

Guidelines, Rules and Regulations of
Touch the Jovian Moon
Contest



Liquid Propulsion System Centre
Valiamala, Trivandrum

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Liquid Propulsion System Centre

Liquid Propulsion Systems Centre (LPSC) / ISRO is the lead Centre for development and realization of earth-to-orbit advanced propulsion stages for Launch Vehicles and also the in space propulsion systems for Spacecrafts. The LPSC activities and facilities are spread across its two campuses viz., LPSC Headquarters and Design Offices at Valiamala, Thiruvananthapuram and Spacecraft Propulsion Systems Unit at LPSC, Bangalore, Karnataka.

LPSC is vested with the responsibility of design, development and system engineering of high performance Space Propulsion Systems employing Earth Storable and Cryogenic Propellants for ISRO's Launch Vehicles and Satellites. Development of fluid control valves, transducers, propellant management devices and other key components of Liquid Propulsion systems are also under the purview of LPSC.

LPSC started in a humble way with low thrust reaction control thrusters and SITVC systems for SLV-3, ASLV and graduated to the development of second and fourth stages with VIKAS engine and PS4 Engines for PSLV and GSLV. Thereafter, to achieve higher payloads to GTO, the highly technology intensive development of Cryogenic Engine and Upper Stage (CUS) was accomplished for GSLV. This was followed by the development of 4.0 m class large L110 liquid booster stage with clustered VIKAS Engines and indigenous development of C25 Cryogenic Stage for GSLV MKIII and the success was achieved in the first attempt itself. In the area of Spacecraft propulsion systems, from monopropellant systems for IRS spacecrafts and bipropellant systems for INSAT class spacecrafts. LPSC has reached great heights by developing flawless propulsion systems for Chandrayaan-1 and Mars Orbiter (MOM) missions. Currently, the development of state of the art Electric Propulsion System (EPS) is initiated and the first propulsion module has been successfully flown in GSAT 9. In addition to these developments, propulsion systems for technology demonstration like RLV TD, Air breathing Propulsion, SRE, CARE module etc were also developed.

LPSC Valiamala is the Centre Headquarters, responsible for R & D, System Design/Engineering and Project Management functions. The Fluid Control Components Entity and the Materials & Mechanical Engineering Entity are located here apart from the Earth Storable & Cryogenic Propulsion Entities, handling the core tasks of the Centre.

LPSC Bangalore focuses on satellite propulsion. Design & Realization of Propulsion Systems, integration of spacecraft propulsion systems for Remote Sensing and Communication satellites, Development and production of transducers / sensors are other major activities at LPSC, Bangalore. Fabrication of launch vehicle stage tanks and structure at ASD/HAL is also coordinated and managed by LHWC at Bangalore.

Pearl Jubilee Celebrations of LPSC

Liquid Propulsion Systems Centre had its inception on 1st June 1987 and is presently completing thirty glorious years as the lead ISRO Centre for development and realization of liquid propulsion systems for launch vehicles and spacecrafts. In the glory of the past 30 years, the LPSC Pearl Jubilee celebrations which span for one year shall focus on initiation of new technological developments, infrastructure buildup, preservation of environment and beauty of the campuses, organizing various events for employees, family members, our partners in Industries, students and general public with the support of one and all.

Touch the Jovian Moon Contest

1 Introduction

Touch the Jovian Moon is a contest for students of Engineering Colleges and Technical Institutions of India, being organized by LPSC/ISRO as part of its Pearl Jubilee Celebrations. Through this contest LPSC aims to challenge the young and ignited minds to work on par with the Indian space scientists by designing a lander mission to any one of the Jovian Moons which are currently of interest to space scientists all over the world.

The contest is planned to impart into the students the rigor of designing a space mission. More than a mere contest, the students may find this a rare opportunity to learn the various stages through which a real space mission would pass through before getting realized and launched. The students will be interacting with an expert panel and learn about the current practices being followed being followed by ISRO in realizing an actual lander mission like the Chandrayan-2 mission being developed currently.

The contest will be conducted in two stages. After the initial selection round, 10 teams eligible to continue with the contest will be selected. These 10 teams will interact with an expert team at LPSC/ISRO in designing a lander mission to the target Jovian moon selected by the respective team. At the end of the contest the teams shall be invited to LPSC/ISRO for an oral presentation in front of the judging panel.

The participants of the selected 10 teams will have the rare opportunity to visit LPSC, Valaiamala and see for real how various subsystems of a rocket get designed and developed. Exciting prizes and opportunity to visit various other centers of ISRO await the winners.

2 Eligibility Criteria and Team Structure

1. Undergraduate Students of Engineering and Fundamental Science branches are eligible for participation
2. Each college/institute can have only a single core team participating in the event.
3. The core team should consist of 6 core student members and 1 faculty member
4. The core team will be responsible for preparation of reports, presentations etc and presentation of the same via video mode or through personal interaction with LPSC as and when required.
5. The core team members is restricted to 6 student members can be supported by any number of students/faculty of the originating institute in carrying out the project.
6. Each team shall submit along with the preliminary report, an authorization letter in the institution letter head from the Head of the Institute certifying the participants from the institute.
7. LPSC reserves all rights to modify the rules and regulation of the contest as and when warranted. LPSC also resevres all rights to discontinue, without prior notice, any team found violating the norms set by LPSC,from continuing in the contest.

3 Structure of the Contest

The contest will be conducted in two stages as detailed below

3.1 Selection Round

The team proposing to take part in the contest is required to identify one target moon among the Jovian Moons in our solar system for their lander mission to land. **The team should prepare a brief report (Not more than 1500 words) detailing the reason for selection of the target moon, the various possible scientific studies that is proposed to be done by the proposed lander mission and the impact of the proposed study on the scientific world and humanity at large. The advantages and disadvantages of selecting the particular target may also be highlighted.**

The report along with copy of authorization letter from the Head of the institution may be emailed to contest_jovian@lpssc.gov.in, on or before 5th of December 2017. The authorization letter should contain the name, contact details and Institution ID number of the core team members as prescribed in the format attached as **annexure -1**.

Upon receipt of the above, the proposal will be reviewed by the expert panel constituted at LPSC. 10 teams coming up with the best proposal report will be identified and will be invited to participate in the design round.

3.2 Lander Mission Design Round

In this round the selected teams will be designing and developing the lander mission to the target moon selected by the respective team. Periodic reviews will be conducted at regular intervals.

The teams shall submit a design report and a 3D CAD model of the spacecraft being designed and shall also give an oral presentation in May 2018 at LPSC, Valiamala, Trivandrum. The winners shall be identified by the expert panel through continuous evaluation of the project at regular intervals, review of submitted report and 3D CAD model and final oral presentation.

Detailed time line of activities in this round will be intimated to the selected teams along with the selection intimation.

4 How to Apply for the Contest

1. Institutions willing to participate in the contest may nominate a core team of 6 members and 1 faculty member duly approved by the Head of the Institution.
2. The core team, in consultation with other interested student/faculty of the institution shall select one of the Jovian Moon as target body for designing a lander mission.
3. The core team shall prepare a mission proposal report (not exceeding 1500 words) highlighting in detail the following aspects
 - Reason for Selection of target moon
 - Scientific studies proposed to be done as part of the proposed mission
 - Impact of the proposed study on the Scientific world and humanity at large thereby justifying the need of such a study
 - Advantages and Disadvantages of selecting the proposed target over the other most probable targets
4. The core team will register their participation in the contest by emailing the above mentioned mission proposal report to contest_jovian@lpssc.gov.in **on or before 12:00hrs of 05/12/2017**. The authorization letter, in the institution letter head, from the Head of the institution, identifying the team members as per the format given in Annexure-1 shall also be attached with the email. No registration will be entertained without the authorization letter.

5 Contact Details

More details of the contest is available in the Pearl Jubilee Celebration page at www.lpsc.gov.in. For any query regarding the contest email may be sent to contest_jovian@lpsc.gov.in.

Annexure-1

Details of core team members to be furnished in the authorisation letter

SL No.	Name	Institution ID No	Branch of Specialisation	Remarks
1				Faculty member
2				Student member
3				Student member
4				Student member
5				Student member
6				Student member
7				Student member
Contact Email id				
Institution Contact Number				
Contact Number of faculty member				