IAF SPACE EXPLORATION SYMPOSIUM (A3)
Interactive Presentations - IAF SPACE EXPLORATION SYMPOSIUM (IP)

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ESTABLISHING AN ANALOG RESEARCH FACILITY IN PAKISTAN FOR MARS EXPLORATION & SPACE RESEARCH ADVANCEMENTS

Abstract

Analog research facilities play a crucial role in simulating extraterrestrial environments on Earth, providing essential data for future Mars missions. The Hingol National Park in Balochistan offers a unique location globally, with its rugged, Martian-like terrain, making it ideal for such a facility. The region's barren landscape, dried-up water channels, and geological formations closely resemble conditions on Mars, providing a natural setting for analog research. As part of preliminary efforts, a Mars analog mission was conducted at Hingol National Park. The mission focused on studying the region's geology and collecting samples for extremophile research. The findings confirmed Hingol's potential as a Mars analog environment, offering valuable insights for Mars exploration. The proposed analog research facility aims to advance space research and development in Pakistan, promoting collaboration between academia, government, and the private sector. It will provide hands-on training for university students and aspiring scientists, helping to develop the next generation of space scientists and engineers. The facility will feature technologies such as a pressurized dome, an observatory, and Mars-simulation field components. The facility's expected outcomes include enhanced research capabilities, educational advancements, and contributions to space technology, positioning Pakistan as a key player in the global space community. This project will play a significant role in advancing space science in Pakistan and supporting humanity's exploration of Mars.