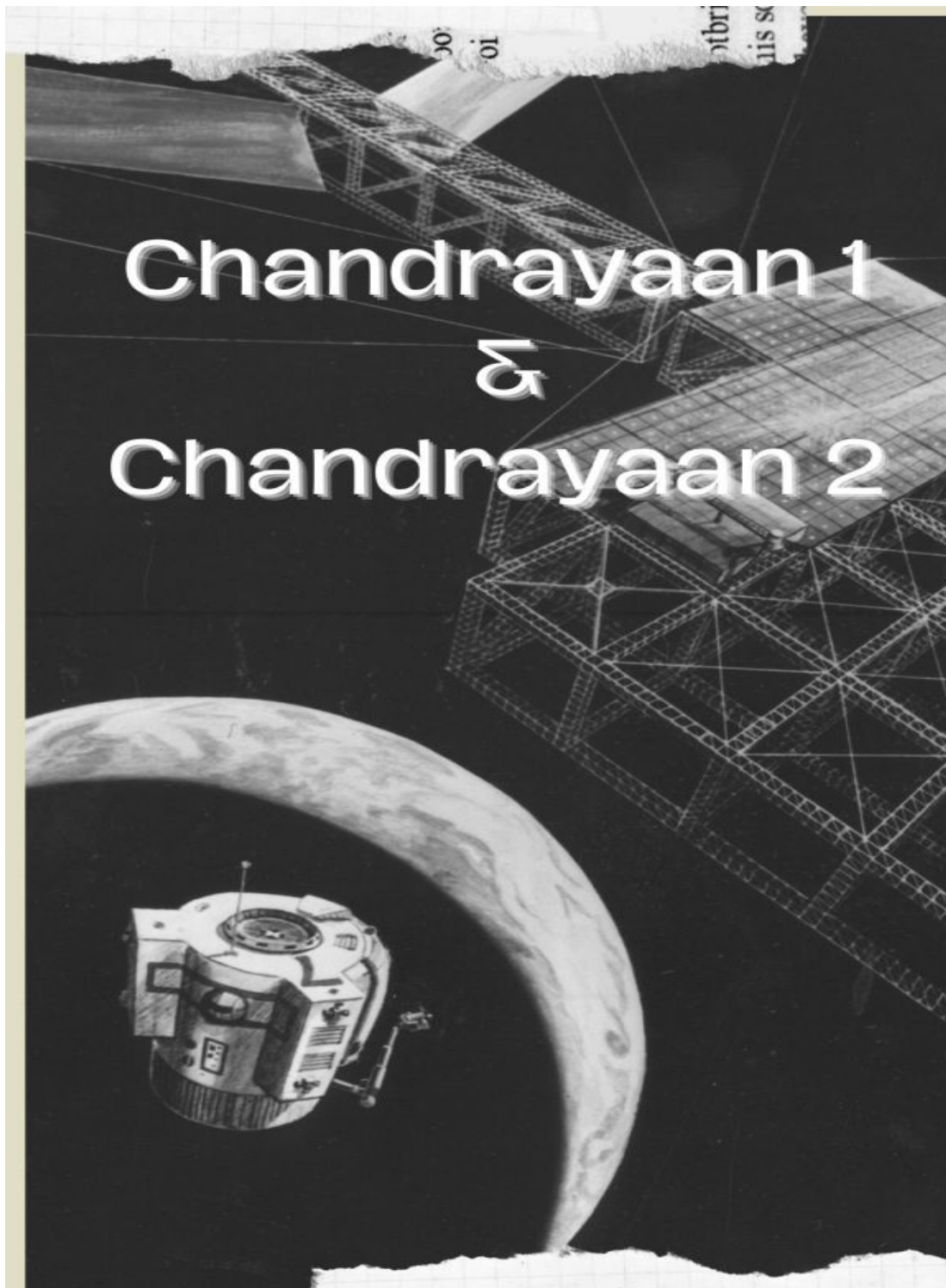


Chandrayaan 1&2



Chandrayaan-1 was India's first lunar exploration mission, launched by the Indian Space Research Organisation (ISRO). It was a significant milestone in India's space program and lunar exploration efforts. Here are some key details about the Chandrayaan-1 mission:

1. **Launch Date:** Chandrayaan-1 was launched on October 22, 2008, using a PSLV-C11 rocket from the Satish Dhawan Space Centre in Sriharikota, India.
2. **Objectives:**
 - To map and study the lunar surface in detail.
 - To analyze the lunar mineral composition, including the presence of water and minerals.
 - To study the Moon's topography and the composition of its surface, including the polar regions.
 - To investigate the Moon's exosphere and its interaction with the solar wind.
3. **Instruments:** Chandrayaan-1 was equipped with 11 scientific instruments, including spectrometers, radar, and imaging equipment, which allowed it to collect data about the Moon's surface and environment.
4. **Discoveries and Achievements:**
 - Chandrayaan-1 made several significant discoveries, including evidence of water molecules on the Moon's surface.
 - The mission helped confirm the presence of water ice in the Moon's polar regions.
 - It provided valuable data for scientists to study the Moon's geology and its history, including evidence of volcanic activity.
 - Chandrayaan-1 also played a crucial role in helping locate water molecules on the lunar surface, which has

implications for future lunar exploration and potential lunar resource utilization.

5. **End of Mission:** Unfortunately, Chandrayaan-1's mission was cut short. It lost communication with ISRO in August 2009 and was declared lost. However, in 2017, NASA's Lunar Reconnaissance Orbiter (LRO) located the Chandrayaan-1 spacecraft on the lunar surface, and it was confirmed that the mission had ended.

Chandrayaan 2

Chandrayaan 2 is India's second lunar exploration mission, developed and launched by the Indian Space Research Organisation (ISRO). It was launched on July 22, 2019, with the primary goal of exploring the Moon's south polar region, a region that had not been extensively studied before. The mission had several key components:

1. **Orbiter:** The Chandrayaan 2 orbiter continues to orbit the Moon. It is equipped with various scientific instruments to study the lunar surface, map its topography, study mineral composition, and analyze the Moon's exosphere.
2. **Vikram Lander:** The Vikram lander was designed to make a soft landing on the lunar surface. It carried the Pragyan rover, which was supposed to explore the lunar surface. Unfortunately, the Vikram lander lost communication with ISRO during its descent, and it crash-landed on the Moon's surface on September 6, 2019.
3. **Pragyan Rover:** The Pragyan rover was part of the lander and was intended to explore the lunar surface, conduct experiments, and analyze soil samples. Unfortunately, due to the lander's failure, the rover was not deployed.

Despite the setback with the Vikram lander, the Chandrayaan 2 mission's orbiter has continued to provide valuable scientific data from its lunar orbit, and ISRO has gained valuable experience that will be useful for future lunar missions. ISRO has also expressed its intention to attempt another lunar mission, Chandrayaan 3, to make another attempt at a soft landing on the Moon in the future.

The Chandrayaan 2 mission, like many lunar exploration missions, had several scientific objectives and potential benefits:

1. **Scientific Research:** Chandrayaan 2 aimed to advance our understanding of the Moon's geology, topography, and mineral composition. The mission's orbiter is equipped with a suite of scientific instruments to study the lunar surface, map it in detail, and analyze its mineralogy. This data can help scientists learn more about the Moon's geological history and evolution.
2. **Water Ice:** One of the critical objectives of Chandrayaan 2 was to search for the presence of water ice on the Moon, particularly in the south polar region. The discovery of water ice would have significant implications for future lunar exploration, as water can be used for drinking, as a source of oxygen, and for producing rocket fuel.
3. **Technology Demonstration:** The mission also served as a technological demonstration for India's space capabilities, particularly in the context of soft landing and rover operations on the Moon. While the Vikram lander was not successful in its landing attempt, ISRO gained valuable experience and data for future missions.
4. **International Collaboration:** Chandrayaan 2 provided opportunities for international collaboration in lunar exploration. It carried instruments from other countries, fostering scientific cooperation in space research.

5. **Inspiration and Education:** Space missions like Chandrayaan 2 can inspire and educate the public, especially students and young scientists, about space science and technology. They can serve as a source of national pride and stimulate interest in STEM (Science, Technology, Engineering, and Mathematics) fields.
6. **Preparation for Future Missions:** The knowledge and experience gained from Chandrayaan 2 are expected to be instrumental in planning and executing future lunar missions, such as Chandrayaan 3, which aims to achieve a successful soft landing on the Moon.