



NASA Langley Research Center, Simulation Development and Analysis Branch - Flight Simulation Facilities

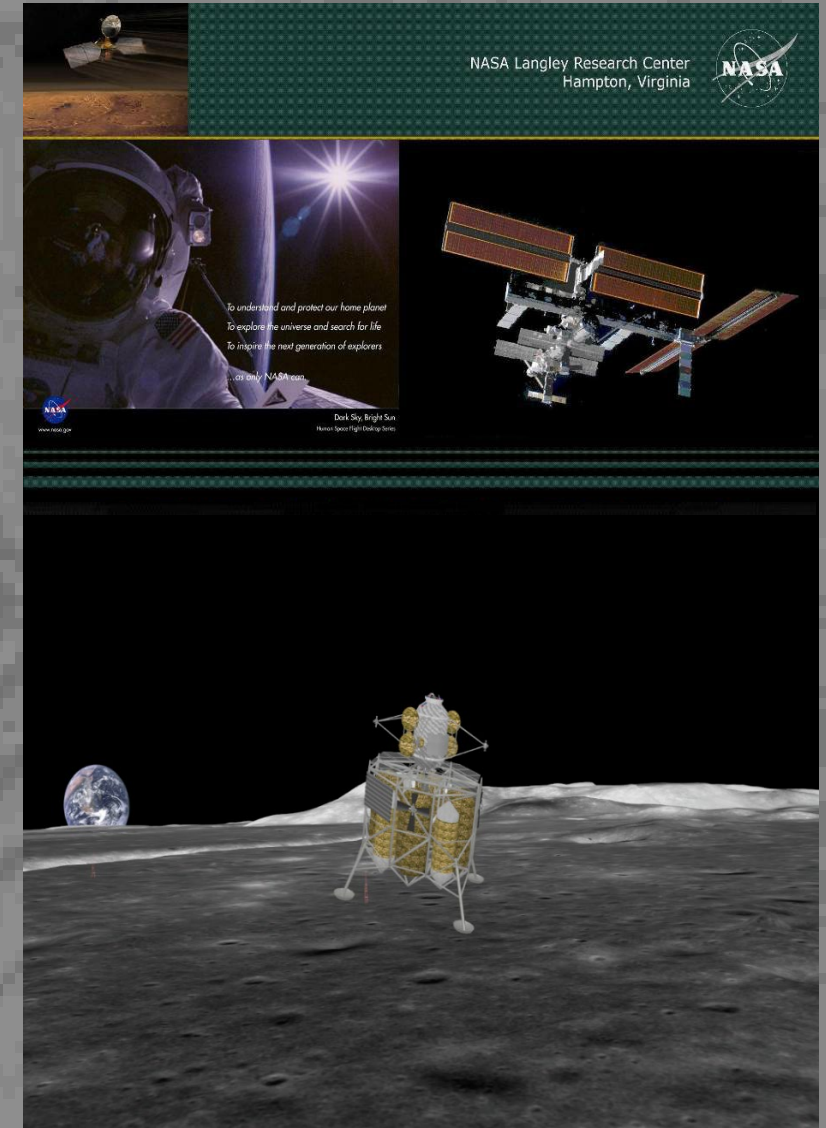
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Simulation Development and Analysis Branch (SDAB)

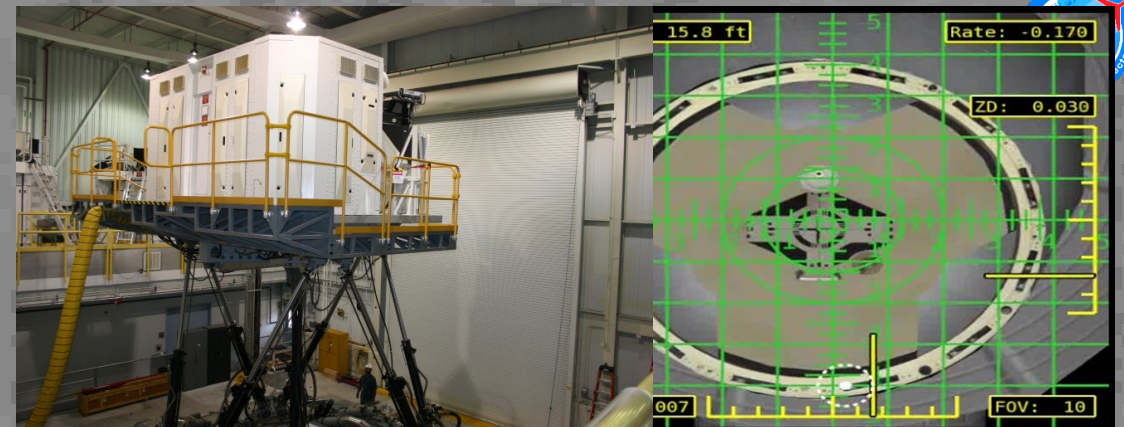
- Design and test concepts for space exploration, aeronautics, and scientific development since 1950s including Mercury, Gemini, and Apollo programs
- LaRC Flight Simulation Facilities are designated as national strategic assets for aerospace research
- Pioneer and advance simulation systems technologies for aerospace and scientific studies
- User Community
 - HEOMD – Orion, Commercial Crew (Sierra Nevada), Ares IX, Ares I, Altair, Mars Scout
 - ARMD – Airspace, Aviation Safety, Subsonics, Supersonics, Hypersonics, and UAS
 - Reimbursable – FAA, DOD, Embry-Riddle, Boeing, international partners (ICATEE, Delft)
 - Collaborate with industry for new flight simulation technologies
 - Integration with labs at LaRC and other NASA Centers, DOD, FAA, Mitre, industry, and universities to conduct large-scale multi-vehicle simulations



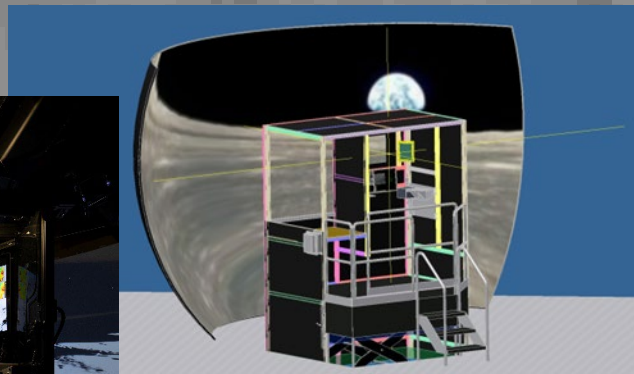
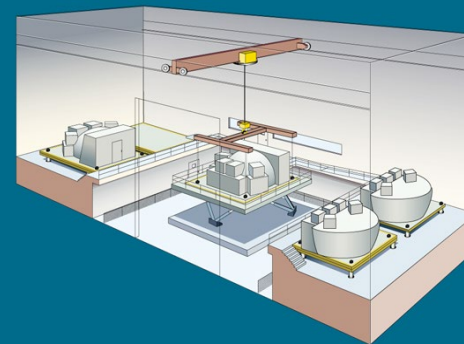


Simulators

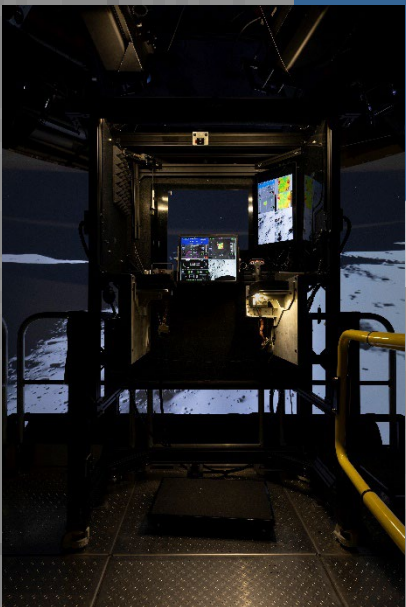
- McFadden Systems Inc Motion System
 - 6 degree-of-freedom synergistic motion system
 - 76-inch leg stroke
 - 22,000 pounds to increase performance bandwidth
- State-of-the-art motion cueing algorithms and advanced algorithms
- Four interchangeable fixed based and motion-based simulator cockpits
- System Integration Laboratory (SIL) for hardware in the loop testing and evaluation



Cockpit Motion Facility (CMF)



Lunar Lander :
Artemis Government Reference Model
Landing Cameras
LIDAR Based Terrain Obstacle Avoidance System
Visual Databases created from LRO data





Background: Tom Wolters

- 40+ years Federal Government Service
- Simulation Systems Engineering for 25 years
 - Aircraft - B757, B737, Military and experimental aircraft
 - Spacecraft - HL-20/Dream Chaser, Orion, Apollo LEM recreation / Altair Initial simulation efforts, HLS Government Reference Model
- Visual Systems
 - Collins Aerospace , Diamond Visionics, Unreal Engine, Open-Source Graphics
 - Data Mining for visual database development – Earth, Moon, Mars, Asteroids
- Study of Lunar Environmental Data and Processes
 - Apollo Program Data
 - Collaboration with NASA Lunar Science Teams
 - NASA Planetary Data System (PDS)
 - LRO Data
 - Grail Data
 - Lunar Ephemeris
 - Korean Pathfinder Lunar Orbiter (KPLO) - Shadow Cam
 - Lunar Regolith and Simulants
 - Exolith Labs
 - Lunar Simulant Users Guide
 - NASA Simulant Development Labs
 - Lunar Static Effects and Regolith Particle Migration
 - Lunar Dust and Plume Surface Interaction (PSI)

- Lunar Environmental Illumination Properties
 - Albedo – Earth and Moon
 - Hapke Effects
 - Retroreflection
 - Man-made material reflectivity and lighting
- Human Vision in the Lunar South Pole Environment
- Design Specification for Natural Environments (DSNE)

