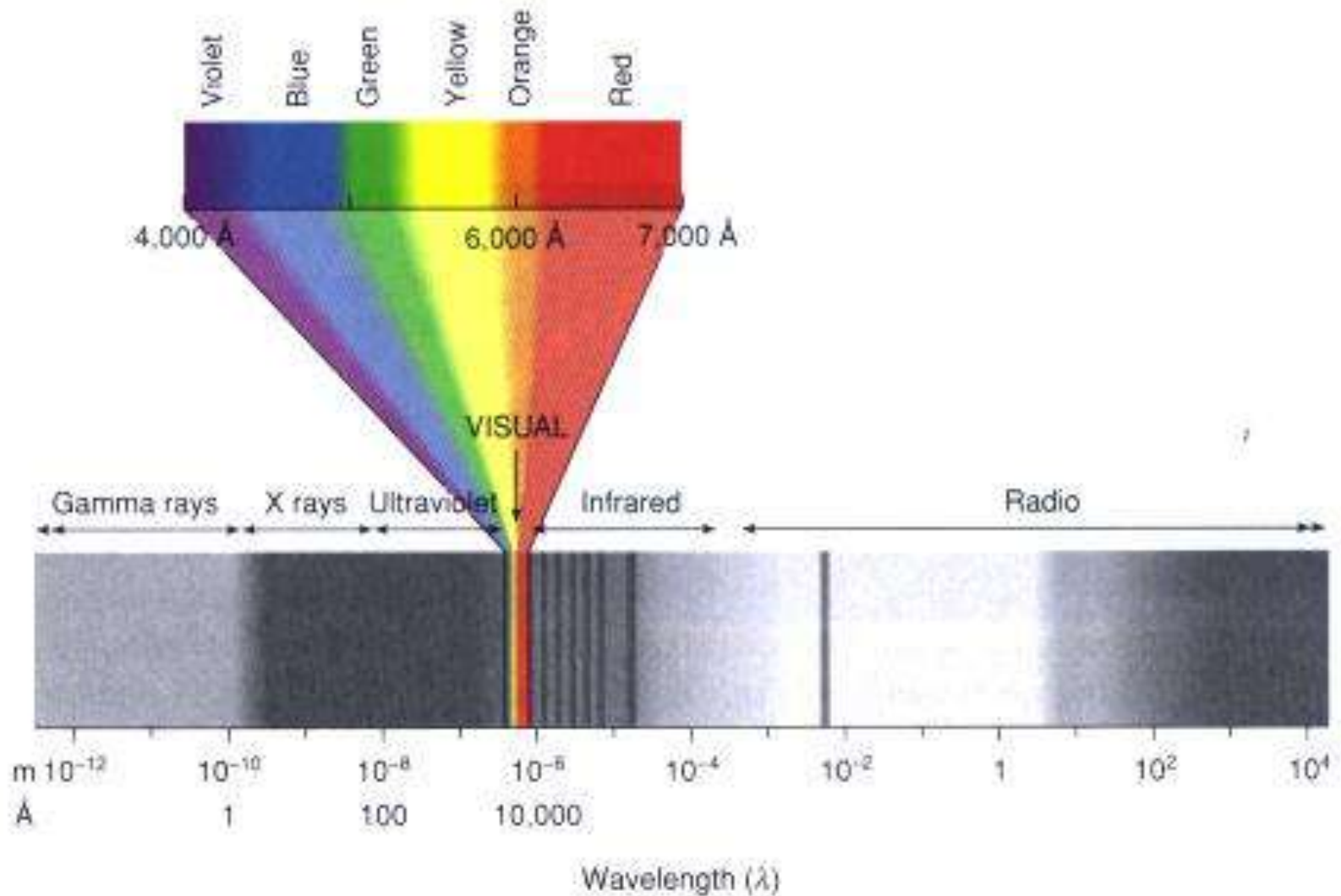


Exploring Space



Electromagnetic spectrum

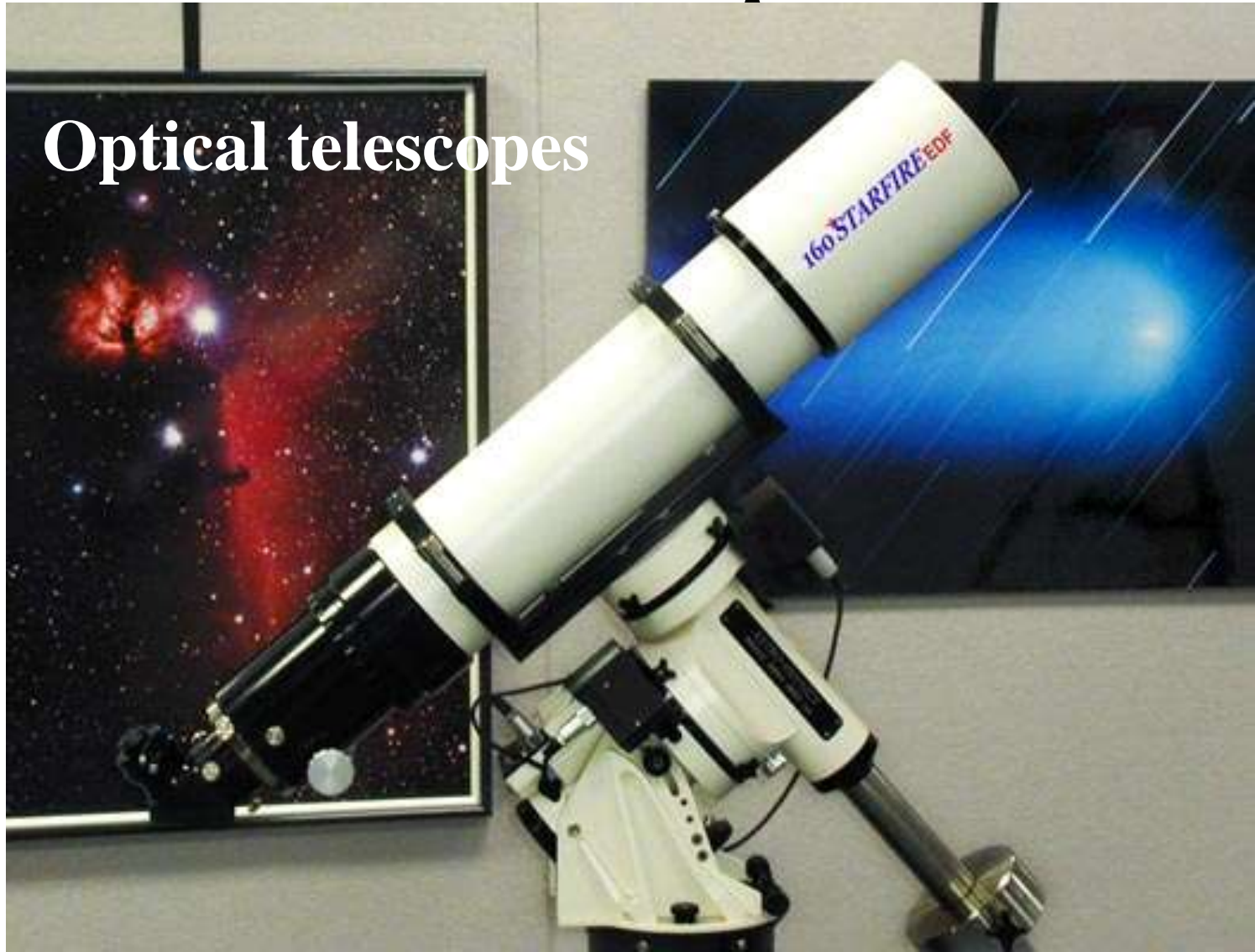


Astronomy

- scientific study of the sun, moon, planets, & stars

Telescopes

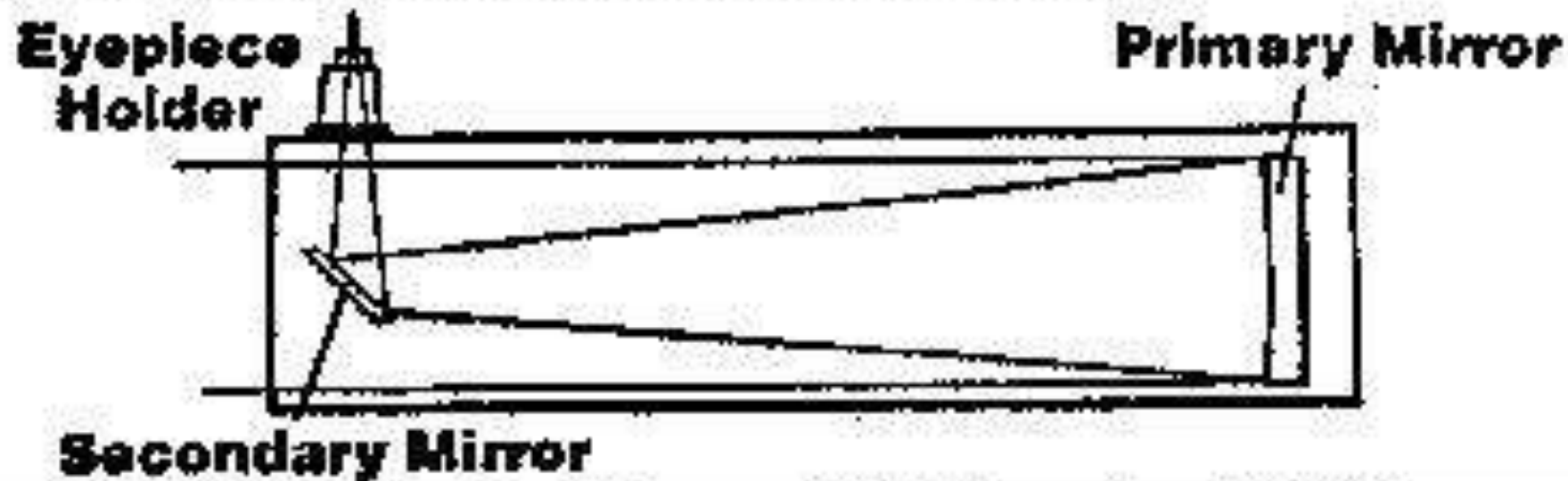
Optical telescopes



REFRACTOR



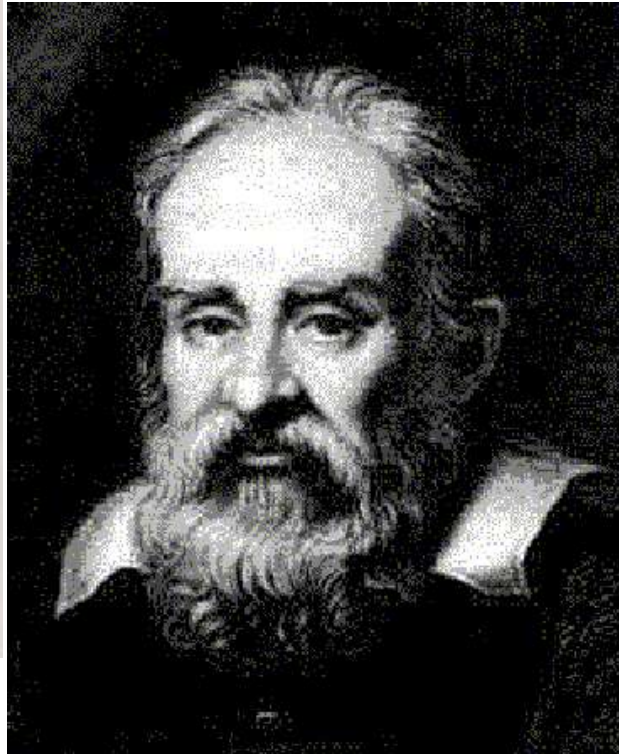
NEWTONIAN REFLECTOR



Refractor telescope

Uses two convex lenses

- First built by Galileo



Reflector telescope

- Uses mirrors and lenses
- First built by Isaac Newton



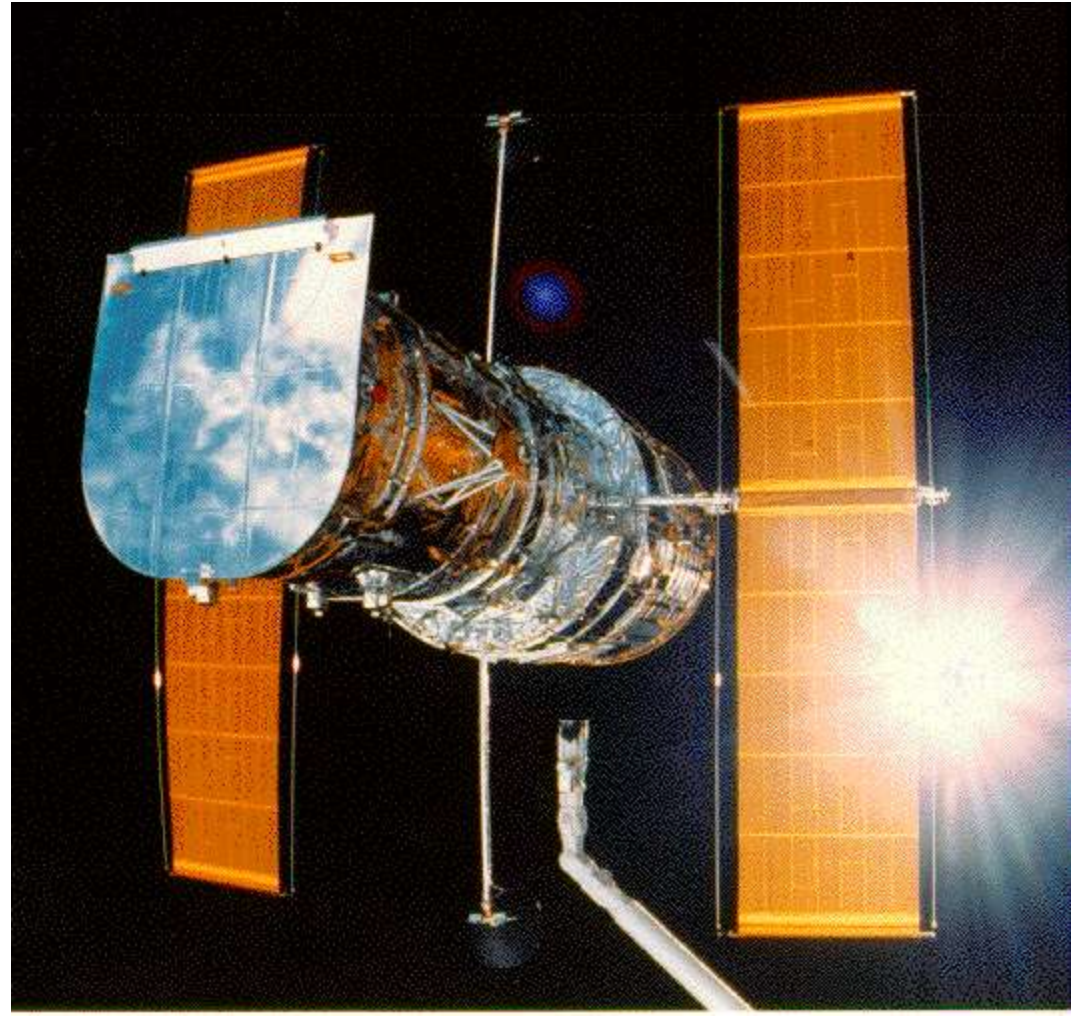
Radio Telescopes

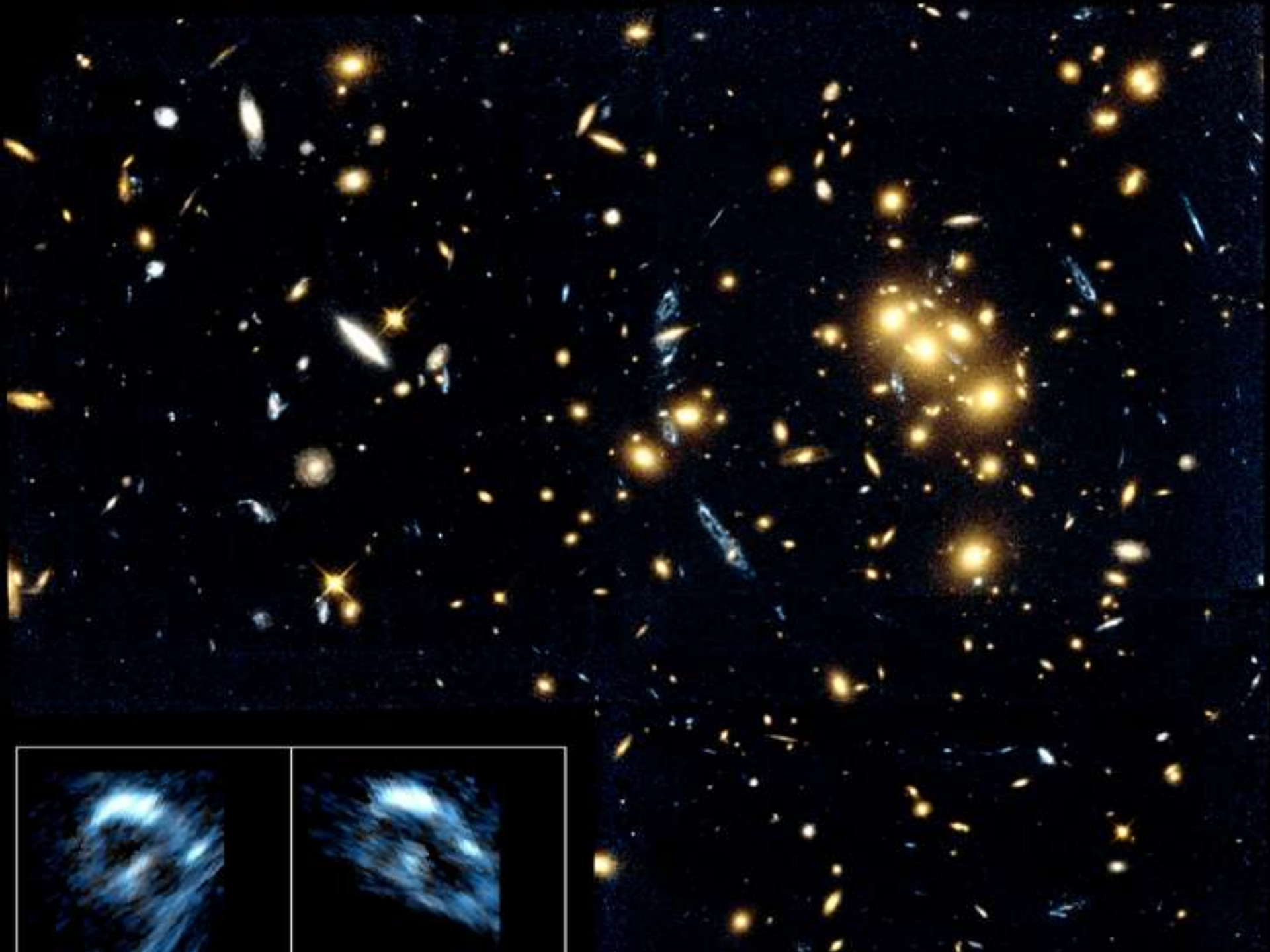
- Picks up radio waves from outer space



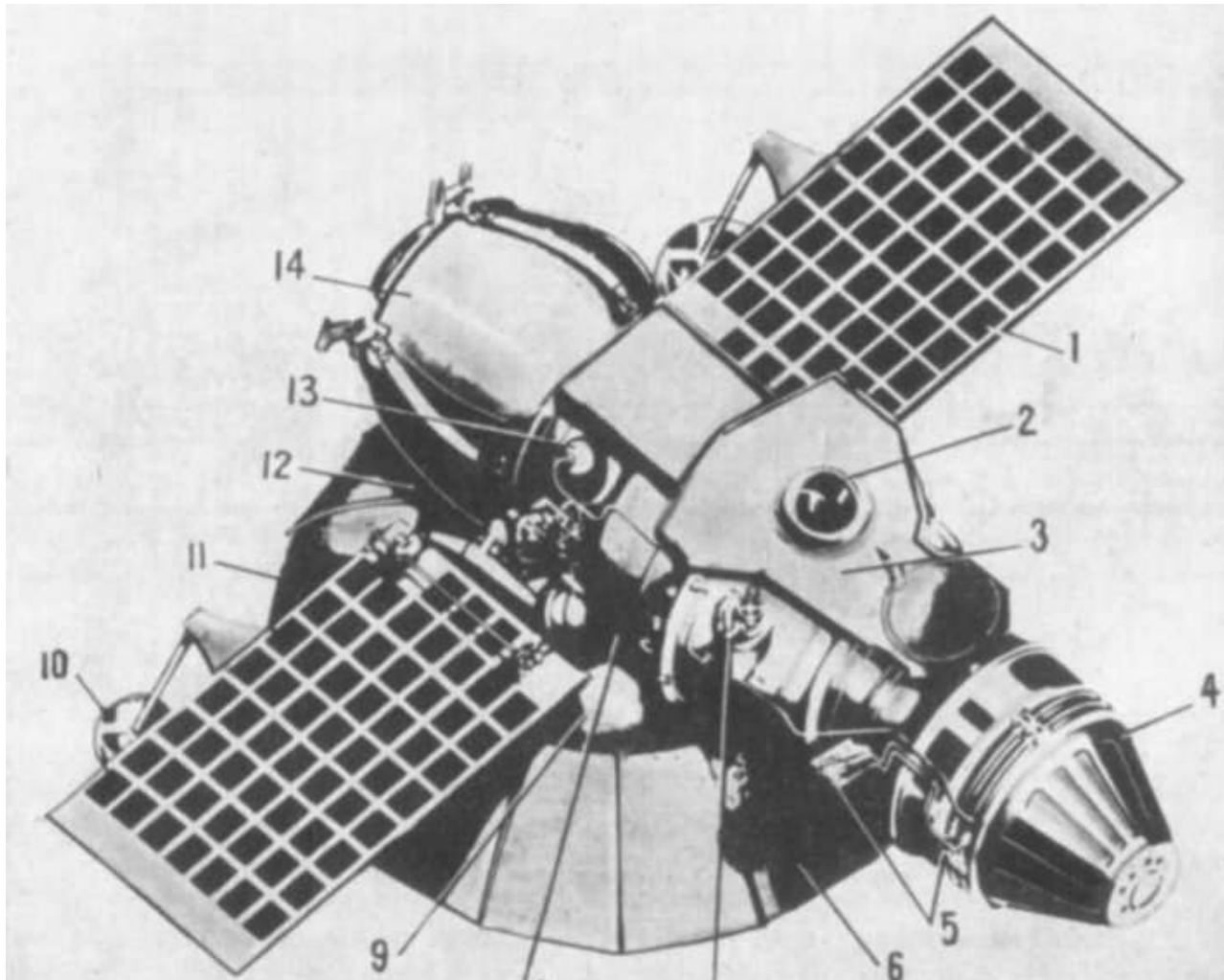
Hubble space telescope

- **Satellite**





Artificial satellites and space probes



Satellite – orbits the planet

- **Artificial – manmade**
- **The first was sputnik I
1957**



Space probes

- **Travel out into the solar system**
 - **Mariner 1- 10 1973**
 - Mars Venus Mercury
 - **Voyager 1977**
 - I – Jupiter & Saturn
 - II – Jupiter, Saturn, Uranus & Neptune
 - **Galileo 1989– traveled to mars and Jupiter**
 - **Viking 1976**
 - Mars
 - **Pathfinder 1996**
 - Sojourner mars vehicle



NASA National Aeronautical and Space Administration



Space race

- The *Space Race* grew out of the Cold War between the United States and the Soviet Union, the most powerful nations after World War II.
- For a half-century, the two superpowers competed for primacy in a global struggle pitting a democratic society against totalitarian communism.

The Race is on

- *What makes the Soviet threat unique in history is its all-inclusiveness. Every human activity is pressed into service as a weapon of expansion. Trade, economic development, military power, arts, science, education, the whole world of ideas.... The Soviets are, in short, waging total cold war.* President Dwight D. Eisenhower, 1958

- *Finally, if we are to win the battle that is now going on around the world between freedom and tyranny, the dramatic achievements in space which occurred in recent weeks should have made clear to us all, as did the Sputnik in 1957, the impact of this adventure on the minds of men everywhere....*

President John F. Kennedy, 1961

- *We have a long way to go in the space race. We started late. But this is the new ocean, and I believe the United States must sail on it and be in a position second to none.*

President John F. Kennedy, 1962

Race to the moon

- **Sputnik I 1957**
- **Yuri A Gagarin 1961**
first human in space



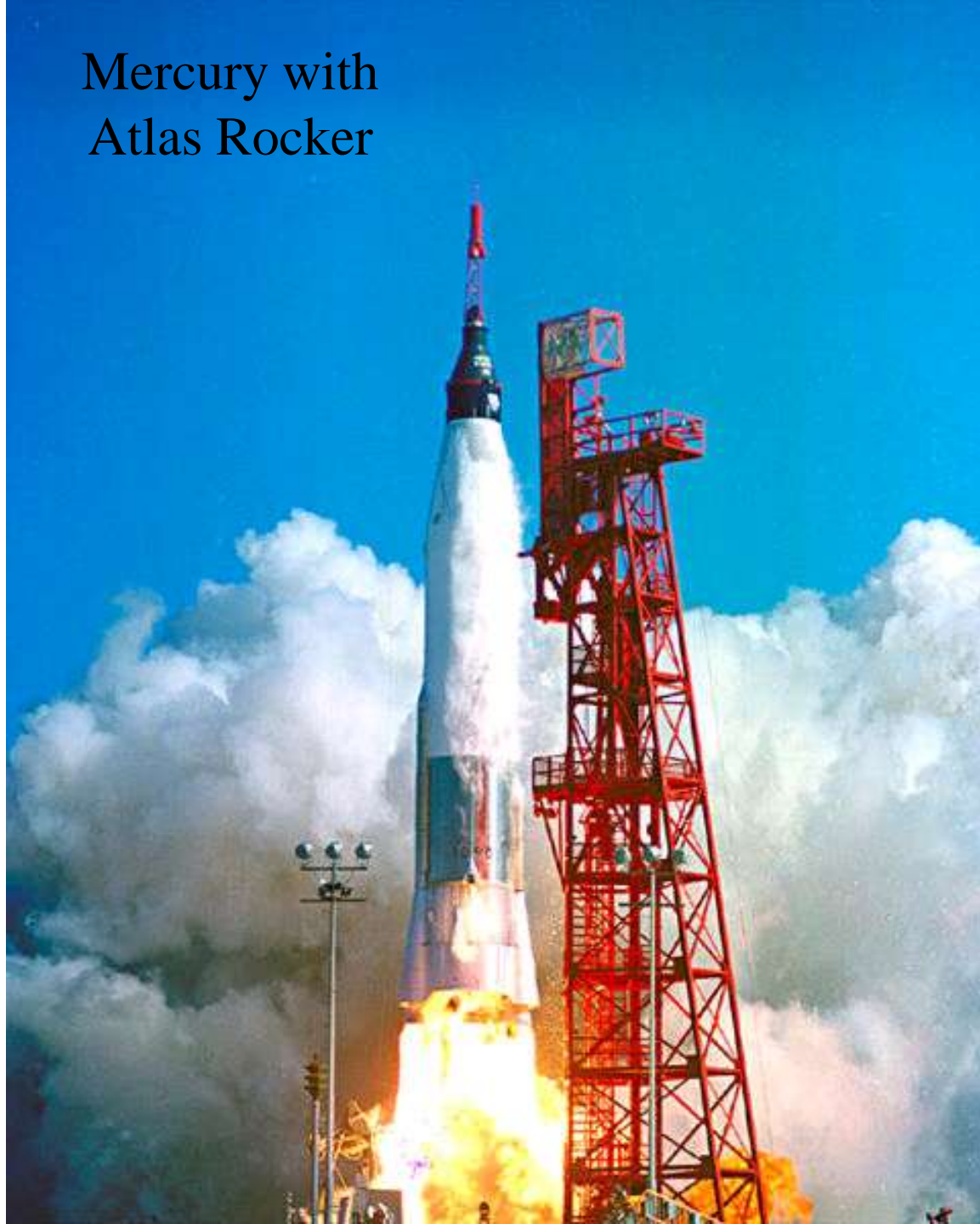
US began mercury project in 1961

- May 5, 1961 Alan B. Shepard was the first US in space
- 1962 John Glen was the first person to orbit earth





Mercury with Atlas Rocker



Mercury w/ Redstone Rocket





1962 started project Gemini





Project Gemini and the Titan Rocket



Project Apollo



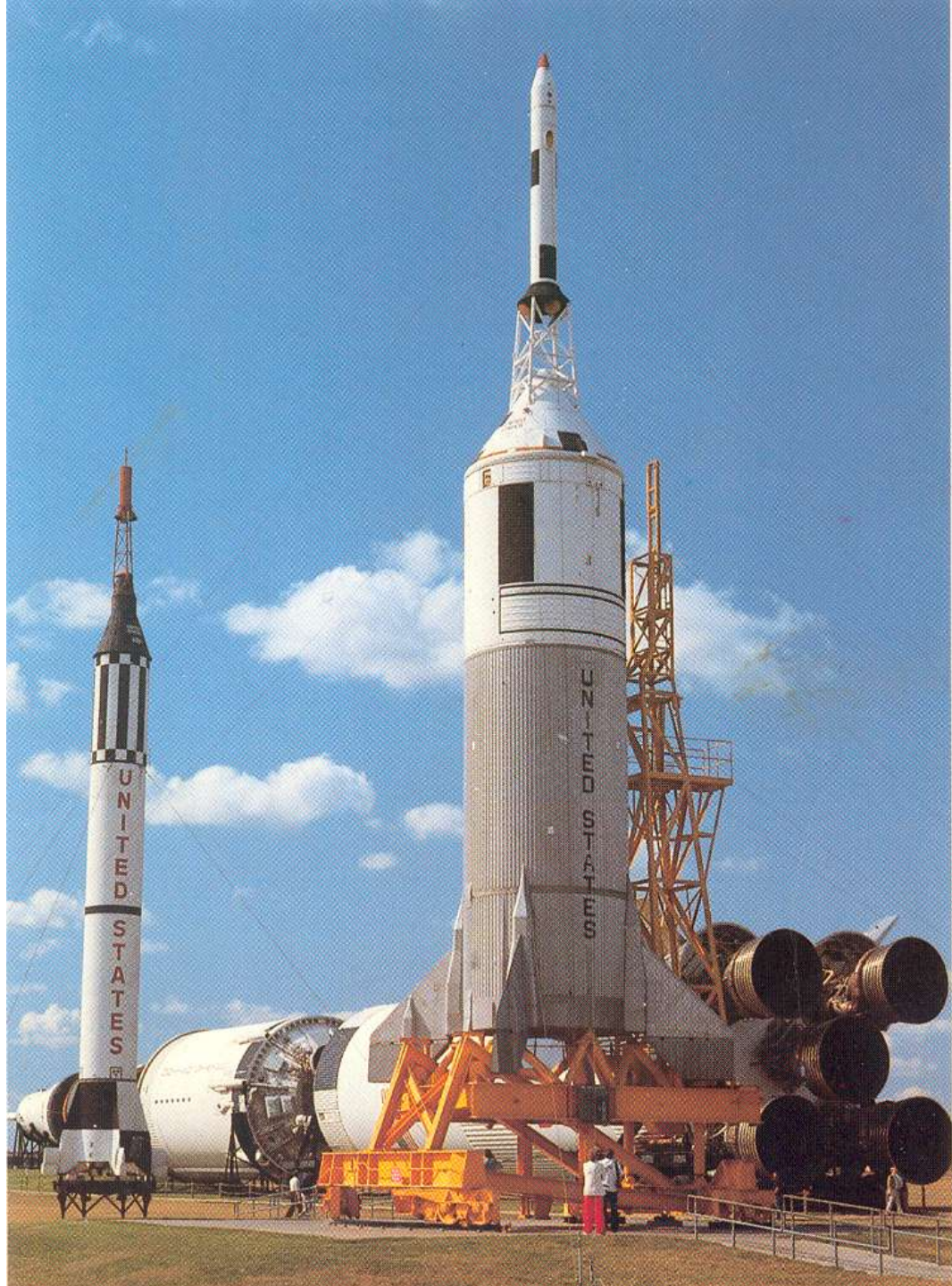
Project Apollo to the moon

- **Went to the moon
July 20, 1969**
- **Neil Armstrong was
the first person to
set foot on the moon**
- **Apollo program
ended in 1972**







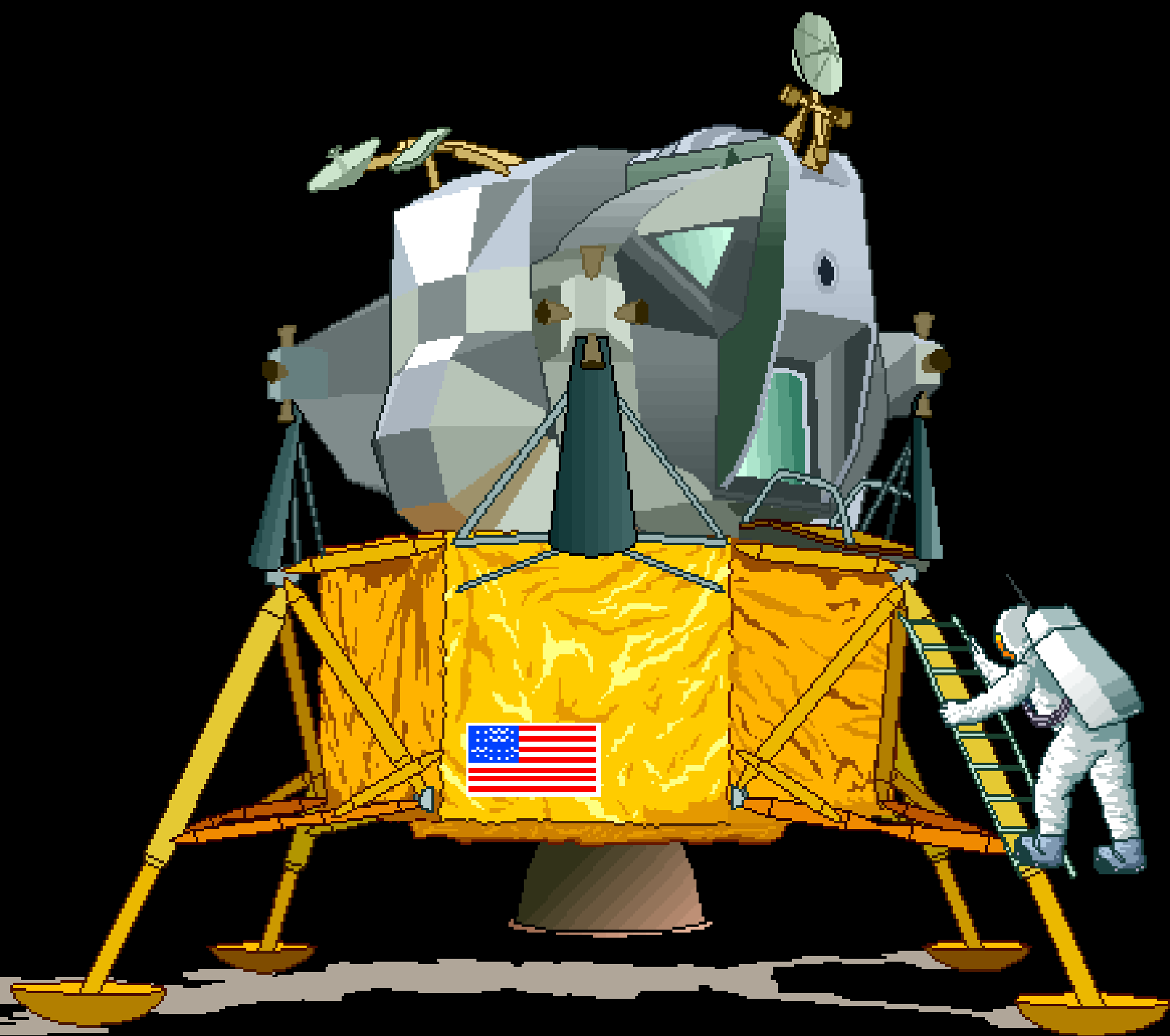


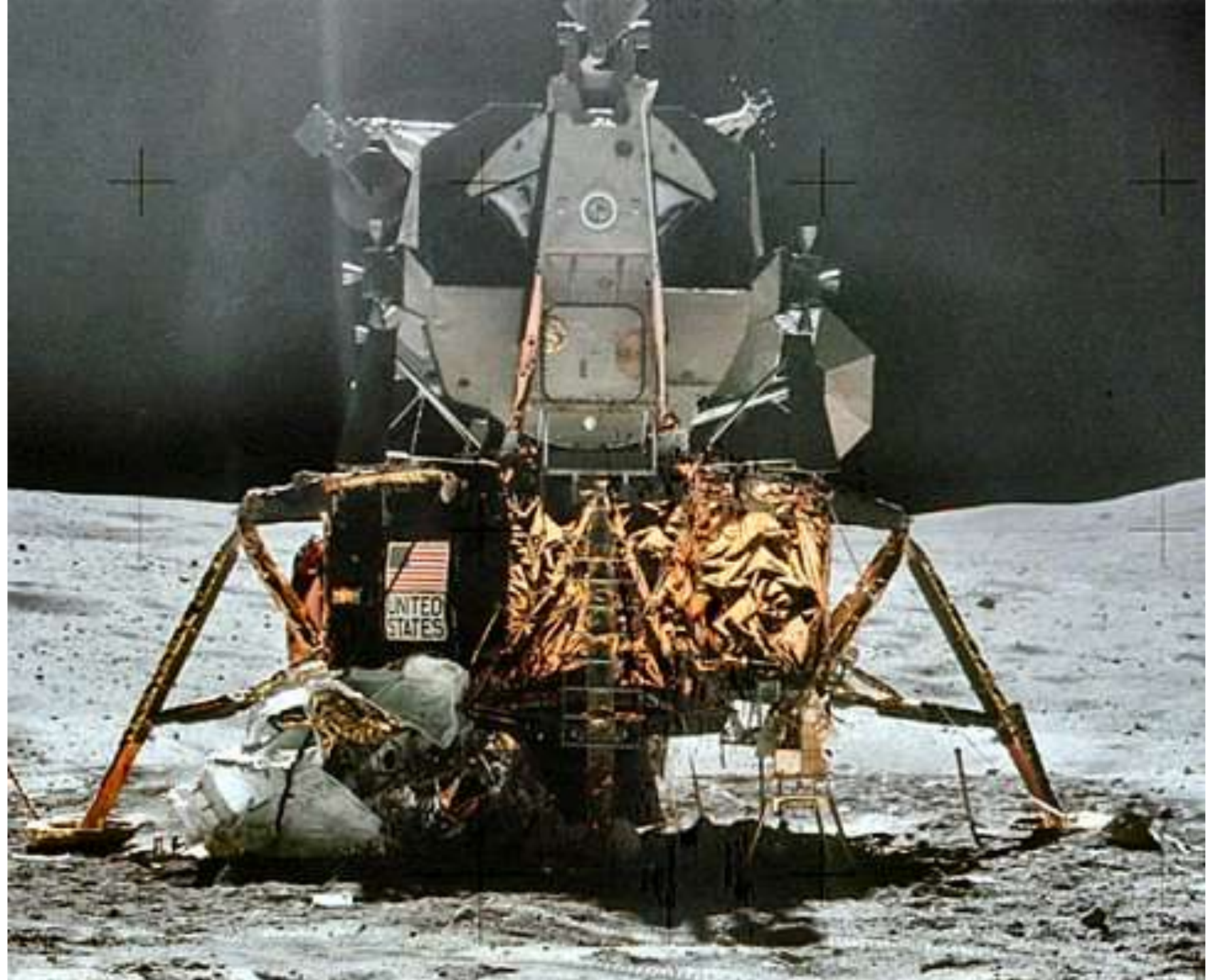




Neil Armstrong, Michael Collins, and Buzz Aldrin
Apollo 11 Crew



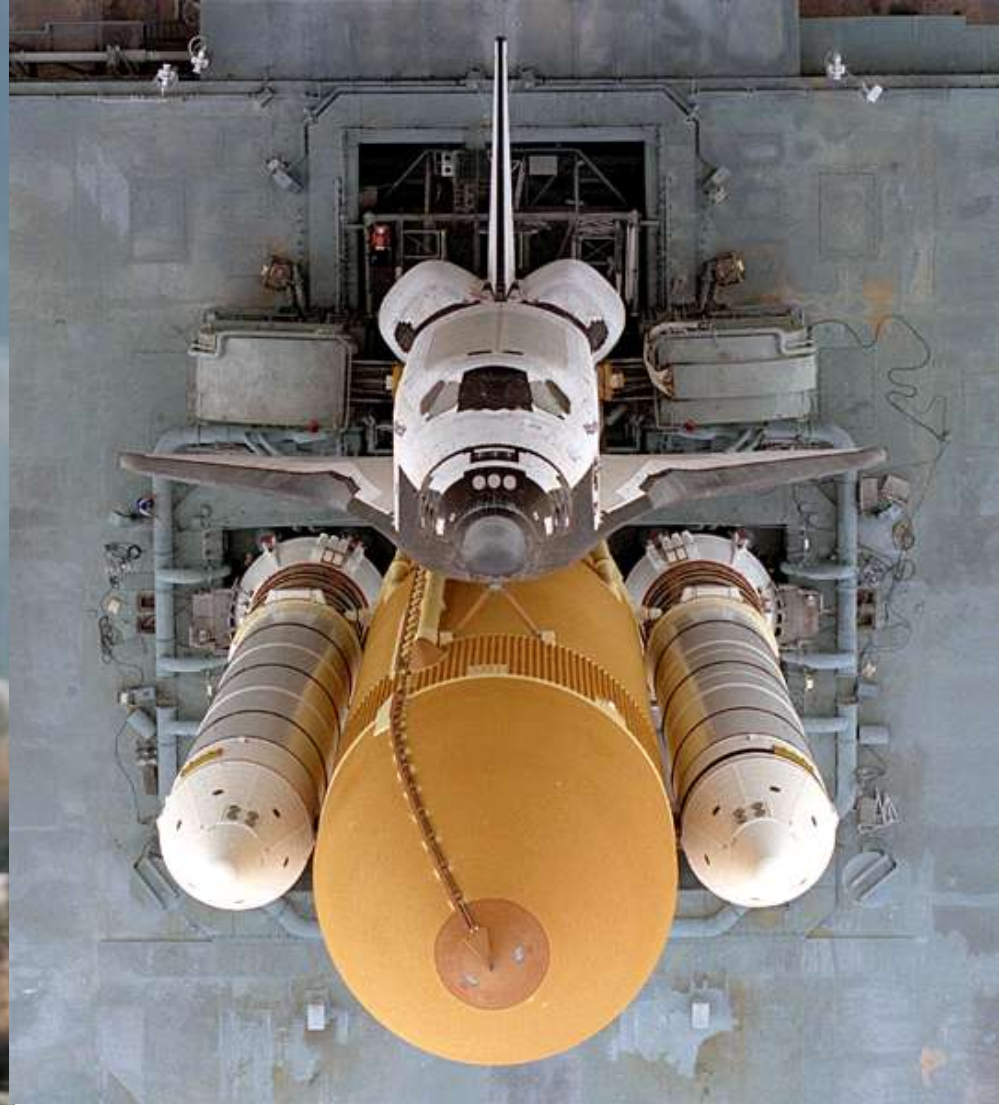


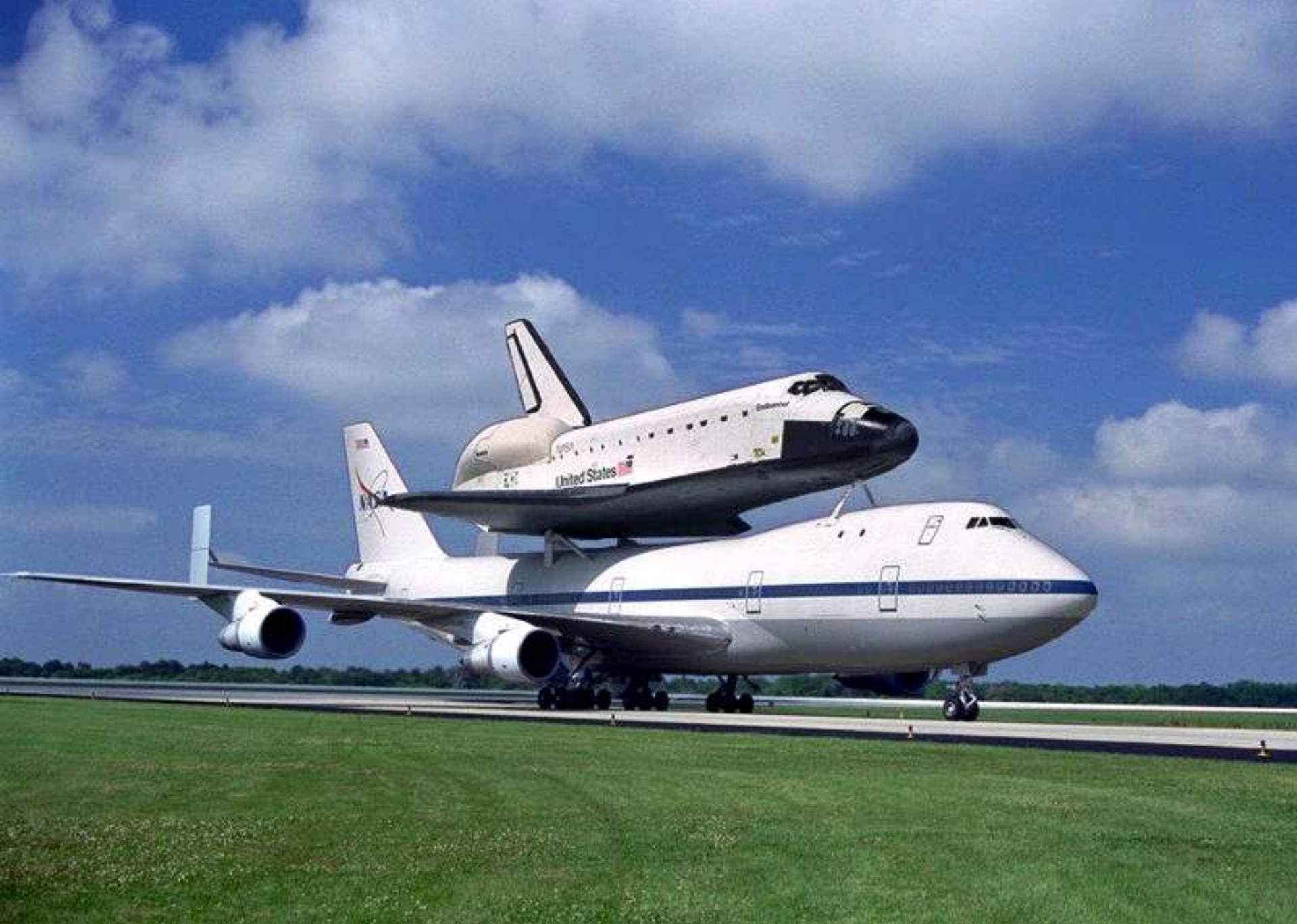


The space shuttle program

- Reusable spacecraft
- space transportation system STS









Space Stations

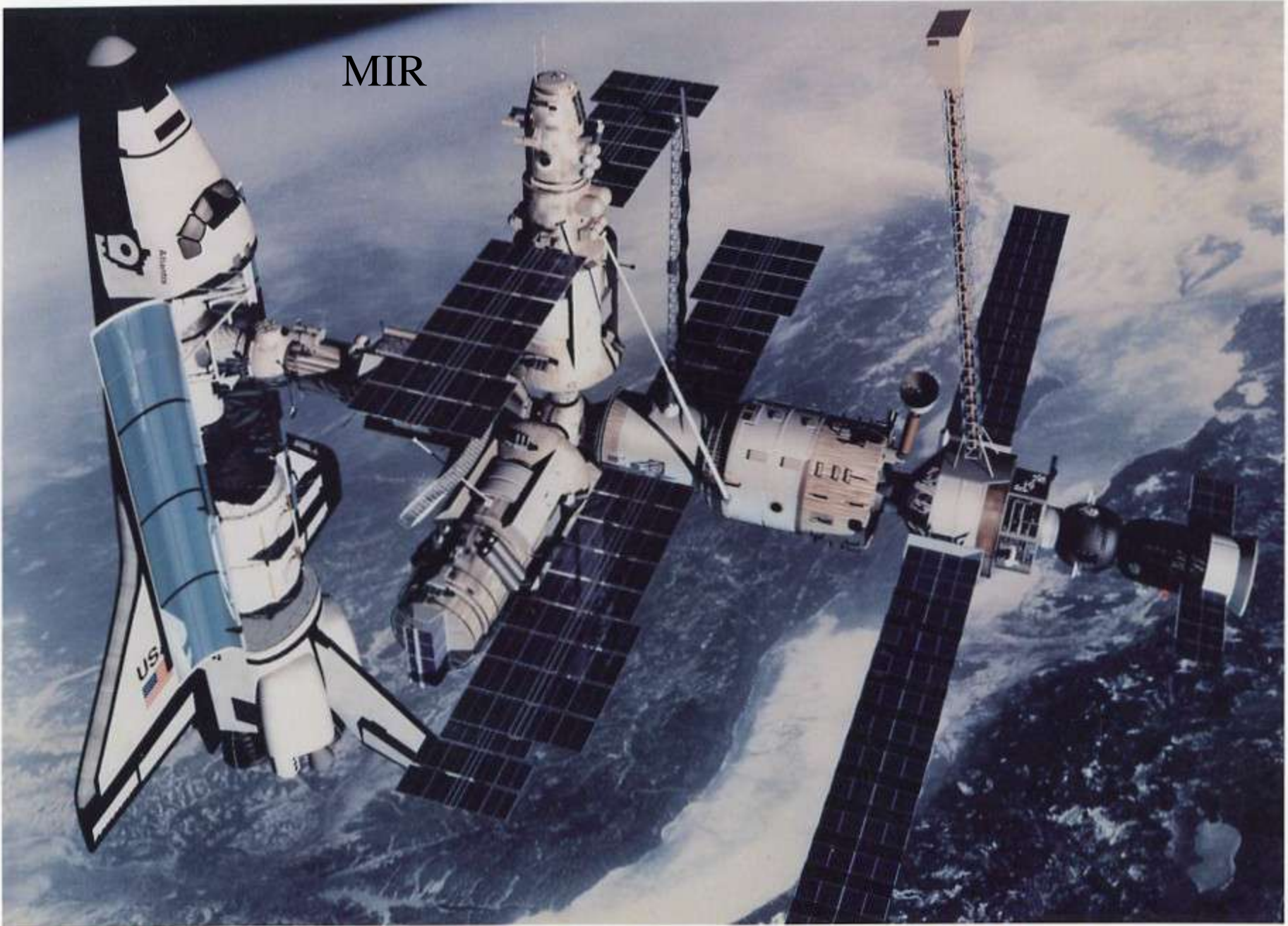
- Skylab 1973 –fell in 1979



MIR



MIR



International Space Station 1997

- **Permanent laboratory in space**



Flight Director



