

REPORT

International Seminar on 'Space Exploration Challenges'

Amity Institute of Aerospace Engineering has organized an International conference on "Space Exploration Challenges on 26th February 2019 at Amity University Uttar Pradesh. The inaugural function started at 10:50 am by lighting the Lamp and Saraswati Vandana. Dr. Sanjay Singh, Director AIAE welcomed the delegates of NASA Spaceward Bound India and explained how the Astrobiology, Astrophysics is helping in space exploration the salient features of the seminar.

The topics for the seminar were:

- 1) **Amity Space Center**: Expectation from Amity students by **Dr. Siddharth Pandey**, Director Blue Marble Space Institute of Science, USA.
- 2) **Mars Surface Exploitation Challenges**: Analogue habitat design by **Dr. Jonathan Clarke**, President, MARS Society Australia.
- 3) **Space Exploration Challenge**: Preserving art and culture in space by **Dr. Annalea Beattie**, Director, MARS Society Australia.
- 4) **Space Exploration Challenges**: Sub surface exploration in space by **Dr. Jennifer Blank**, Scientist, NASA AMES Research Centre.

Dr. Siddharth Pandey started his talk explaining the need of Amity Space Centre and the expectations from the students. He talked about SpaceX3 and SpaceX4 Launches in 2014. He motivated the students to connect to the masses to spread the knowledge of science and space. He discussed the plans for Amity Space Centre and the plan to engage with Industry and Government in Space Projects. He further said that the Space Center will be completed in 3 phases and in the due process we have to engage the students and researchers from multi-disciplinary areas.

Dr. Jonathan Clarke gave his talk after Dr. Siddharth and he explained the challenges in sending and bringing back the people from Mars. He discussed the idea of analogue habitat and technologies on the Earth to mimic the condition on Mars. The purpose of analogue system was to decrease the surprises. He talked about the crew member sample size, exploration zone layout to provide safe platform for integrated research. He shared his experiences on hot spring study in Ladakh, operational and analogue research in Ladakh and at different parts of the world. He further explained the need of solar powered system and waste management techniques. For the researchers across the world he stressed upon the importance of site selection, station design and station management.

Dr. Annalea Beattie talked about Art and Governance in an Extraterrestrial society. She talked upon responsible and ethical decision making, importance to preserve art and culture, law enforcement for extraterrestrial activities. She stressed that artist should have the right to sustain art practice and choose their own subject matter. We should strengthen cultural capacities. Organizations should responsibly enable artists and non-artists alike with the means and processes to identify their own needs in order to sustain Art making. She asked to promote

freedom of expression and the condition of creativity. Lastly she discussed the importance to respect legitimate interest of all stake holders in Art making. Deliberate art practices should be mandated.

Dr. Jennifer Blank talked about robotic astrobiology mission. She discussed the importance of caves in studying the material and microbial species of particular planet. She discussed BRAILLE (Biological and Resource Analogue Investigation in Low Light Environment) project and its application on Lava caves exploration. Huge mineral deposition and microbial life are present inside the caves. Challenges in cave entry and research is paramount due to small fissures and claustrophobic environment. She stressed on the studies to be conducted in the field of microbiology, minerology, organic geochemistry, machine learning etc. She discussed the concept of SLAM for ground sampling location records, ground truth location. She talked about NRIVSS, simulation overviews in the field of cave exploration.

Ms. Ekta Chandel and Ms. Vibhati, students of AIAE 3rd year gave a presentation on Artificial gravity and Hostile Space Environment respectively. They talked about the effect of weightlessness on the Astronauts, balance disorder, eyesight disorder suffered by the Astronauts on returning to the earth.

Problems due to exposure to radiation, space debris provides important insight into the training and selection criteria for the Astronaut.

After this question and answer was opened to the students, where over 10 important questions on wide range of issues ranging from Gravity, Sustainable energy from space, Life deep inside the earth crust, Scaling the parameters depending on earth and mars environment conditions.

After the Q&A session, the seminar was concluded with the vote of thanks delivered by Prof. R. K. Chauhan.