NASA Ames Overview and Personal Journey from Intern to Director

Dr. Eugene L. Tu
Director, NASA Ames Research Center

2023 Asian Pacific American Heritage Month
Jet Propulsion Laboratory
May 23, 2023

What Does NASA Do?

Aeronautics Research

Transform Aviation through R&D

Space Operations

Launch and Space Operations

Deep Space Exploration Sys.

Moon to Mars Exploration

Science

Understand the Sun, Earth, and Universe

Space Technology

Develop and transfer revolutionary technologies

NASA Centers

Ames Research Center

Glenn Research Center

HQ

Goddard Space Flight Center

Langley Research Center

Marshall Space Flight Center

Armstrong Flight Research Center

Jet Propulsion Laboratory

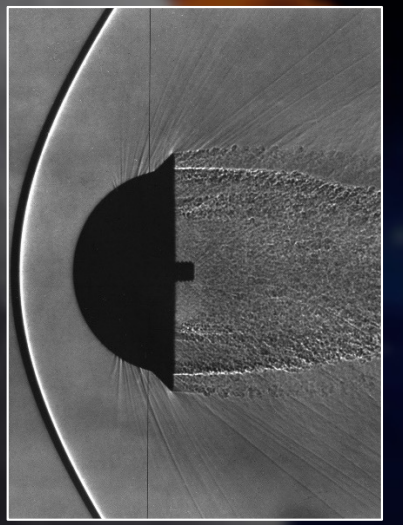
Johnson Space Center

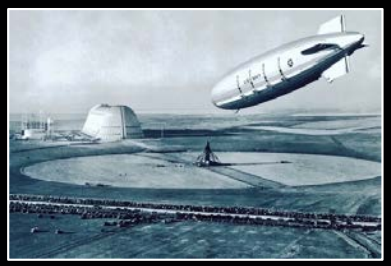
Stennis Space Center

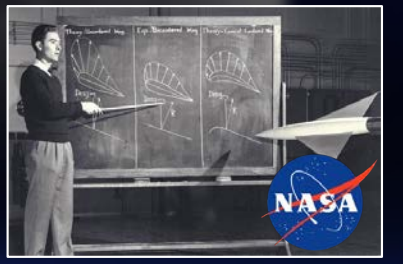
Kennedy Space Center

Ames Aeronautical Laboratory

NACA's Second Laboratory







1915 1917 1939 1941 1946 1958

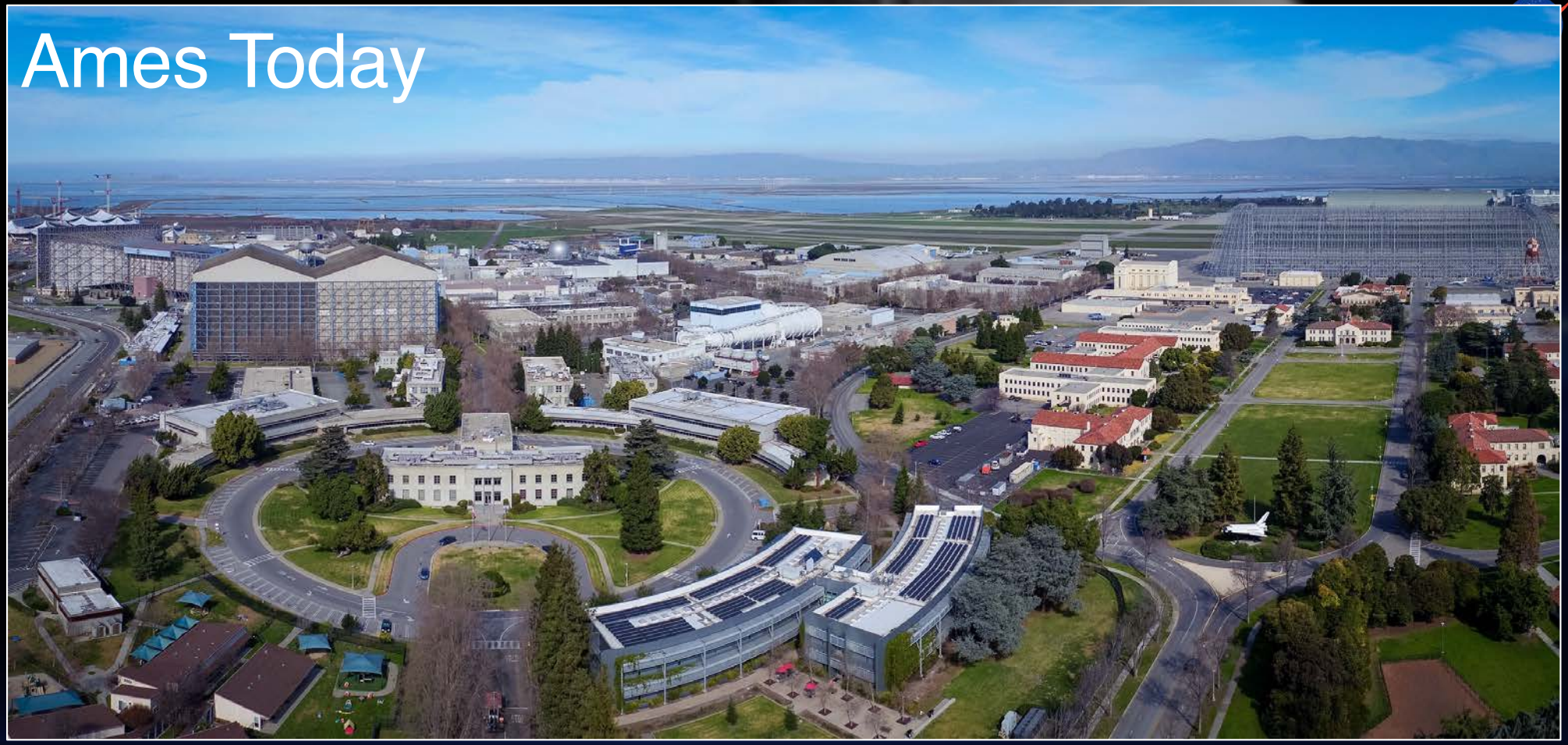
"Langley Memorial Aeronautical Laboratory"
Langley Research Center (LaRC)

"Ames Aeronautical Laboratory"
Ames Research Center (ARC)

"Aircraft Engine Research Laboratory"
Glenn Research Center (GRC)

"Muroc Flight Test Unit"
Armstrong Flight Research Center (AFRC)

Ames Today



Occupants (FY23)

~1,300 civil servants; ~1,900 on-site contractors
~5,800 NRP workforce
~700 students (OSTEM, Pathway, NRP(CMU) & Chabot SCC)

Real Property

~1,900 acres; 400 acres security perimeter
5M building ft²
Airfield with ~9,000 and 8,000 ft. runways

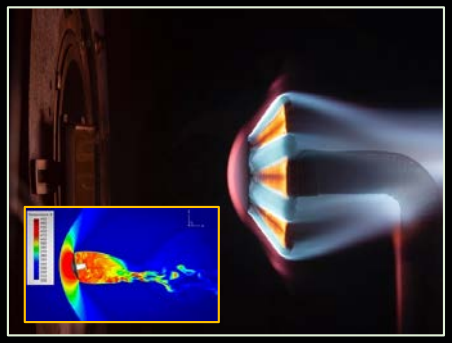
Budget (FY23)

~$1B (includes reimbursable/EUL)

Core Competencies

Air Traffic Management

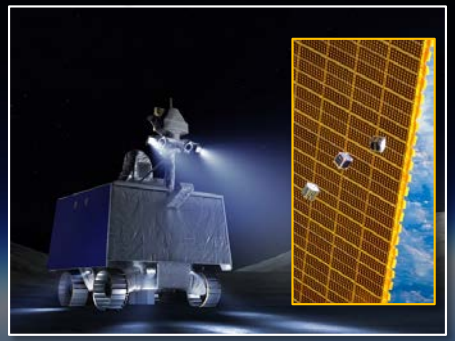
Entry Systems



Advanced Computing & IT

Intelligent / Adaptive Systems

Cost-Effective Space Missions



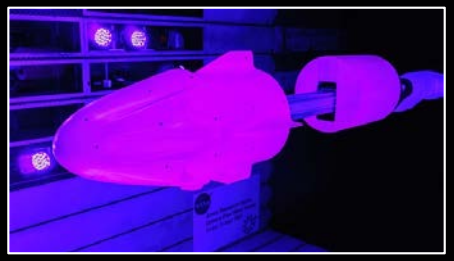
Aerosciences

Astrobiology & Life Science

Space & Earth Sciences

Major Research Facilities

Wind Tunnels



Arc Jet Complex

Simulators

Supercomputing

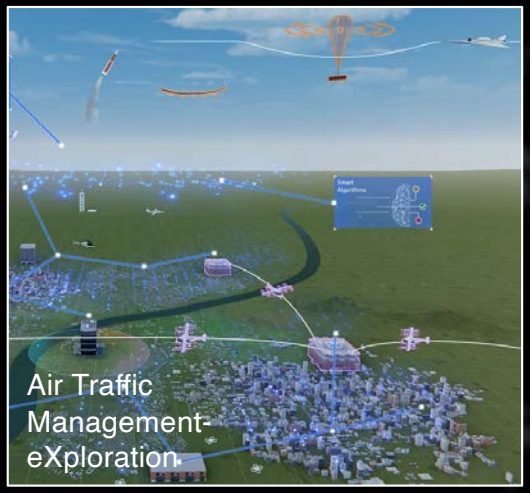
NASA Ames and Moffett Complex

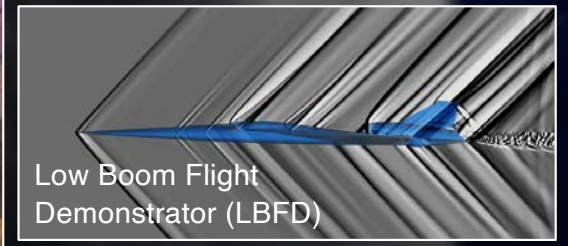
- To advance NASA's overall mission
  - Helping NASA expedite its return to the Moon and the exploration of Mars
  - Helping NASA meet programmatic objectives
  - Providing positive financial returns
  - Keeping the Ames property useful to NASA goals
  - Helping NASA expand its base of support

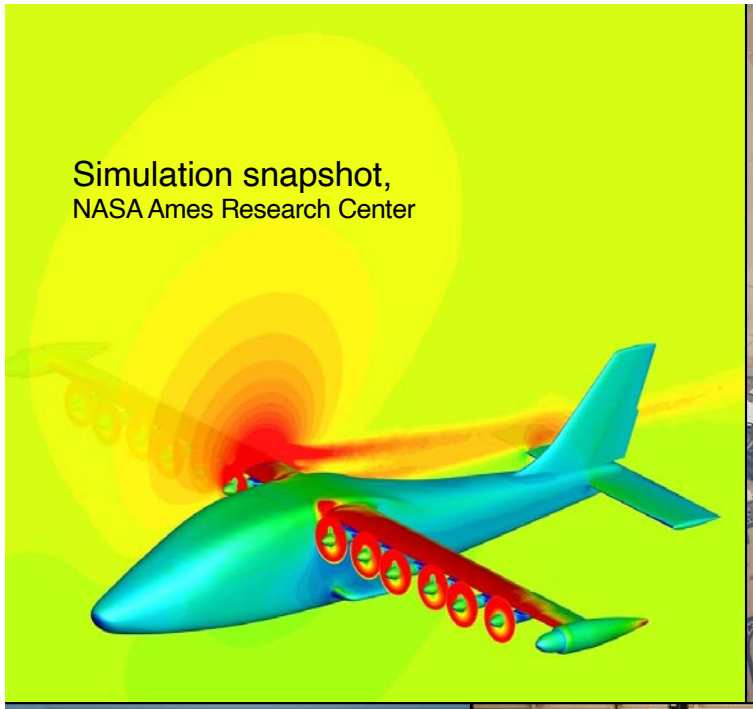
- NASA Ames Campus, 406 Acres
- Eastside Airfield
  - Planetary Ventures, 1,000 Acres
  - California ANG (CAANG), 111 Acres
- NASA Research Park
  - Shenandoah Plaza Historic District, 64 Acres
  - University of California, 36 Acres
  - Mountain View Housing Ventures, 46 Acres
- Bay View – Planetary Ventures R&D, 42 Acres

Aeronautics Research

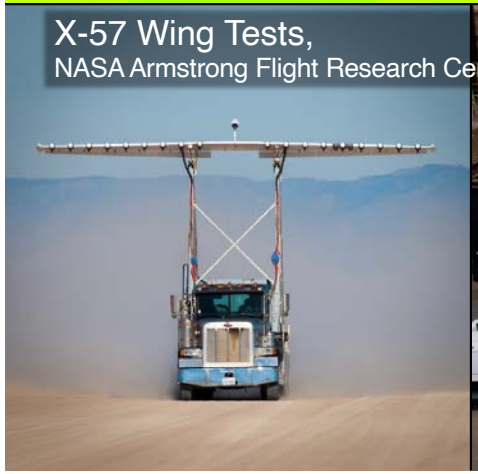
Transform aviation through revolutionary technology research, development, and transfer

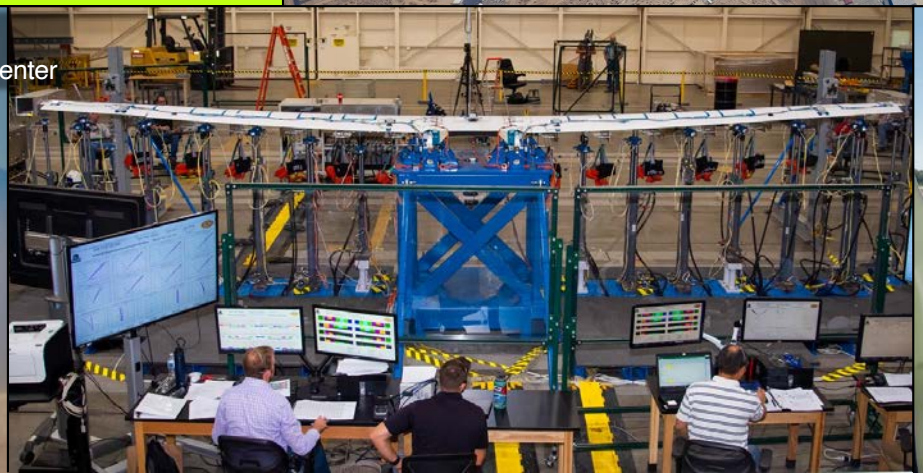





Simulation snapshot,
NASA Ames Research Center


All-Electric X-57 Maxwell
N857NA
NASA

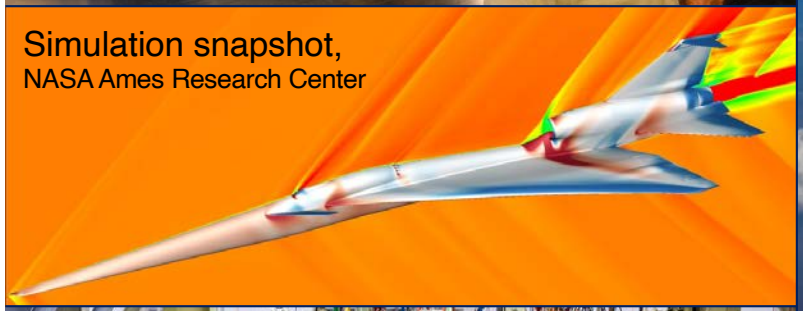

X-57 Wing Tests,
NASA Armstrong Flight Research Center




Tecnam P2006T cockpit

X-59 Low Boom Flight Demonstrator

Wind Tunnel Tests,
NASA Ames Research Center

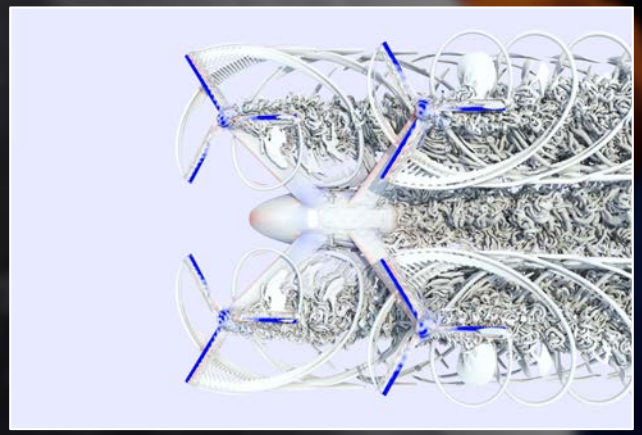


Simulation snapshot,
NASA Ames Research Center

Final Integration
Lockheed Martin's *Skunk Works*, Palmdale, CA

Aeronautics Research

Advanced Air Mobility



Exploration Systems Development

Define and manage systems development for programs critical to Artemis and plan the Moon to Mars exploration approach in an integrated manner

Orion Space Craft

Space Launch System

Exploration Ground Systems

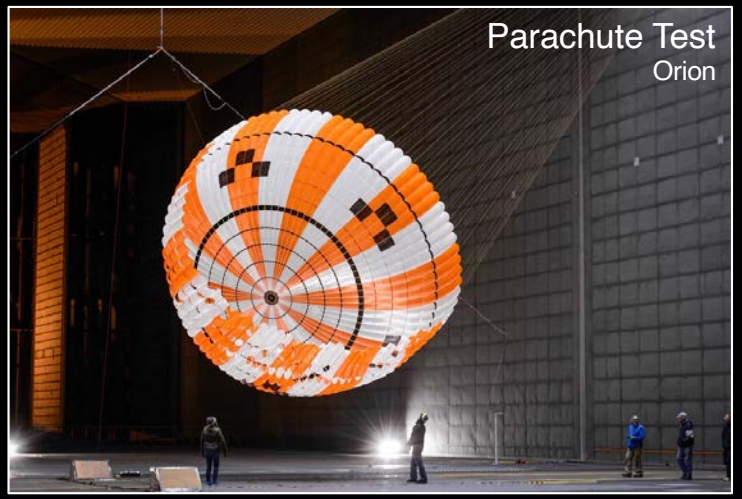
Gateway

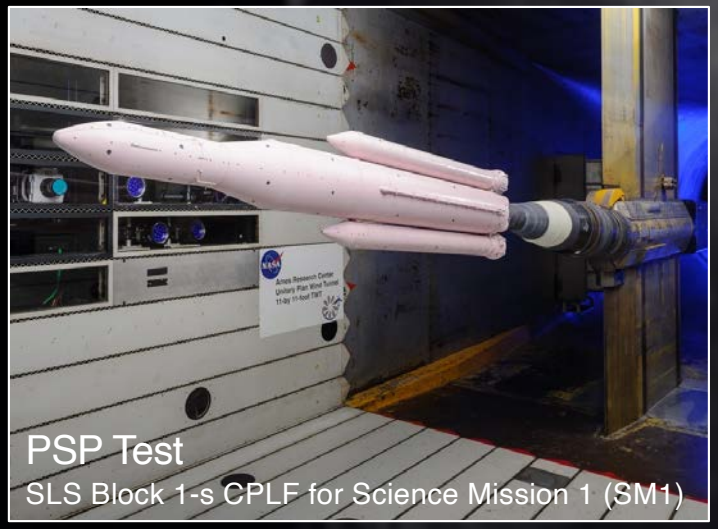
Human Landing System

Artemis Base Camp

Exploration Systems Development

Wind Tunnel Testing



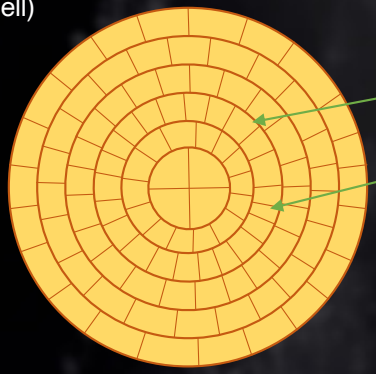


Exploration Systems Development

Heatshield and Backshell Development

Orion 3DMAT Material Response in IHF/LEAF for combined convective and radiative test

Artemis 1&2 Instrumentation Hardware (Heatshield And Backshell)



DFI Sensors
Artemis-1

Thermocouple plug

Radiometer sub-assembly prior to installation into heat shield

Orion heatshield material exposed to arcjet plasma

Engineers from Ames Research Center and Marshall Space Flight Center remove Avcoat segments from the surface of the Orion heat shield.

VIPER Surface Segment (Rover + Instruments)

Subsurface excavation
TRIDENT Drill

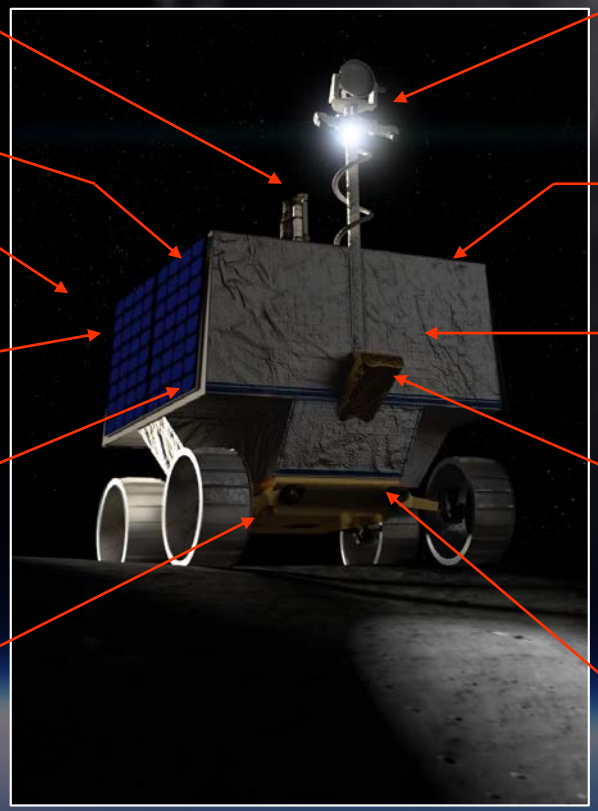
Localization
Star tracker

Situational Awareness
Aft Cams (1pr)

Situational Awareness
Hazard Cams
(2 cams x 2 sides)

Power
Solar Array (3-sides)

Prospecting & Evaluation
Mass Spectrometer Observing Lunar Operations (MSolo) Instrument



Situational Awareness & Communication
Nav Cams (1pr)
Lights (1pr)
Antenna Mast

Heat Rejection
Radiator (on top)

Rover Control
Flight Avionics (internal)

Prospecting
Neutron Spectrometer System (NSS) Instrument

Prospecting & Evaluation
Near Infrared Volatiles Spectrometer System (NIRVSS) Instrument

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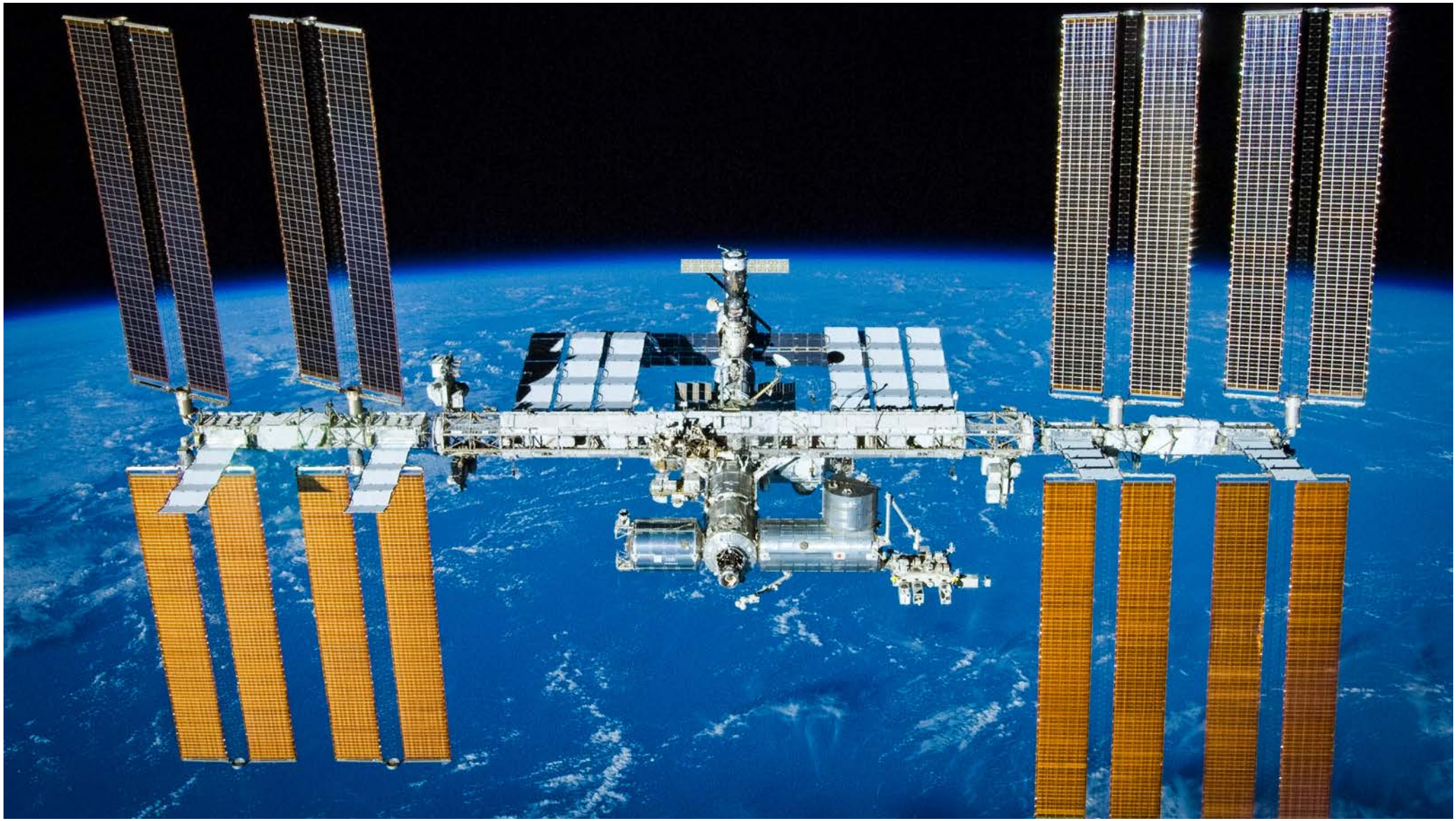
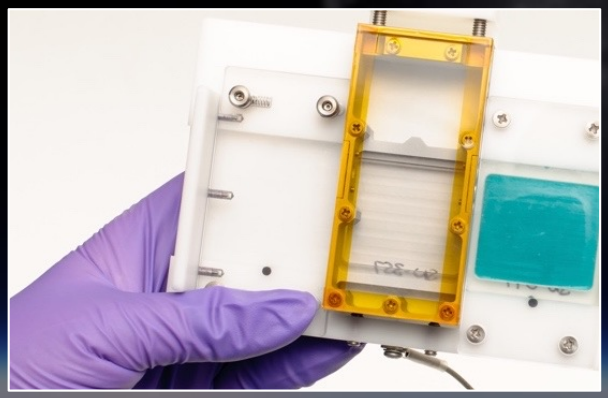


Space Biology

Rodent Research

Fruit Fly Labs



Bioculture System Validation

MARS Perseverance Rover and Ingenuity Helicopter

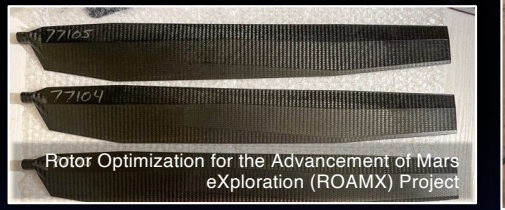

Testing a Parachute Made for Mars

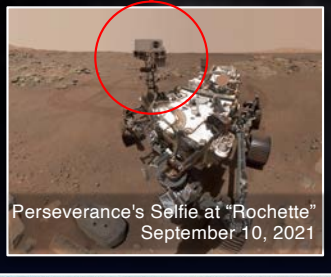

July 30, 2020


Shielding the Spacecraft During Its Fiery Descent


Feb 18, 2021


Measuring the Extreme Environment During Landing


Rotor Optimization for the Advancement of Mars eXploration (ROAMX) Project


Perseverance's Selfie at "Rochette" September 10, 2021

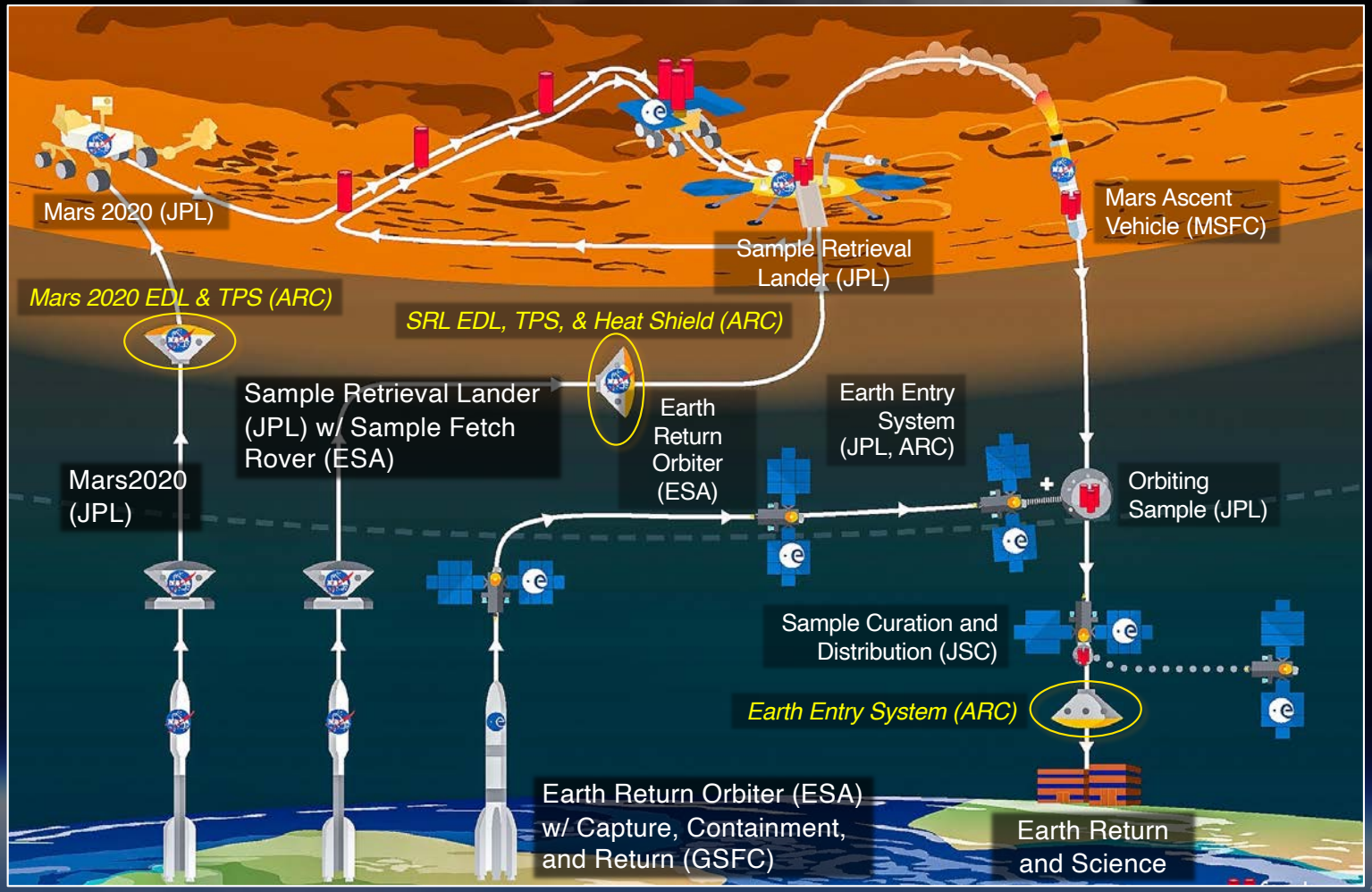

Solar Eclipse on Mars April 20, 2022


Ingenuity's Second Flight As Seen by Perseverance April 22, 2022

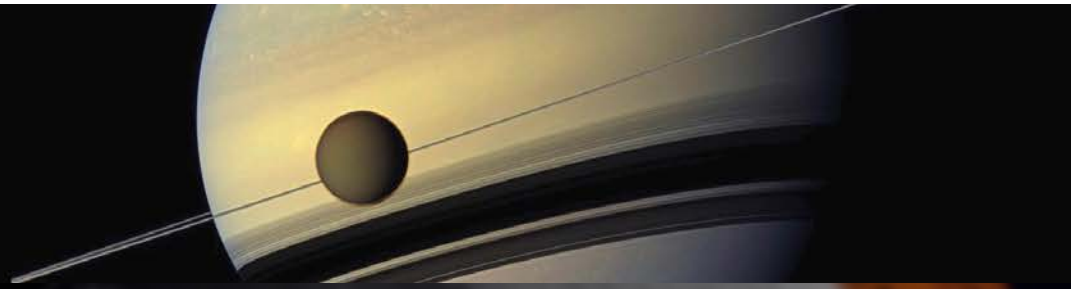

Helping the First Mars Helicopter Fly


Perseverance Views Dust Devils Swirling Across Jezero Crater, June 01, 2022

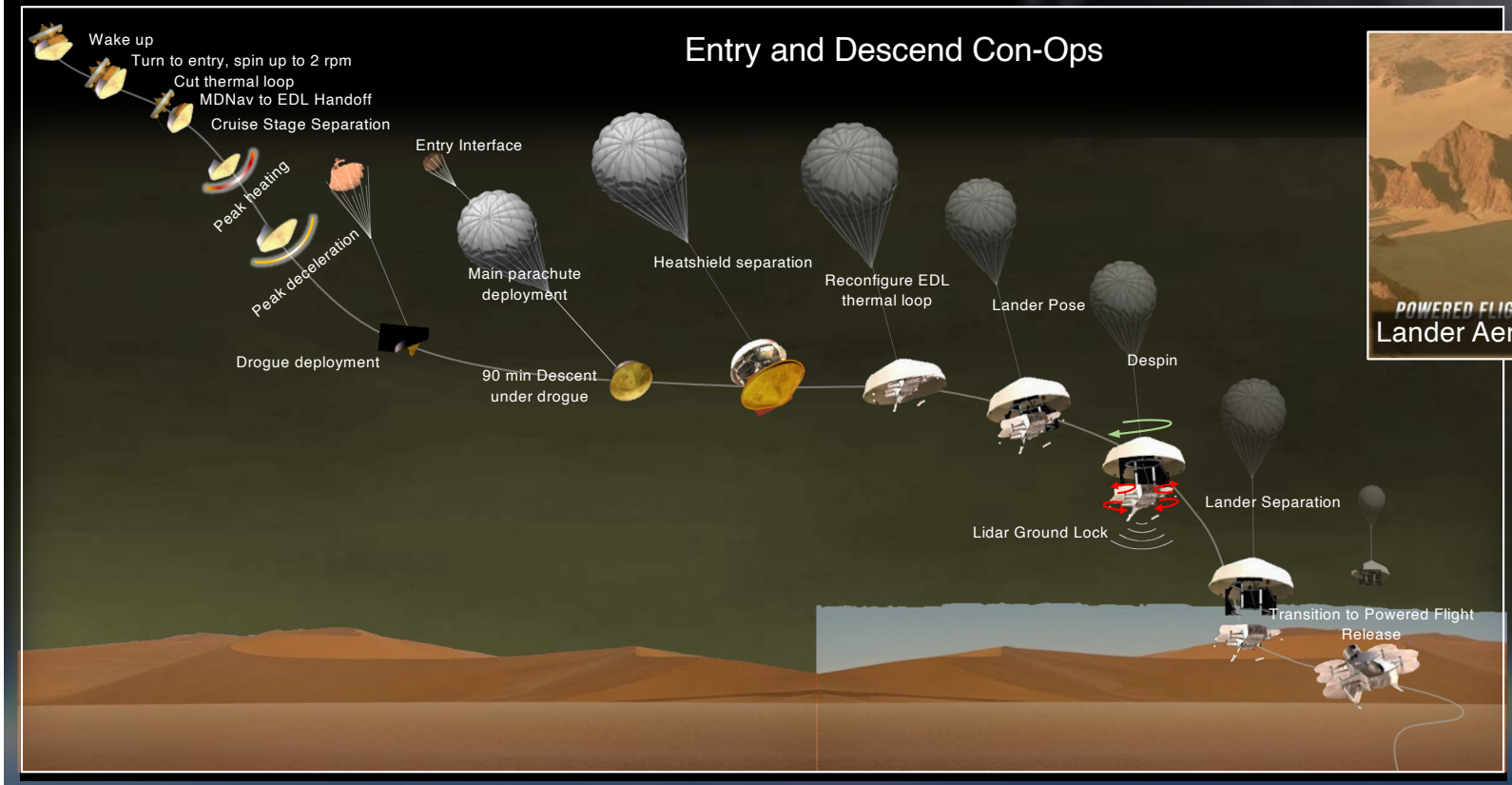
Mars Sample Return

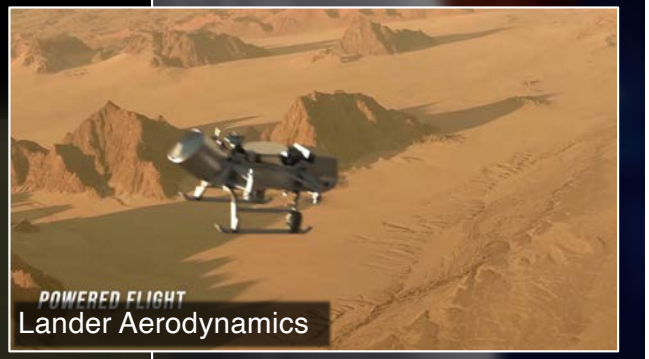


DRAGONFLY

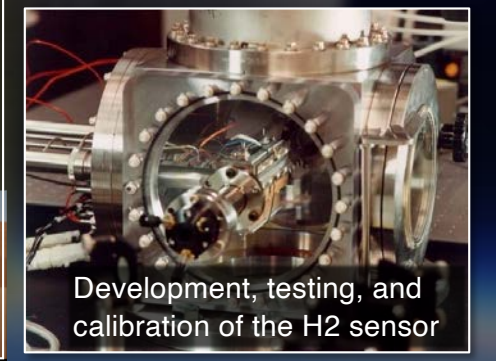


Entry and Descend Con-Ops





Lander Aerodynamics



Development, testing, and calibration of the H2 sensor

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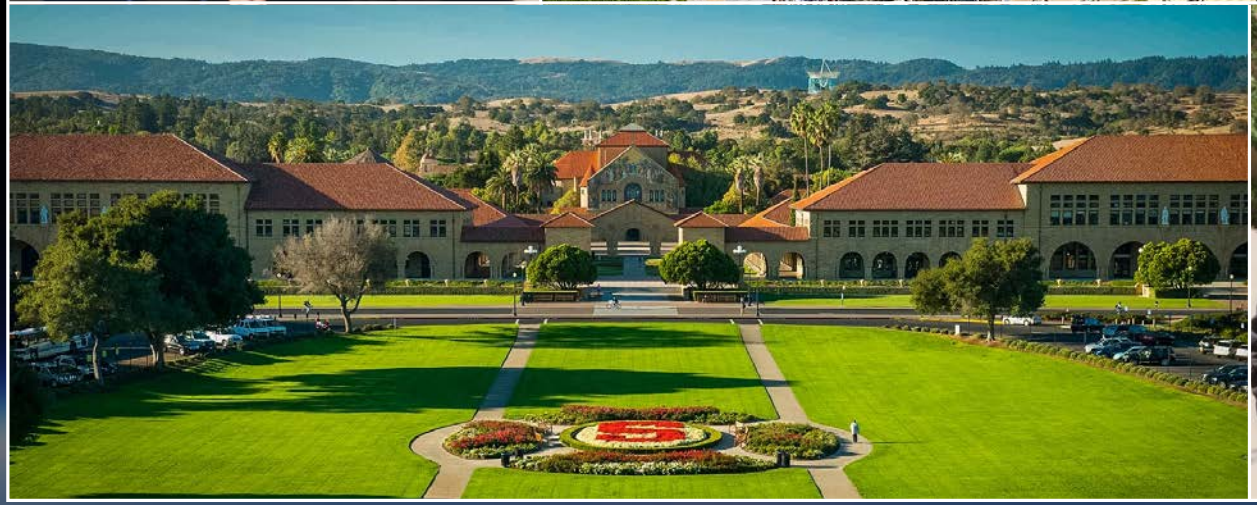

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CONTROL SURFACE SIMULATION

Guru P. Guruswamy
Sterling Federal Systems

Eugene L. Tu and Peter M. Goorjian
Applied Computational Fluids Branch
NASA Ames Research Center

Co-op Student —
Eugene L. Tu

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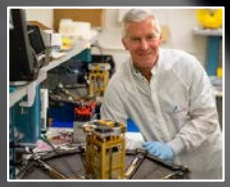
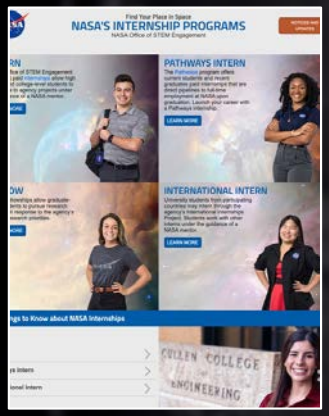
UNIVERSITY OF
CALIFORNIA BERKELEY.
Cal
STANFORD.
STS-68, 82, 103, 110
STS-110, 102, 105
TO EUGENE —
BEST WISHES FROM BOTH SIDES
OF THE BAY!!! WE CAN CO-EXIST
PEACEFULLY IN SPACE

Opportunities at Ames

- Upcoming openings:
  - Computer Scientists
  - Engineers: Aerospace, Software, Electrical, Materials, Systems
  - Physical Scientists: Astrobiology, Biosciences, Space, and Earth Sciences
  - Business Operations (HR, Public Affairs, Procurement, IT)
- Pathways and Education Programs: Internships, Fellowships, Intern Employment and Recent Graduate Program
  - Engineering
  - Physical Scientist
  - Human Resources
  - Finance
  - Business Administration





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www.usajobs.gov

www.nasa.gov/careers

Thank You!

Eugene.L.Tu@nasa.gov