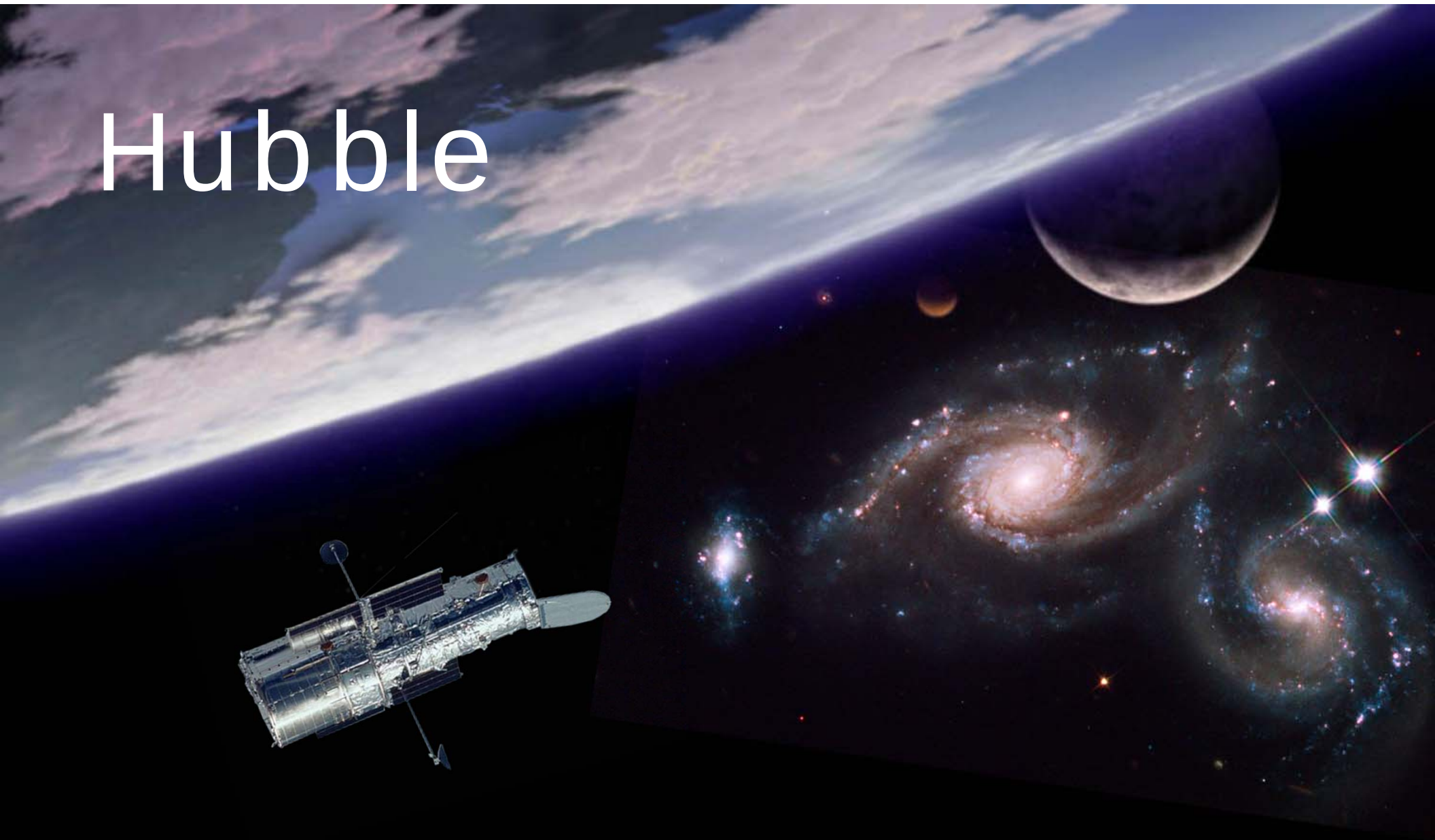
Hubble



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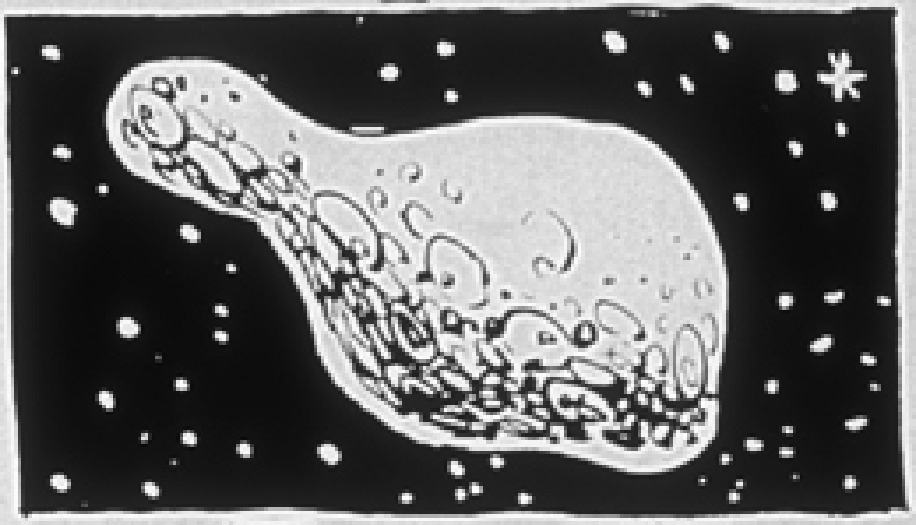
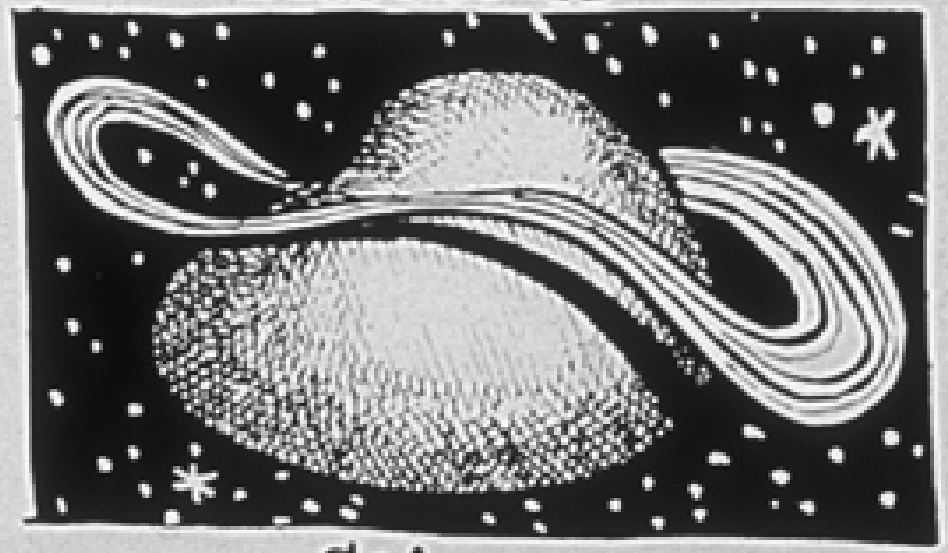
First photos from the Hubble



The moon

Jupiter

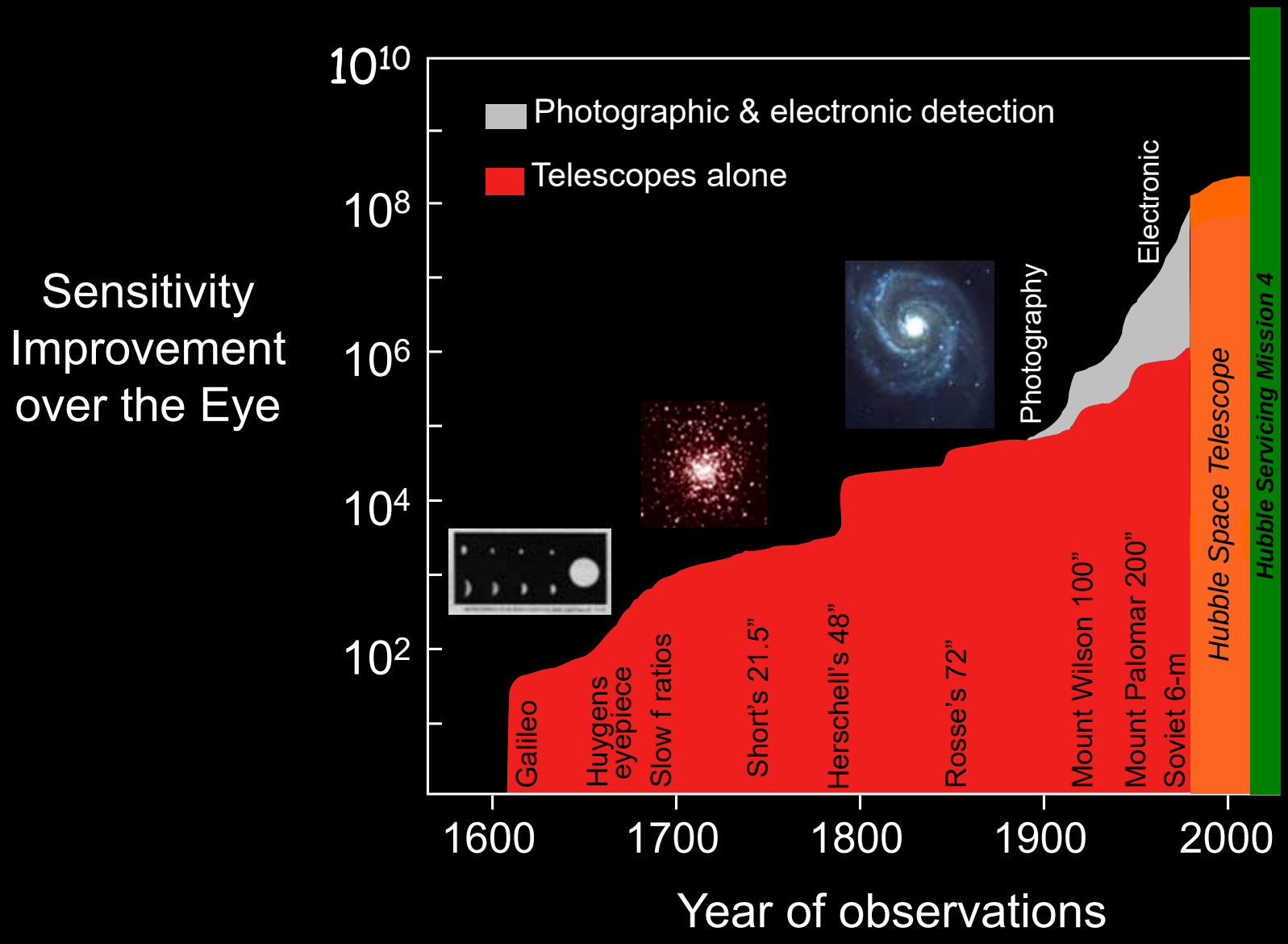


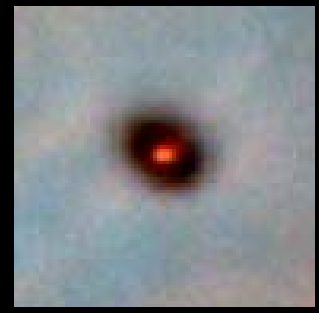
Saturn

Taxpayers

Search & Discovery

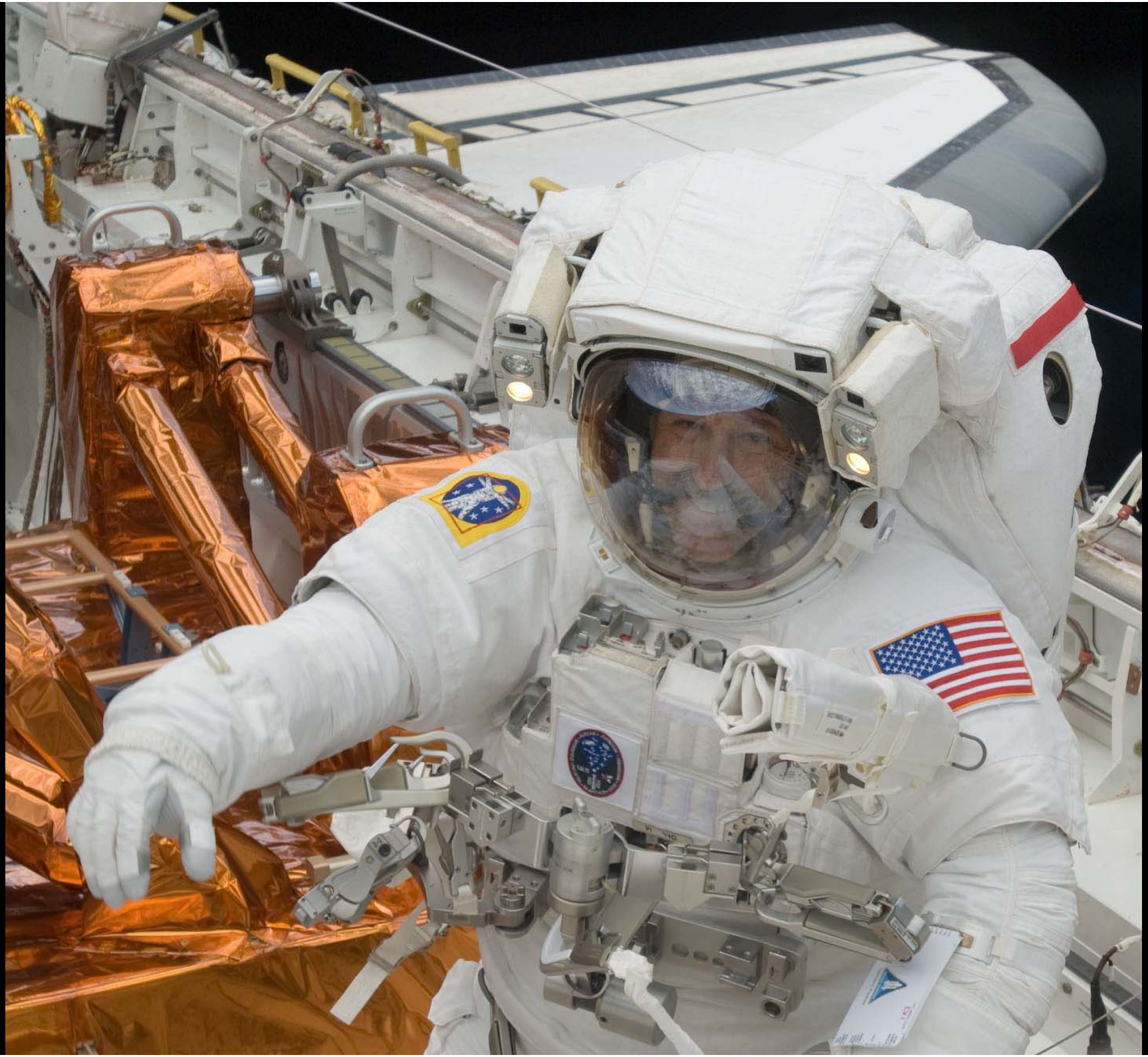
After Fig. 3.10 in *Cosmic Discovery*, M. Harwit





SM1	SM2	SM3A	SM3B	SM4
				
1993	1997	1999	2002	2009


STS-125 May 11-24 2009

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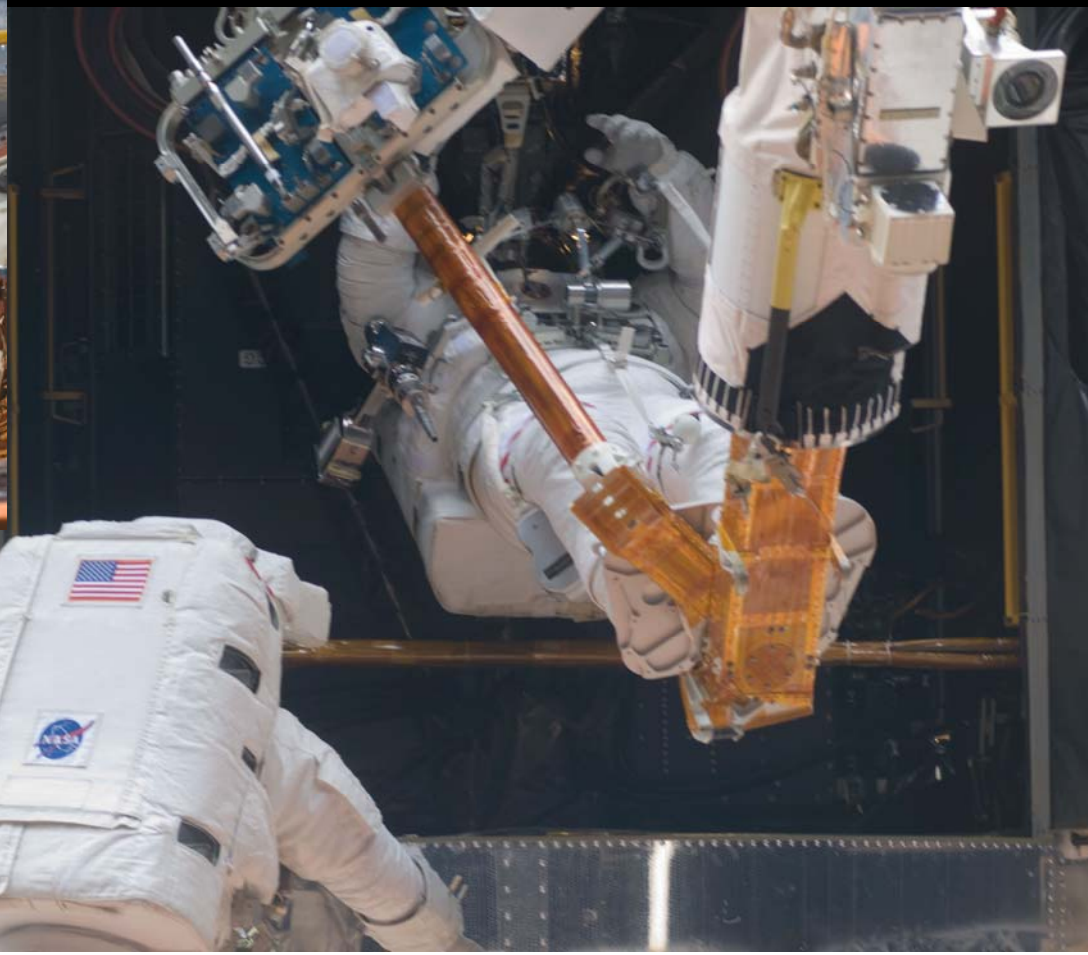
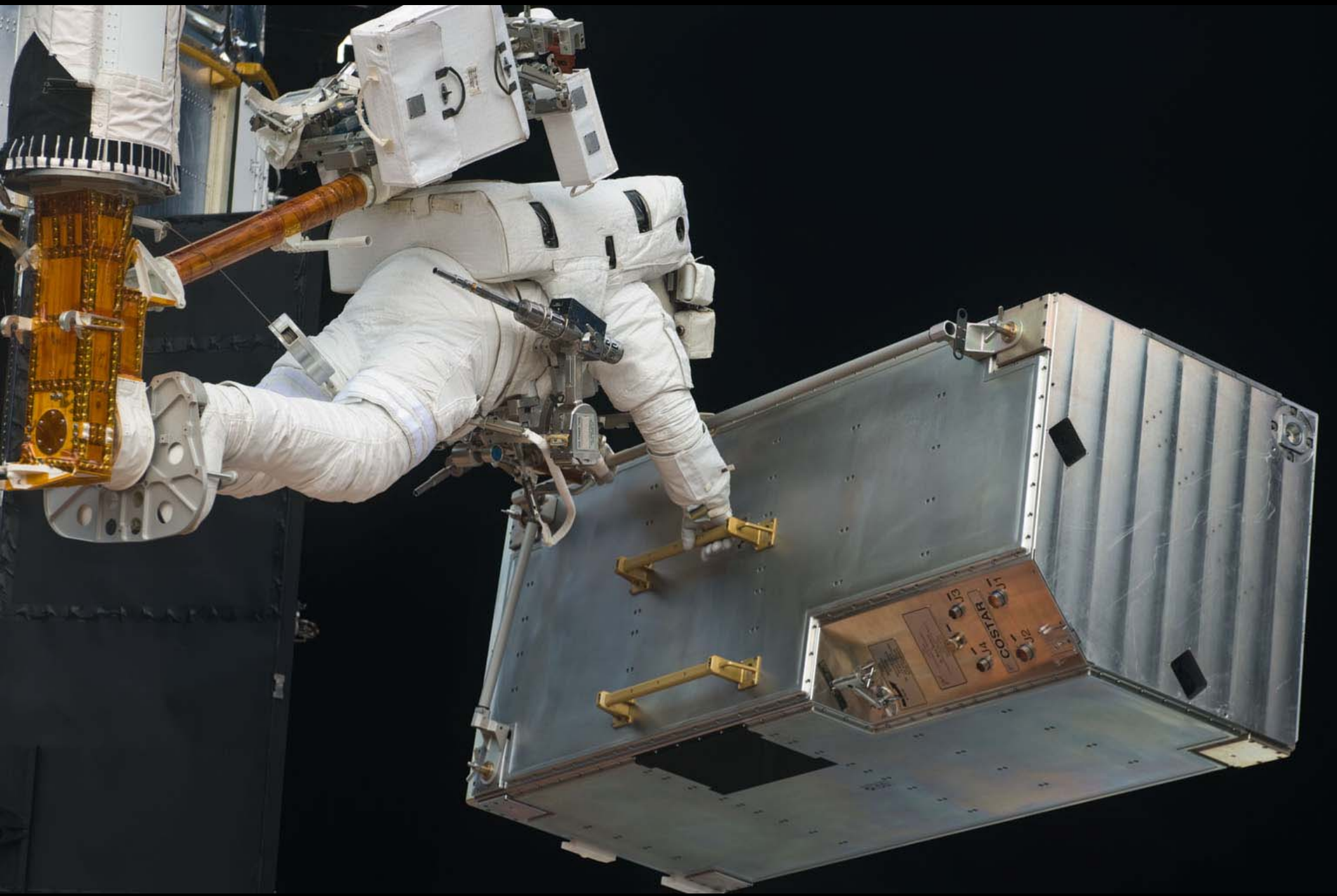
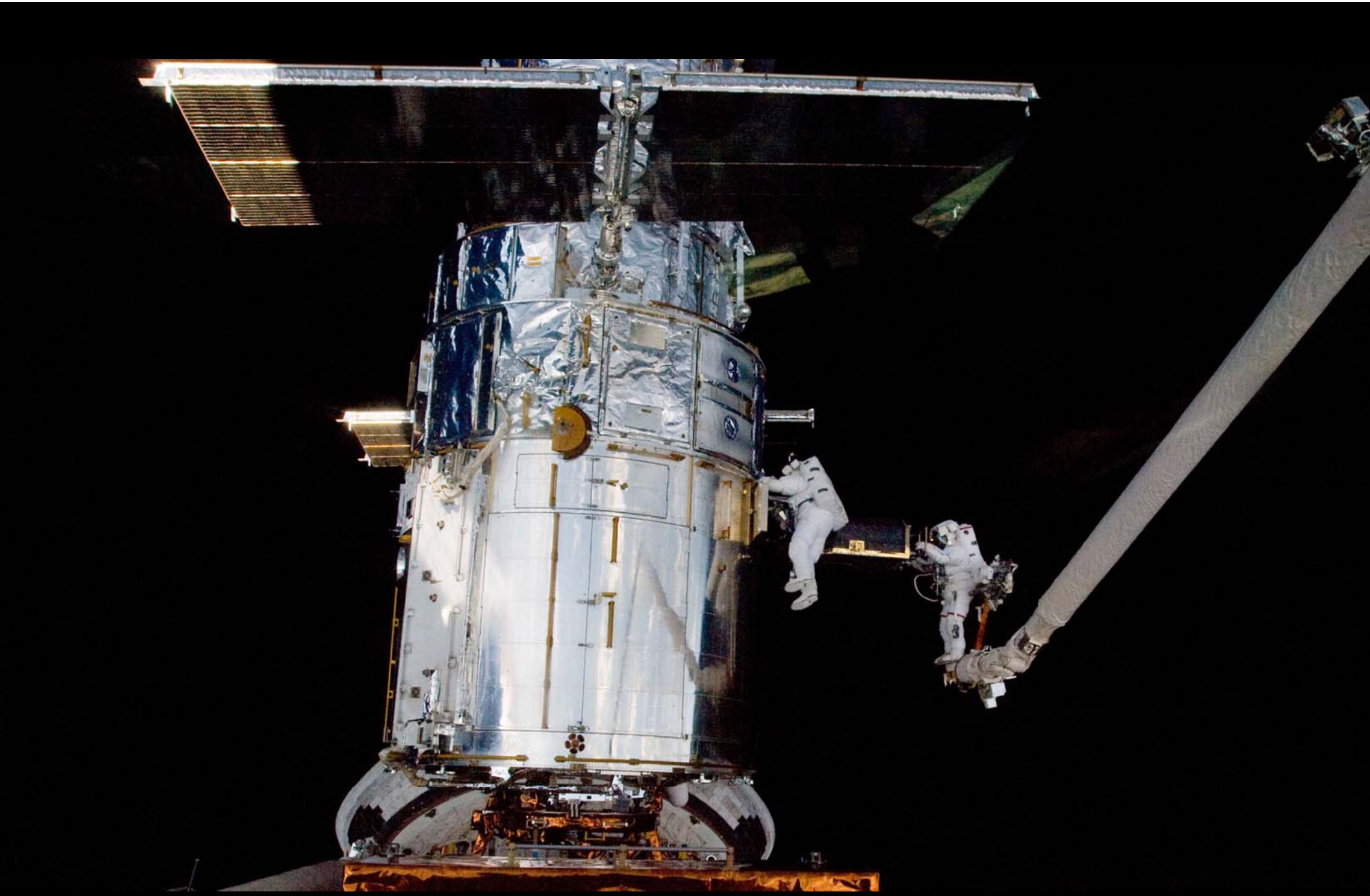
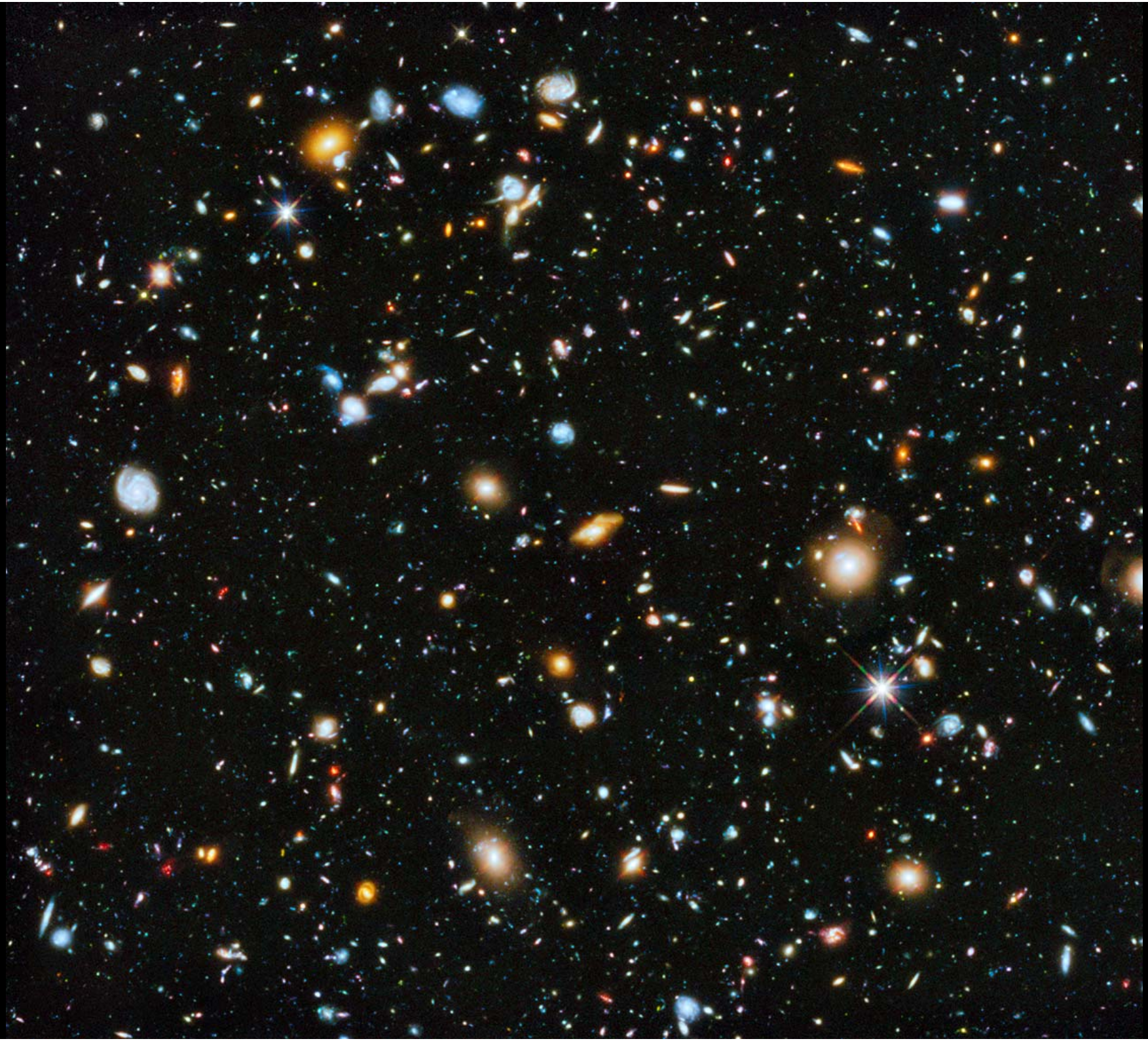
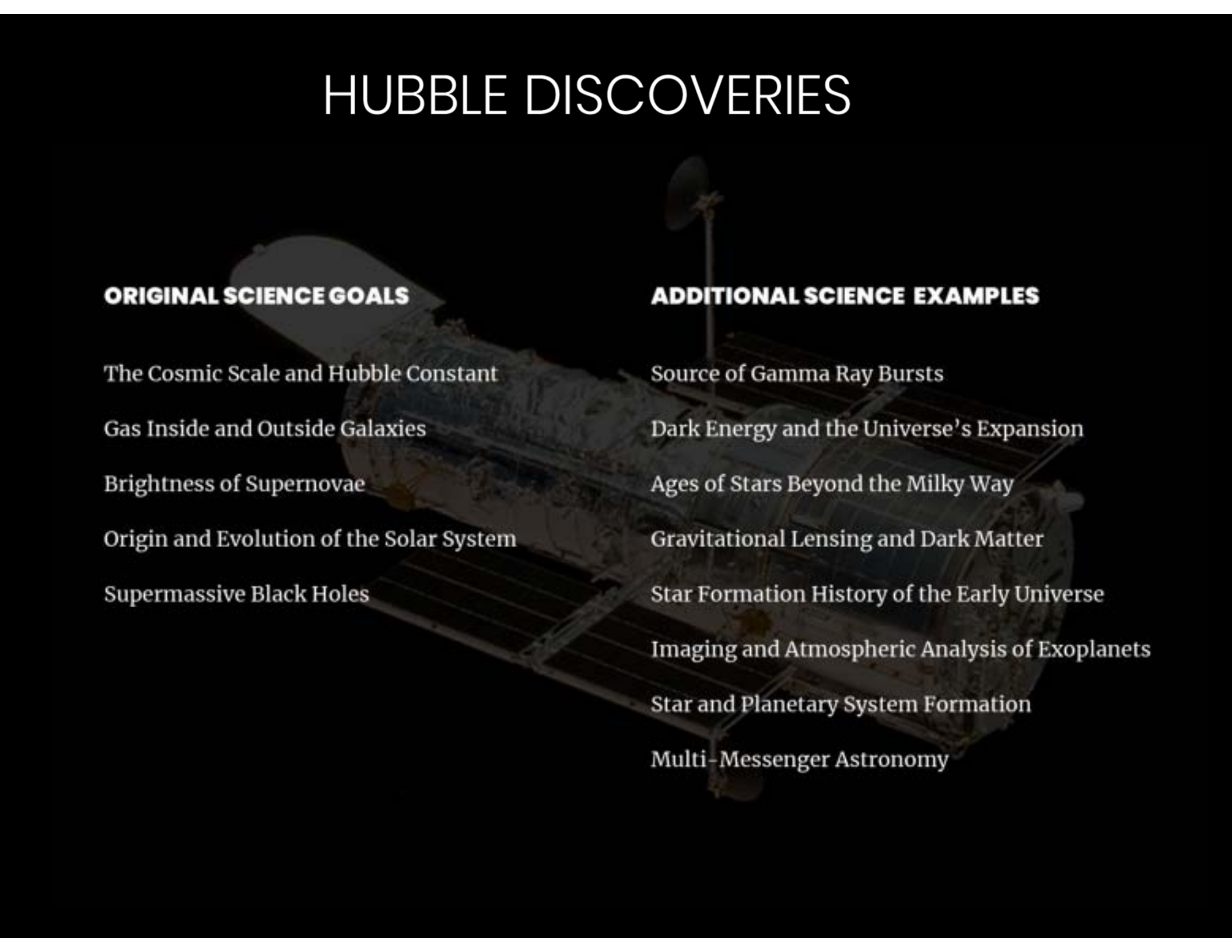



COSTAR
J3
J4
J1
J2





HUBBLE DISCOVERIES



ORIGINAL SCIENCE GOALS

The Cosmic Scale and Hubble Constant

Gas Inside and Outside Galaxies

Brightness of Supernovae

Origin and Evolution of the Solar System

Supermassive Black Holes

ADDITIONAL SCIENCE EXAMPLES

Source of Gamma Ray Bursts

Dark Energy and the Universe's Expansion

Ages of Stars Beyond the Milky Way

Gravitational Lensing and Dark Matter

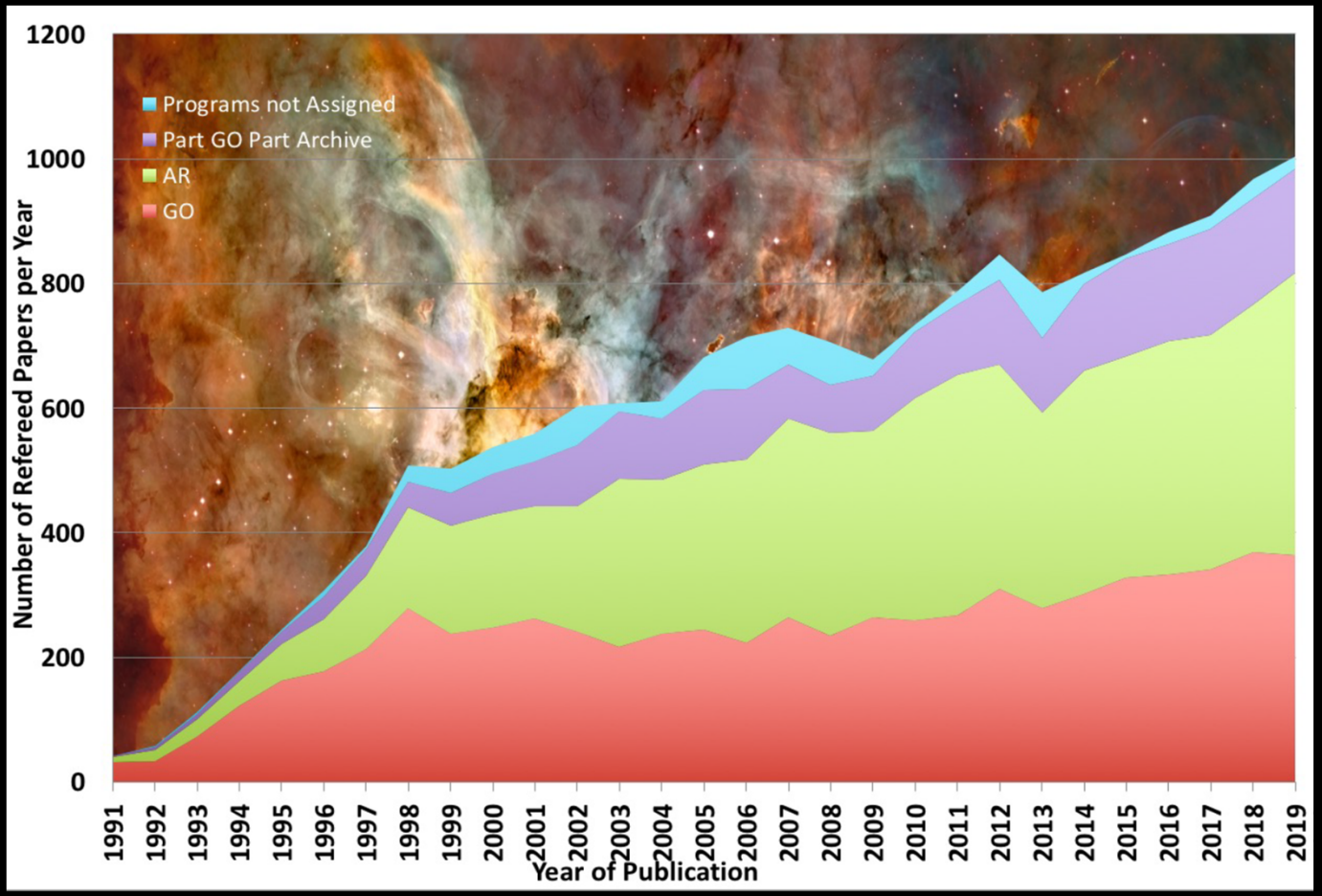
Star Formation History of the Early Universe

Imaging and Atmospheric Analysis of Exoplanets

Star and Planetary System Formation

Multi-Messenger Astronomy

Hubble supports a wide range of science through a vast international user community



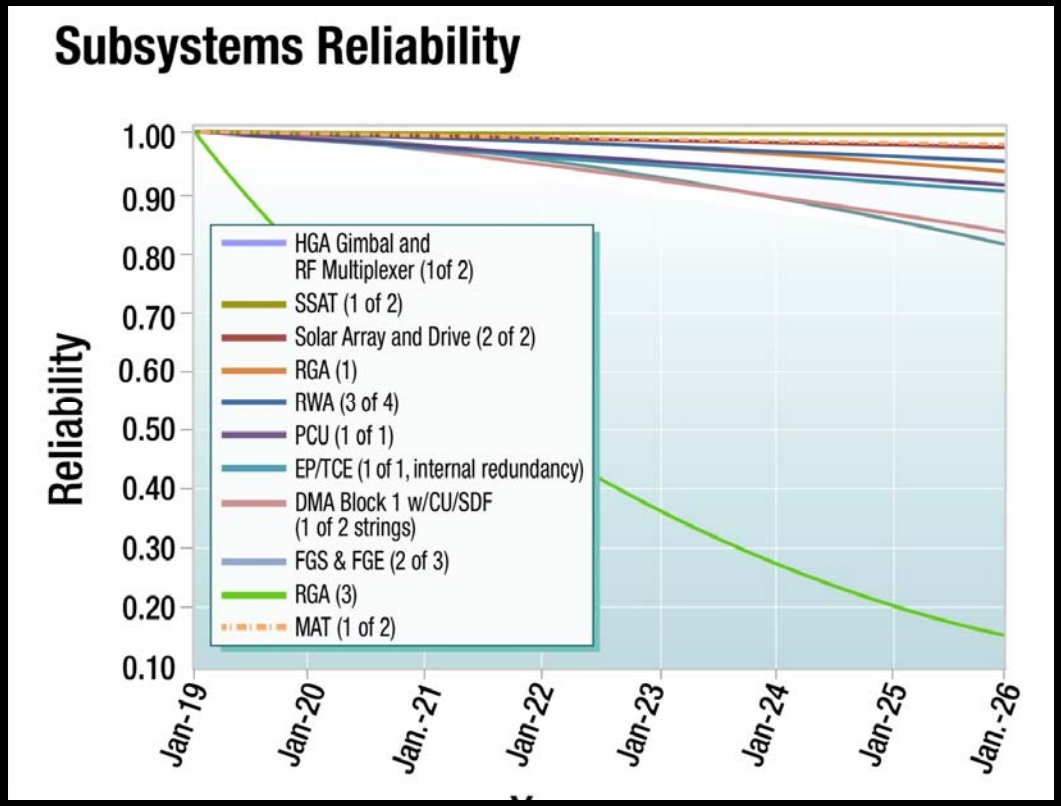
Breadth of Hubble Science

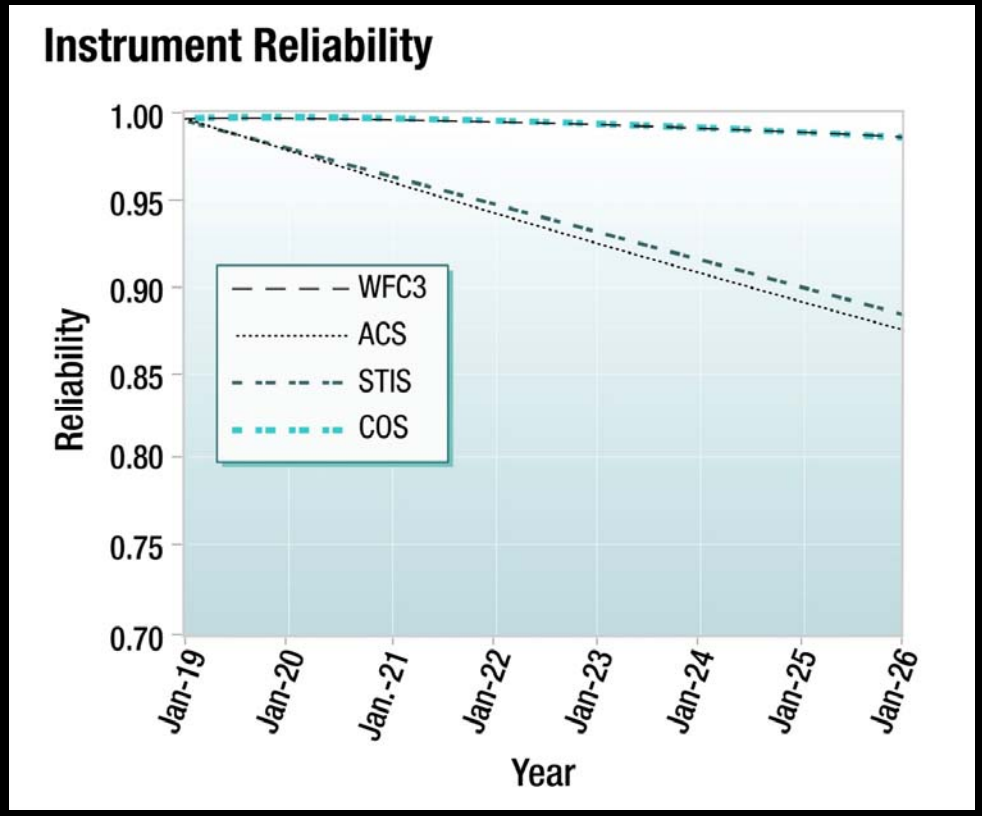
1000+ refereed papers/year
17,530+ publications to date
2+ new published papers per day
875,000+ citations
600+ PhD theses
20% of all astronomy papers reference Hubble

Distribution of Science Programs

Solar system - 8%
Exoplanets - 12%
Stellar populations - 11%
Stellar Physics - 23%
Galaxies & Intergalactic Medium - 28%
Black Holes - 12%
Cosmology - 6%

We expect Hubble to be scientifically productive well into the 2020s





SSAT = S-band Single Access Transmitter
SA/SADM = Solar Array / Solar Array Drive Mechanism
RWA = Reaction Wheel Assembly
RGA = Rate Gyro Assembly
PCU = Power Control Unit

EP/TCE = Electrical Power / Thermal Control Electronics
DMA = Direct Memory Access
CU/SDF = Control Unit / Science Data Formatter
FGS/FGE = Fine Guidance Sensor / Fine Guidance Electronics

WFC3 = Wide Field Camera 3
ACS = Advanced Camera for Surveys
STIS = Space Telescope Imaging Spectrograph
COS = Cosmic Origins Spectrograph

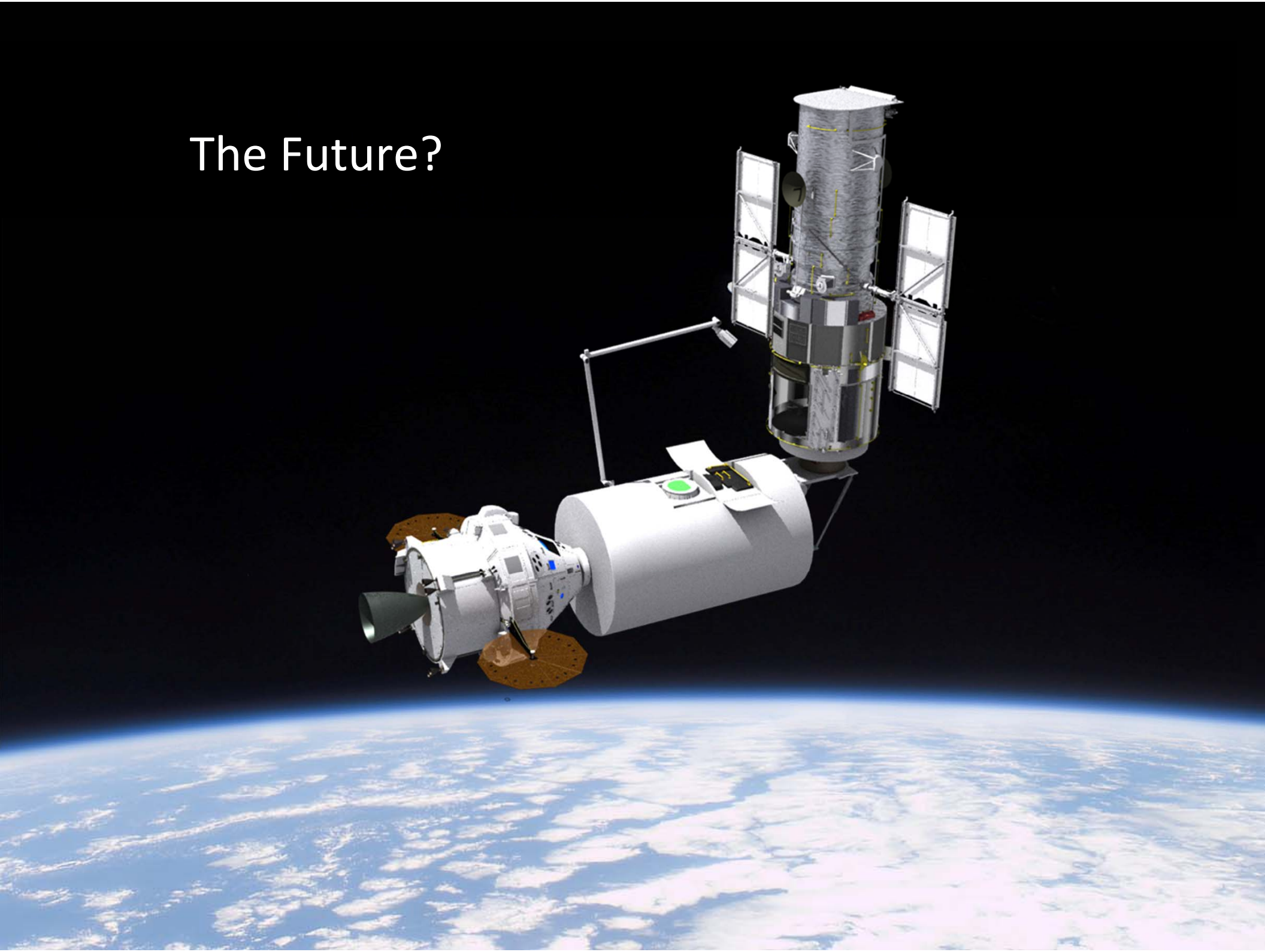
Hubble

- Unravelling the Mysteries of the Universe
- Doing the impossible
- Leveraged the best of science and human spaceflight
- Pushed the boundaries of what people can do in space
- Setting the standard for future space missions

Hubble is a metaphor for the best in all of us

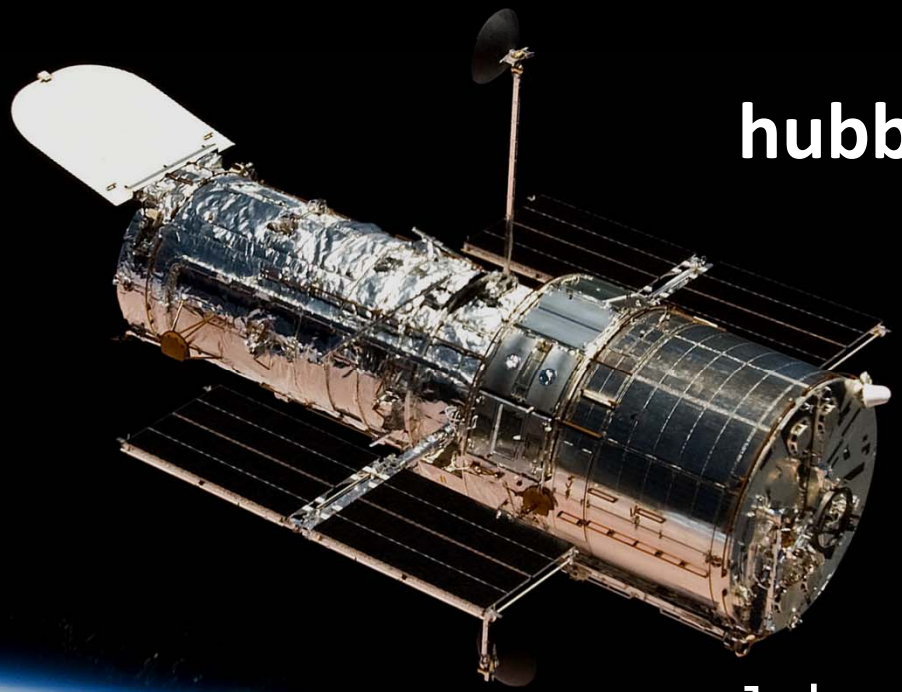
Most of all, Hubble is the people's telescope
It touches us all, inspiring a diverse worldwide community
to share the wonder and awe of discovery

The Future?




Happy 30th Anniverary!

The Hubble Story is still very much alive…



hubblesite.org

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