

Pakistan's Space Activities and Long-Term Plans

What is known about Pakistan's Space activities and long-term plans. Status March 2025)
(Compiled and edited from chatGPT and DeepSeek by Joachim J. Kehr)

Pakistan's space activities are primarily spearheaded by the **Space and Upper Atmosphere Research Commission (SUPARCO)**, which was established in 1961. SUPARCO is responsible for the nation's space program, including satellite development, space research, and applications of space technology for socio-economic development. Below is an overview of Pakistan's space activities and long-term plans. [1]
Early Initiatives: Pakistan was among the first ten nations to initiate a space program. The program commenced under the guidance of Dr. Abdus Salam, Pakistani theoretical physicist and a Nobel laureate 1979, focusing on rocketry and high-altitude research. [2]

Key Space Activities and Achievements

1. Satellite Development and Launches:

- Pakistan has launched several satellites, including:
 - **Badr-1** (1990): Pakistan's first indigenously developed satellite, launched aboard a Chinese rocket.
 - **Badr-B** (2001): A low Earth orbit (LEO) satellite for experimental communication.
 - **PakSAT-MM1** was launched on April 12, 2003. This high-power multi-mission satellite, designed to bolster communication infrastructure across the country, highlights Pakistan's commitment to leveraging space technology for socio-economic development.
 - **Paksat-1R** (2011): A geostationary communication satellite launched with Chinese assistance, providing TV broadcasting, internet, and telecommunication services.
 - **PRSS-1** (Pakistan Remote Sensing Satellite) and **PakTES-1A** (2018): Launched via China's Long March rockets, these satellites are used for Earth observation and remote sensing.
 - **PakTES-1B**. On December 9, 2023, Pakistan, in collaboration with China, launched its latest satellite, marking a significant milestone in its space exploration journey. PakTES-1B, an earth observation satellite, is designed to monitor natural disasters, agricultural developments, and water resources, enhancing Pakistan's ability to manage and mitigate environmental challenges, it was launched aboard a *Chinese Long March 4B rocket*. [3]
 - **iCube-Qamar**: In May 2024, the iCube-Qamar mission, a miniaturized satellite built in collaboration between the Institute of Space Technology (IST) and the Pakistan Space and Upper Atmosphere Research Commission (SUPARCO), successfully deployed as part of China's Chang'e-6 lunar mission. This marked Pakistan's first foray into lunar exploration and showcased IST's expertise in advanced spacecraft technologies.
 - **PRSC-EO1 (Pakistan Remote Sensing Satellite - Earth Observation #1)** is an Electro-Optical Satellite developed by Pakistan's SUPARCO. It was launched from China's Jinqian Satellite Centre on January 17, 2025, by China Great Wall Industry Corporation (CGWIC), a subsidiary of the China Aerospace Science and Technology Corporation (CASC).
 - **PAUSAT-1**: On January 14, 2025 Pakistan launched its latest satellite, on a [SpaceX's Falcon 9](#) launch vehicle.

2. Pakistan is part of the China-Pakistan space cooperation, which includes joint satellite projects like the **China-Pakistan Economic Corridor (CPEC) Space Program**. The collaboration with China has been pivotal. China's advanced space technology, combined with Pakistan's

strategic needs, has created a symbiotic relationship that promises mutual benefits. The CPEC, a cornerstone of China's Belt and Road Initiative (BRI), has further cemented this partnership. The integration of space technology into CPEC projects is expected to enhance infrastructure development, resource management, and regional connectivity. [1]

3. **Remote Sensing and Earth Observation:**

- SUPARCO uses remote sensing satellites for applications such as disaster management, agriculture, urban planning, and environmental monitoring.
- The **PRSS-1** satellite is a key asset for high-resolution imaging and resource mapping.

4. **Space Research and Development:**

- SUPARCO conducts research in areas such as atmospheric studies, space weather, and satellite technology.
- The agency has also developed sounding rockets for upper atmosphere research.

5. **International Collaboration:**

- In 2024 Pakistan introduced the **National Space Policy**, aiming to enhance the country's space capabilities through international cooperation, public-private partnerships, and strategic planning. The policy emphasizes applications such as communication, remote sensing, and navigation to support sectors like agriculture, water management, and urban planning. [4]
- Pakistan collaborates with space agencies and organizations such as China National Space Administration (CNSA), European Space Agency (ESA), and Turkey's Space Technologies Research Institute (TÜBİTAK UZAY).
- The country is also a member of the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS).

Long-Term Plans

1. **Indigenous Satellite Development:**

- SUPARCO aims to develop and launch more satellites independently, reducing reliance on foreign partners.
- Plans include the development of communication, remote sensing, and scientific satellites.

2. **Space Exploration and Lunar Missions:**

- Pakistan has expressed interest in lunar exploration, potentially collaborating with China on future missions.
- There are discussions about sending a Pakistani astronaut to space, possibly through collaboration with China's human space program, in fact China signed a MOU with Pakistan to train astronauts for future missions to the Chinese Space Station (CSS) in spring 2025. [5]

3. **Space Applications for Socio-Economic Development:**

- SUPARCO plans to expand the use of space technology for agriculture, disaster management, climate monitoring, and national security.
- The agency is also working on enhancing satellite-based communication infrastructure.

4. **Human Resource Development:**

- SUPARCO is focused on building capacity in space science and technology through education and training programs.
- The establishment of space science institutes and universities is part of this effort.

Challenges and Future Prospects

Despite early initiatives, Pakistan's space program has faced challenges, including limited funding and technological constraints, hindering its ability to compete with regional counterparts.

However, the renewed focus on international collaborations, policy reforms, and ambitious projects under the **Space Vision Program 2040** reflects Pakistan's commitment to advancing its space capabilities in the coming decades. [6]

In summary, Pakistan's space activities have evolved from early research endeavors to a comprehensive long-term strategy aimed at establishing a robust presence in space technology and exploration. Through strategic collaborations and policy initiatives, Pakistan aspires to harness space technology for socio-economic development and scientific advancement.

References

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