



SPONSORSHIP PROPOSAL

2021 - 2022



TEAM ANTARIKSH
A STUDENT SPACE TECHNOLOGY TEAM
R V COLLEGE OF ENGINEERING



Rashtreeya Sikshana Samithi Trust RV College of Engineering®

Autonomous
Institution Affiliated to
Visvesvaraya
Technological
University, Belagavi

Approved by AICTE,
New Delhi, Accredited
by NAAC, Bengaluru



About Us

Team Antariksh is a student space technology team whose goal is to understand, disseminate and apply these engineering skills for the innovation in the field of Aerospace Technology. Team Antariksh had humble beginnings back in 2015 with a couple of like-minded space enthusiasts who had a vision. Today it is a 100+ member strong team working on multiple projects successfully and simultaneously. Team Antariksh is currently engaged in designing a nanosatellite payload for ISRO's PS4 platform and in designing and fabricating Sounding Rockets. The Sounding Rocket Project is a project which aims at the ideation, design and fabrication of Sounding Rockets with a solid rocket motor. Team Antariksh is one of the five teams that have been selected from India for the prestigious Spaceport America Cup 2022, which is to be held in Las Cruces, New Mexico. Spaceport America Cup is the largest inter-collegiate rocket conference and competition and this is the second time that Team Antariksh has made it into the competition. The technologies developed from the Sounding Rocket will be extended to realize a self-landing rocket as a long-term goal of Team Antariksh and develop a community of diligent and dedicated team of rocketeers in India. Team Antariksh is also pursuing the designing and fabrication of a microbiological payload for ISRO's PS4 platform. This would make Team Antariksh one of the first teams to send a microbiological payload into space, which probably is rare even for ISRO.

R V College of Engineering

Rashtreeya Vidyalaya College of Engineering is one of the leading colleges in India and the top college in Karnataka. It has earned fame as one of the earliest self-financing colleges in Karnataka. The institution is run by the Rashtreeya Sikshana Samithi Trust (RSST). The trust runs over 25 institutions and RV College of Engineering is the flagship institute under their trust. Team Antariksh is affiliated to RV College of Engineering and functions as one of the technical teams present in the college. Team Antariksh is the sole technical team focused on space technology and is one of the most prestigious and respected teams in the entire college.



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Spaceport America Cup

The Spaceport America Cup is designed around IREC, or the Intercollegiate Rocket Engineering Competition and is the most prestigious competition for student rocketry teams from all around the globe. With over 150 teams participating in the competition annually, from various countries, it has gained fame as the largest intercollegiate rocketry competition. Students launch solid, liquid and hybrid rockets to target varying altitudes from 10k feet. Team Antariksh has been selected twice to be a part of the Spaceport America Cup. Two years ago, Team Antariksh was one among the only four teams from India to get an entry into the competition. It was a tremendous milestone and the team has forever been on the rise. This year, Team Antariksh once again made it into the competition, becoming one among the five teams from India that got selected to participate in the competition. The design and ideation phase for the rocket has been completed by the team and the process of manufacturing has also begun. The competition for this year is scheduled around June and Team Antariksh is well ahead of the timeline with a keen intent on winning the title.



Announcement of Opportunities – PS4 Orbital Platform (ISRO)

PS4 – Orbital Platform refers to the novel idea formulated by ISRO to use the spent fourth stage of the PSLV to carry out in-orbit scientific experiments for an extended duration of one to six months for which ISRO had solicited proposals. Team Antariksh is on a mission to design a microbiological payload for analysing the effects of microgravity on the growth of the bacteria. The experiment will be the first of its kind to be performed by undergraduate students in India. The team has completed the design and ideation phase and will begin the development of the payload soon enough. The overall mission lifetime is 2 months in-orbit and during the course of time, real time data will be sent to ISRO's ground station for further analysis and to deduce concrete results. These results will prove heavily beneficial to ISRO and other space agencies in planning future manned missions.





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Development Process

The development of the rocket spans about a year. The first stage of the development begins with preliminary research to develop feasible concepts and the mission timeline. Several technical sessions help us finalise the design through analysis and validation. Small prototypes are built during the course of the semester to test and analyse the designs. Once the designs are properly validated, manufacturing files are created and sent off to the local manufacturers. The manufacturing phase of the rocket will be concluded by the end of March. Several pre-assembly tests are done and the rocket finally enters into the Assembly, Integration and Testing phase. Rigorous testing is done on the rocket to ensure that the rocket holds true to the name and reputation of the team. Once the rocket is ready, it is finally shipped to the competition. To keep on track with the proposed timeline, the team requires adequate funds and industrial support. Initially the team was supported with a seed money of **Rs. 1,50,000** by the college to realise the prototype at the start of the financial year. The budget of the entire project is estimated to be around **Rs. 9,00,000**. To meet the deficit, the team always looks for support and industrial collaborations.

PROJECT BUDGET				
Project Title: ReSOLV-Mk-I			Estimated Total Cost: ₹ 9,19,382.00	
Subsystem	Description	Cost (₹)		Total (₹)
		EM	FM	
Aerostructures	Rocket stability, Drag reduction and design of a robust structure	84,549.00	2,04,549.00	2,89,098.00
Avionics	Powering and guidance of Rocket	-	42,016.00	42,016.00
Propulsion	Provides thrust to reach the apogee	36,830.00	77,895.18	1,14,725.18
Recovery	Safe retrieval of Rocket	36,300.00	50,600.00	86,900.00
Payload	Objective of the rocket	34,840.00	49,990.00	84,830.00
SA Cup Fee	Rocket fee and Team registration fee	-	1,31,812.65	1,31,812.65
Logistics	Shipping and customs charges	-	1,70,000.00	1,70,000.00
Total		1,92,519.00	7,26,863.00	9,19,382.00



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MILESTONES

2015
Inauguration of the team by Late Prof. Udipi Ramachandra Rao, Former Chairman, ISRO

2017
First place in 'Space Missions' competition held at Indian Institute of Astrophysics

2017
Talk on India's successful Mars Orbiter Mission by Mr. Nitin Ghatpande, URSC

2018
Talks on "Trends in Satellite Technology and Challenges faced by Student Satellites" by Prof. M Krishnaswamy, ISRO

2019
Visit to Airbus India facility in Bengaluru as part of sponsorship and partnership for the team

2020
Acceptance of the RVSAT-1 PDR by ISRO

2021
Promotional Video of TA in Cranfield University's International Space Students' Workshop

2017
Approval of Baseline Design Review (BDR) by ISRO.

2017
Meeting with Indian Institute of Astrophysics for seeking technical assistance for projects.

2017
Meet with FCCI, New Delhi for sponsorships for the team.

2019
Expanded our horizons and started a new project of manufacturing Sounding Rockets.

2020
Participation in the Human Spaceflight Conference hosted by ISRO-IAA-ASI.

2020
Ret. NASA Scientist Mr. Ravi Margasahayam addressed TA on his journey from RVCE to NASA.



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RESEARCH ACCOLADES

- **10 Paper Publication** in the **70th International Astronautical Congress**, 2019, Washington DC, USA
- **02 Paper Publications** on the **Satellite Day 2018, URSC, ISRO**, Bengaluru, India
- **01 Paper Publication** in the **International Congress at AIDAA 2019**, Rome, Italy
- **01 Paper Publication** in the **IEEE International Conference for Convergence in Technology**, Mangalore, India.
- **09 Paper Publications** at **71st International Astronautical Congress**, 2020, The
- **Paper Publications** at **69th International Astronautical Congress**, 2018, Bremen, Germany
- **01 Paper Publication** at **International Conference on Small Satellites 2019**, Hyderabad
- **02 Paper Publications** at Alchemist, Belagavi
- **01 Poster Publication** at the **International Conference on Small Satellites**, 2019, Hyderabad, India
- **02 Conference Papers** and **02 journal publications** at **IJNTSE**, 2018 India
- **03 Papers Publications** a **2nd ICMAE 2018**, Indore, India.
- **01 Paper Publication** at **IEEE Aerospace and Electronics Aeroconf**, 2020 BigSky, Montana.
- **02 Paper Publications** at **IEEE Aeroconf 2021**.

-----**39 PUBLICATIONS**-----

OUR WORK – A PICTORIAL REPRESENTATION

The technical progress of the team has been in leaps and bounds. A few technical milestones are depicted below in a more perceptible manner.



Figure 1: OpenRocket model of ReSOLV-1

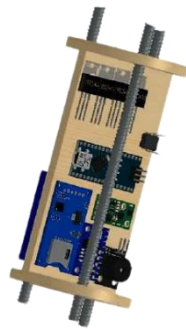


Figure 3: Avionics Bay of Insight-1

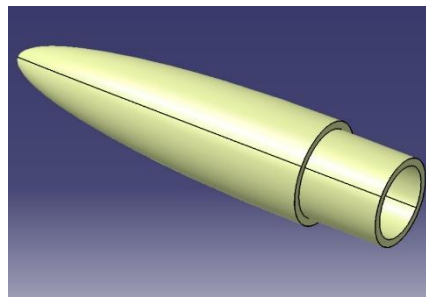


Figure 2: Nose Cone of Insight-1

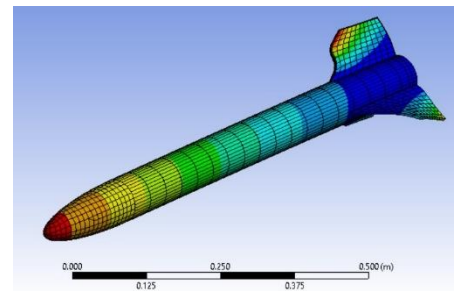


Figure 4: Structural Analysis of Insight-1

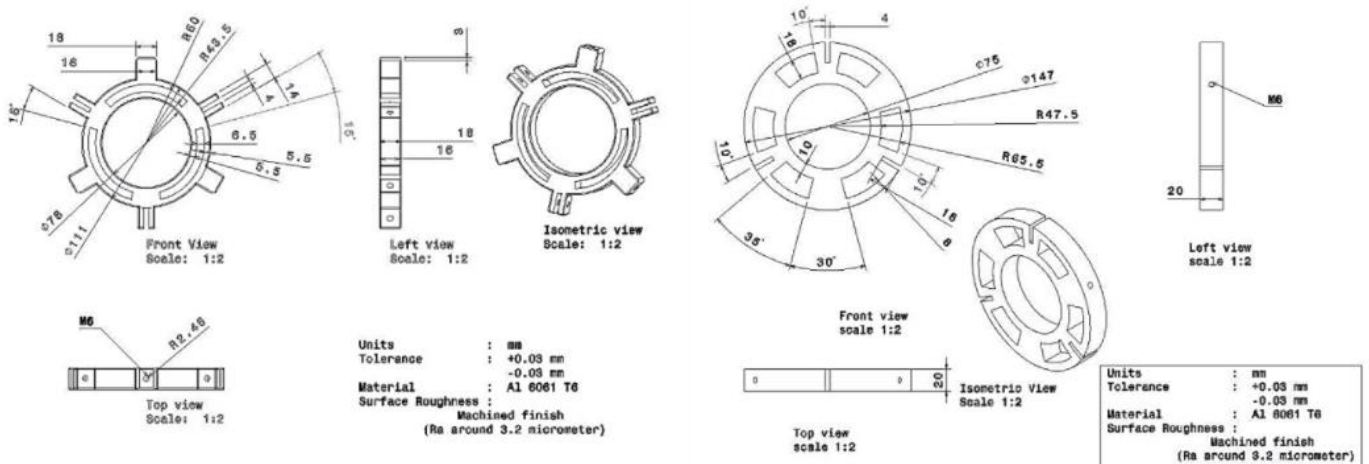


Figure 5: 3D CAD Model



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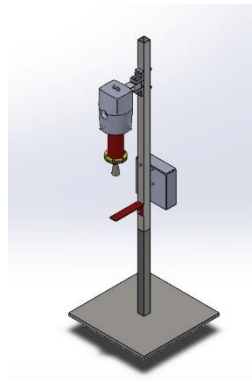


Figure 6: Static Fire Test Stand

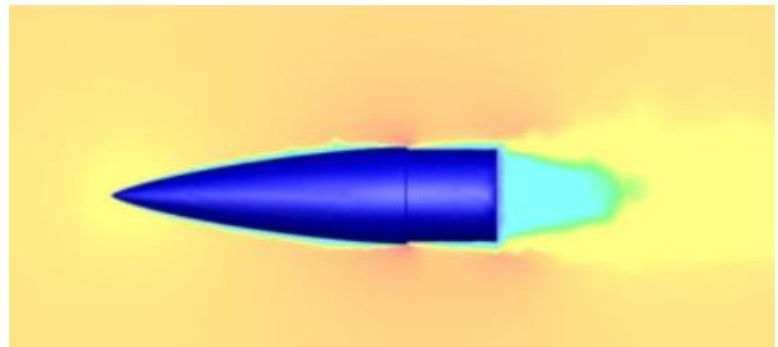


Figure 7: CFD Analysis



Figure 4: Prototype

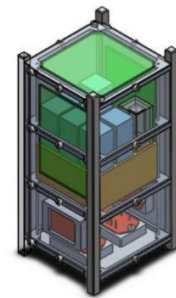
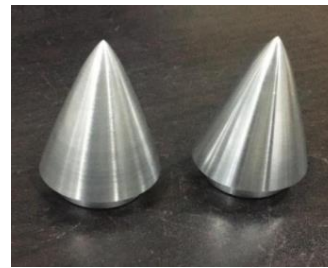


Figure 5: Production and Manufacturing

OUR TOOLS





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Sponsorship Levels

With the help solicited, we will be able to succeed in the completion of such projects and compete in competitions like the Spaceport America Cup. Your contributions will also serve as a morale booster in the completion of our RVSAT-1 project. A sponsorship chart is depicted below which is the sponsorship standard that Team Antariksh uses. Benefits from the team will be provided in every possible way the team can, based on the monetary value of your support. The team is willing to work out any other way so that we end up with a mutually beneficial partnership.

- ✓ Platinum (₹3,00,000 and above)
- ✓ Gold (₹1,00,000 and above)
- ✓ Silver (Upto ₹1,00,000)

BENEFITS	SILVER TIER	GOLD TIER	PLATINUM TIER
	UPTO ₹1,00,000	ABOVE ₹1,00,000	ABOVE ₹3,00,000
Availability of Team for Presentation		✓	✓
Exclusive Video	✓	✓	✓
Website Presence	✓	✓	✓
Database			✓
Industry based Innovation Labs			✓
Campus Ambassadors			✓
Assistance in Workshops		✓	✓
Social Media Shout out	✓	✓	✓
Access to Capable Maturity Model		✓	✓
CSR Tax Incentives	✓	✓	✓
Conduct Placement and Internships			✓
Acknowledgement in Team Publications / Events		✓	✓
Media Presence		✓	✓
Logo Placement (Team Apparels and Rockets)			
40 x 40 cm Prominent Logo on Front Body Tube			1 Logo
30 x 30 cm on Front Body Tube		1 Logo	
20 x 20 cm on Aft Body Tube	1 Logo		

* Benefits are liable to change based on the discussions between the two parties



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