



Department of Aerospace Engineering
Indian Institute of Space Science and Technology
Valiamala, Thiruvananthapuram - 695 547, Kerala

ASTRA

Aerospace Symposium on
Technological Research Advancements

AGNI 2025

ISHMT - RCT Annual Colloquium on
Advances in Energy Systems

Pre-Conference Event

KSPACE - Lift Off

Workshop on Space Technology Applications for Budding Entrepreneurs

2025
JUNE

12
THU

13
FRI

14
SAT



in association with

ISHMT - Regional Chapter Trivandrum & KSPACE



ASTRA – AGNI 2025

Program Schedule

Time	Day 1 Events (JUNE 12): KSPACE Lift Off		Venue
09:30 – 10:30	Inauguration		Multi-Purpose Hall
09:30 – 09:35	Invocation		
09:35 – 09:40	Welcome Address	Akhil AI, Convener, Program Committee - ASTRA	
09:40 – 09:50	Presidential Address	Prof. Dipankar Banerjee, Vice Chancellor, IIST	
09:50 – 10:05	Lighting of the Lamp & Inaugural Address	Shri. Ajayalal PR, Deputy Director (MSA), LPSC, ISRO	
10:05 – 10:10	Felicitation	Dr. G Ayyappan, Former CTO - IIST, Associate Director, VSSC, ISRO	
10:10 – 10:15	Felicitation	Shri. Midhun Babu, Senior DGM, L & T Aerospace	
10:15 – 10:20	Felicitation	Shri. G Levin, CEO – KSPACE, Former Deputy Director, VSSC, ISRO	
10:20 – 10:25	Vote of Thanks	Ashok Kumar, Convener, Technical Committee - ASTRA	
10:25 – 10:30	National Anthem		
10:30 – 11:15	Address by Guest of Honour	Dr. Prakash Chauhan, Director, National Remote Sensing Centre, ISRO	
11.15 – 11:30	Tea Break		
11:30 – 12:15	Guest Address	Shri. K Anand, Deputy Director (MSA), VSSC, ISRO – “Empowering space start-ups in India”	
12:15 – 13:00	Guest Address	Shri. G Levin, CEO - KSPACE – “Indian Space-Tech Capabilities & Opportunities”	
13:00 – 14:00	Lunch		
14:00 – 15:00	Guest Address	Shri. Ashok Kurian Panjikaran, Senior Manager, Kerala Startup Mission – “Start-up Lifecycle”	
15:00 – 15:45	Guest Address	Shri. G Narayanan, Former CMD, NewSpace India Limited, Deputy Director, LPSC - “Business Opportunities in Space Sector”	
15:45 – 16:00	Tea Break		
16:00 - 16:30	IIST - STIIC Presentation	Shri. Harish CS, Chairman, Task Team, “IIST initiatives towards innovation and start-up ecosystem”	
16:30 – 17:15	Startup Experiences Panel Discussion Valediction	Hex20, Strava Technologies, Taclog Shri. G Levin	

ASTRA – AGNI 2025

Program Schedule

Time	Day 2 Events (JUNE 13): ASTRA – AGNI 2025		Venue
09:45 – 10:55	Inauguration		MPH
09:45 – 09:50	Invocation		
09:50 – 09:55	Welcome Address	Prof. Shine SR, Chair, ASTRA 2025 & President, ISHMT - RCT	
09:55 – 10:10	Presidential Address	Prof. Dipankar Banerjee, Vice Chancellor, IIST	
10:10 – 10:25	Lighting of the Lamp & Inaugural Address	Shri. R Hutton, Associate Director, LPSC, ISRO	
10:25 – 10:40	Release of Book of Abstracts and Address	Dr. S Sunil Kumar, Vice President, ISHMT & Patron, ISHMT - RCT	
10:40 – 10:45	Felicitation	Prof. Kuruvilla Joseph, Dean (Academics) & Registrar, IIST	
10:45 – 10:50	Vote of thanks	Prof. M Deepu, HOD, Dept. of Aerospace Engineering, IIST	
10:50 – 10:55	National Anthem		
10:55 - 11:15	High Tea		MPH
11:15 – 12:00	Keynote Lecture 1	Shri. R Hutton, Associate Director, LPSC, ISRO - " India's Human Spaceflight Mission – GAGANYAAN "	MPH
12:00 – 12:45	Keynote Lecture 2	Ms. Hiral Shah, Senior Manager, Siemens Energy India- " Applications of Machine Learning in Gas Turbines "	MPH
12:45 - 13:45	Lunch Break		
13:45 - 14:30	Keynote Lecture 3	Dr. Manjunath, Technical Director, Gas Turbine Research Establishment, DRDO - " Manufacturing aspects of gas turbine and its challenges "	MPH
14:30 - 15:30	Technical Session 1	5 parallel sessions	AE Block
15:30 - 15:45	Tea Break		
15:45 – 17:00	Lab visit and faculty interaction		AE Block
17:30 – 18:45	Cultural event		MPH

ASTRA – AGNI 2025

Program Schedule

Time	Day 3 Events (JUNE 14): ASTRA – AGNI 2025		Venue
9:00 – 10:15	Technical Session 2	5 parallel sessions	AE Block
10:15 – 11:00	Keynote Lecture 4	Shri. KR Jyothilal IAS, Additional Chief Secretary, Govt. of Kerala - " Kerala Hydrogen Valley - Opportunities for Research and Start-up Companies ".	MPH
11:00 – 11:15	Tea Break		
11:15 – 12:00	Keynote Lecture 5	Dr. M Angappan, Group Director, Aeronautical Development Agency - " Materials and Manufacturing for Light Combat Aircraft: Trends and Challenges ".	MPH
12:15 – 13:15	Technical Session 3	5 parallel sessions	AE Block
13:15 – 14:15	Lunch Break		
14:15 – 15:00	Keynote Lecture 6	An Interactive session with Dr. Gangan Prathap - " How many scientists/technologists should a nation have? ".	MPH
15:00 – 15:15	Tea		
15:15 – 16:20	Valedictory Function		MPH
15:15 - 15:20	Welcome Address	Resmy J Devan, Convener, Program Committee - ASTRA	
15:20 – 15:25	Presidential Address	Prof. M Deepu, HOD, Dept. of Aerospace Engineering, IIST	
15:25 – 15:35	Valedictory Address	Dr. S Susheel Kumar, Secretary, ISHMT RCT	
15:35 – 15:40	Conference Report	Harikrishnan C I, Convener, Organising Committee - ASTRA	
15:40 – 15:55	Presentation of Awards	Vice Chancellor/Dean, IIST	
15:55 – 16:05	Feedback from participants		
16:05 – 16:10	Concluding Remarks	Dr. Sooraj VS, Coordinator, Organising Committee - ASTRA	
16:10 – 16:15	Vote of Thanks	Ramya Raveendran, Convener, Organising Committee - ASTRA	
16:15 – 16:20	National Anthem		

ASTRA – AGNI 2025

Program Schedule

Detailed Technical Presentation Schedule

Day 2 (June 13) – Technical Session (TS1)		
Session: TS1 – TP1	Venue: Seminar Hall	Time: 14:30 – 15:30
Time	Paper ID and Title	Author
14:30 – 14:40	39 - Closed-Loop Isp-Based Propellant Ratio Control in Dual-Propellant Hall Effect Thrusters Using Xenon and Krypton	Aditya Pillai, Gayathri M Subhash; Gourishankar V, (VIT Bhopal University).
14:40 – 14:50	41 -Effects of hydrogen addition on thermal efficiency of self-aspirating domestic burners	Madhav JP (IIST)
14:50 – 15:00	45 - Hybrid Heating-Assisted Shape Memory Alloy Integration for Real-Time Burning Rate Adjustment in Solid Rocket Systems	Varshan Vijay Gopal, Uma Maheshwar Naidu Namadharula, Bharath Kumar Konga. (Malla Reddy College of Engineering and Technology)
15:00 – 15:10	59 - Reactive Flow Simulation in Scramjet Engines: Coupling ANSYS Fluent with CHEMKIN Chemistry for Supersonic Combustion Modelling	Arjun Padmnathan, Bhavana S; Aharthi T, (SASTRA University).
Session: TS1 – AFM1	Venue: C103	Time: 14:30 – 15:30
Time	Paper ID and Title	Author
14:30 – 14:40	19 - Aerodynamic Efficiency Through Biomimicry: Investigating the Hydrodynamic Locomotion of Snakes for Aerospace Applications	Shazibsha Bandanawaz (SRMIST).
14:40 – 14:50	25 - Impact of RANS Turbulence Models on Separation Bubble Formation in Scramjet Intake	Diya Nambiar, Rushikesh Vivekanand, Resmi Prasad (ACE College of Engineering).
14:50 – 15:00	30 - Aerodynamic Optimization of Blended Haack-Ogive Nose Cones: Effect of Blend Start Location at Hypersonic Speed	Tarun Prabash P, Prajwal N, (R V College of Engineering).

ASTRA – AGNI 2025

Program Schedule

15:00 – 15:10	32 - Structural Analysis of the Fish Bone Active Camber Morphing Mechanism	Abhishek P, Ashmita A J (Ace College of Engineering).
Session: TS1 – SD1	Venue: C106	Time: 14:30 – 15:30
Time	Paper ID and Title	Author
14:30 – 14:40	17 - Terrain mapping drone on mars	Sheik Mohiddin (Sri Vasavi engineering college)
14:40 – 14:50	26 – Development of a smart beam	Rahul Karri (Indian Institute of Technology (BHU) Varanasi)
14:50 – 15:00	29 - Finite Element Analysis of Regular and Stair wise Staggered Bio-inspired Composites Utilizing Cohesive Zone Modelling	Ankaj Kumar (IIST)
15:00 – 15:10	33 - Prospective Liner less Composite Tankages for Satellite Propulsion System	Sandeep Kumar (VSSC, ISRO)
15:10 – 15:20	70 - Influence of Geometry on Interlamellar Connections in Nacre-Inspired Composites	Ramya Raveendran (IIST)
15:20 – 15:30	60 - Enhancement of Dynamic Stability of Structures Using Smart Materials	Saaya Saleesh Chaithanya Santhosh, Neenu Jose, Biju C V, (Nirmala College of Engineering)
Session: TS1 – MM1	Venue: Conference Hall	Time: 14:30 – 15:30
Time	Paper ID and Title	Author
14:30 – 14:40	43 - Effect of Efficient and Inefficient Discharge Pulses in Transistor-Based μ -Electric Discharge Machining of Ti-6Al-4V	Manikandan M, Basil Kuriachen, Jose Mathew (National Institute of Technology Calicut)
14:40 – 14:50	56 - Enhancing the Mechanical Characteristics of AZ31 Mg alloy with Reinforcement [Cr(NO ₃) ₃] via FSP	Deva Moorthy S (Karpagam College of Engineering)
14:50 – 15:00	57 - Heat transfer studies on Aluminium Silicon Carbide composite heat spreader	Anjitha Anil (TKM College Of Engineering, Kollam)
15:00 – 15:10	61 - Heat transfer studies on Aluminium Silicon Carbide composite heat spreader	Anup Kumar (IIST)

ASTRA – AGNI 2025

Program Schedule

Session: TS1 – BM1			Venue: Council Hall			Time: 14:30 – 15:30		
Time		Paper ID and Title				Author		
14:30 – 14:40		83 - Fundamental Studies on the Influence of Varying Swirl Strength on the Thermoacoustic Behaviour of Confined Partially Premixed Flames				Ramakrishnan PV (M. Tech, IIST)		
14:40 – 14:50		84 - Heat Transfer Enhancement in Supercritical Helical Heat Exchanger by Geometric Modification and Flow Pulsation				Sonu Maruti Harijan (M. Tech, IIST)		
14:50 – 15:00		86 - Development of Ground Resonance Simulation for Helicopters				Tadepalli Subha Chandrika (M. Tech, IIST)		
15:00 – 15:10		87 - Development of Equivalent Mechanical Model to Predict Rotary Sloshing in Cylindrical Tanks				Vignesh Viswanath (M. Tech, IIST)		
15:10 – 15:20		106 - Effect of Intermittent Liquid Injection in Rayleigh-Bénard Augmentation				Prashil Khare (B. Tech, IIST)		
15:20 – 15:30		107 - Vibration Characteristics and Buckling Analyses of Closed Cylindrical Shells Under External Pressure Using the Differential Transform Method				Shingala Vaidik (B. Tech, IIST)		
Day 3 (June 14) – Technical Session (TS2)								
Session: TS2 – AFM2			Venue: C103			Time: 09:00 – 10:15		
Time		Paper ID and Title				Author		
09:00 – 09:10		36 – Dynamics of low Reynolds number confined impinging jet				Akshay Gholap (IIST)		
09:10 – 09:20		38 - Testing and Comparison of a Toroidal propeller vs Standard propeller				Revathi Vijayan (ACE College of Engineering)		
09:20 – 09:30		50 - Applications of Artificial Intelligence in Aircraft Systems and Operations				Mohammed Arsh (Nims University Rajasthan)		
09:30 – 09:40		54 – Golden Eagle Inspired Airfoil Design				Manikandan N (Kumaruguru college of Technology)		
Session: TS2 – SD2			Venue: C106			Time: 09:00 – 10:15		

ASTRA – AGNI 2025

Program Schedule

Time	Paper ID and Title	Author
09:00 – 09:10	42 - Digital Twin Framework for a plate bonded with Transducer for Structural Health Monitoring Using Guided Waves	Vishnu Harikumar (IIST)
09:10 – 09:20	44 – Ensuring Structural integrity: A quality centric approach to C32 LH2 tank qualification for human rated missions	Nikhil Prakash (LPSC, ISRO)
09:20 – 09:30	47 – IOT Integration	Prakash K (Nehru Institute of Engineering and Technology)
09:30 – 09:40	48 -Unsupervised Learning using Convolutional Auto encoder for Loosening Detection with Lamb Waves in Bolted Aluminium Lap Joint	Goutham KB (IIST)
09:40 – 09:50	58 - Feasibility Study of an Extensible Nozzle on the Cryogenic Upper Stage of LVM-3	Anand Jude L (National Institute of Technology, Calicut)
09:50 – 10:00	77 - Dyn- construction and shifting of stability lobe diagrammatic Analysis	Sreeji Sreenivas (Carmel Polytechnic College); Dr. Lawrance G (Karunya Institute of Technology, Coimbatore); Dr. Biju C V (Nirmala Institute of Technology, Thrissur) *; Dr. Sam Paul P (Karunya Institute of technology and Sciences)
10:00 – 10:10	27 – Design of compact circularly polarized X-band 4x4 microstrip antenna array	Kaushal Karthik K M, Swateekha S R, Phani Samhitha K (Vellore Institute of Technology, Chennai Campus)
Session: TS2 – TP2	Venue: Conference Hall	Time: 09:00 – 10:15
Time	Paper ID and Title	Author

ASTRA – AGNI 2025

Program Schedule

09:00 – 09:10	46 – Lunar Regolith Utilization for Rocket Fuel Production	Tharabi Suthaharan (Hindustan Institute of Technology and Science)
09:10 – 09:20	49 – Short Take-off, Big Impact: Hybrid Propulsion and Ground-Assisted Launch	Porni G R (Nehru Institute of Engineering and Technology)
09:20 – 09:30	51 - Effect of heat transfer on the characteristics of free shear layers subjected to shock interaction	Akhil Sivadas (IIST)
09:30 – 09:40	52 - Modelling Pilot Thermoregulation in Harsh Cockpit Conditions	Chithramol M K (IIST)
09:40 – 09:50	53 - Investigation of the effects of Co ₂ Dilution on the characteristics of turbulent non premixed CH ₄ -Air flames using PIV technique	Al Ameen H (IIST)
Session: TS2 – BM2 Venue: Council Hall Time: 09:00 – 10:15		
Time	Paper ID and Title	Author
09:00 – 09:10	88 - Design and Analysis of a Novel End Effector for Capturing Tumbling Objects.	Karthikeyan P (M. Tech, IIST)
09:10 – 09:20	90 - Deep Neural Network Pipeline for Projectory Optimization	Kiran M Aralikatti (M. Tech, IIST)
09:20 – 09:30	92 - Finite Element Analysis on the Influence of Platelet Geometry and Constituent Properties on the Mechanical Behaviour of Bio Inspired Composites	Adithya Binu Nair (B. Tech, IIST)
09:30 – 09:40	93 - Investigation and Characterization of Combustion Instabilities Through Experimental and Numerical Methods	Ashish Shinde (B. Tech, IIST)
09:40 – 09:50	94 - Evaluation of Mixed Mode Fracture Toughness in Composites	Karthikeyan B (B. Tech, IIST)
09:50 – 10:00	108 - Design Modelling and Developmental Studies of a Complaint Constant Force Mechanism	Prapti Rathod (B. Tech, IIST)
Day 3 (June 14) – Technical Session (TS3)		
Session: TS3 – TP3 Venue: Seminar Hall Time: 12:15 - 13:15		
Time	Paper ID and Title	Author
12:15 – 12.25	55 - A Comparative Analysis of Combustion Tap-Off and Full-Flow Staged Combustion Cycles	Arpit Hatila Tirth Patel, Anish S. (National Institute of Technology Karnataka).
12:25 – 12:35	66 - Transient Thermodynamic Modelling and Experimental Study of High-Pressure	Sreejith T R (LPSC, ISRO)

ASTRA – AGNI 2025

Program Schedule

	Stored Gas Inside a Gas Bottle Kept in a Cryogenic Dewar Vessel During Its Venting	
12:35 – 12:45	68 - Evaluating Thermal Entropy from ISRO Rocket Launches: Quantification, Climatic Impacts, and Energy Recovery Strategies.	Akshay K (College of engineering Perumon)
12:45 – 12:55	35 - Comparative Analysis of Heat Flux Predictions from CFD and Hybrid CFD-DSMC Simulations for Nozzle Operating in Vacuum Conditions	Ashok Kumar (IIST)
12:55 – 13:05	40 - Passive Thermal Control for CubeSats Using Phase Change Materials	Allen John Darin J, Dhinesh S (Mahendra Engineering College).
Session: TS3-TP4		
Venue: C-103		
Time: 12:15 - 13:15		
Time	Paper ID and Title	Author
12:15 – 12:25	71-Transition to Limit Cycle Oscillations in a Methane-Oxygen Combustor	Deepak E (IIST)
12:25 – 12:35	82- Patient-Specific Computational Cerebrovascular Hemodynamics: Saccular Aneurysm	Hari Krishna Menon (IIST)
12:35 – 12:45	72-Atomization characteristics of an effervescent ramp injector	Saran Dharan (IIST)
12:45 – 12:55	76-Experimental and Numerical Investigation of Direct Contact Condensation of Gaseous Nitrogen, Carbon Dioxide and Steam in Liquid Nitrogen Pool	Jishad Kuniyil (IIST)
12:55 – 13:05	81-Cooling Strategies for Axial Flux Permanent Magnet Motors in High Power Applications	Akhil C (IIST)
Session: TS3 – SD3		
Venue: C-106		
Time: 12:15 - 13:15		
Time	Paper ID and Title	Author
12:15 – 12:25	65-Comprehensive Dynamic Modelling of Spur Gears: Coupled Bearing and Backlash Effects with Shaft-Influenced Mesh Stiffness	Noufal N S (IIST)
12:25 – 12:35	37-Development of Bio- inspired composites	Resmy J Devan (IIST)
12:35 – 12:45	74-Analytical method for the pullout response of bio inspired sutured	Sachin Chandran C (IIST)

ASTRA – AGNI 2025

Program Schedule

	structures using the contact mechanics of equivalent cylinders	
12:45 – 12:55	75-A Spectral Approach for Analysing Load Capacity and Pressure Distribution in Gas Foil Bearings	Harikrishnan C I (IIST)
12:55 – 13:05	78- Meshfree Method for Static Analysis of Timoshenko Nano Beam Using Strain Driven Nonlocal Model	Akhil SL (IIST)
Session: TS3-MM2	Venue: Conference Hall	Time: 12:15 - 13:15
Time	Paper ID and Title	Author
12:15 – 12:25	64-Mitigation and Management of Space Debris: A Multi-Layer Shielding and Collection Approach	Kishore NM (Kumaraguru college of Technology)
12:25 – 12:35	73-Structural Topology Optimization for Space Robotics	Ashish Zachariah (IIST)
12:35 – 12:45	79- A Smart Cooling – Sweating Type Wheel for Green Grinding via Additive Manufacturing	Sarath Babu Surendran (IIST)
12:45 – 12:55	80-3D Printing Hollow Metal Parts for Space: A Study on LP-DED with Inconel 718	Akhil A I (IIST)
Session: TS3-BM3	Venue: Council Hall	Time: 12:15 - 13:15
Time	Paper ID and Title	Author
12:15 – 12:25	91- Development of Automated Tool for Optimization of Low-Thrust Multiple Gravity Assist Trajectories Using Shape-Based Methods	S Amirthavarshini (M. Tech, IIST)
12:25 – 12:35	97- Design of Low-Energy Transfer for Lunar Missions	Onkar Kiran Urunkar (B. Tech, IIST)
12:35 – 12:45	100- Experimental and Numerical Investigation of Turbulent Spots in Bypass Transition	Rajat Shrirang Hegde (B. Tech, IIST)
12:45 – 12:55	101- Vibration of Frustum-Shaped Membrane	Raushan Kumar (B. Tech, IIST)
12:55 – 13:05	103- Design of a Low-Energy Transfer from Earth to Mars via Lagrange Points	Sahil Nitin Sonawane (B. Tech, IIST)

ASTRA – AGNI 2025

Program Schedule
