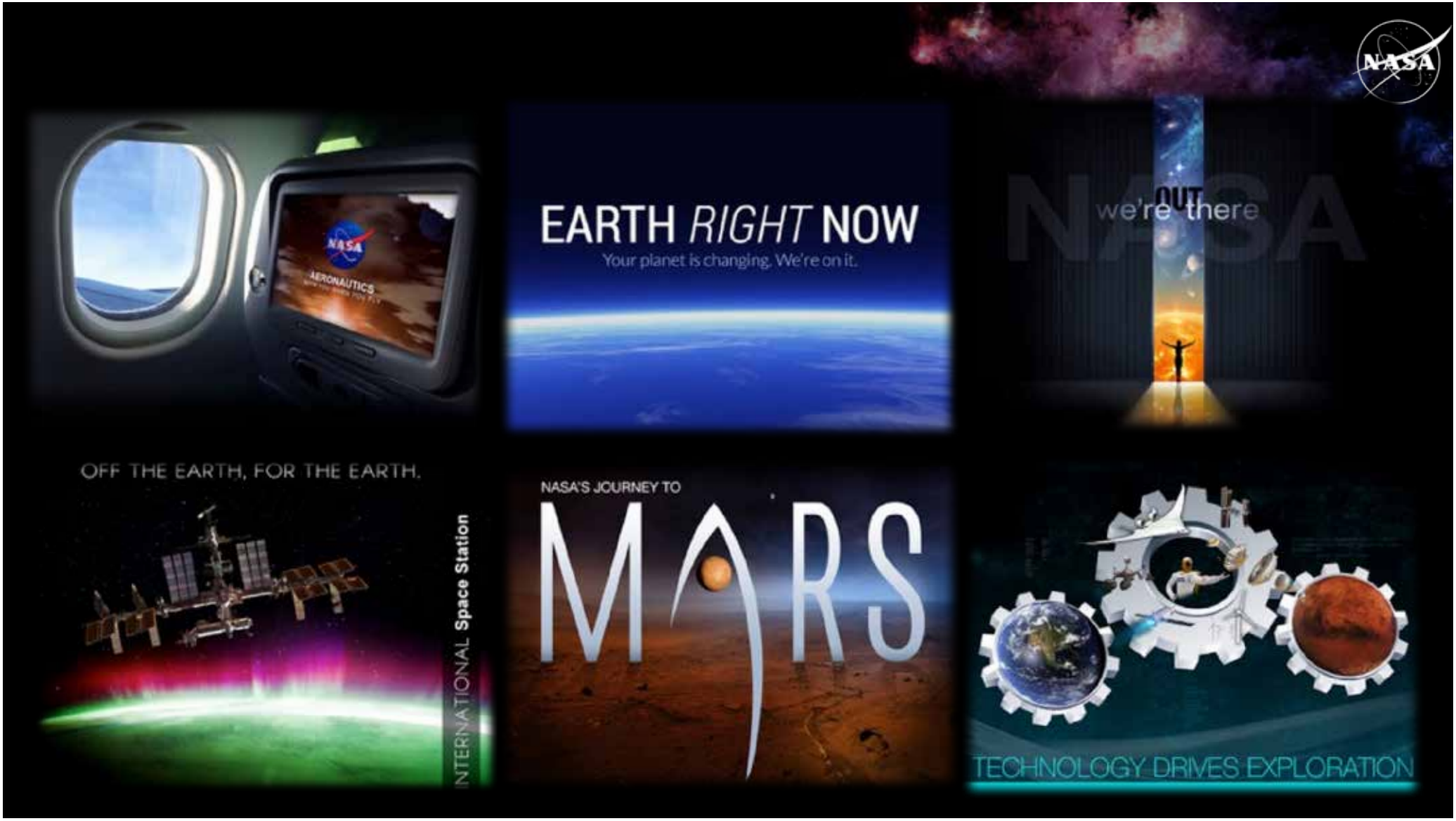

Space Policy Debate
On Space Privatization & Property Rights
Dr. Eugene Tu
Director, NASA Ames Research Center


NASA
AERONAUTICS
EARTH RIGHT NOW
Your planet is changing. We're on it.
NASA
we're OUT there
OFF THE EARTH, FOR THE EARTH.
INTERNATIONAL Space Station
NASA'S JOURNEY TO
MARS
TECHNOLOGY DRIVES EXPLORATION

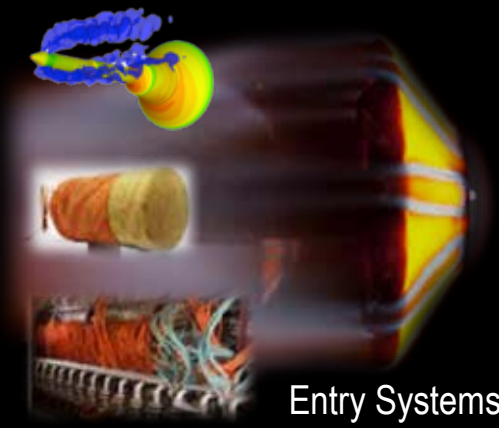

NASA Centers and Installations
Ames Research Center
Plum Brook Station
Glenn Research Center
Independent Verification and Validation Facility
Goddard Institute for Space Studies
Goddard Space Flight Center
Headquarters
Jet Propulsion Laboratory
Armstrong Flight Research Center
White Sands Test Facility
Johnson Space Center
Michoud Assembly Facility
Stennis Space Center
Marshall Space Flight Center
Kennedy Space Center
Langley Research Center
Wallops Flight Facility

Ames Research Center

- Occupants: ~1130 civil servants; ~2,100 contractors;1,650 tenants
  855 summer students in 2016
- FY2016 Budget: ~$915M (including reimbursable/EUL)
- ~1,900 acres (400 acres security perimeter); 5M building ft^2
- Airfield: ~9,000 and 8,000 ft runways

Ames Core Competencies

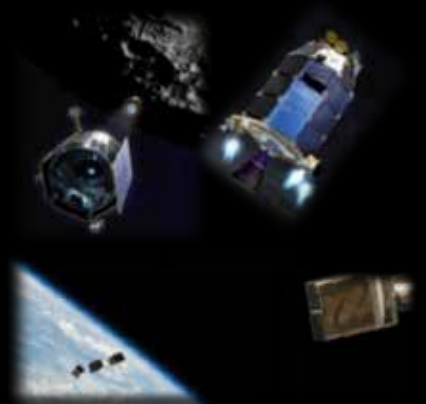
Air Traffic Management



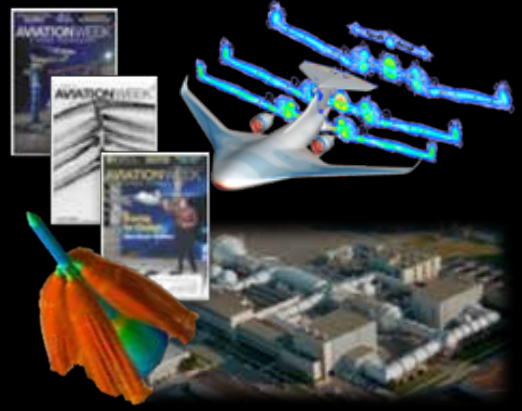
Entry Systems

Advanced Computing & IT Systems

Intelligent/Adaptive Systems

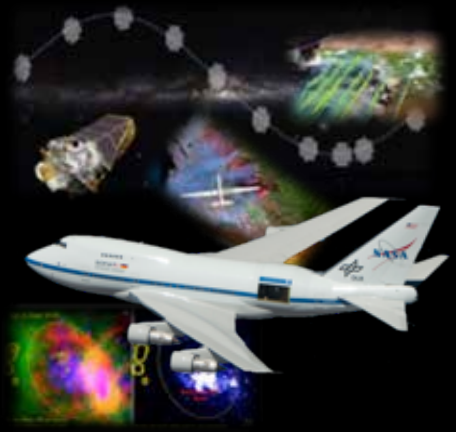


Cost-Effective Space Missions

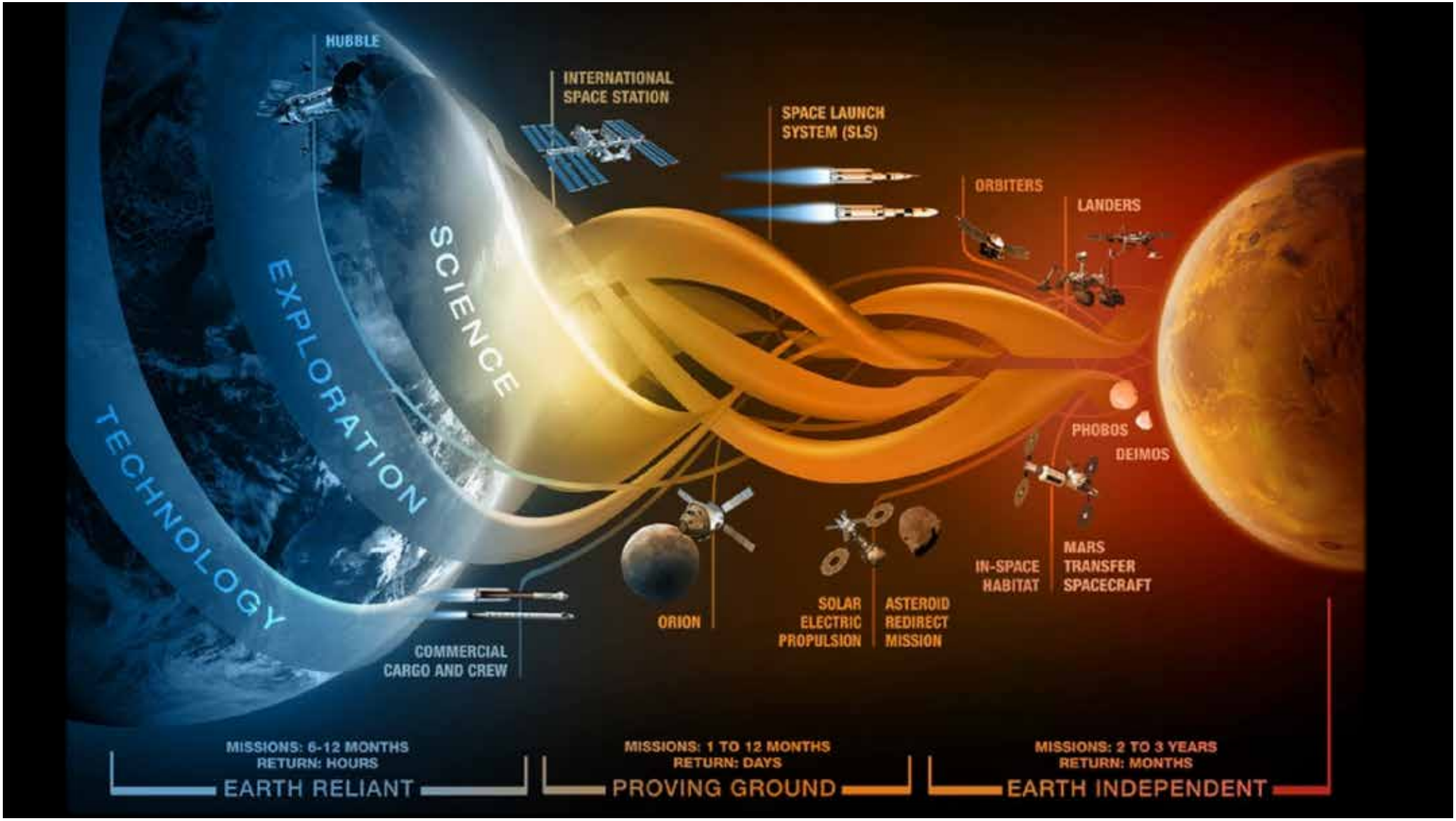


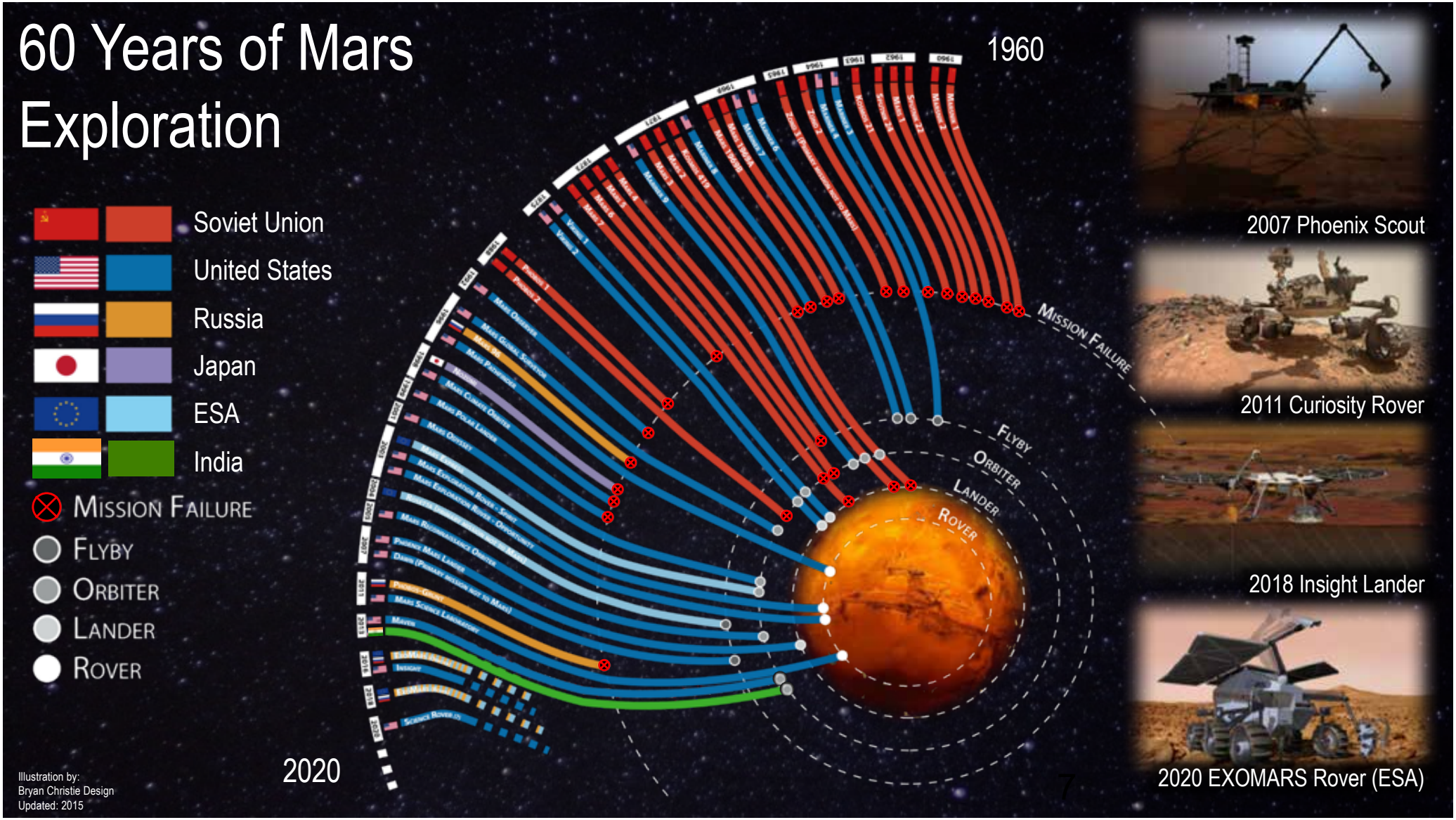
Aerosciences

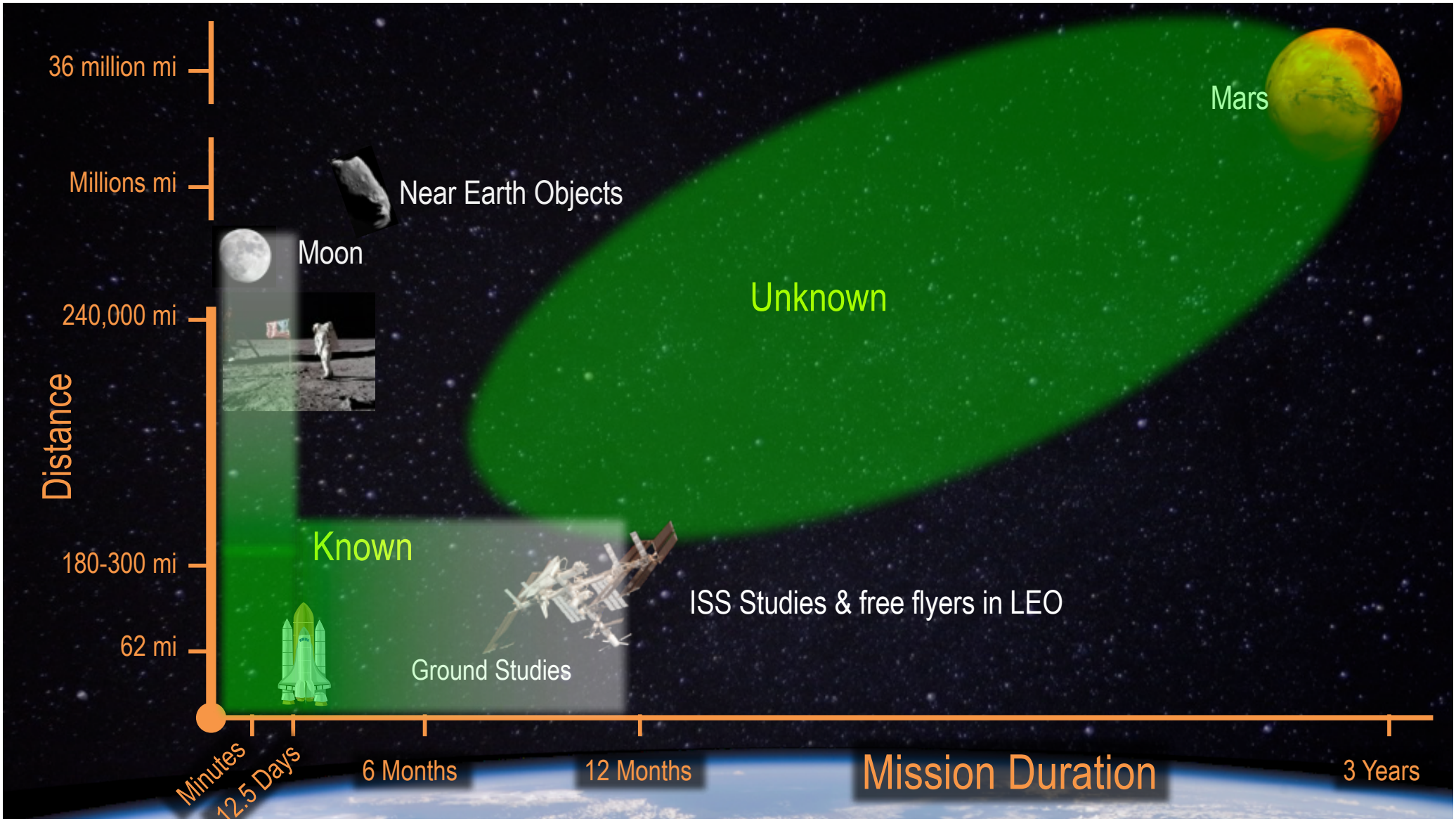
Astrobiology and Life Science



Space and Earth Sciences


HUBBLE
INTERNATIONAL SPACE STATION
SPACE LAUNCH SYSTEM (SLS)
ORBITERS
LANDERS
SCIENCE
EXPLORATION
TECHNOLOGY
PHOBOS
DEIMOS
IN-SPACE HABITAT
MARS TRANSFER SPACECRAFT
ORION
SOLAR ELECTRIC PROPULSION
ASTEROID REDIRECT MISSION
COMMERCIAL CARGO AND CREW
MISSIONS: 6-12 MONTHS
RETURN: HOURS
EARTH RELIANT
MISSIONS: 1 TO 12 MONTHS
RETURN: DAYS
PROVING GROUND
MISSIONS: 2 TO 3 YEARS
RETURN: MONTHS
EARTH INDEPENDENT


60 Years of Mars Exploration
1960
2020
Soviet Union
United States
Russia
Japan
ESA
India
Mission Failure
Flyby
Orbiter
Lander
Rover
Mission Failure
Flyby
Orbiter
Lander
Rover
2007 Phoenix Scout
2011 Curiosity Rover
2018 Insight Lander
2020 EXOMARS Rover (ESA)
Illustration by:
Bryan Christie Design
Updated: 2015


36 million mi
Millions mi
240,000 mi
180-300 mi
62 mi
Distance
Near Earth Objects
Moon
Mars
Unknown
Known
ISS Studies & free flyers in LEO
Ground Studies
Minutes
12.5 Days
6 Months
12 Months
Mission Duration
3 Years

Analogy: History of Aviation

Kitty Hawk (1903)

Boeing 247 (1934)

DC-3 (1935)

X-1A (1946)

X-2 (1952)

X-15 (1959)

NASA launched
AT&T Telstar (1962)

Space

Aviation

NACA (1915)

The Air Mail Act (1925)

Air Commerce Act (1926)

Civil Aeronautics Act (1938)

FAA, NASA (1958)

Airline Deregulation
Act (1978)

Commercial Space Transportation

Commercial Resupply Services

The Canadarm 2 reaches out to grapple the SpaceX Dragon cargo spacecraft and prepare it to be pulled into its port on the ISS. (4/17/2015)

Commercial Crew Program


Pad 39-A (11/9/67): Apollo 4, the first test flight of Saturn V.
Pad 39-A (4/12/81): STS-1,: John Young and Bob Crippen flew Columbia for 2days
Pad 39-A (2/19/17): SpaceX CRS-10 “Dragon”, first launch from Pad 39-A since the final space shuttle mission.


Cal
UNIVERSITY OF
CALIFORNIA BERKELEY
STANFORD
STS-68, 82, 103, 110
STS-110, 112, 125
TO EUGENE -
BEST WISHES FROM BOTH SIDES
OF THE BAY!!! WE CAN CO-EXIST
PEACEFULLY IN SPACE