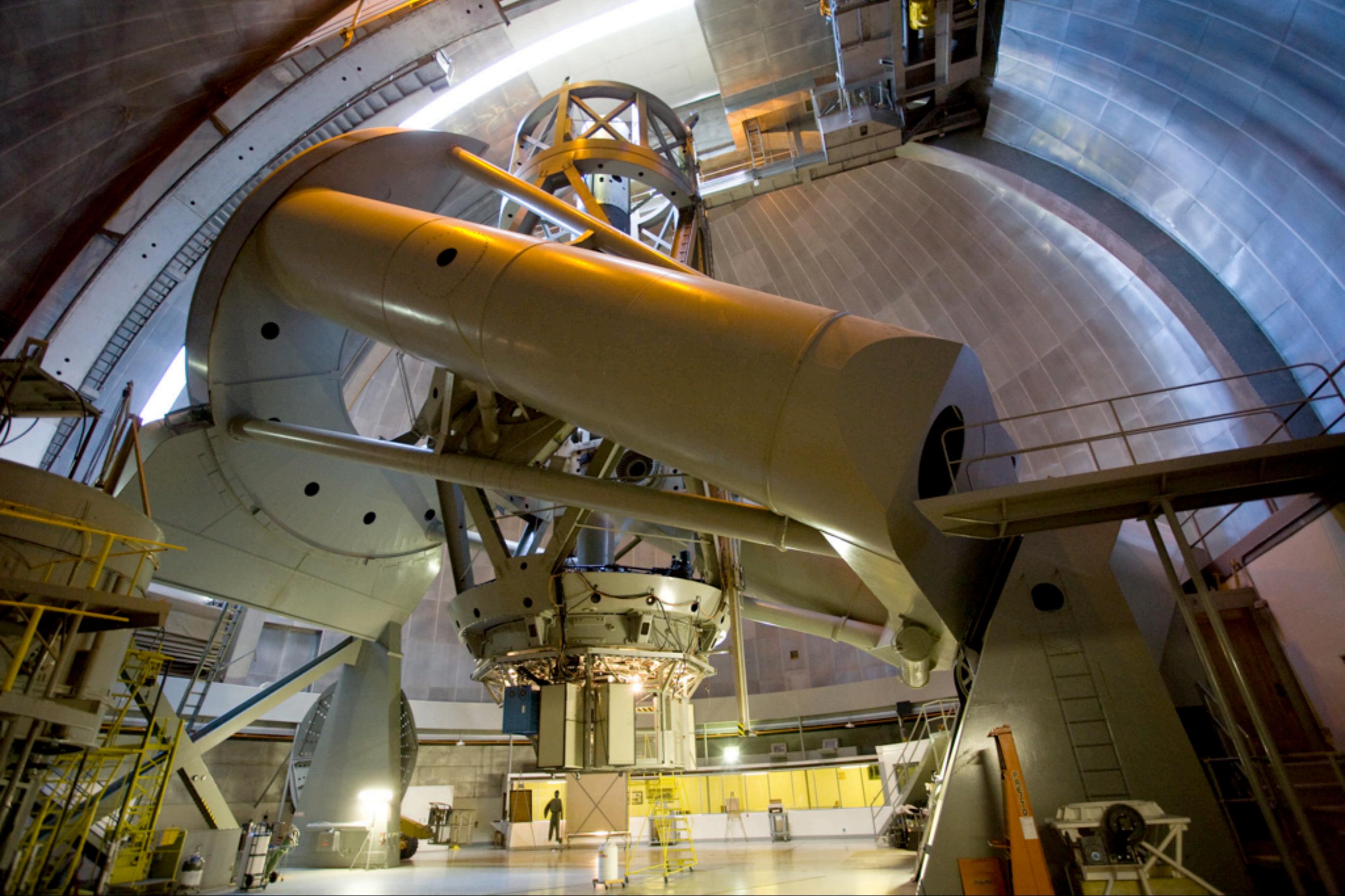
100 inch reflecting telescope, Mt Wilson, CA

Built by George Ellery Hale in 1917 – world's largest telescope until 1948

Used by Edwin Hubble to discover galaxies outside the Milky Way and the expanding universe





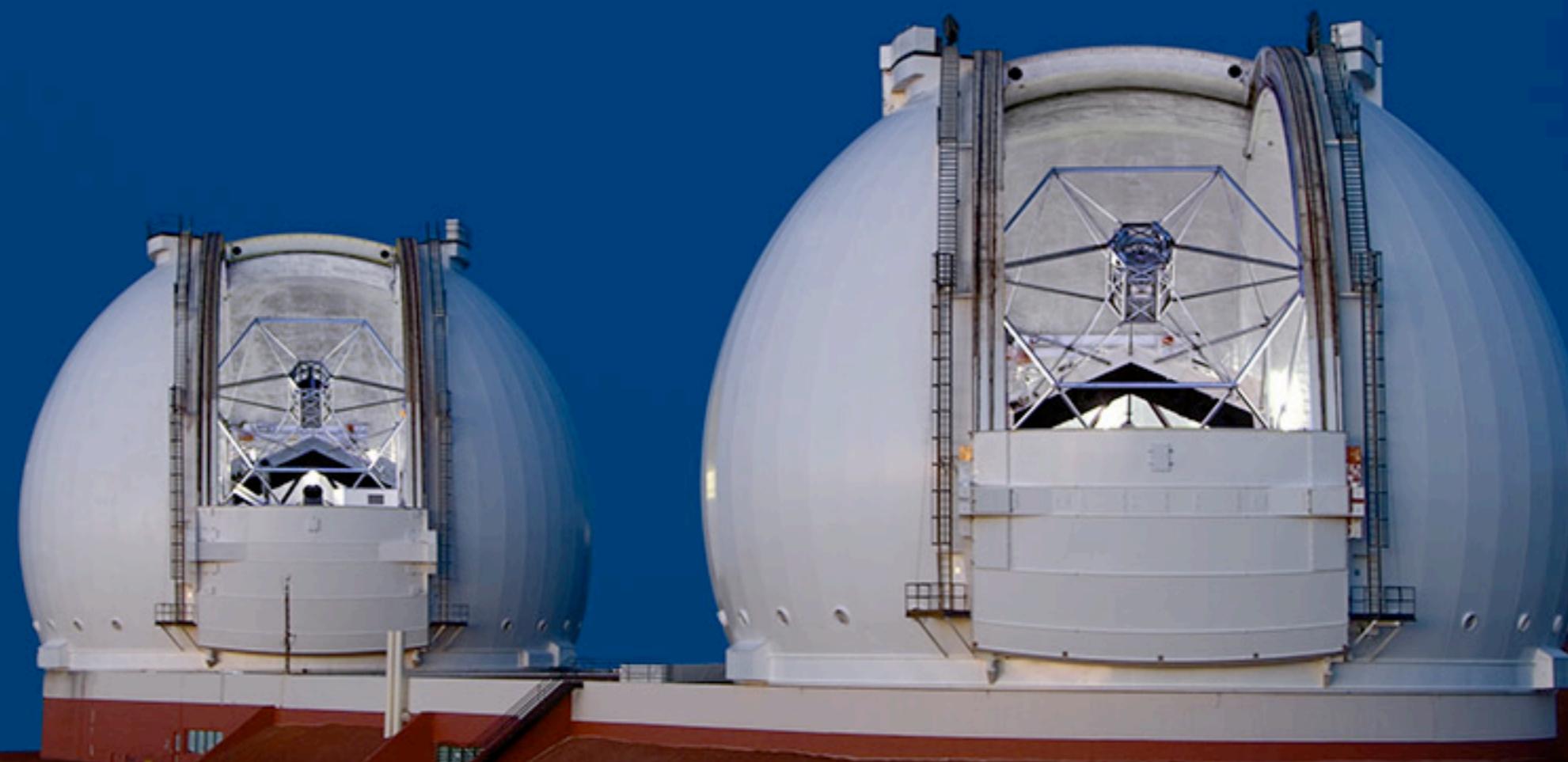


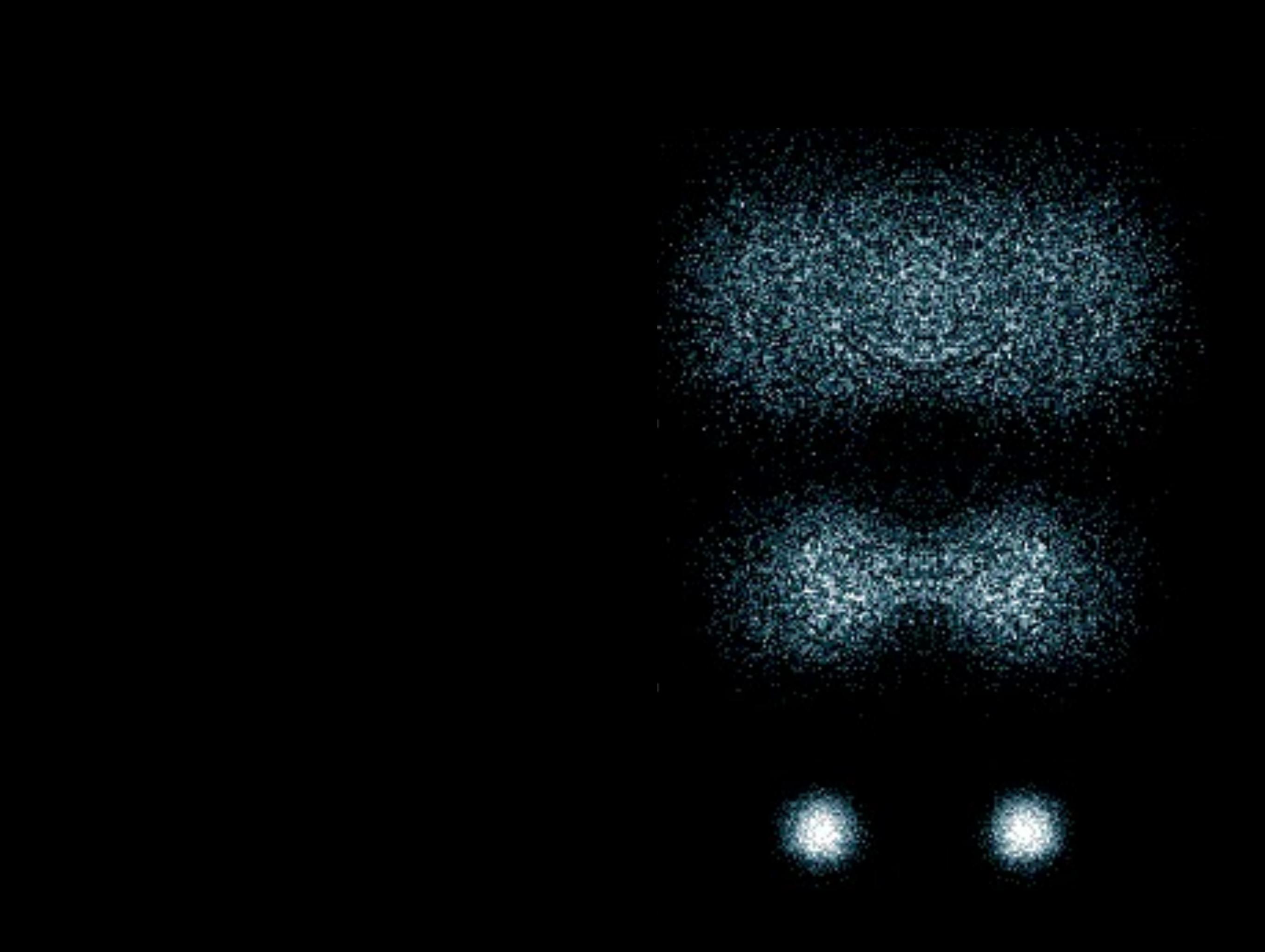
Hale 200 inch Telescope, Palomar Observatory, CA (1948)



The largest telescopes now have segmented mirrors, computer controlled for proper alignment. This is lighter than a single mirror.

Keck Telescopes, Mauna Kea, HI (1993-1996)





1

3

2

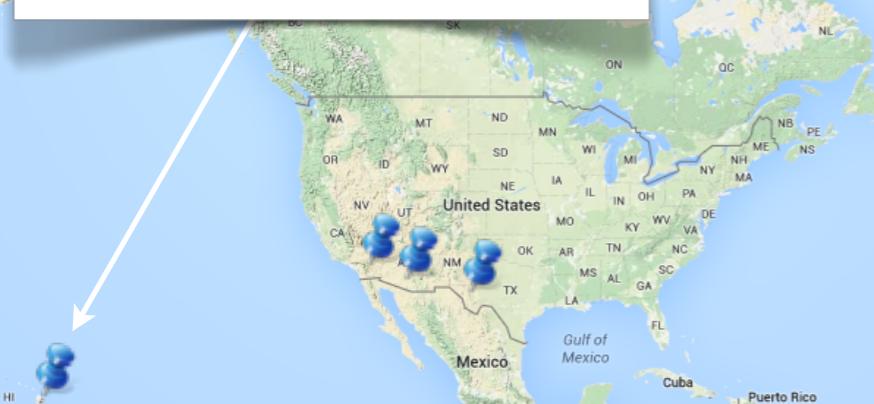
4

Low resolution

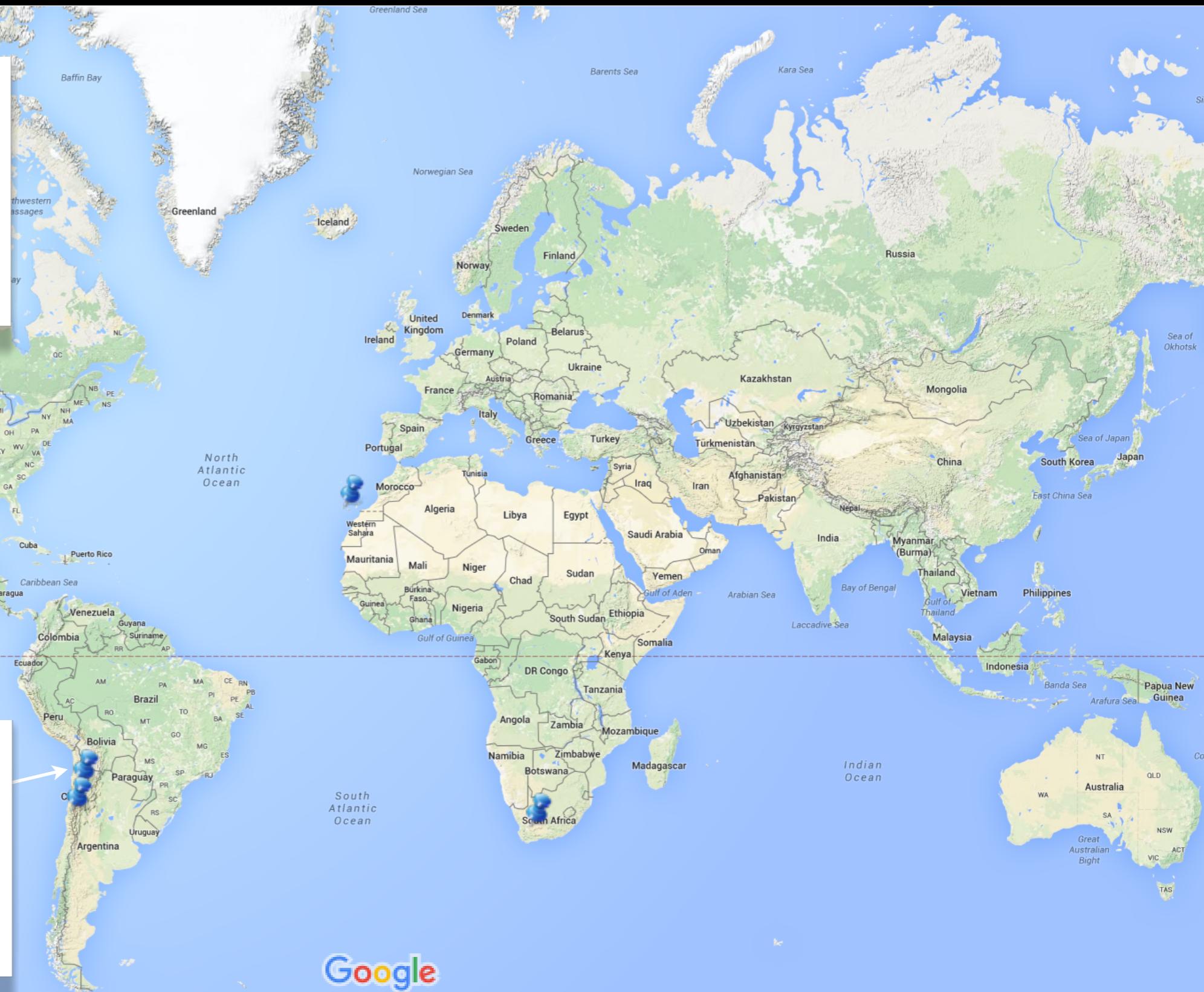
Higher resolution

Where do we put telescopes?

Mauna Kea, Hawaii



Paranal, Chile



Where do we put telescopes?



Southern Africa Large Telescope



VLT (Very Large Telescopes)
European Southern Observatory, Paranal, Chile

[ARCHIVE](#)
[WHAT IF?](#)
[BLAG](#)
[STORE](#)
[ABOUT](#)



**A WEBCOMIC OF ROMANCE,
SARCASM, MATH, AND LANGUAGE.**

XKCD UPDATES EVERY MONDAY, WEDNESDAY, AND FRIDAY.

TELESCOPE NAMES

 [PREV](#) [RANDOM](#) [NEXT >](#)

- | | |
|-------------------------------------|--|
| THE VERY LARGE TELESCOPE | <input checked="" type="checkbox"/> |
| THE EXTREMELY LARGE TELESCOPE | <input checked="" type="checkbox"/> |
| THE OVERWHELMINGLY LARGE TELESCOPE | <input checked="" type="checkbox"/> (CANCELED) |
| THE OPPRESSIVELY COLOSSAL TELESCOPE | <input type="checkbox"/> |
| THE MIND-NUMBINGLY VAST TELESCOPE | <input type="checkbox"/> |
| THE DESPAIR TELESCOPE | <input type="checkbox"/> |
| THE CATASTROPHIC TELESCOPE | <input type="checkbox"/> |
| THE TELESCOPE OF DEVASTATION | <input type="checkbox"/> |
| THE NIGHTMARE SCOPE | <input type="checkbox"/> |
| THE INFINITE TELESCOPE | <input type="checkbox"/> |
| THE FINAL TELESCOPE | <input type="checkbox"/> |

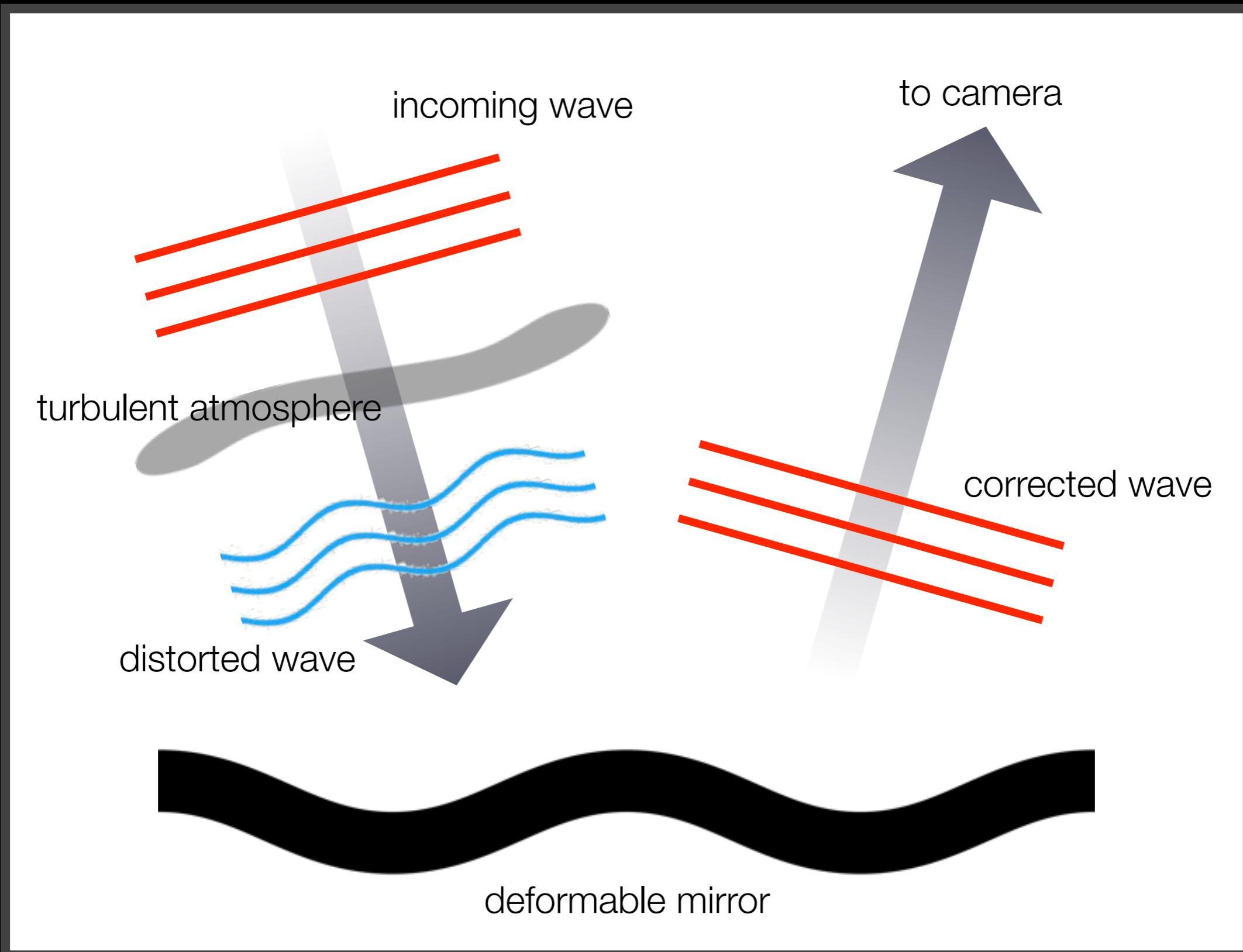
The Thirty Meter Telescope will be renamed
The Flesh-Searing Eye on the Volcano.

 [PREV](#) [RANDOM](#) [NEXT >](#)

PERMANENT LINK TO THIS COMIC: [HTTP://XKCD.COM/1294/](http://xkcd.com/1294/)

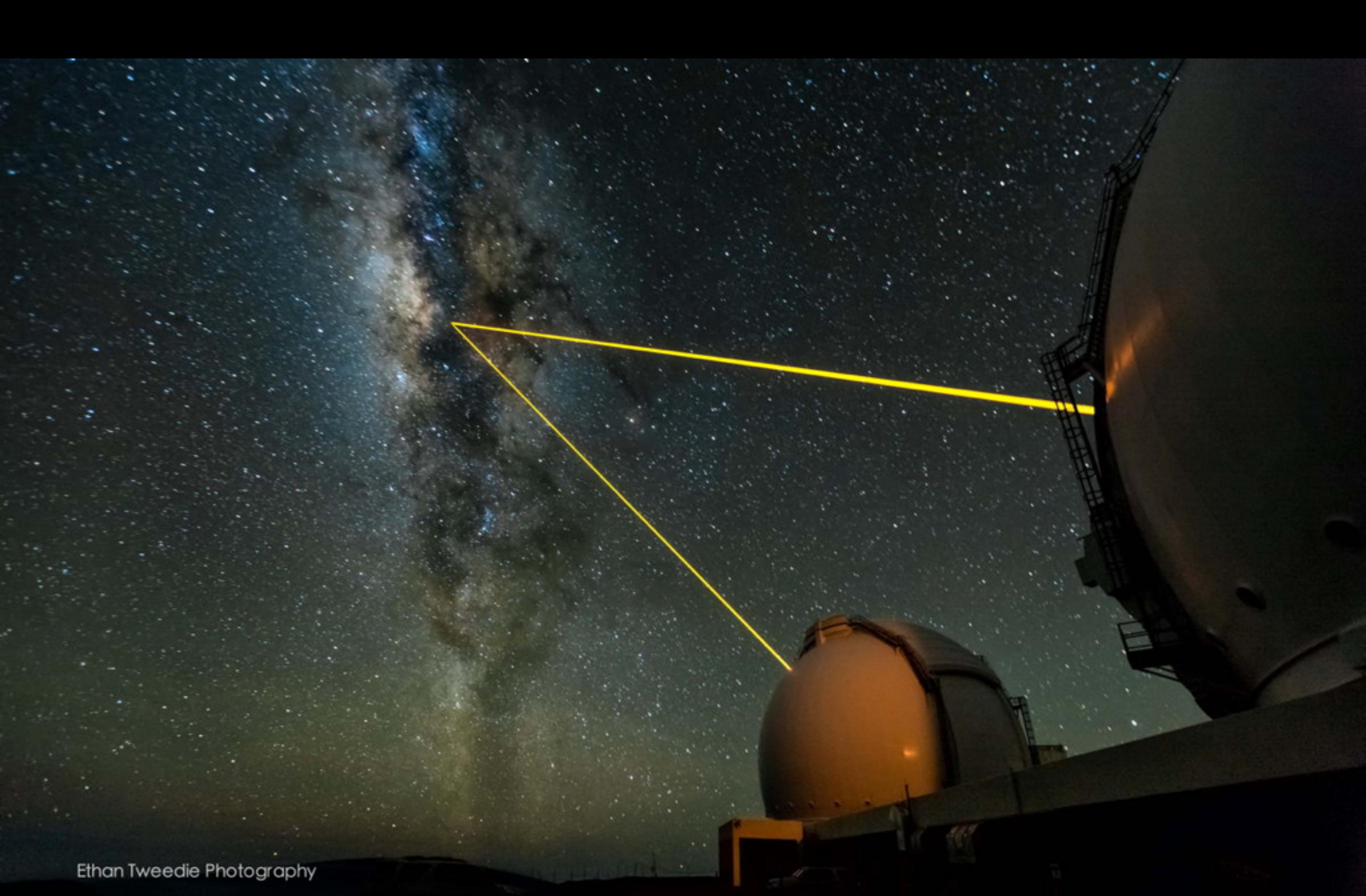
IMAGE URL (FOR HOTLINKING/EMBEDDING): [HTTP://IMGS.XKCD.COM/COMICS/TELESCOPE_NAMES.PNG](http://imgs.xkcd.com/comics/telescope_names.png)

Fix it: Adaptive Optics





Center of the Milky Way galaxy, observed without (left) and with (right) adaptive optics



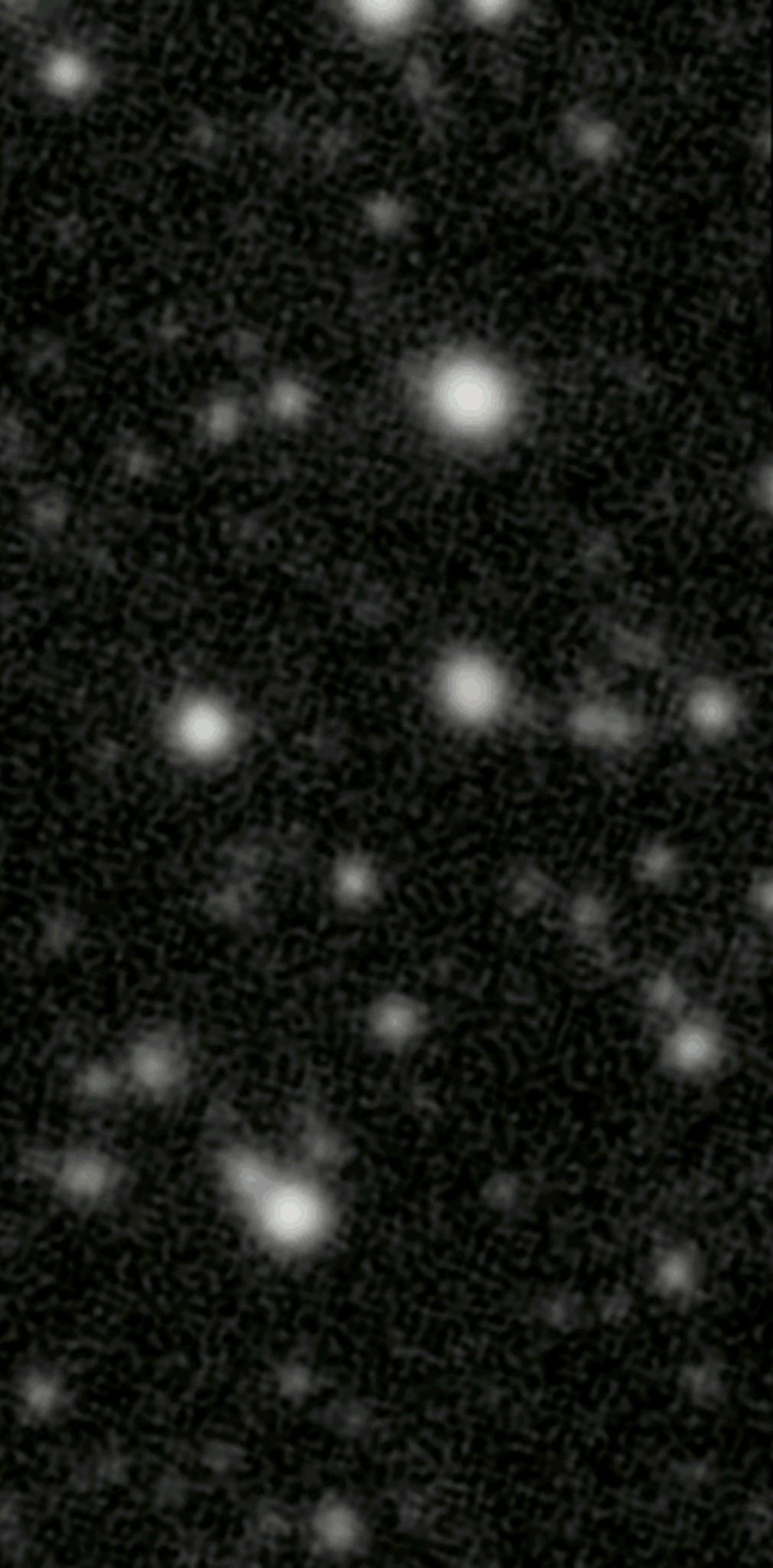
Ethan Tweedie Photography



© Adam Elliott 2012

The Hubble Space Telescope





Animation: the Hubble
Deep Field, from the
ground and from space

<http://www.astrobin.com/22346/>

Animation: the Hubble Deep Field, from the ground and from space

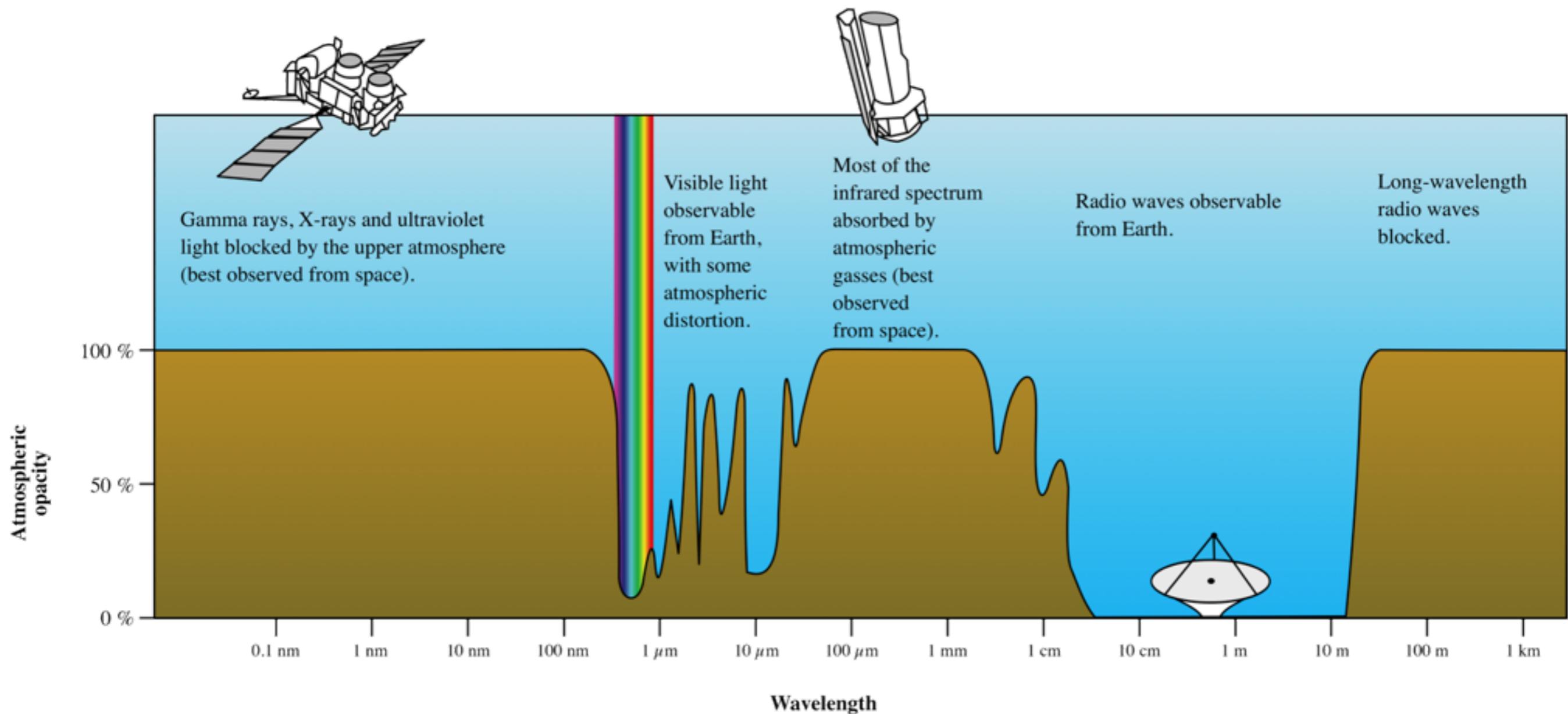
<http://www.astrobin.com/22346/>



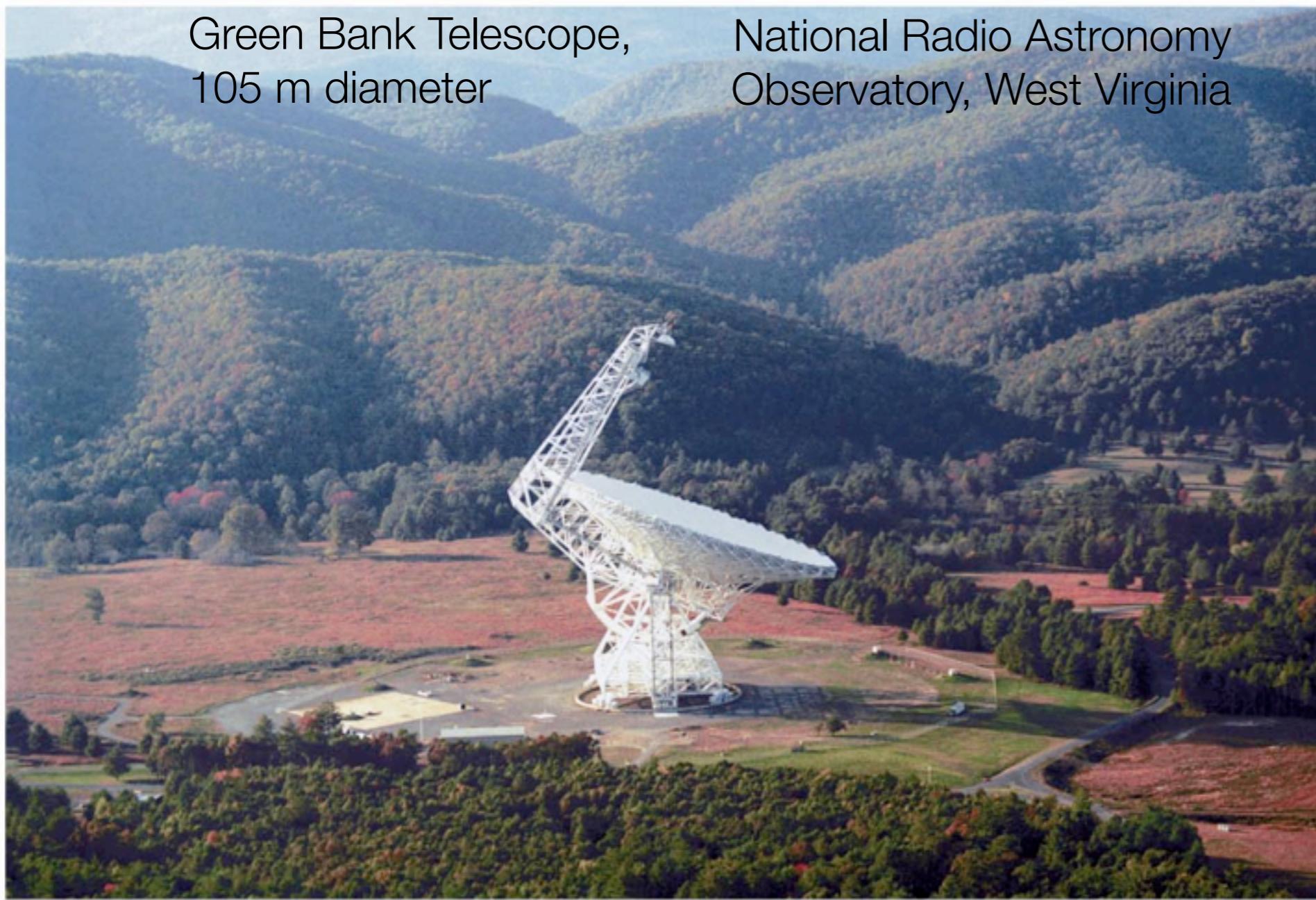
Hubble Deep Field

ST Scl OPO January 15, 1996 R. Williams and the HDF Team (ST Scl) and NASA

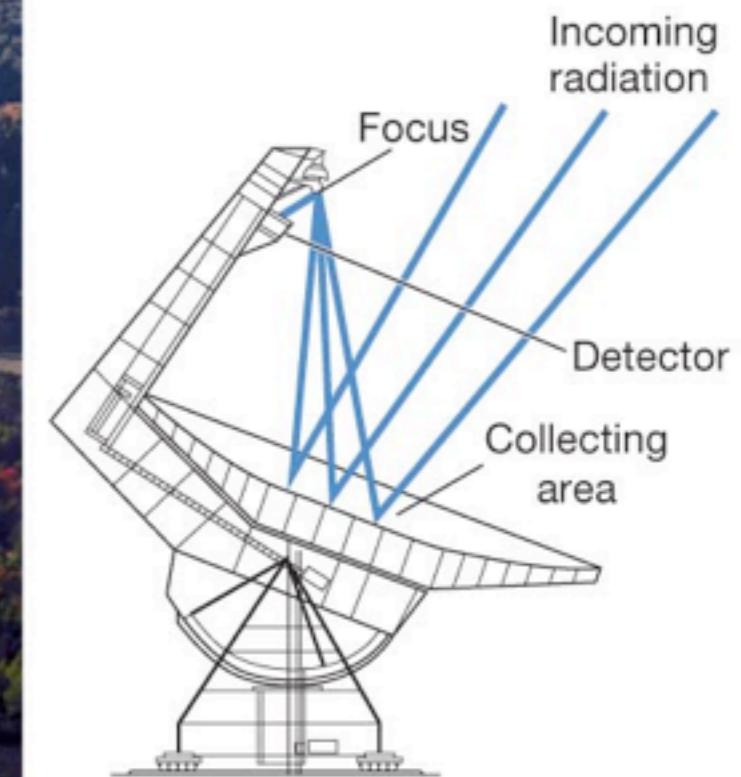
HST WFPC2



Green Bank Telescope,
105 m diameter



National Radio Astronomy
Observatory, West Virginia



Parkes Radio Telescope,
Australia
64 m dish

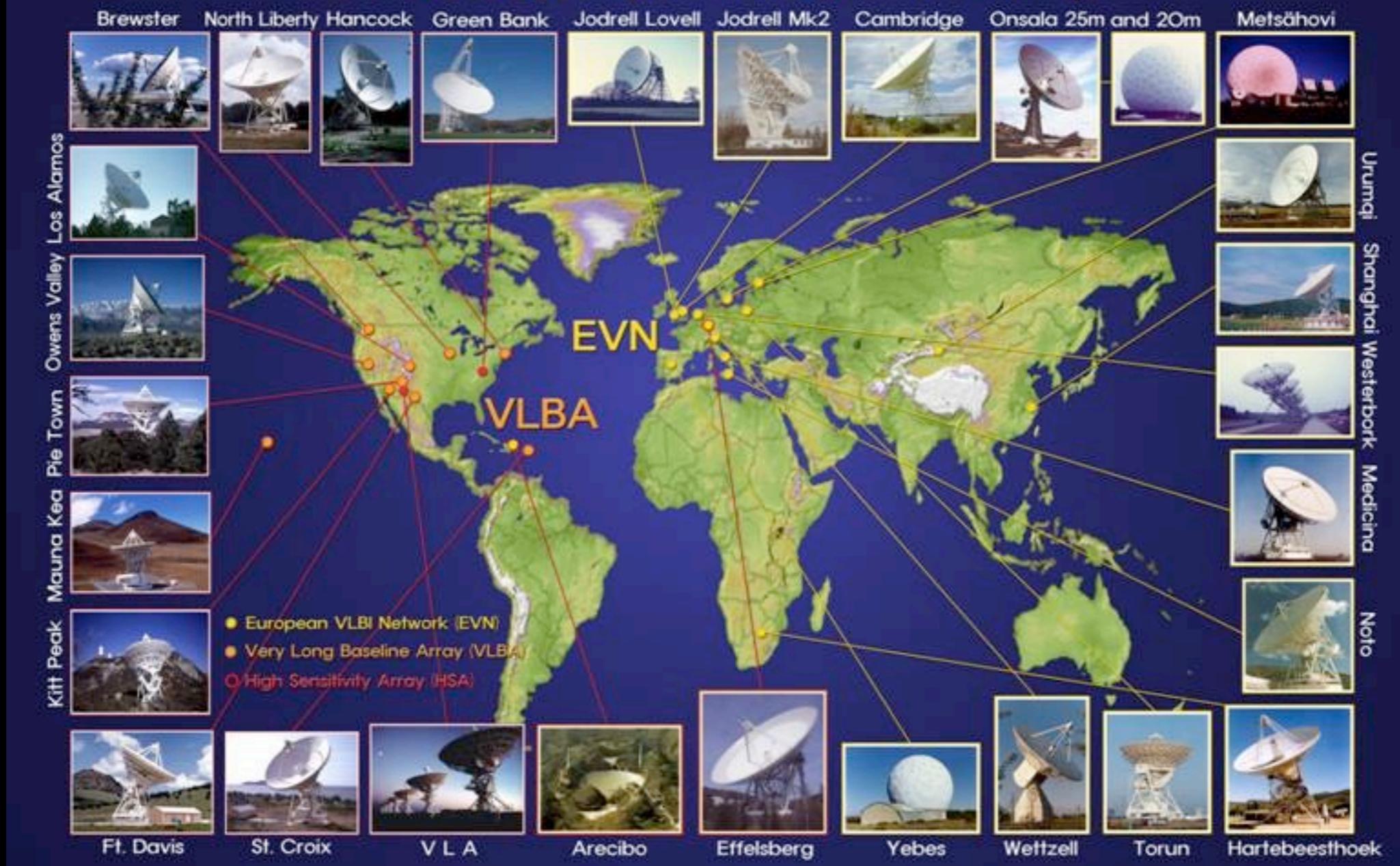






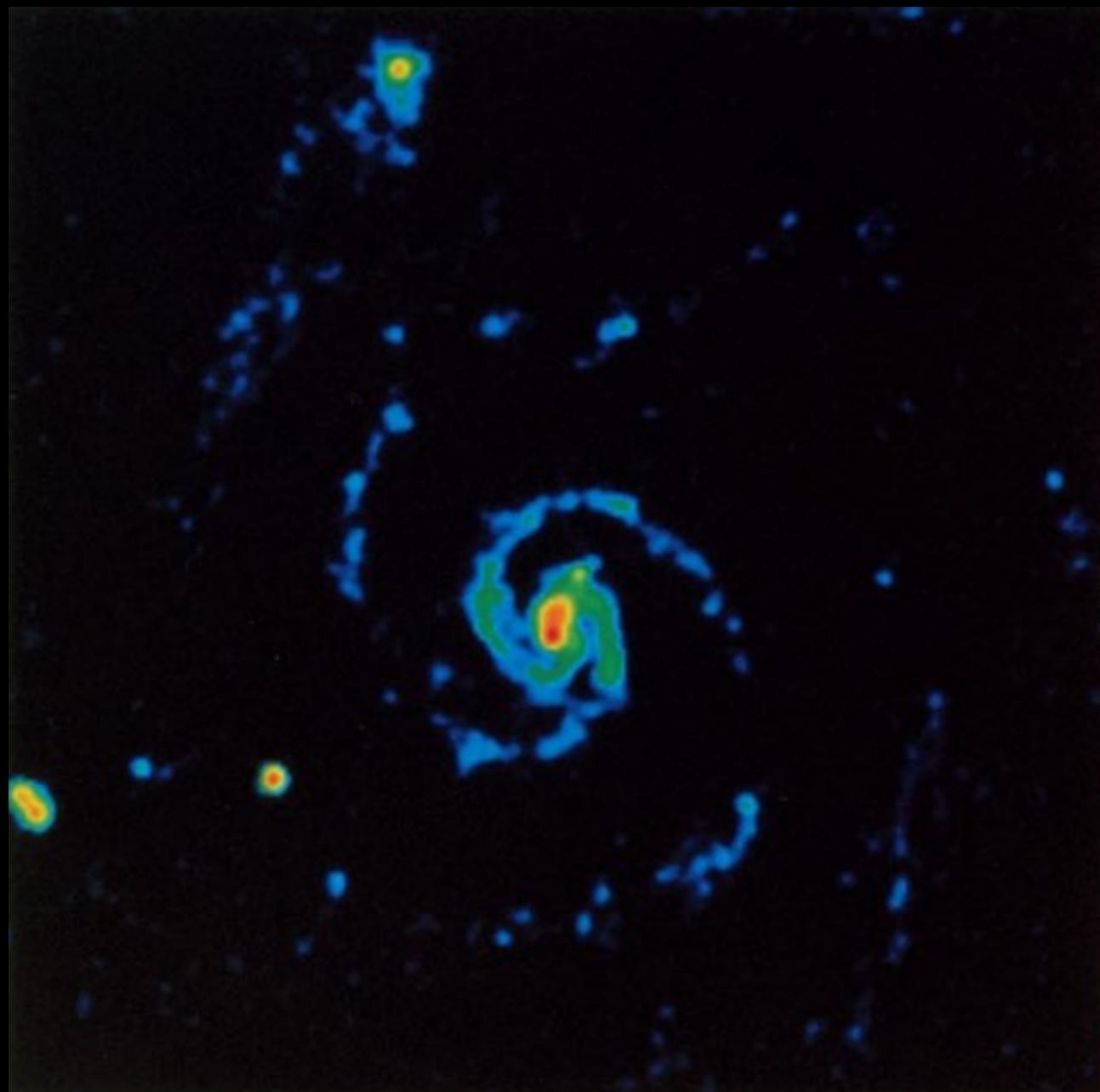
The VLA

The Global VLBI - Array



Very Long Baseline Interferometry (VLBI):
resolution of a telescope with the size of the Earth!

M51 from radio interferometry



M51 in visible light



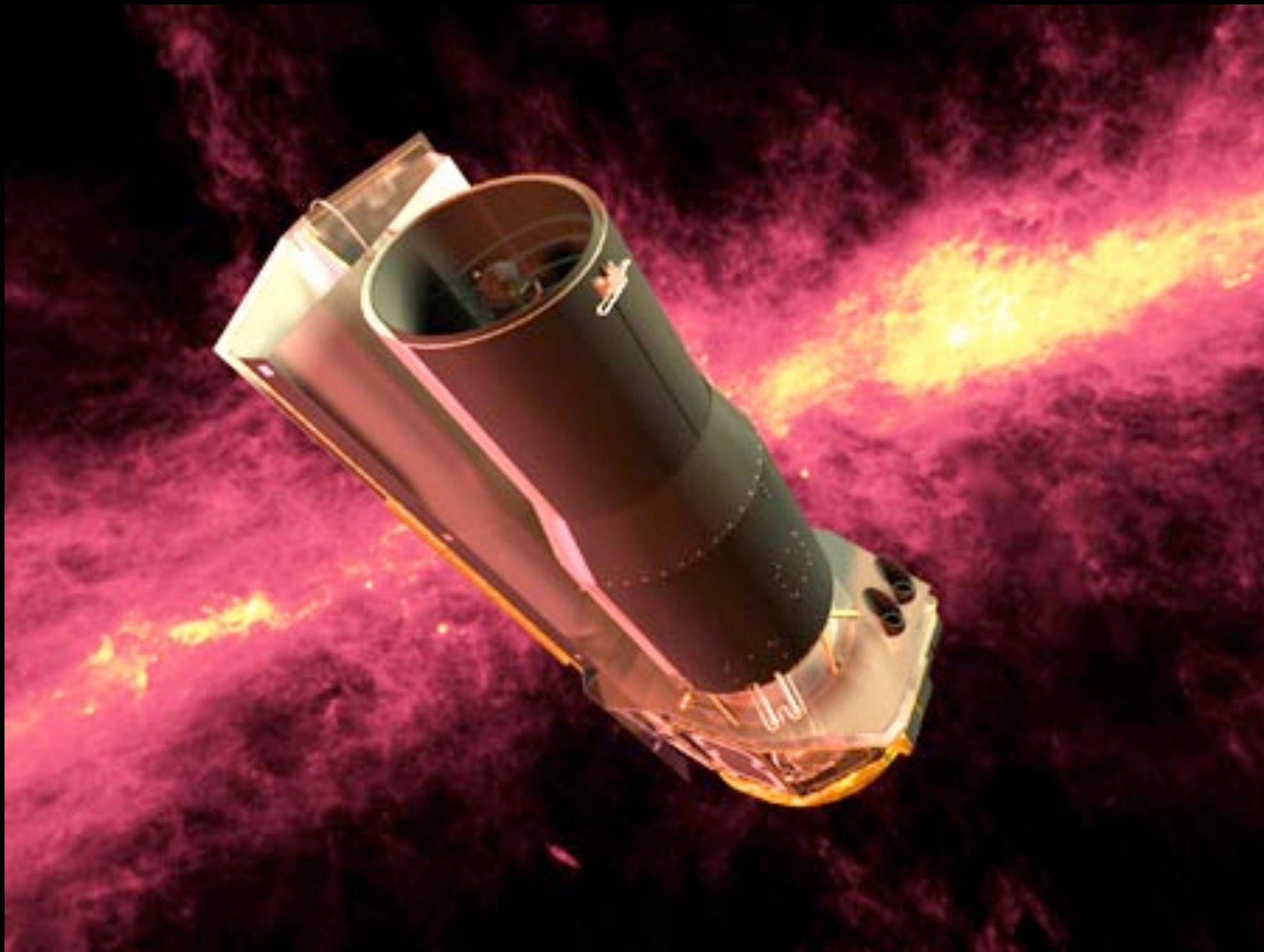
Using interferometry we can get radio images
with resolution close to optical

The Atacama Large Millimeter Array, in
Chile's Atacama desert, elevation
16,600 ft



Murchison Widefield Array





Visible Light (DSS/D. De Martin)



Infrared Light



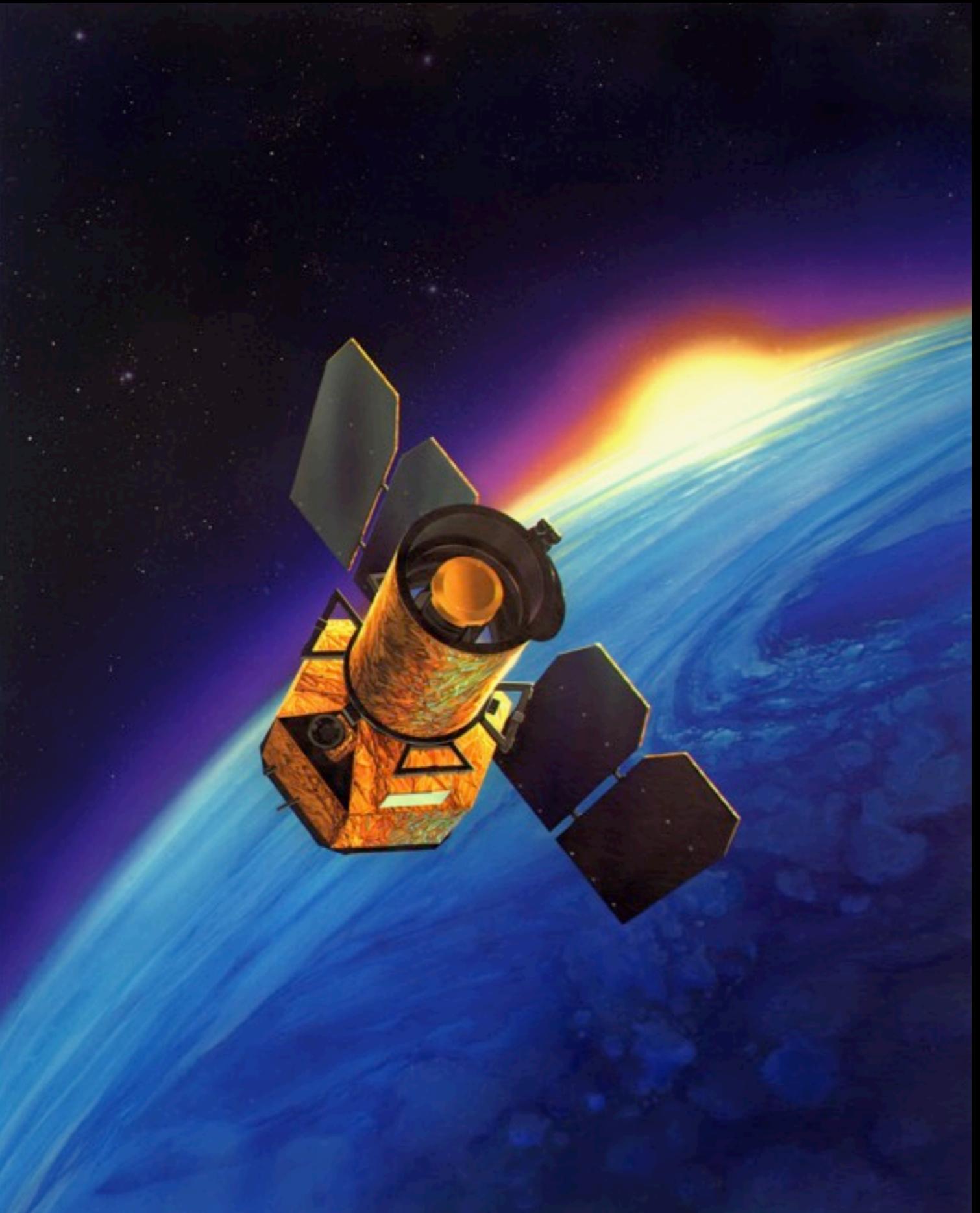
North American Nebula Comparison
NASA / JPL-Caltech / L. Rebull (SSC/Caltech)

Spitzer Space Telescope • IRAC • MIPS
ssc2011-02b

GALEX:

Galaxy Evolution Explorer

Space-based
UV telescope



Ultraviolet + Visible/GALEX + SDSS



Visible/SDSS



Ultraviolet Tail of Galaxy IC 3418

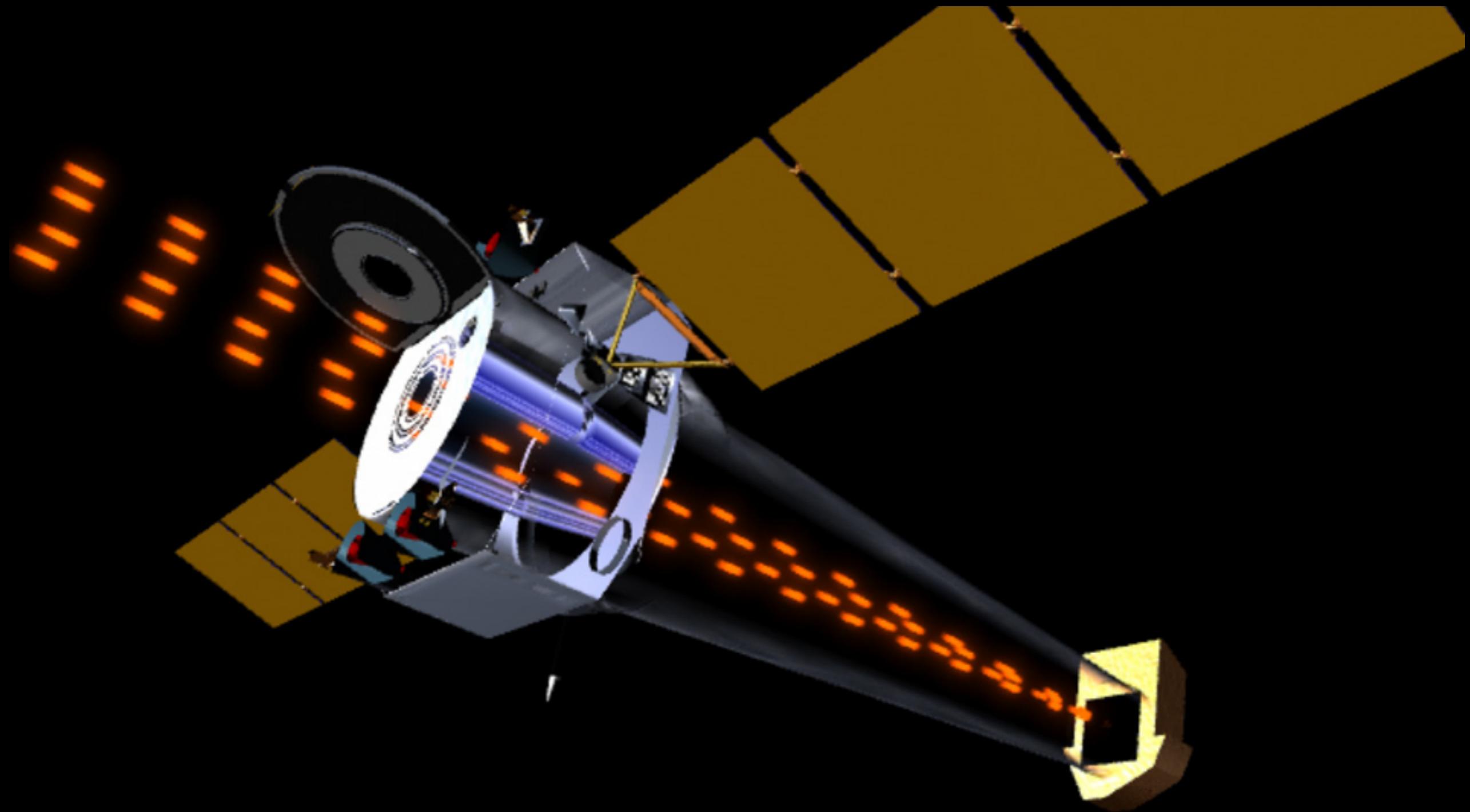
NASA/JPL-Caltech

GALEX • FUV • NUV
Sloan Digital Sky Survey

GALEX image of the Andromeda Galaxy



The Chandra X-ray Observatory



X-ray image of supernova
remnant Cassiopeia A,
from the Chandra X-ray
Observatory

