Vencury: A Satellite for Mercury and Venus

Vencury is a satellite designed to travel to Mercury and Venus. The project is led by ANGSHUK JANA

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Earth's Planetary Neighbors: Mercury and Venus

Our solar system is a diverse place, home to a variety of planets with unique characteristics. Today, we'll explore two of Earth's closest neighbors: Mercury and Venus.

by Angshuk Jana

Mercury: The Closest Planet

Distance

Mercury is the closest planet to the Sun, averaging a distance of 36 million miles (58 million kilometers).

Size

Mercury is the smallest planet in our solar system, with a diameter of about 3,032 miles (4,880 kilometers).

Climate

Mercury has extreme temperature swings, ranging from -279 degrees Fahrenheit (-173 degrees Celsius) at night to 801 degrees Fahrenheit (427 degrees Celsius) during the day.

Venus: Earth's Twin

Distance

Venus orbits the Sun at an average distance of 67 million miles (108 million kilometers).

Size

Venus is slightly smaller than Earth, with a diameter of about 7,521 miles (12,104 kilometers).

Climate

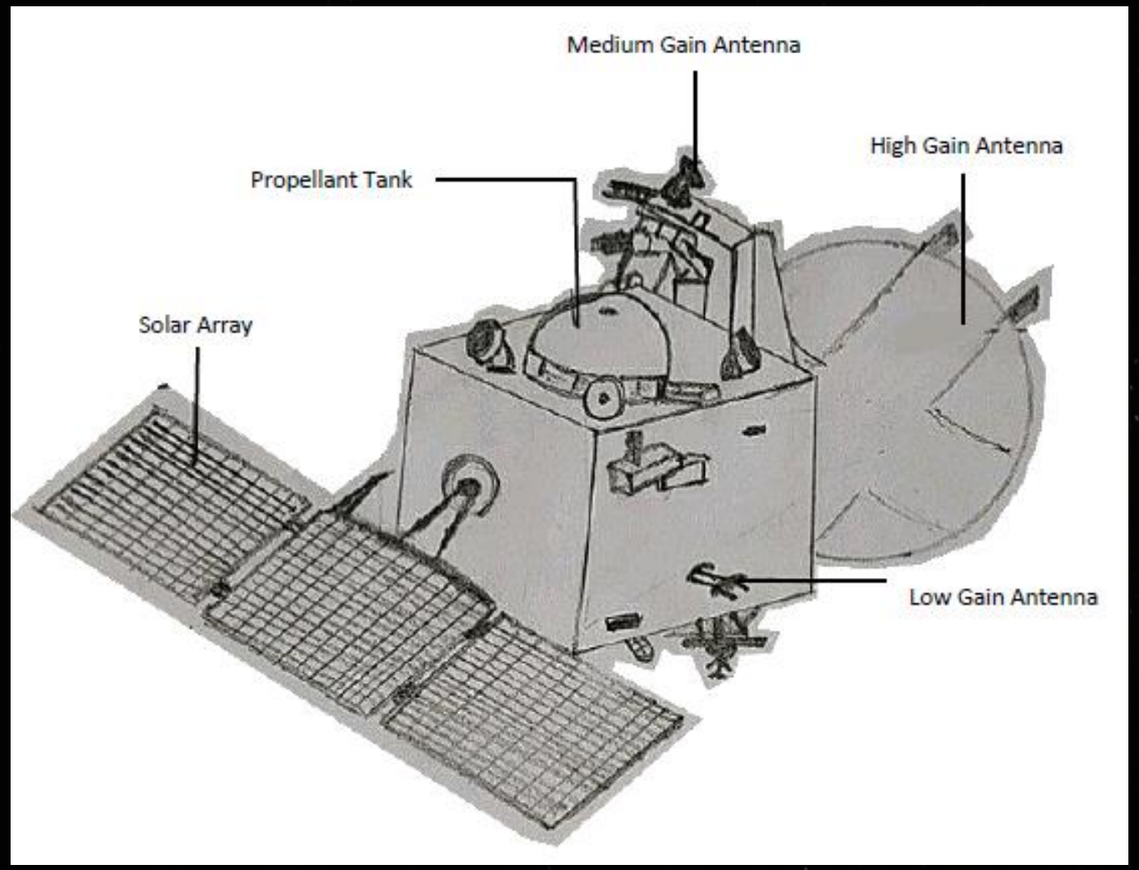
Venus is known for its extremely hot and dense atmosphere, with surface temperatures reaching 867 degrees Fahrenheit (464 degrees Celsius).

Venus's Atmosphere: A Greenhouse Effect

Component	Percentage	Impact
Carbon Dioxide	96.5%	Traps heat, creating a runaway greenhouse effect
Nitrogen	3.5%	Contributes to atmospheric pressure

Frontal View

This is a hand-drawn image of the Vencury satellite's frontal view. It is not to scale.

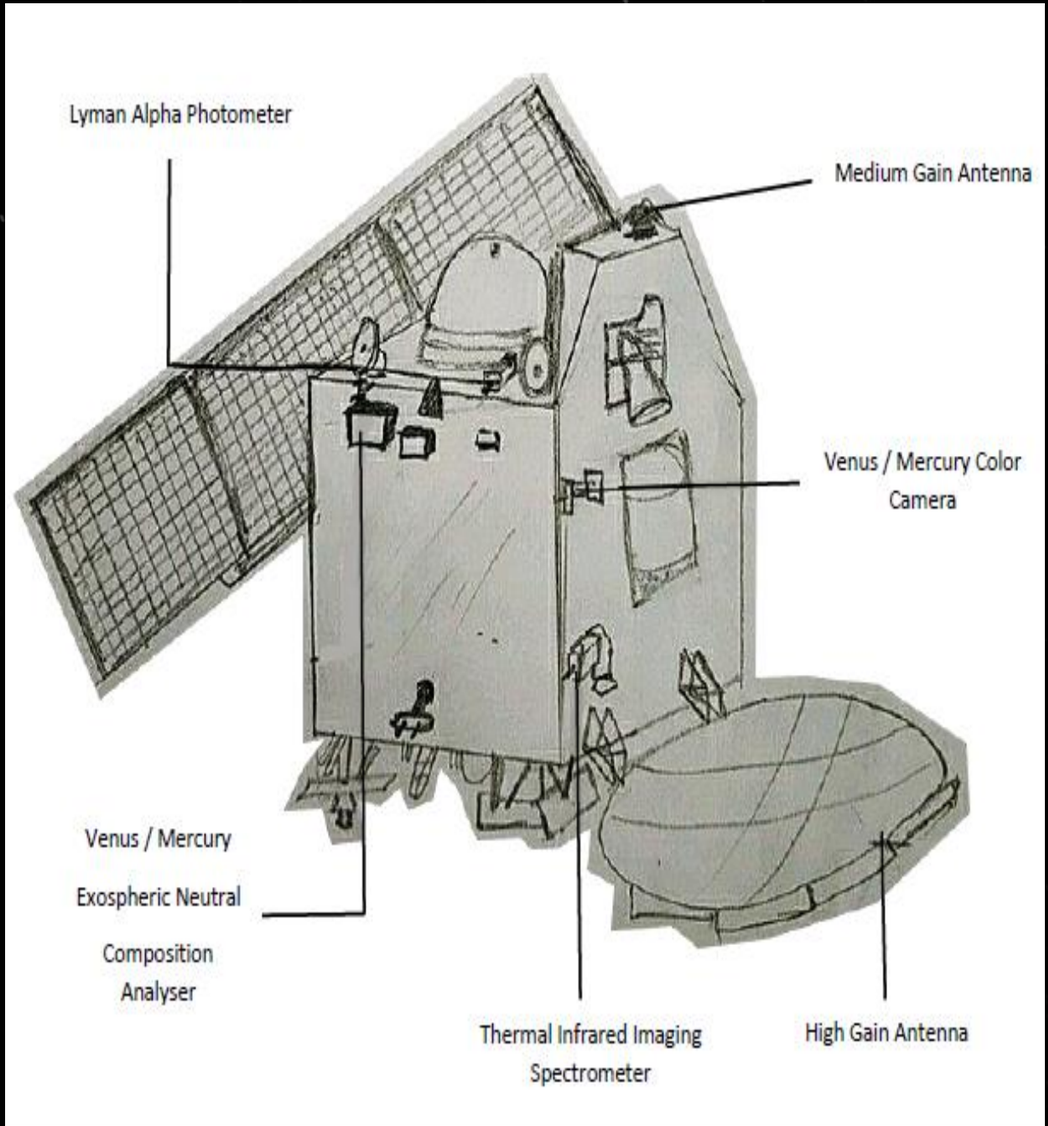


Satellite Design

The Vencury satellite is designed with a sleek and modern aesthetic.

Communication Systems

The satellite features advanced communication systems for data transmission.



Dorsal View

This is a hand-drawn image of the Vencury satellite's dorsal view, based on spectrometer data. It is not to scale.

1 Spectrometer Data

The dorsal view is based on spectrometer data, providing insights into the satellite's composition.

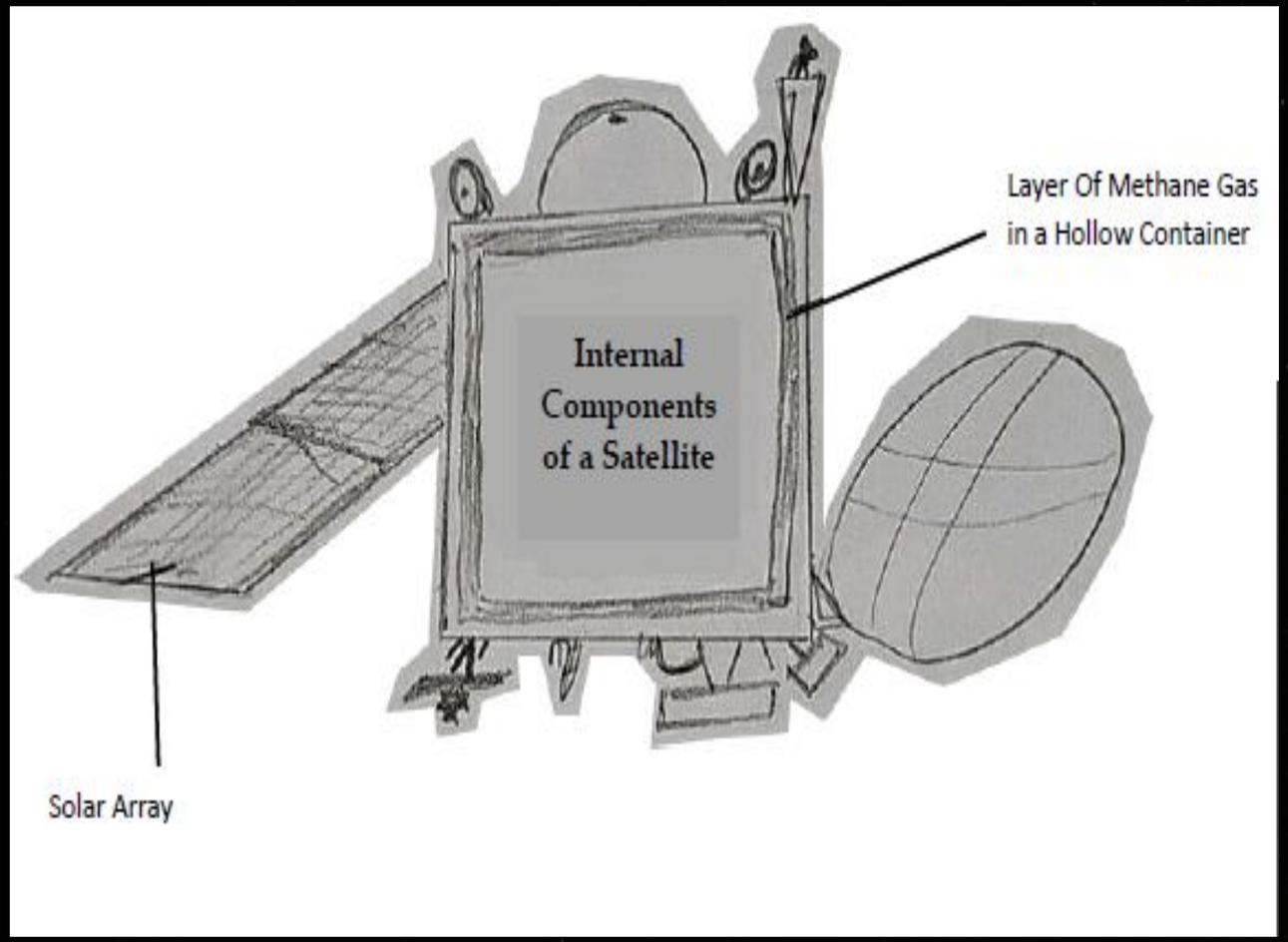
2 Scientific Instruments

The satellite is equipped with scientific instruments for data collection and analysis.

3 Data Transmission

The satellite transmits collected data back to Earth for further research and analysis.

Internal View



Solar Array

The satellite's solar array is designed to capture energy from the sun.

Energy Storage

The captured energy is stored in batteries for use during periods of darkness.

Power Management

The satellite's power management system ensures efficient energy utilization.

Satellite Materials

The Vencury satellite is constructed using Tantalum Carbide (TaCx) or Hafnium Carbide (HfC), both with a melting point of 3880 degrees Celsius.

Tantalum Carbide

A highly durable and heat-resistant material.

Hafnium Carbide

Another robust and heat-resistant material option.

Internal Protection

The satellite's internal components are protected by a container filled with methane gas or chlorofluorocarbons (CFCs).

1

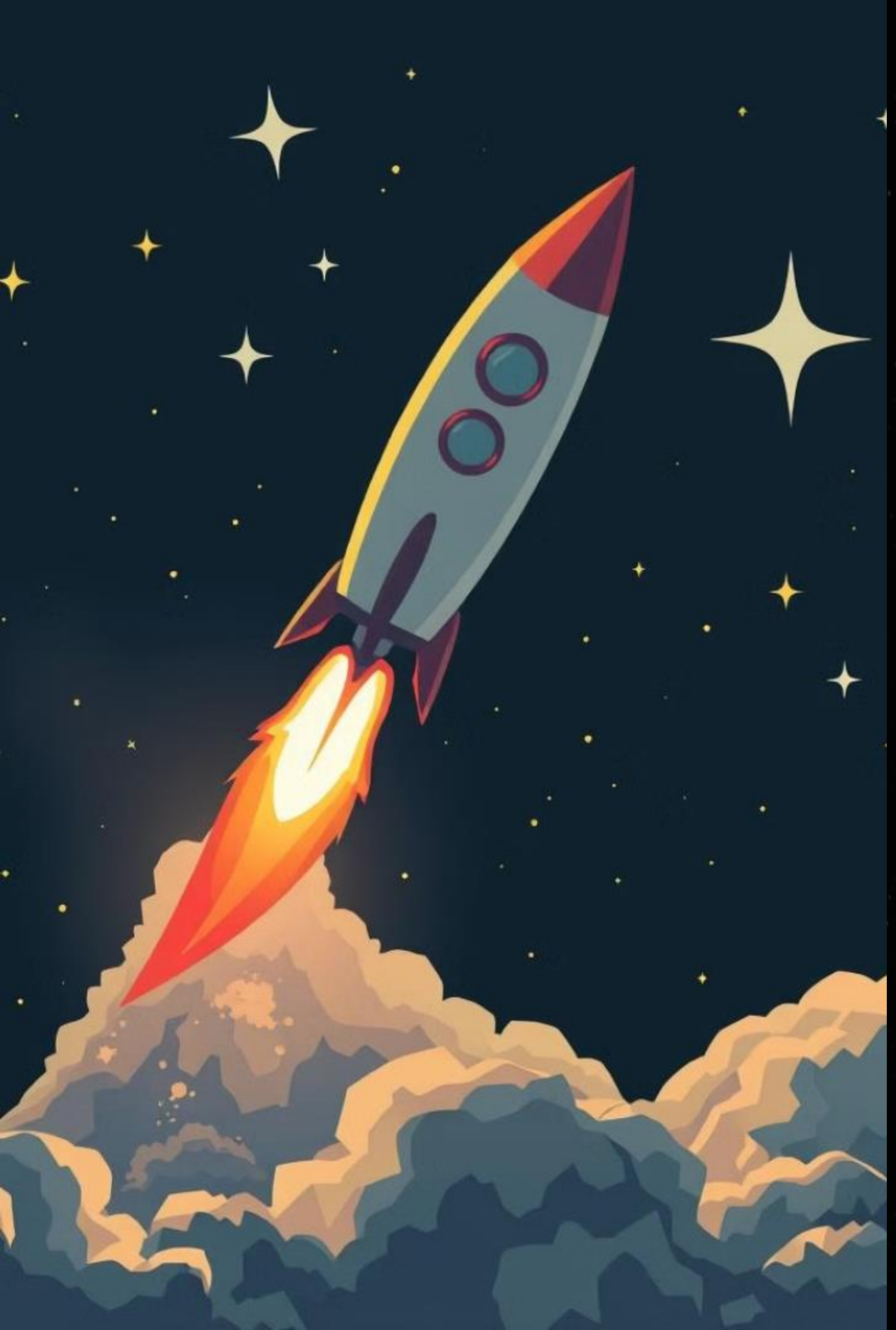
Methane Gas

Provides an inert atmosphere to prevent corrosion and oxidation.

2

Chlorofluorocarbons (CFCs)

Act as a refrigerant to maintain optimal operating temperatures.



Distance and Launch Vehicles

The distance from Earth to Mercury is 94.032 million kilometers, and the distance to Venus is 240.66 million kilometers.

Launch Vehicle	Description
PSLV-C57	Indian Space Research Organisation (ISRO) launch vehicle.
SpaceX Starship	Reusable spacecraft developed by SpaceX.

Launching Satellites: Reaching for the Stars

1. ## Pre-Launch Preparation

   Satellites undergo rigorous testing and preparation before launch, ensuring they are ready for space.

2. ## Launch Vehicle Selection

   Choosing the right launch vehicle depends on the satellite's size, weight, and intended orbit.

3. ## Liftoff and Ascent

   The launch vehicle propels the satellite into space, overcoming Earth's gravity.

4. ## Deployment and Orbit

   Once in space, the satellite separates from the launch vehicle and enters its designated orbit.

Boost System

The Vencury satellite is equipped with a high-boost system to adjust its trajectory.

High Boost

The boost system provides a significant increase in velocity.

Trajectory Adjustment

The boost system allows for precise adjustments to the satellite's path.

Precise Targeting

The boost system ensures the satellite reaches its intended destination.

Trajectory Shifting

The boost system is activated only when the trajectory needs to be shifted to the next target.

1

Initial Trajectory

The satellite follows a predetermined path towards its initial target.

2

Boost Activation

The boost system is activated to adjust the trajectory.

3

New Trajectory

The satellite follows a new trajectory towards its next target.

Satellite Missions: Uncovering the Universe

1 Communication

Satellites play a vital role in telecommunications, enabling global connectivity.

2 Navigation

GPS satellites provide precise positioning information for navigation and mapping.

3 Earth Observation

Environmental monitoring, weather forecasting, and disaster management rely on Earth observation satellites.

4 Scientific Research

Satellites gather data about the universe, from distant stars to Earth's atmosphere.

Exploring the Future: Beyond Earth

As technology advances, our ability to explore the universe expands. Future missions to Mercury and Venus promise to reveal even more about these fascinating planets and their place in our solar system.

Vencury: A Vision for Exploration

Vencury represents a significant step forward in space exploration, paving the way for future missions to Mercury and Venus.