



A glimpse of space exploration and the challenges of life away from Earth

Susana B Zanello, PhD
Universities Space Research
Association (USRA)

USRA

- USRA was founded at the suggestion of the National Academy of Sciences.
- One hundred five universities participate in space research for NASA, including space life sciences research.

NASA Centers





Project Mercury 1961-1963

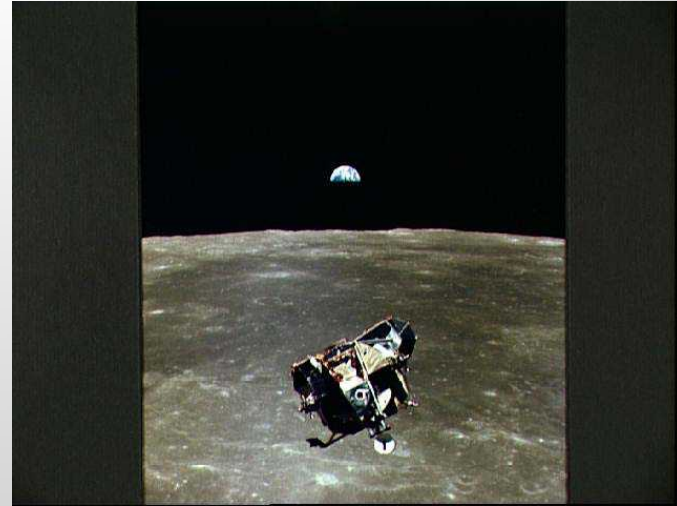


Project Gemini 1965-1966

Apollo Program (1968-1972)



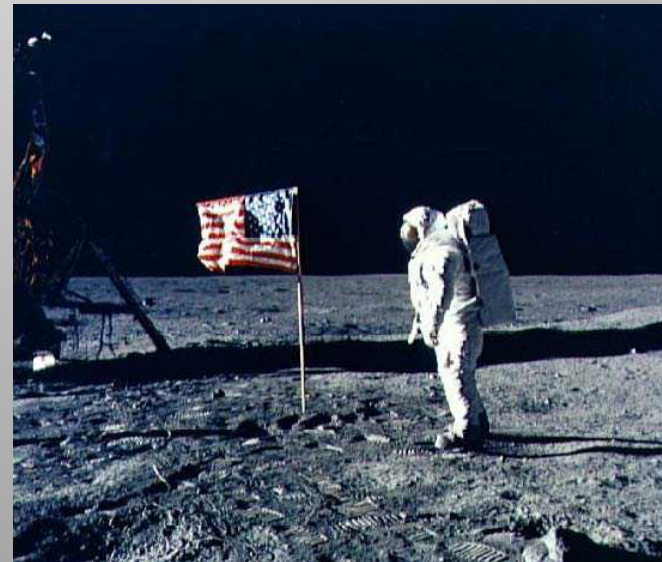
Saturn V launch



Lunar module ascent



Apollo 11 Crew

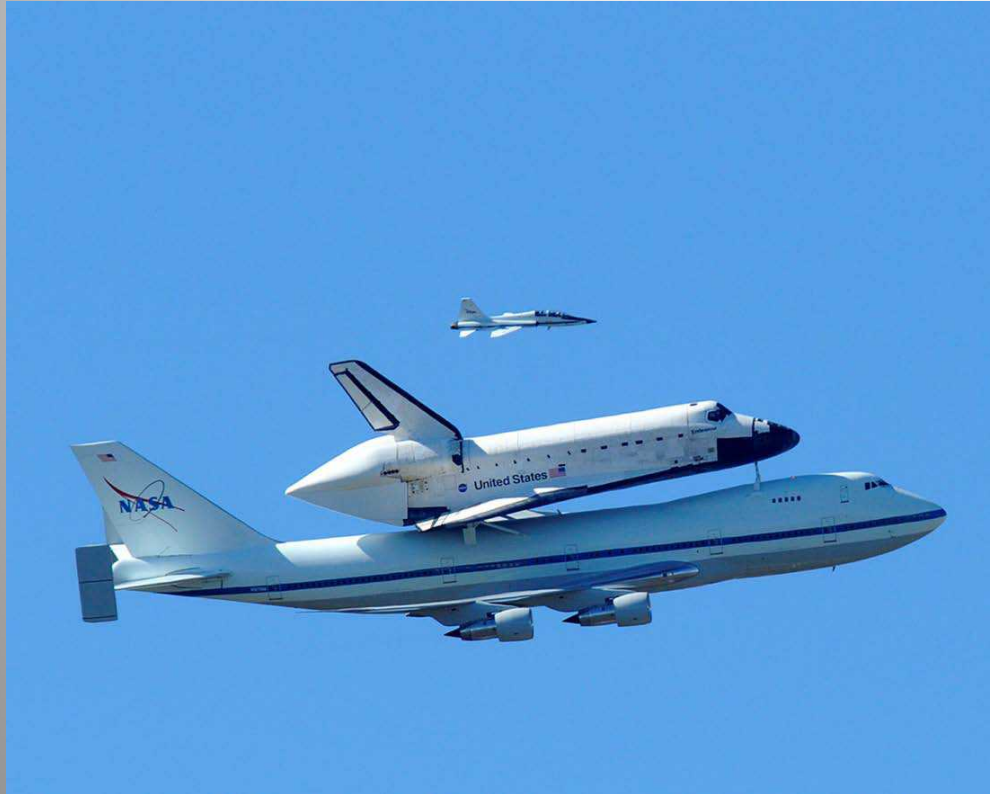


Apollo 11 Moon landing (July 1969)



Space Shuttle Program (1981-present)





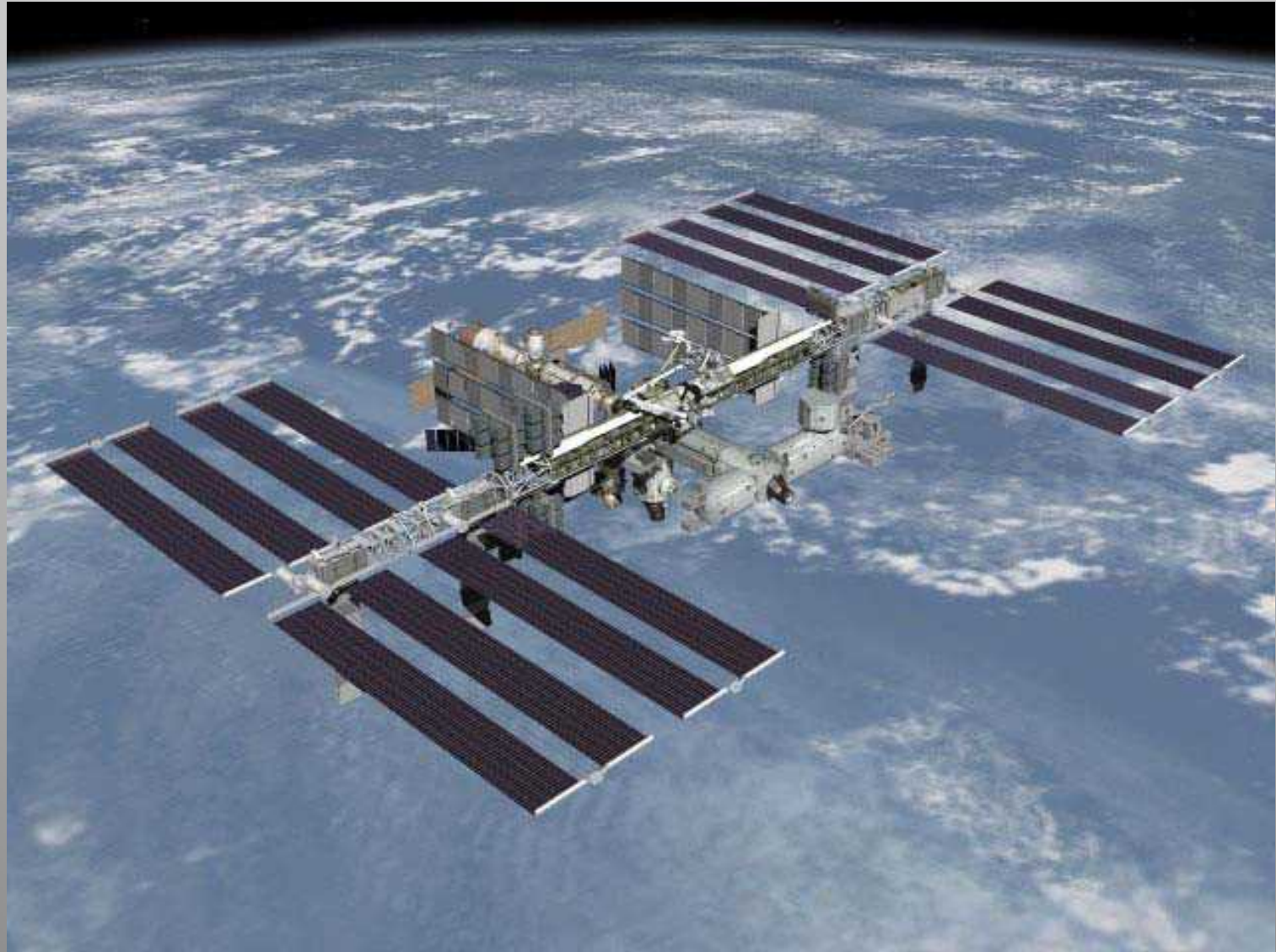
Boeing 747 carrying shuttle back to KSC
(Overflying JSC)



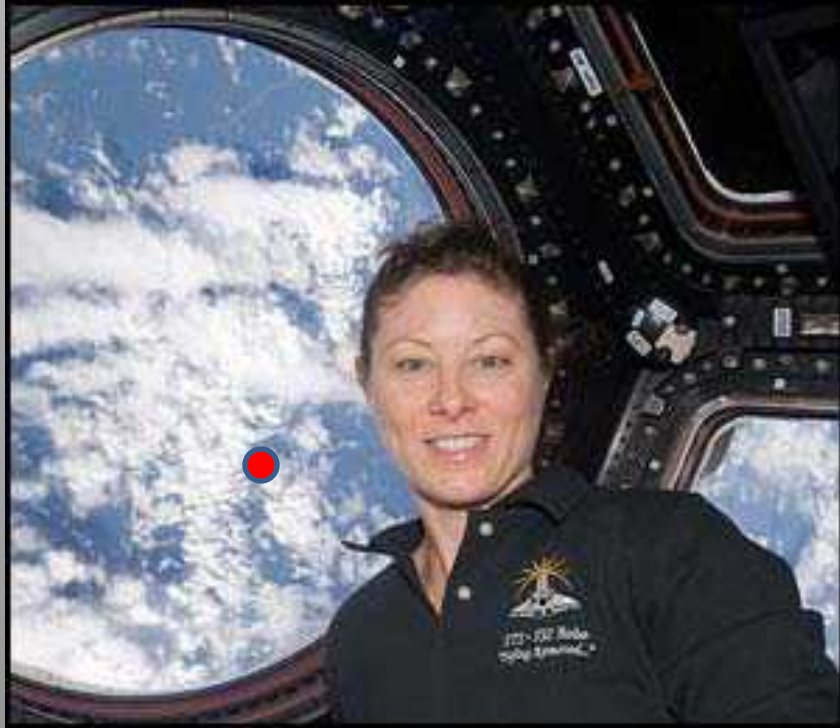
Mission Control



International Space Station (ISS)



ISS



The new observation cupola (STS 132, May 2010)



The new observation cupola: Shuttle in STS130 docked to the ISS (Feb 2010)

Microgravity



ISS018E033784





Work
and
science



ISS024E015187

Flight Analogs



Bed rest



Parabolic flight

Flight Analogs



Desert Research and Technology Studies (RATS)



Antarctica

Flight Analogs

NEEMO: NASA Extreme Environment Mission Operations





Surface Rover prototype

National Aeronautics and Space Administration



Roundup

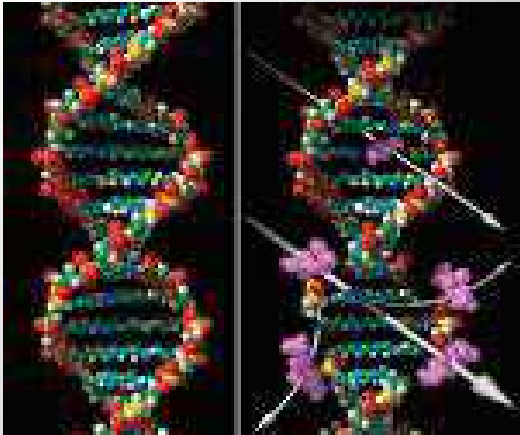
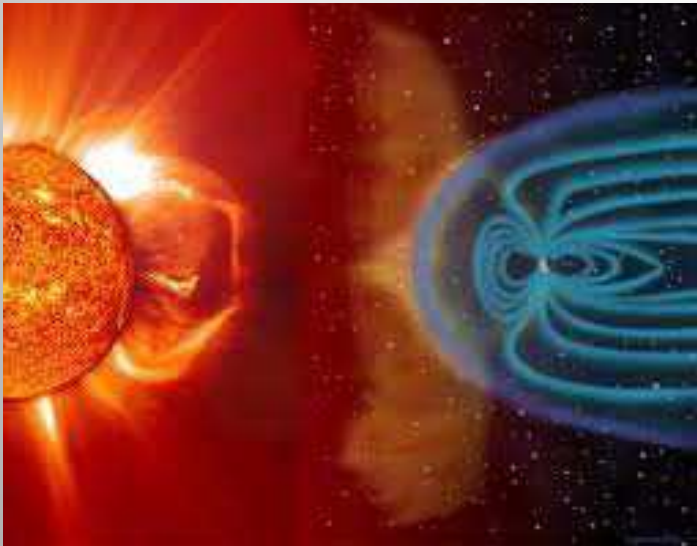
Lyndon B. Johnson Space Center

September | 2010



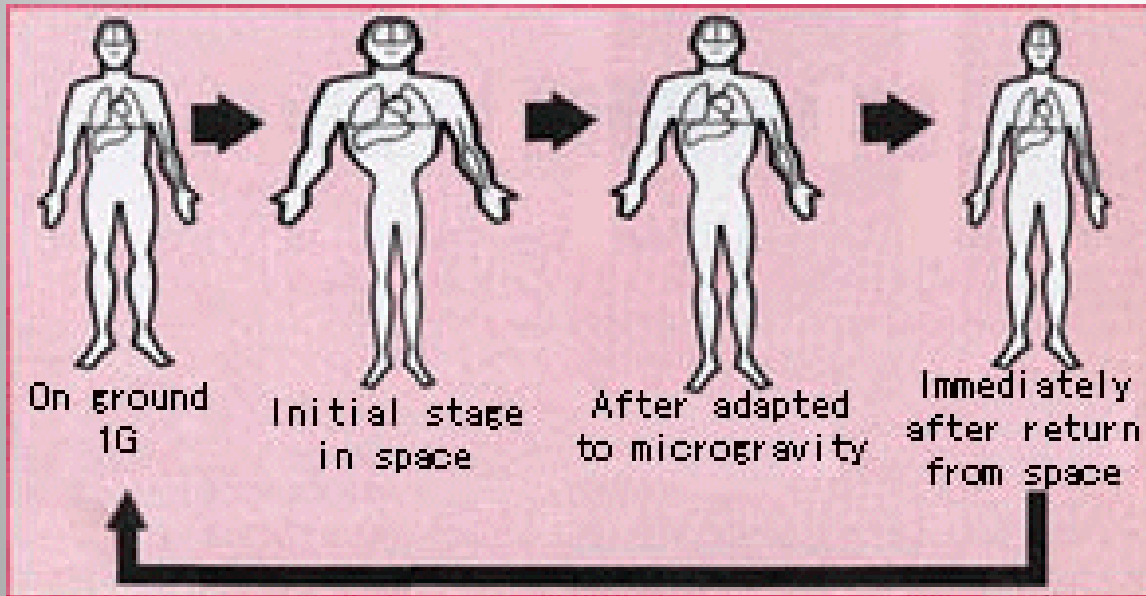
When humans and robots join forces

Life challenges: Radiation



Life challenges: bone loss and muscle deconditioning





Cardiovascular risks





ISS009E16218

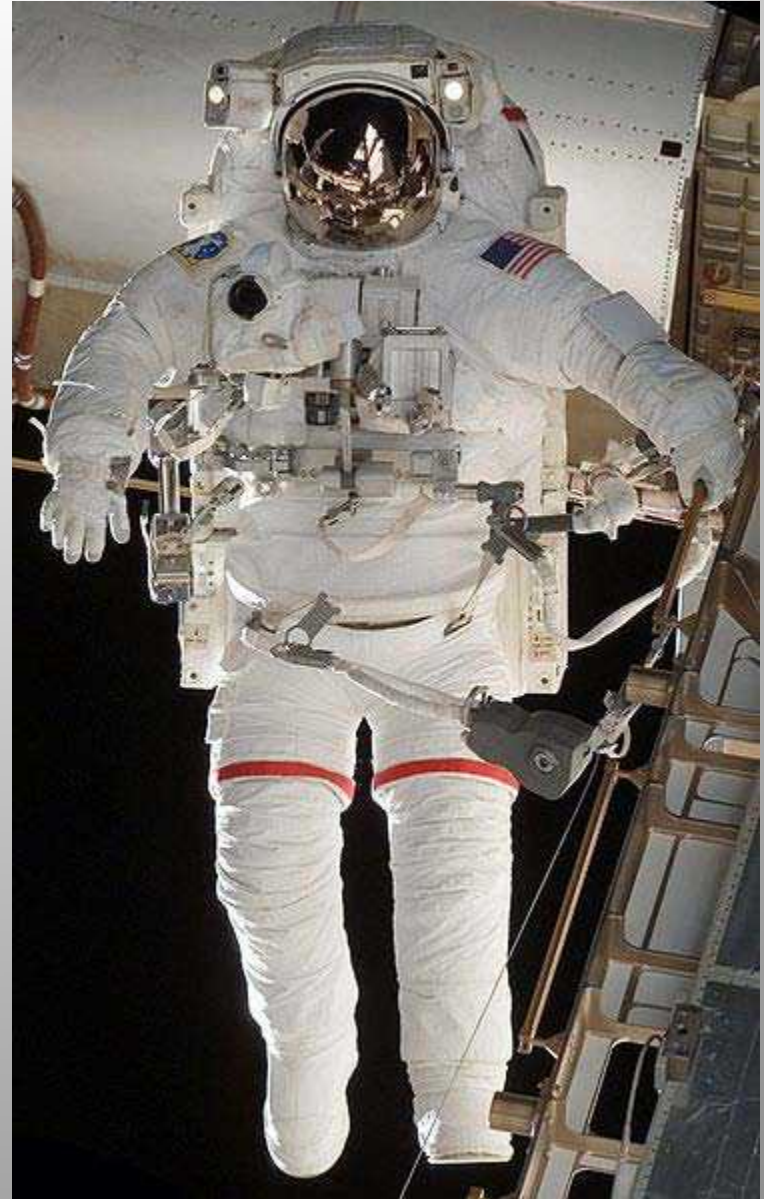
Nutrition



Space Suits



ACES



EMU

The future?

