

TEAM ABHYUDAY



ABOUT US

Team Abhyuday was formed in 2020 to provide an ecosystem to rocketry enthusiasts in IIT Madras

- ❖ Currently, we are participating in world's largest intercollegiate rocketry competition - [Spaceport America Cup 2022](#)
- ❖ Only IIT to qualify for this event in very first attempt

Team Composition

- 19 Undergraduates
- 1 Postgraduate
- 1 PhD Scholar



VISION & MISSION

Spaceport America Cup

- To manufacture a student built sounding rocket, competing with world's best rocketry brains
- To get exposure to global rocketeer network & mentors

Research & Development

- To model scientifically useful experiments as payload
- To develop a liquid propulsion system & a state-of-art solid rocket motor
- To research and innovate unique fins & nose designs for improved flight efficiency

STEM Outreach

- To promote model rocketry in India & IITs through social media forums & communication
- To conduct events & online sessions for public awareness on & off campus

SPACEPORT AMERICA CUP

Spaceport America Cup is an annual event organized by [Experimental Sounding Rocket Association \(ESRA\)](#) for student rocketry teams globally to show their innovation. The main competitions in this event are as follows:



Intercollegiate Rocket Engineering Competition

- Shortlisted teams launch their rockets aiming for a max altitude of either 10k or 30k ft
- Score is awarded based on closeness to the target height & the success of recovery

SDL Payload Challenge

- Students are required to make payloads that promote useful learning opportunities
- Score is awarded based on scientific relevance, construction & execution

TIMELINE

April - July 2021	Research & Design
15 June 2021	2021 batch recruitment
September 2021	Advisors & mentors onboarded
16 October 2021	First entry at Spaceport America Cup 2022
26 October 2021	Qualified for Spaceport America Cup 2022
11 December 2021	First progress report submitted
12 February 2022	Second progress report submitted
March 2022	Manufacturing & testing
23 April 2022	Third progress report submission
14 May 2022	Final technical report submission
21 - 25 June 2022	Spaceport America Cup 2022
July 2022	R&D in Propulsion concepts



APPROACH



AIRFRAME

Model the rocket structure



PAYLOAD

Generate electricity from motion



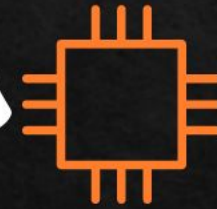
PROPULSION

Generate thrust with COTS solid rocket motor



AVIONICS

Facilitate recovery with altimeter & GPS



RECOVERY

Deploy parachutes with black powder charge



MANAGEMENT

Training

Research

Design & Simulation

In-house manufacturing

Testing

Launch

Recovery

VALUE PROPOSITION

Product Differentiation



Scientific experiment for generating electricity from motion vibrations as payload



Recovery of critical components for cost optimisation

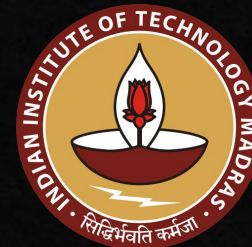
Team Differentiation



Highly skilled multidisciplinary team



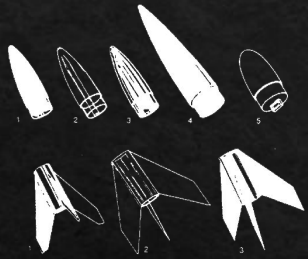
Guidance of ISRO & IITM mentors & expert fabricators



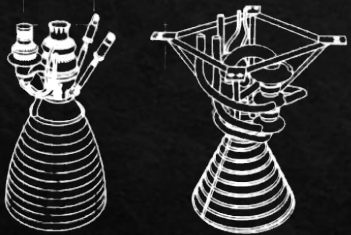
Access to IITM's quality infrastructure & indigenous labs

PROJECT IMPACT

Product Design



To model suitable nosecone, fin designs for supersonic speeds;



Research & innovation in rocket propulsion (liquid engine)



Approx. 50% cost (10 Lakh) cost reduction per rocket in future projects by component reuse

Social



To promote rocket science for everyone including kids



Hands-on training on rocket manufacturing for 50+ students



EMPLOYMENT



BUDGET BREAKDOWN

Category	Vertical	Budget	Remarks
Product Development	Airframe	2.5 Lakh	<ul style="list-style-type: none"> Material Nosecone Bulkhead
	Payload	1.5 Lakh	<ul style="list-style-type: none"> MR Fluid damper PTFE Neodymium magnet
	Avionics & Recovery	2.5 Lakh	<ul style="list-style-type: none"> Parachute Shock cords Altimeter & GPS
	Propulsion	1.5 Lakh	<ul style="list-style-type: none"> Solid motor Inner tube Thrust plate Motor retainer
Total		8 Lakh	

GRAND TOTAL

30.2 Lakh

Category	Vertical	Budget	Remarks
Travel & Logistics	Travel	15 Lakh	<ul style="list-style-type: none"> Travel partner VISA Tickets
	Logistics	3 Lakh	<ul style="list-style-type: none"> Shipping rocket Packing
	Accomodation	2.5 Lakh	<ul style="list-style-type: none"> Accomodation in US
Total		20.5 Lakh	
General Services	Fees	1.2Lakh	<ul style="list-style-type: none"> Competition fees Mentor fees
	Merchandise	0.5Lakh	<ul style="list-style-type: none"> Tshirt Printing Painting of rocket
Total		1.7 Lakh	

SPONSORSHIP

Ways in which you can support

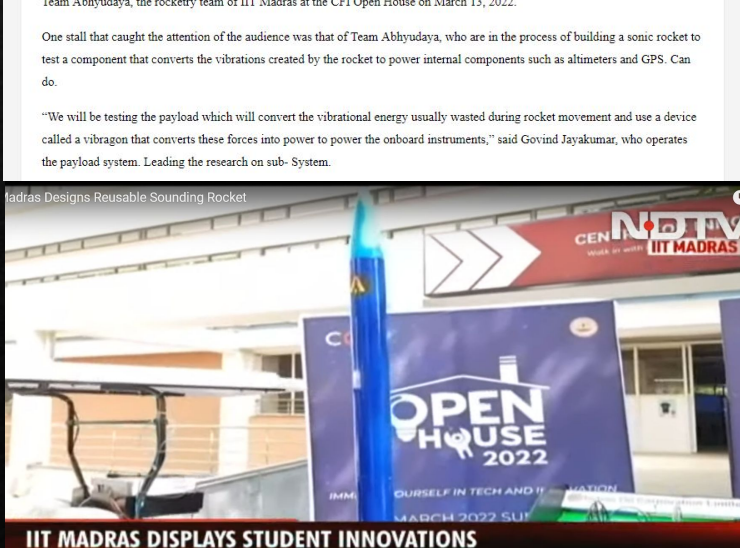
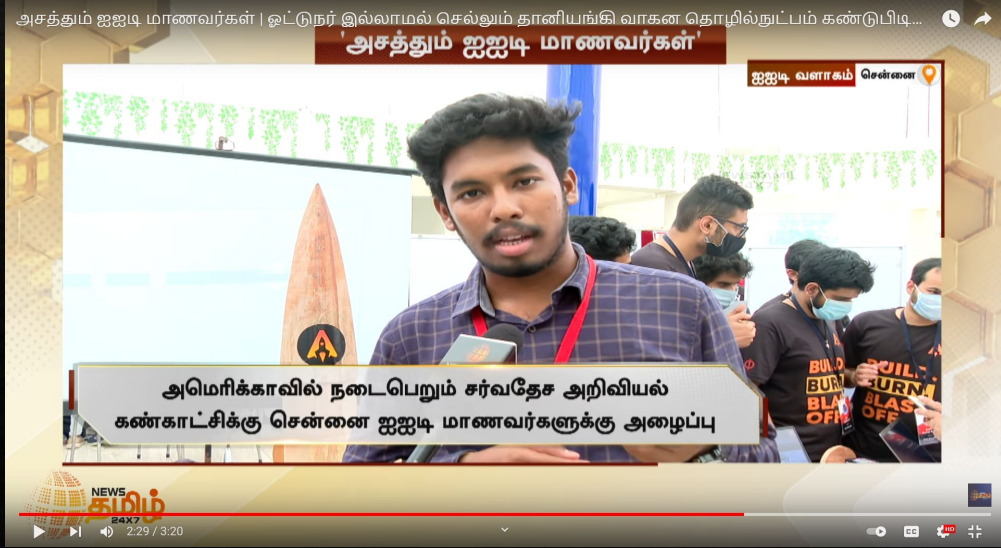
Financial Sponsors	Financial support as per our Sponsorship Package (Page- 9, 10) in installment or whole
In-kind Sponsors	Providing materials used in manufacturing of rocket, precision elements for Payload, Propulsion motor, Electronic components or Parachutes
	Providing required services such as Shipping, Accommodation, Travel, Packaging
Support	Scientific mentorship, Consulting

Why should you sponsor us?

- Exposure to student innovation & ideas
- Equity built around supporting Science & Technology
- Building engagement opportunity & leverage research ecosystem in IIT Madras
- CSR & Tax Exemption

Support us in our endeavours! For details, refer our [Spons Brochure](#)

MEDIA COVERAGE



RISKS & MITIGATION

Category	Risks	Mitigation
Product Development	Payload experiment malfunction	<ul style="list-style-type: none">● If there is no time to fix it, it can be used as a dummy payload.
Testing	Failure during component testing	<ul style="list-style-type: none">● Comprehensive testing plan much before the competition
Transportation	Delay/ Damage in transportation	<ul style="list-style-type: none">● Extra components can be carried as backup● Mentors in USA can assist
Other	Pandemic Restriction on travel	
	Unavailability of VISA	
	Weather condition affect trajectory	

*while most of the risks are being taken care of while working, some of them are beyond our control

ADVISORY BOARD

Faculty Advisors



[Prof. Sathyan Subbiah](#)
Professor, Dept.
of Mechanical
Eng. , IIT Madras



[Prof. Prabhu Rajagopal](#)
Professor, Dept.
of Mechanical
Eng. , IIT Madras

Flyer of Record



[Randall Ejma](#)
Inventor of Blue
tube, L3 Certified

Partners



[STAR Lab, Surat](#)
Experienced
team in space
technologies

Mentors



[Prof. Lazar Chitilappilly](#)
Project Director,
ABPP @ VSSC /
ISRO Trivandrum



[Prof. P Ramakrishna](#)
Dept. Aerospace
eng., IIT Madras



[Prof. Muruganandam](#)
Dept. Aerospace
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[Abhinav B.](#)
Student,
Embry-Riddle
Aeronautical
University

Management



Nimisha
Sharma



Ashish
Shrotri



Jaybhai
Pansuriya

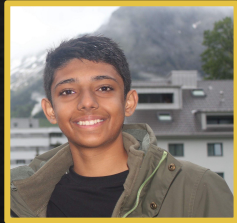


Hrishabh
Srivastava

Avionics & Recovery



Kapil Garg



Ishan
Mankodi



Shrid
Suresh

Payload



Andrea



Govind J.



Shrey
Patel

Airframe



Brij Chaun



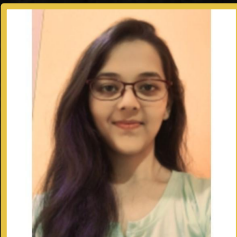
Hari
Sudhan P.



Varun
Kumar S.



Piyush
Bhujbal



Sreya B.



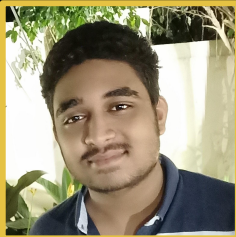
Sarthak
Singh



Hareharan
V.



Aaditya E.



Pavan
Kumar G.



Aditya
Meshram

Thank You



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