

# Report of One-Day Workshop on ‘Tech Talk on Rocket Systems’

**Date:** 21st March 2025  
**Time:** 9:30 AM onwards  
**Venue:** Main Building Conference Hall, Coimbatore Institute of Technology



COIMBATORE INSTITUTE OF TECHNOLOGY  
(Government Aided Autonomous Institution)  
COIMBATORE - 14



INTERNAL QUALITY  
ASSURANCE CELL (IQAC)  
&  
INSTITUTION'S INNOVATION  
COUNCIL (IIC)



JOINTLY ORGANIZE

SEMINAR ON  
“TECH TALK ON  
ROCKET SYSTEMS”

ALL ARE CORDIALLY INVITED



**DATE**  
MARCH 21, 2025

**VENUE**

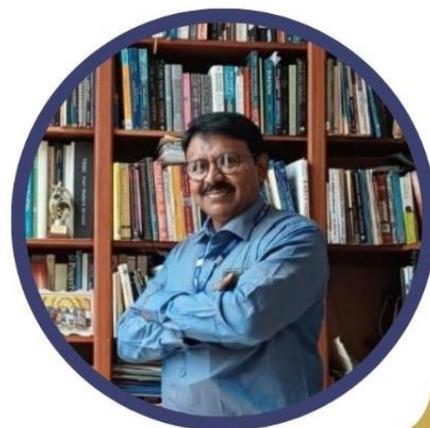
MAIN BUILDING  
CONFERENCE HALL



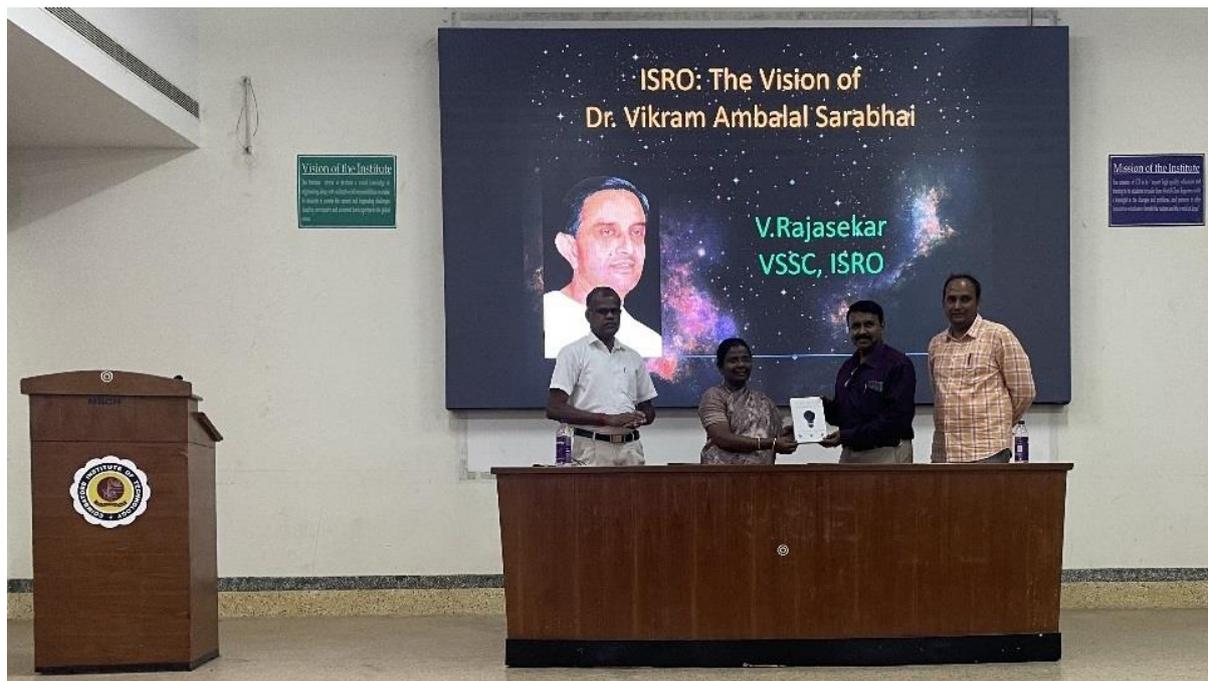
**TIME**  
9.30 AM

Speaker

**V.Rajasekar**  
**Associate Project**  
**Director - HRLV,**  
**GSLV Mk III Project.**  
**VSSC/ ISRO**  
**Trivandrum**



<p><b>ABOUT THE PROGRAMME</b></p> <p>Rocket launching is a highly precise process that requires cutting-edge propulsion, navigation, and mission control technologies. ISRO (Indian Space Research Organisation) has emerged as a global leader in cost-effective and reliable space missions. From the trusted PSLV to the powerful GSLV Mk III, ISRO has successfully launched satellites, interplanetary probes, and lunar missions. Notable achievements include Mangalyaan, Chandrayaan, and the upcoming Gaganyaan human spaceflight mission. This workshop will explore ISRO's advancements, rocket launch dynamics, and future innovations, providing insights into India's growing role in global space exploration and its vision for the next generation of space missions.</p> <p><b>RESOURCE PERSONS</b></p> <p><b>Er.V.Rajasekar</b> Associate Project Director - HRLV, GSLV Mk III Project, VSSC/ ISRO Trivandrum - 695 022</p> <p><b>Er.Steaphen Sigatapu</b> HRLV Team Member, GSLV Mk III Project, VSSC/ ISRO Trivandrum - 695 022</p>	<p><b>ORGANIZING COMMITTEE</b></p> <p><b>Chief Patrons</b></p> <p><b>Mr.R.Santosh</b>      <b>Mr.S.Rajiv Rangasami</b> Managing Trustee,      Correspondent, CIT Institutions      CIT Institutions</p> <p><b>President</b> <b>Dr. A. Rajeswari,</b> Principal, CIT</p> <p><b>Coordinators</b> <b>Dr. M. Mandhirasalam</b> IQAC COORDINATOR</p> <p><b>Dr.N.K. Karthikeyan</b> IIC COORDINATOR</p> <p><b>Co-Coordiators</b> <b>Dr. E.Arul</b> <b>Dr.M.Kaarthik</b></p> <p><b>VENUE</b> <b>Main Building Conference Hall,</b> <b>Coimbatore Institute of Technology,</b> <b>Coimbatore - 641 014</b></p> <p><b>Scan here for Registration</b></p> 	<p><i>One Day Workshop</i> on <b>Tech Talk on Rocket Systems</b> <b>21<sup>st</sup> March 2025</b></p>    <p><b>Organized by</b></p> <p><b>INTERNAL QUALITY ASSURANCE CELL (IQAC)</b> &amp; <b>INSTITUTION INNOVATION COUNCIL (IIC)</b></p> <p><b>COIMBATORE INSTITUTE OF TECHNOLOGY</b> <b>COIMBATORE - 641 014</b></p>
--	---	---



The Tech Talk on Rocket Systems workshop was conducted at Coimbatore Institute of Technology. The event, organised by the Internal Quality Assurance Cell (IQAC) and the Institution Innovation Council (IIC), aimed to impart profound insights into India's advancements in space exploration, rocket systems, and ISRO's contributions to scientific progress.

The workshop was structured into two sessions, each encompassing distinct aspects of rocket technology and space missions. The sessions were led by distinguished experts from the Vikram Sarabhai Space Centre, ISRO, Er. V. Rajasekar, Associate Project Director - HRLV, GSLV Mk III Project, The discussions provided a comprehensive understanding of ISRO's evolution, technological breakthroughs, and forthcoming space endeavours.

## Session 1: ISRO's Journey and Contributions

The first session commenced at 10:00 AM, focusing on the historical evolution of ISRO and its pivotal role in India's space sector.

India's space programme was initiated with the establishment of INCOSPAR in 1962, under the stewardship of Dr Vikram Sarabhai. Subsequently, ISRO was formally constituted in 1969, spearheading indigenous advancements in satellite and rocket technology. The early years of ISRO were marked by experimental launches and foundational research, culminating in the successful deployment of Aryabhata, India's maiden satellite, in 1975.

Dr Vikram Sarabhai, revered as the Architect of India's Space programme, envisioned leveraging space technology for national development. His pioneering efforts laid the foundation for satellite communication, remote sensing, and meteorological forecasting. Under his leadership, ISRO embarked on developing the Rohini satellite series and conceptualising experimental launch vehicles.

ISRO's illustrious milestones include the PSLV, renowned for its precision and reliability in launching earth observation and interplanetary satellites. The Mars Orbiter Mission in 2013 positioned India as the first nation to reach Mars on its maiden attempt. The GSLV and GSLV Mk III were engineered with cutting-edge cryogenic propulsion technology, empowering India to deploy heavier satellites into geostationary orbits.

The Chandrayaan-1 mission in 2008 provided groundbreaking evidence of water molecules on the lunar surface. The subsequent Chandrayaan-2 and Chandrayaan-3 missions advanced lunar exploration through sophisticated rover and lander technology. ISRO is presently developing the Gaganyaan mission, envisaged as India's first indigenous human spaceflight programme.

The session also shed light on ISRO's collaborations with global space agencies, alongside its aspirations for deep-space expeditions, including missions to Venus and interstellar explorations.



## **Session 2: Technical Aspects of Rocket Systems**

The second session commenced at 11:30 AM, delving into the engineering and operational intricacies of ISRO's rocket systems.

The discussion encompassed solid, liquid, and cryogenic propulsion systems, each playing a vital role in launch vehicle performance. Solid propulsion, as utilised in the first stage of PSLV, imparts an immense thrust for initial ascent. Liquid propulsion, employed in PSLV's second stage, facilitates enhanced control and efficiency. Cryogenic propulsion, incorporated in GSLV and GSLV Mk III, enables the deployment of high-payload satellites into superior orbital trajectories.

The session further elucidated thrust vector control, multi-stage separation, and aerodynamic stability, which are critical parameters in ensuring mission success and payload integrity.

Mission planning and control were extensively explored, emphasising the significance of Mission Control Centres, which orchestrate launch operations, satellite positioning, and trajectory corrections. Telemetry, tracking and command systems facilitate seamless communication between ground stations and spacecraft. Various orbital insertion mechanisms were discussed, detailing Low Earth Orbit, Geostationary Orbit, and interplanetary transfer strategies.

The session also highlighted emerging technologies in space exploration. ISRO is actively developing reusable launch vehicles to establish cost-efficient and sustainable space travel. Semi-cryogenic propulsion systems, currently under development, aim to enhance fuel efficiency and payload capacity. Discussions also covered India's ambitious plans for interplanetary missions, including explorations of Venus, asteroids, and outer planetary bodies.

The session concluded with an interactive dialogue, where students and faculty engaged with ISRO scientist, deliberating on technical intricacies, mission challenges, and prospective innovations in rocket engineering.