A Journey Through The Cosmos:

My Visit to JPL

September 25, 2023

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Introduction: Why JPL?

1

JPL, or Jet Propulsion Laboratory, is a leading center for robotic exploration of the solar system.

2

Visiting JPL provides a unique opportunity to learn about the latest advancements in space exploration and interact with scientists and engineers.

3

It is managed by NASA and is responsible for the design, development, and operation of spacecraft and instruments that study Earth, other planets, and beyond.

JPL: A Brief History

1936 - Founding of JPL

JPL was founded in 1936 by a group of students from the California Institute of Technology (Caltech). Its original purpose was to conduct rocket experiments.

1958 - Transition to NASA

In 1958, JPL was transferred to NASA and its focus shifted to the exploration of space. JPL has since become a key center for robotic exploration of the solar system.

Notable Missions

JPL has been involved in numerous notable missions, including the Voyager missions, Mars rovers, and the Juno mission to Jupiter.

A Private Tour: Dr. Eric Huff

Biography

Dr. Eric Huff was raised in Bullhead City, Arizona, and followed an early passion for physics to college in Tucson and a PhD at Berkeley. He's done original work on a variety of topics, ranging from observational cosmology to tidal modeling of surface features on Jovian moons.

Education

- PhD, Astrophysics, University of California, Berkeley
- B.S., Astronomy, Physics, and Mathematics, University of Arizona

Professional Experience

- Postdoctoral Fellow, Center for Cosmology and AstroParticle Physics, the Ohio State University (2012-2016)

Research Interests

- Dark energy and cosmic acceleration
- Gravitational lensing
- The large-scale structure of the universe
- Precision cosmology
- Principled statistical inference

The Mars Yard: Testing Ground for Rovers

What is the Mars Yard?

- The Mars Yard is a simulated Martian environment used for testing rovers and their capabilities.
- It consists of a carefully designed terrain that replicates the surface features and challenges of Mars.
- The Yard allows scientists and engineers to assess the performance of rovers before sending them to Mars.
- Rovers are put through various tests and challenges in the Mars Yard to ensure their functionality and durability.

Inside the Control Room: The Heart of Missions

The Control Room: A Mission's Nerve Center

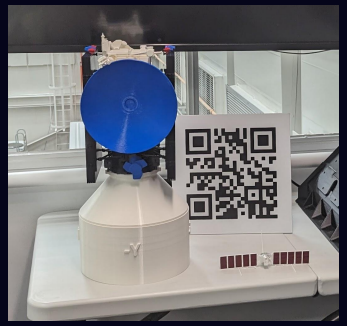
- The control room at JPL is where mission operators monitor and control space missions.
- Operators provide real-time data and communication with spacecraft.
- The control room is equipped with advanced technology and monitoring systems.

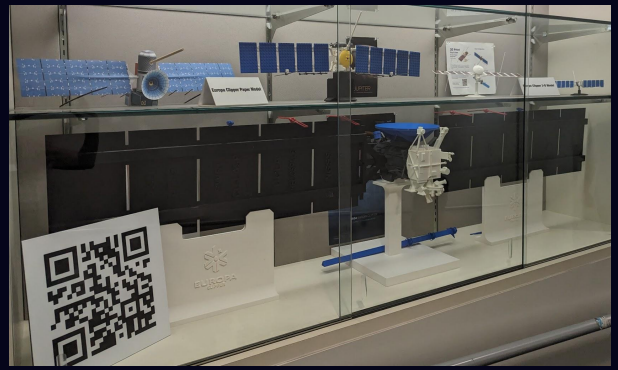
The Spacecraft Assembly Facility

- State-of-the-art facility for building and testing spacecraft
- Cleanroom environment to prevent contamination
- Multiple assembly bays for simultaneous spacecraft construction
- Specialized equipment for handling delicate and sensitive components

https://www.youtube.com/watch?v=yk0X3Sh2gIE

Europa Clipper





- The Europa Clipper is a planned mission by NASA's Jet Propulsion Laboratory (JPL) to study Jupiter's moon Europa.
- It is designed to investigate whether Europa has the potential to harbor life and assess its habitability.
- The mission aims to conduct detailed reconnaissance of Europa, characterize its ice shell, and investigate its [alleged] subsurface ocean.
- Europa Clipper will carry a suite of scientific instruments to study the moon's surface, atmosphere, and subsurface, including a high-resolution camera, ice penetrating radar, mass spectrometer, and magnetometer.

JPL's Role in Space Exploration

- JPL is a leading center for robotic exploration of the solar system.
- It designs and builds spacecraft for various missions, including Mars rovers and deep space probes.
- JPL's research and development efforts contribute to scientific discoveries and advancements in space technology.

Mars Sample Return

- Objective: Collect samples from Mars and bring them back to Earth for analysis
- Expected launch date: 2026

MARS PERSEVERANCE ROVER

FULL-SCALE MODEL

LAUNCH:
July 30, 2020

LANDING:
February 18, 2021

MISSION:

To seek signs of ancient microbial life on Mars.

This six-wheeled robotic explorer is searching for rocks that could preserve signs of ancient microbial life, if it existed, in Jezero Crater on Mars.

Perseverance has a drill to collect core samples of rock and soil, then store them in sealed tubes for pickup by a future mission that would return them to Earth for detailed study.

This rover is paving the way for future human explorers by testing technologies that may be used on future missions. These include a technology that produces oxygen from the Martian atmosphere, a critical resource for human exploration, improved landing techniques, and weather reports, that could assist astronauts living and working on Mars someday.

Von Karman Museum