

# NASA Ames Research Center

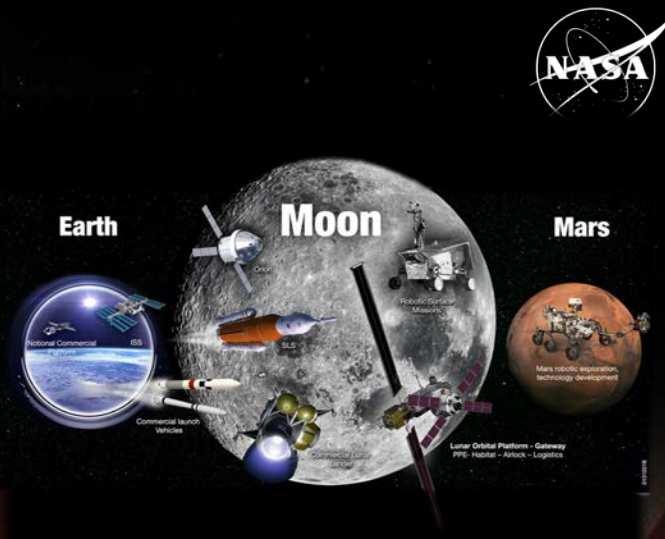
## An Overview



Dr. Eugene Tu, Director



International Space Station



# NASA Centers and Installations



# Ames is One of the Early NACA Laboratories



Joseph S. Ames



NACA

Langley

Ames

Lewis

Dryden

NASA

1915

1939

1940

1946

1958


# 78 Years of Innovation

This collage features numerous hexagonal tiles, each representing a significant innovation in aerospace and space exploration. The tiles are arranged in a grid-like fashion, with larger blue text indicating decades (1940, 1950, 1960, 1970, 1980, 1990, 2000, 2015). The innovations include:

- 1940:** Conical Camber, Arcjet Research
- 1950:** Hypervelocity Free Flight
- 1960:** Apollo Re-Entry Shape, CFD
- 1970:** Life Sciences Research, Pioneer Venus
- 1980:** Tiltrotor, Air Transportation System
- 1990:** Human Centered Computing, Nanotechnology
- 2000:** Mars Science Lab, ISS, Pleiades
- 2015:** SSERVI, Kepler, Sustainability Base, Quantum Computing

Other notable innovations include: Tekites, Apollo Guidance System, X-36, Lunar Prospector, SOFIA, Flight Simulator, Blunt Body Concept, Pioneer 10/11, Galileo, Space Biology, Apollo Heat Shield Tests, Lifting Body, Transonic Flow, Viking, IRIS, Aero Institute, ECROSS, LADEE, Astrobology Institute, Kuiper Observatory, 80x120 Wind Tunnel, and the Apollo 5000 Guidance System.

# Ames Research Center

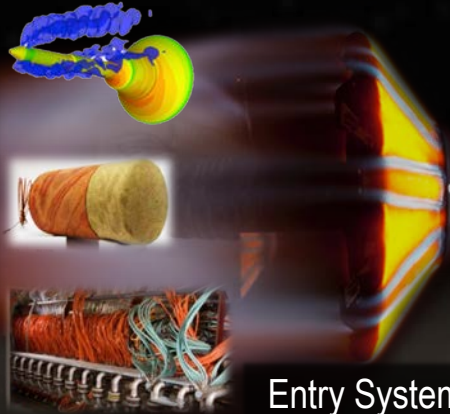


- Occupants:
  - 1175.8 civil servants (FY18 “ceiling”); ~2,100 contractors; 1,650 tenants
  - 855 summer students in 2016
- FY2016 Budget: ~\$915M (including reimbursable/EUL)
- ~1,900 acres (400 acres security perimeter); 5M building ft<sup>2</sup>
- Airfield: ~9,000 and 8,000 ft runways

# Core Competencies at Ames Today



Air Traffic Management



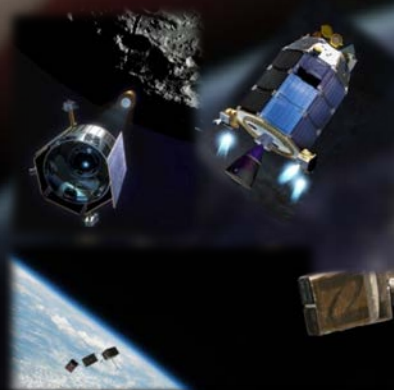
Entry Systems



Advanced Computing & IT Systems



Intelligent/ Adaptive Systems



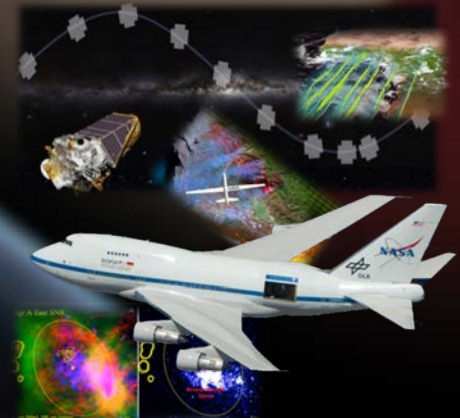
Cost-Effective Space Missions



Aerosciences

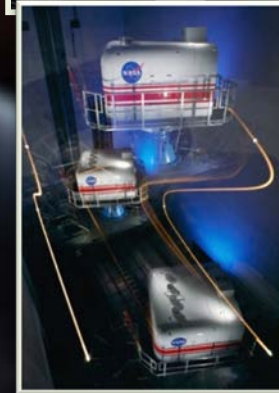
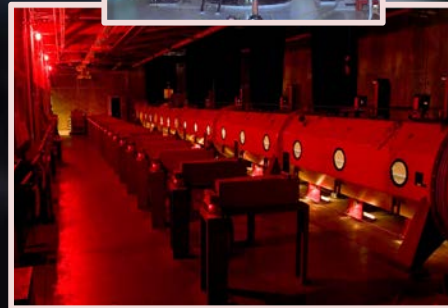
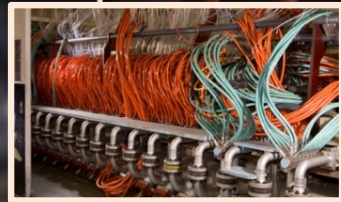
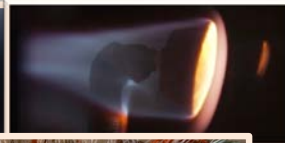
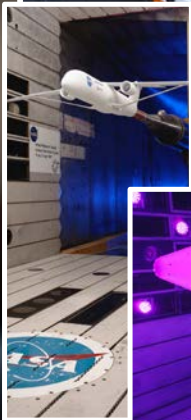
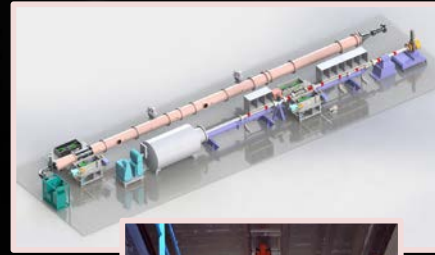


Astrobiology and Life Science



Space and Earth Sciences

# Major Research Facilities



Wind Tunnels

ARC Jet Complex

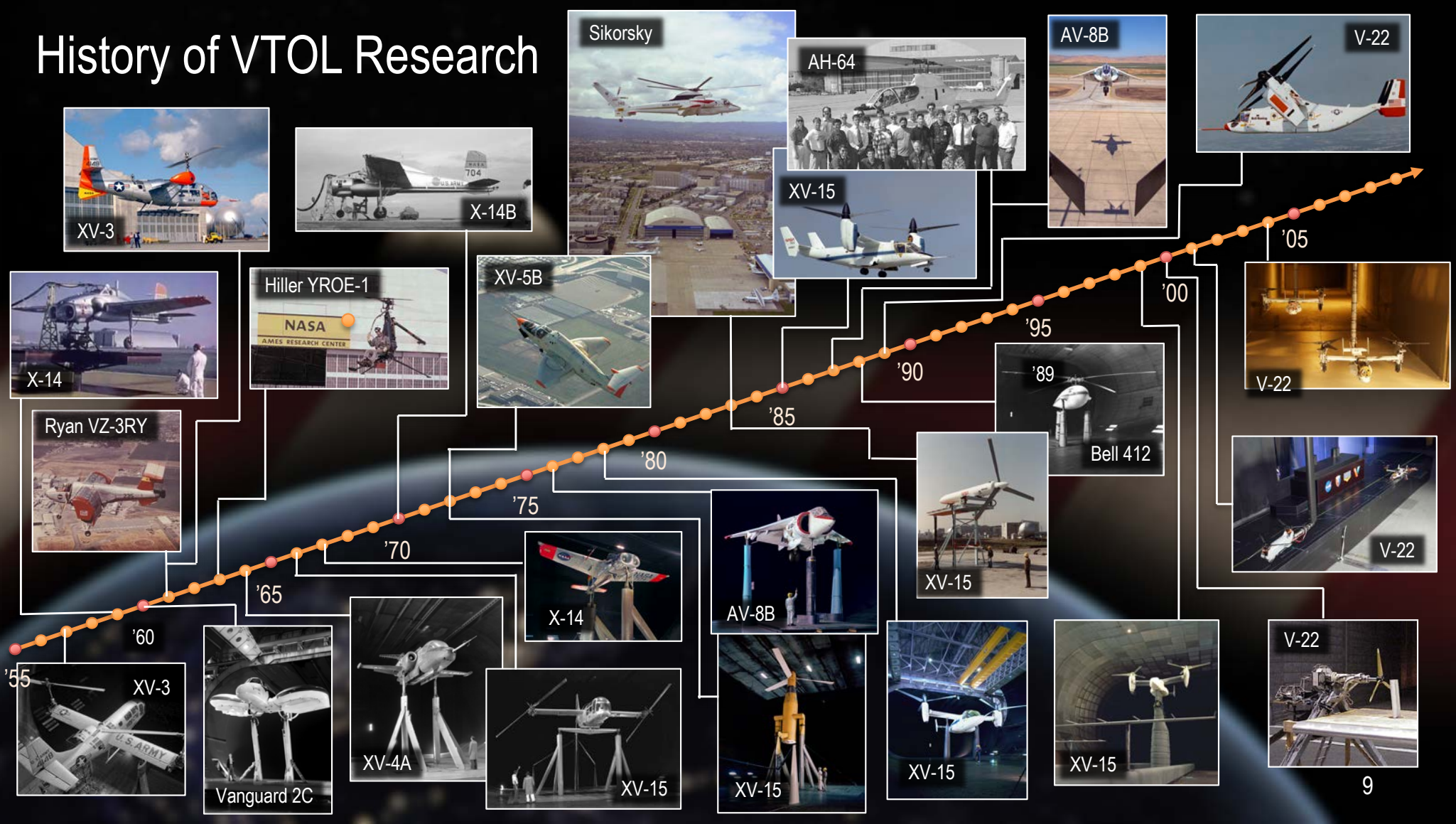
Range Complex

Simulators

Advanced  
Supercomputing

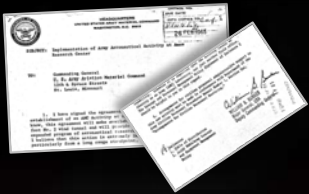


# History of VTOL Research

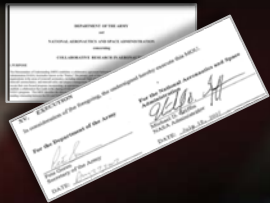


# Collaboration with the Army

1965 Joint Agreement



2007 MOU



- Leadership Development
- International partnership
- Contribute to University Rotorcraft/ Vertical Lift COEs and industrial collaborations
- Publications/awards



Test Capabilities



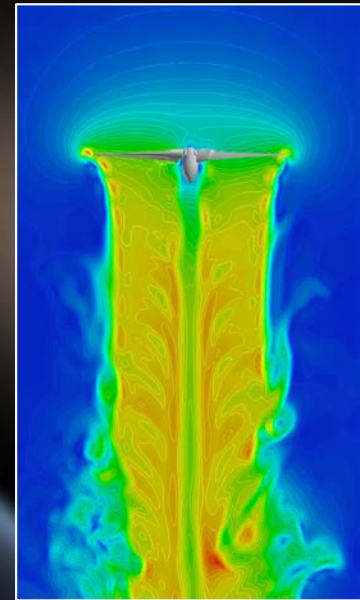
Measurement Techniques



Configuration Development



Flight Dynamics and Control

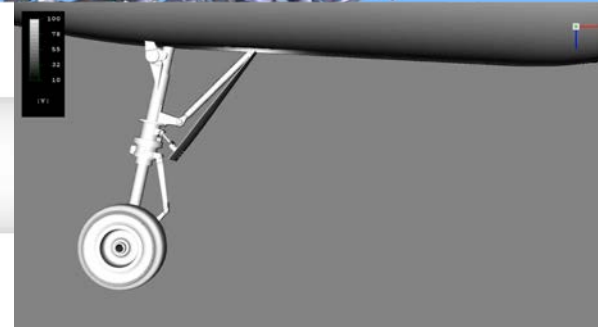
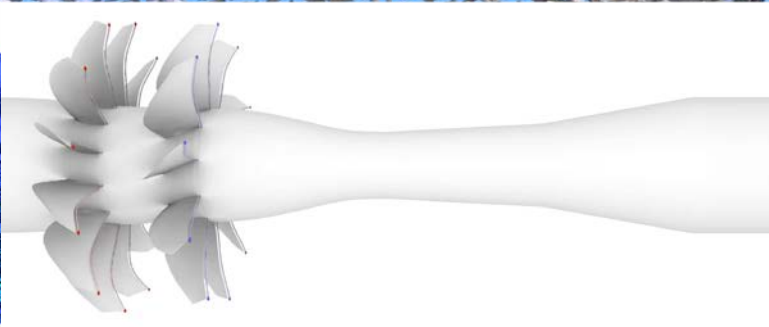
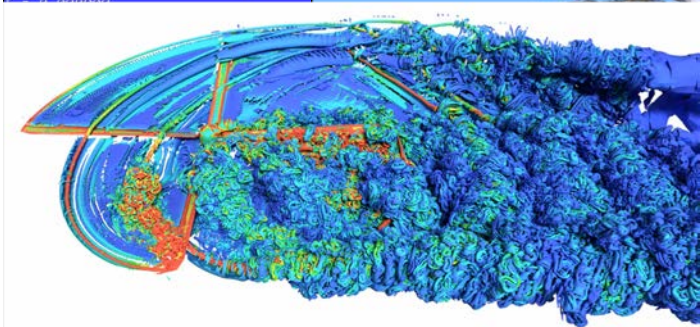
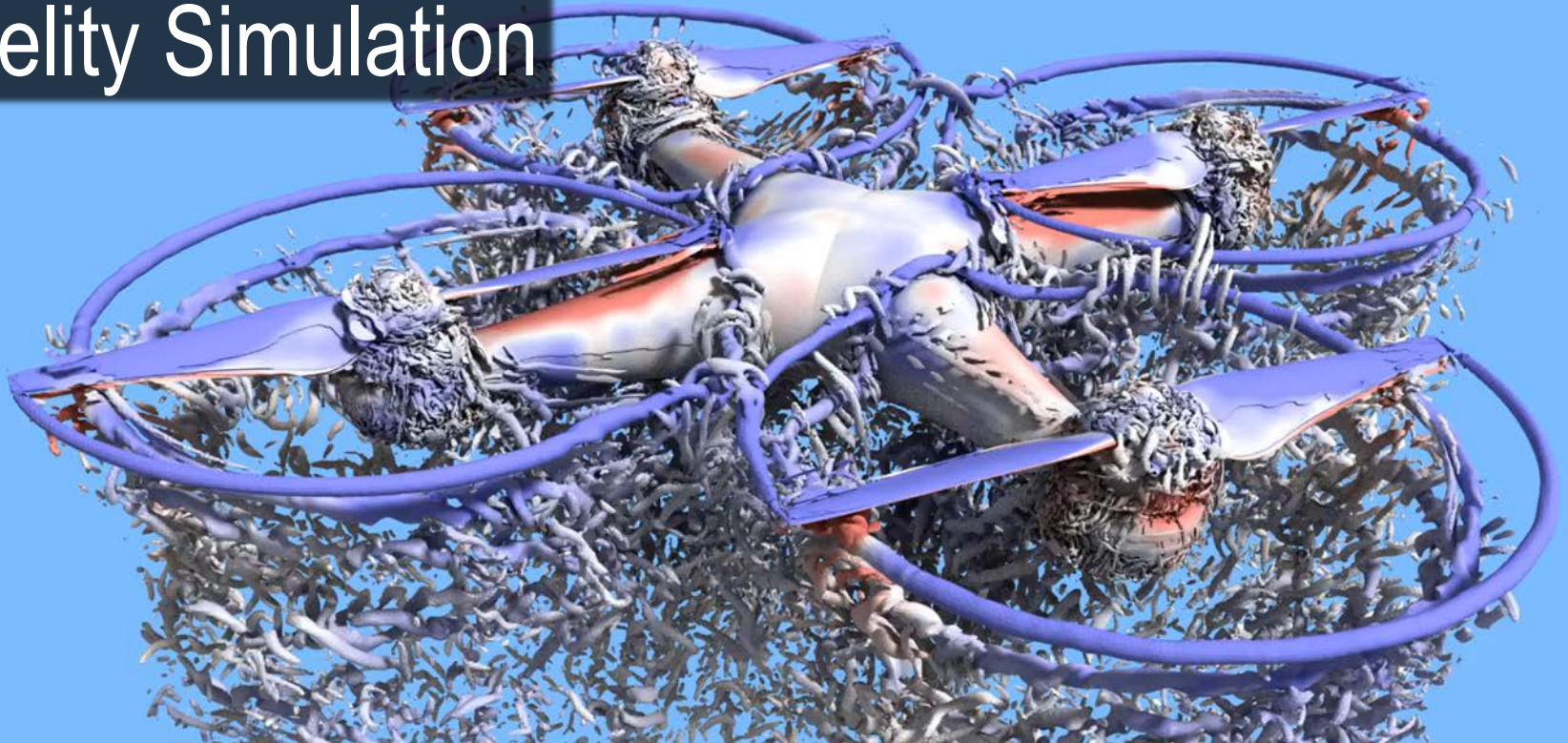
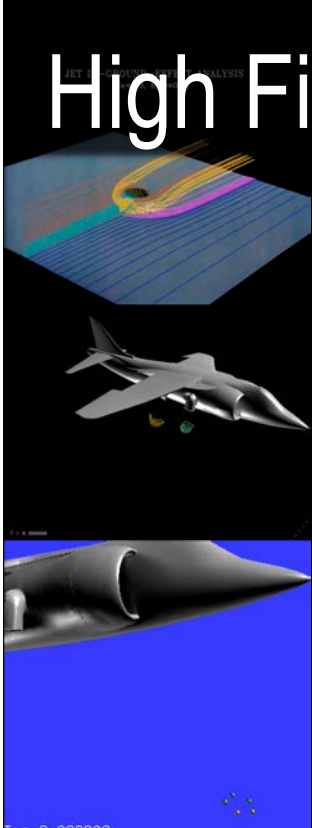


Simulation

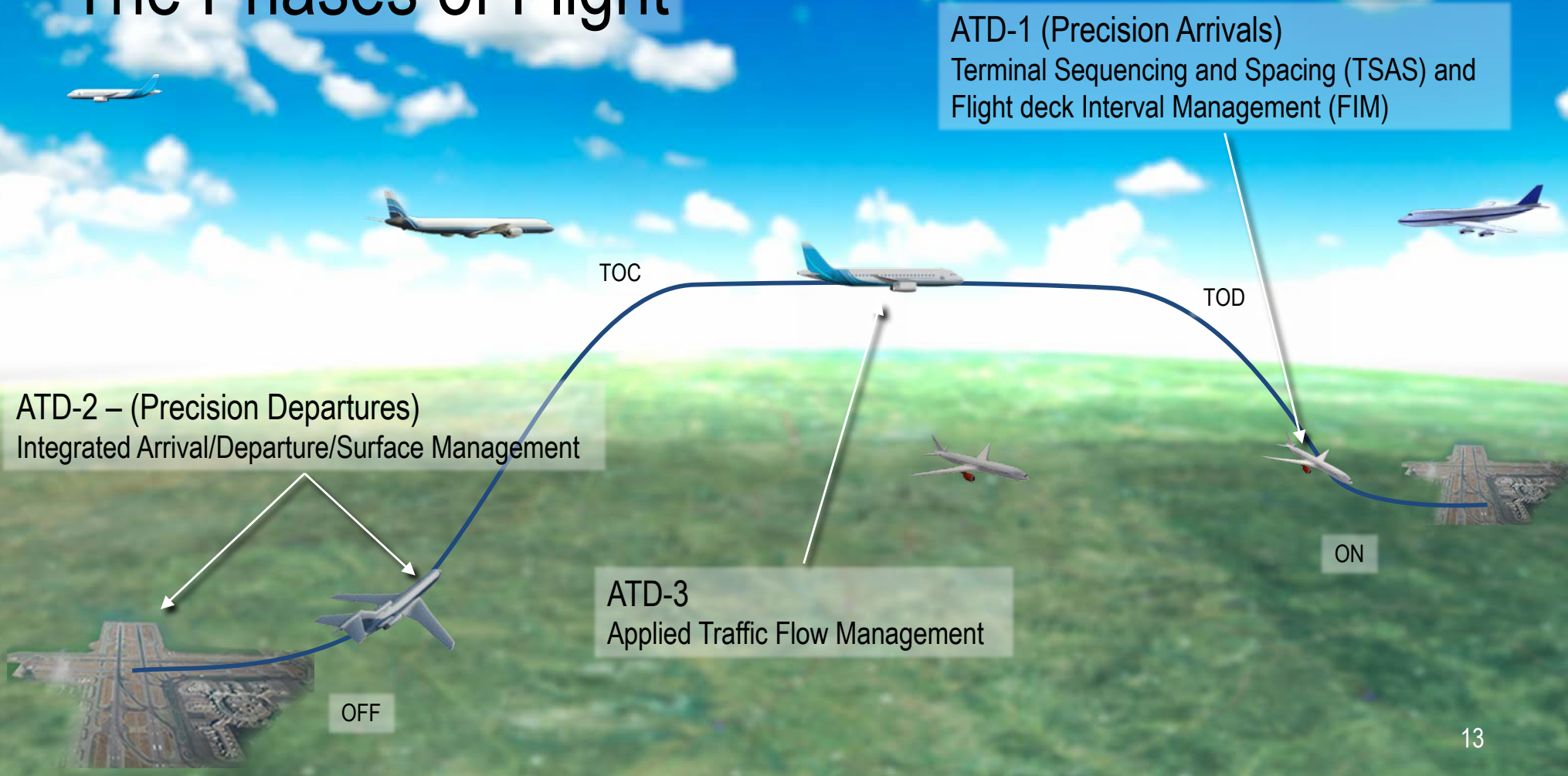
# Tiltrotor Test Rig in the 40- by 80-Ft Wind Tunnel



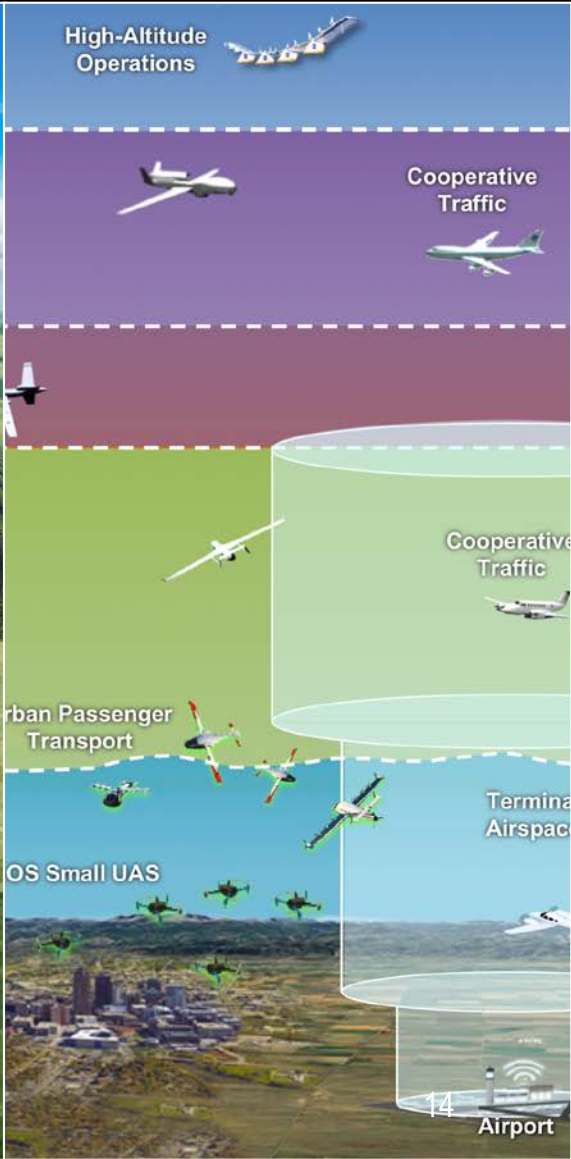
# High Fidelity Simulation



# The Phases of Flight



# Integrating UAS in the NAS



# Partnerships at Ames

## Commercial



## Virtual Institutes



## Inter-Agency



## NASA Research Park



## International



## Academia



