

BITS Goa students unveil Mars Rover

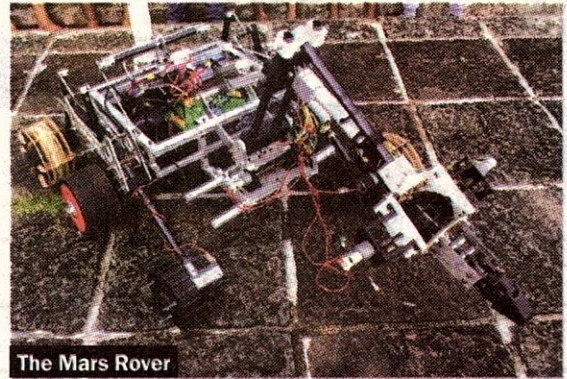
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A Mars Rover designed by a team of students of BITS Pilani, K K Birla Goa Campus was recently unveiled by BITS Pilani Vice Chancellor, professor, Souvik Bhattacharyya in the presence of professor, Dean Administration, D M Kulkarni.

The multidisciplinary team of students which started in 2018 is called Project Kratos: Mars Rover. Presently the team comprises of about 70 students led by Ithihas Madala and supervised by professor Toby Joseph (Department of Physics). The rover is equipped with advanced subsystems suitable for interplanetary deep space missions, seeking to study the application of engineering and scientific research into rover robotics, autonomous traversal, and detection of extraterrestrial life.

The team is preparing to participate in competitions such as International Rover Competition (IRC), University Rover Competition (URC), International Mars Hackathon, and the International Rover Design Challenge. In these competitions the rover is expected to fulfil tasks such as Extreme Retrieval task through rough terrain, Equipment Servicing task to perform intricate operations with 5 Degrees of Freedom arm, Autonomous Navigation and Life Detection.

Project Kratos involves various subsystems which con-



The Mars Rover

tribute to the making of the rover:

Mechanical - Works on the mechanical framework, designing and manufacturing of the entire rover. SOLIDWORKS is the main CAD software along with ANSYS for the FEA of the design.

Autonomous - Is responsible for autonomous traversal of the rover in a non-discovered environment. We perform tasks like path planning, object detection and localisation to enable the rover to calculate an optimum path using data from various sensors. ROS (Robotics Operating System) is used, and a firm grasp on Python or C++ is required.

Life Detection - The objective is to design experimental techniques to detect life. The system uses computation and spectroscopic techniques to study soil and rocks characteristics, traditional lab techniques and emerging techniques like bioelectronics and biosensors.

4. **Electronics** - This looks after interfacing between all on board electronics including a 5 degree of freedom robotic arm, communication to the base station and powering the rover with the help of a customised Battery Management System.



Team with Vice Chancellor, professor, Souvik Bhattacharyya