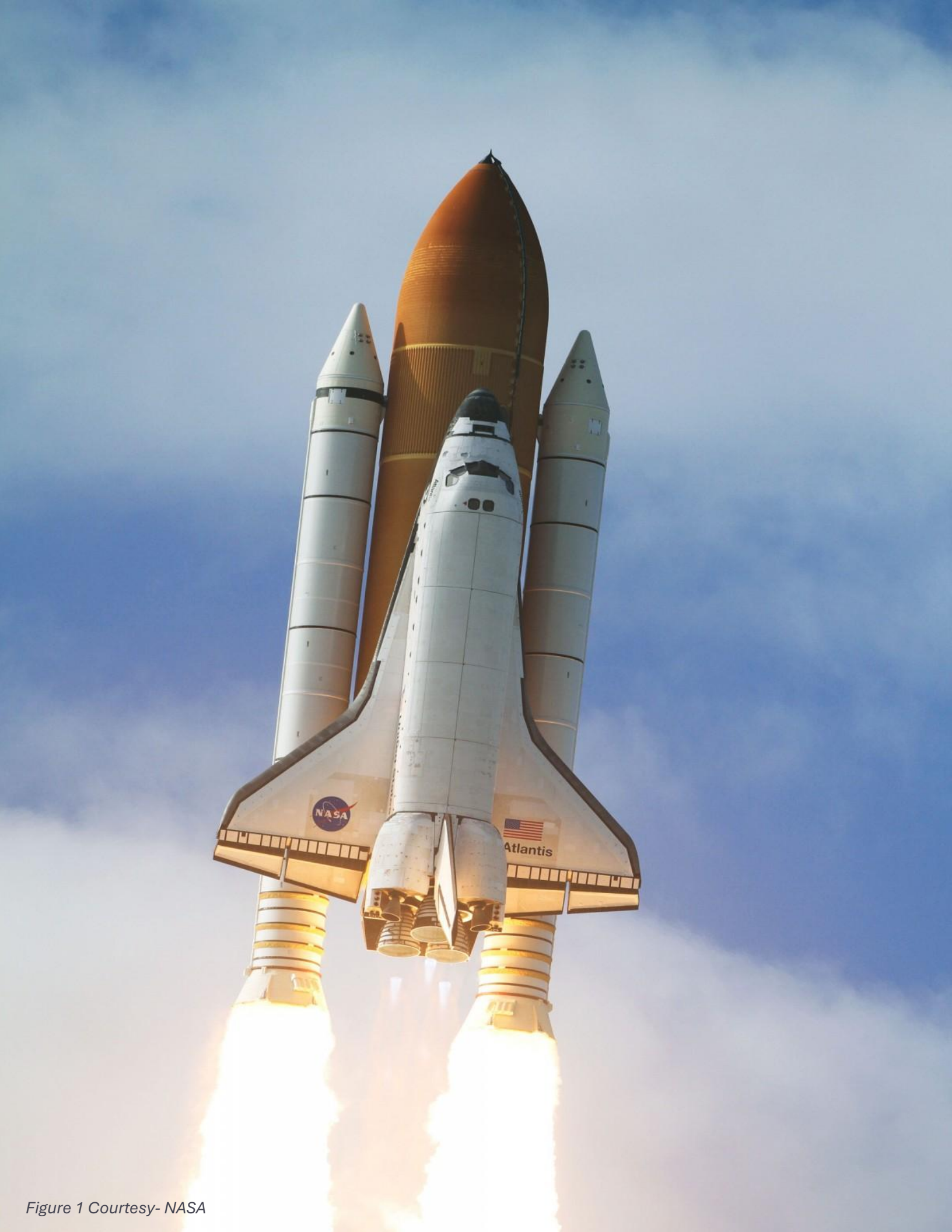


Figure 1 Courtesy- NASA

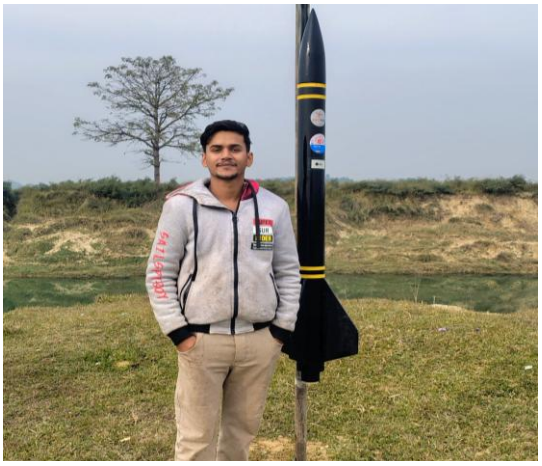
With a proven track record in the field, we offer companies a unique opportunity to collaborate and achieve precision-crafted solutions at an affordable cost. Combining technical excellence with meticulous attention to detail, our services are designed to deliver unparalleled quality, making us a trusted partner in the exciting world of model rocketry.

By Ratnesh Soni

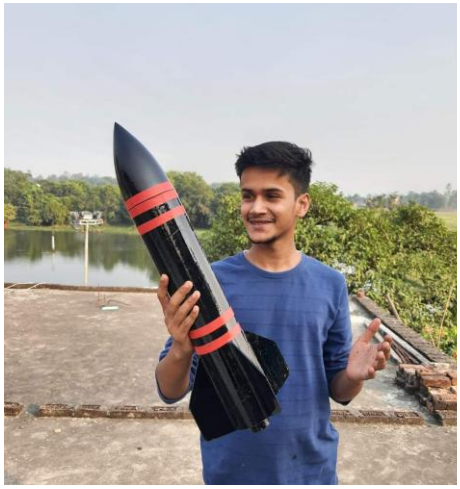
INDEX

1. ABOUT US

This was founded by Ratnesh Soni, a passionate rocketry enthusiast who began his journey in model rocketry as a hobby in 2016. With a background in chemistry and a strong curiosity about how things work, Ratnesh turned his fascination into a more serious pursuit.



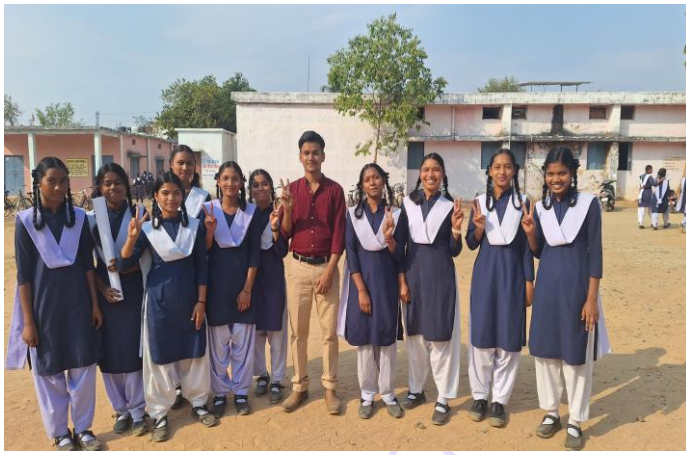
In 2020, during the lockdown, he launched his YouTube channel Series Experiment to share his knowledge of rocket science with a wider audience. Self-taught through books and by connecting with experts worldwide, especially from the U.S. and Canada, Ratnesh began teaching viewers how to create rocket motors using materials like sugar, potassium nitrate, and PVC pipes.



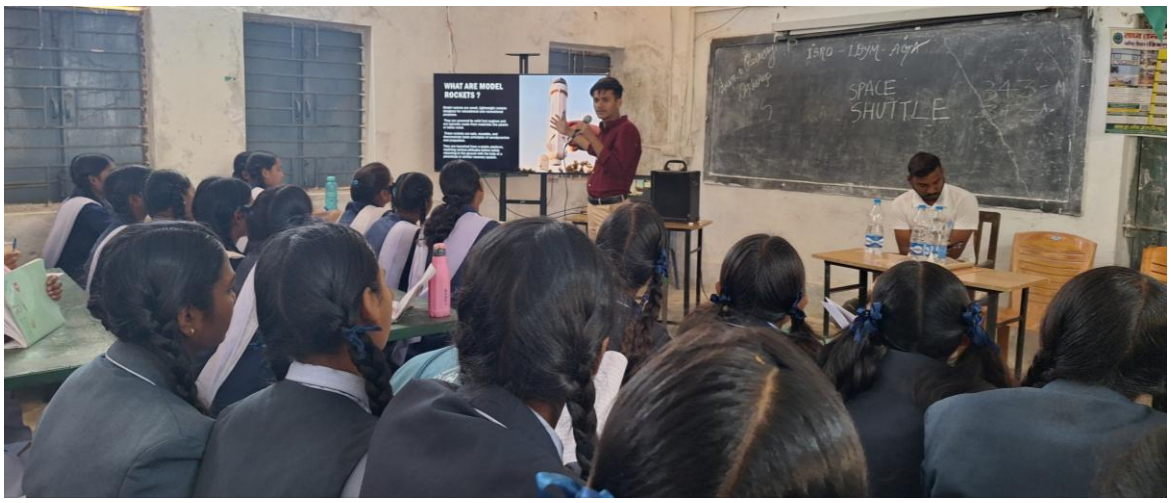
The tutorials on his channel cover a range of topics, from making low to high-power rocket motors to explaining how everyday materials can be transformed into powerful rocket engines.

His step-by-step guides, including methods for producing rocket fuel, attracted a dedicated following, with Series Experiment becoming the go-to source for rocketry information in Hindi.

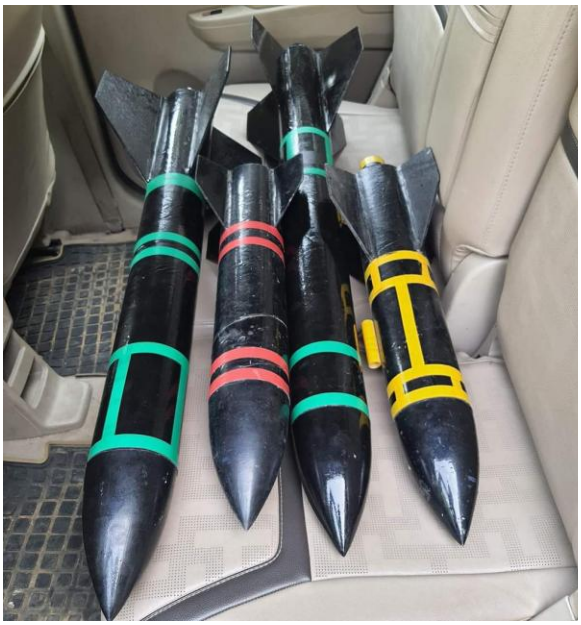
Recognizing that not everyone has the time or experience to make their own motors, Ratnesh founded this amazing platform for providing quality services. We provide pre-built rocket motors to educational institutions, NGOs, and select individuals, ensuring that all products are used responsibly.



The company operates primarily through platforms like Instagram, Facebook, and YouTube, helping to promote rocketry in India. Our mission is to make model rocketry accessible, fostering curiosity and innovation among students.

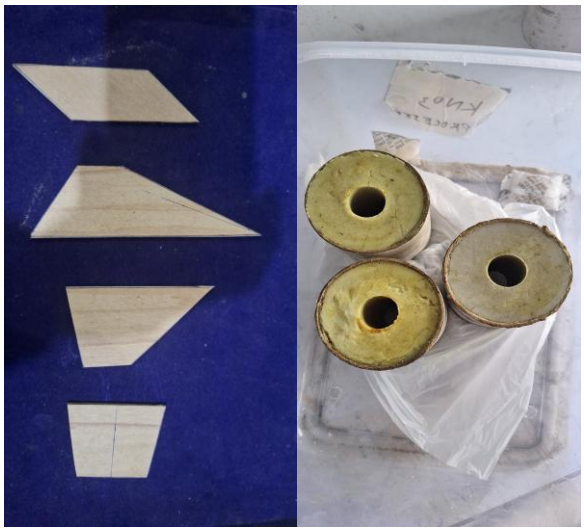


2. WHAT IS MODEL ROCKETRY?



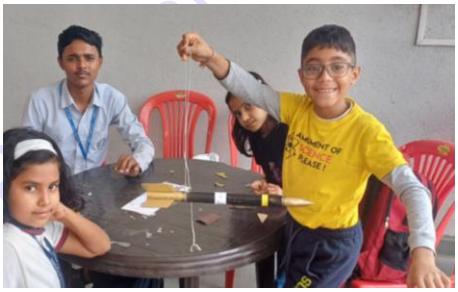
Model rocketry is a hobby and educational activity that involves designing, building, and launching small rockets powered by commercially available solid motors. Made from lightweight materials like plastic or cardboard, these rockets use simple engineering principles to reach heights from a few hundred to several thousand feet.

With parachutes or recovery systems, they return safely to the ground, making it a safe and accessible introduction to rocketry. Model rocketry mirrors real-world rocketry, introducing enthusiasts to core principles like aerodynamics, propulsion, and Newton's Laws of Motion.



SCIENCE AND ENGINEERING BEHIND MODEL ROCKETRY

Model rocketry integrates several scientific and engineering concepts:

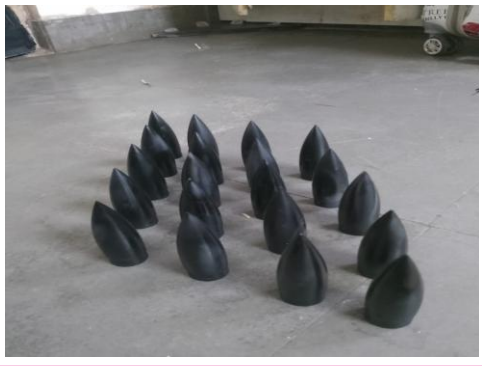


1.Aerodynamics: Understanding air interaction with the rocket's body to ensure stability and efficiency.

2.Propulsion: Achieved using solid rocket motors, often made with potassium nitrate and sugar.

3.Thrust: Provides the upward force needed to overcome gravity and air resistance.

4.Newton's Laws of Motion: Dictate the rocket's movement based on action-reaction forces.

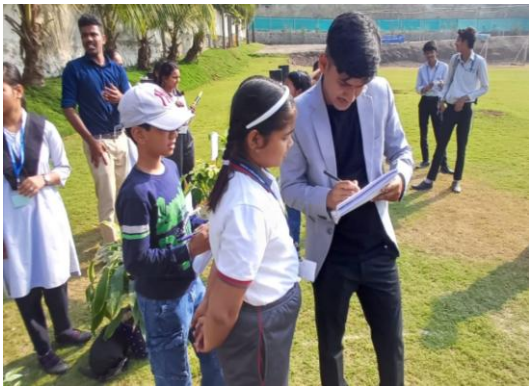


5.Structural Engineering: Rockets are built from lightweight yet sturdy materials, ensuring they can withstand the forces of flight. Through model rocketry, students get practical exposure to aerospace engineering, applying principles used by organizations like NASA and ISRO.

3. WHY MODEL ROCKETRY FOR STUDENTS?

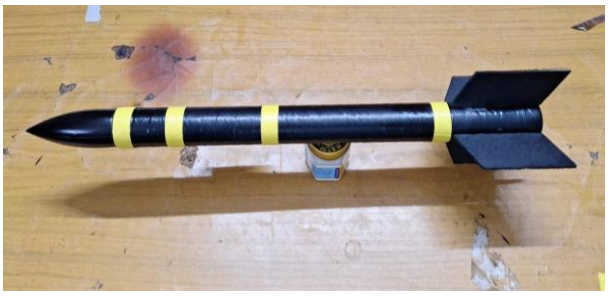
Model rocketry is a powerful educational tool, offering several key benefits:

1. STEM Learning: Incorporates science, technology, engineering, and mathematics, making complex concepts tangible and engaging. Students learn through doing, which enhances their grasp of key ideas like thrust, gravity, and air resistance.

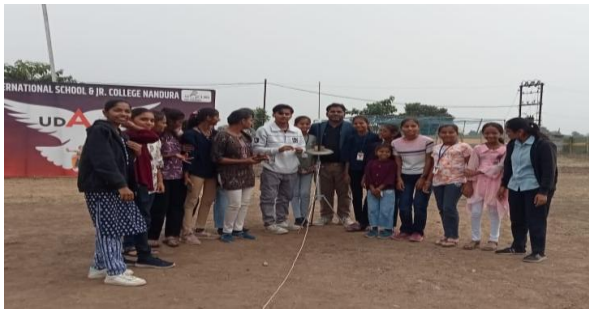


2. Hands-On Experience: Unlike traditional learning, model rocketry requires students to build, test, and refine their projects. This practical approach helps them develop real-world skills.

3. Problem-Solving Skills: Model rocketry challenges students to improve rocket designs, optimize flight paths, and ensure safe recoveries, fostering critical thinking and creativity.

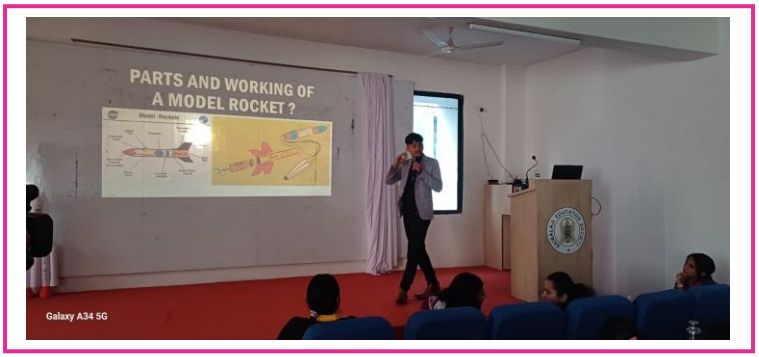


4. Creativity and Innovation: Students design and test rockets, experimenting with different shapes and materials. Each launch becomes a learning experience that encourages innovative problem-solving.



5. Mathematics in Rocketry: Involves calculating flight trajectories, launch angles, and flight times. These real-world applications deepen students' appreciation for mathematics.

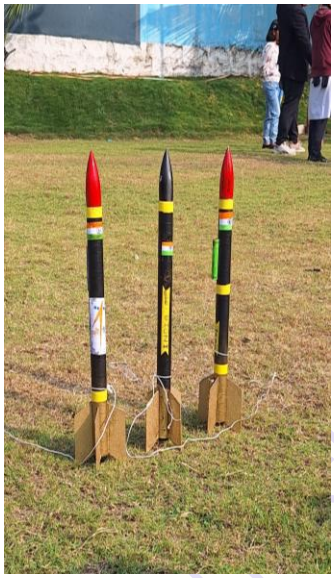
6. Space Missions and the Indian Context: With the success of missions like Chandrayaan and Gaganyaan, space exploration is a growing field in India. Model rocketry taps into this excitement, encouraging students to pursue careers in aerospace engineering and space science.



WHY MODEL ROCKETRY IS RELEVANT FOR INDIA?

India's achievements in space exploration, notably ISRO's Chandrayaan-3 and Gaganyaan missions, have ignited national interest in rockets and space missions. Model rocketry presents an accessible entry point for students to engage with aerospace science.

As India continues its ascent in the global space industry, model rocketry helps cultivate the next generation of space scientists and engineers.



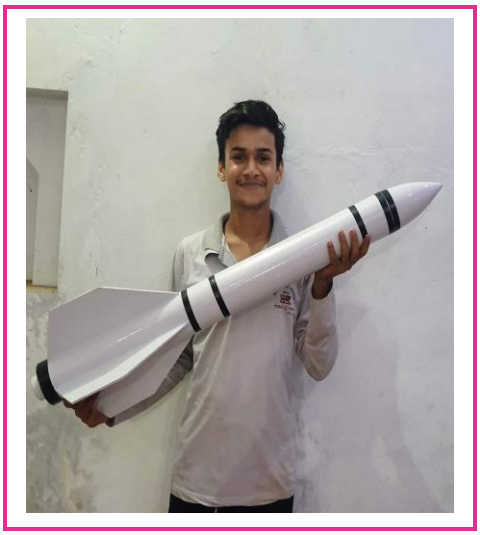
It aligns with India's goal of promoting scientific literacy and innovation, providing students with the skills they need to contribute to future space missions and technological advancements.

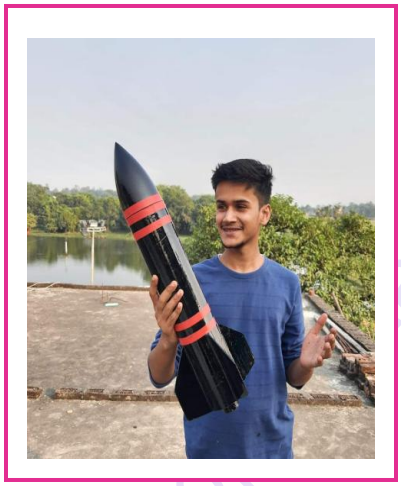
Introducing model rocketry to students not only nurtures a passion for space but also helps India build the next generation of space scientists, engineers, and innovators.

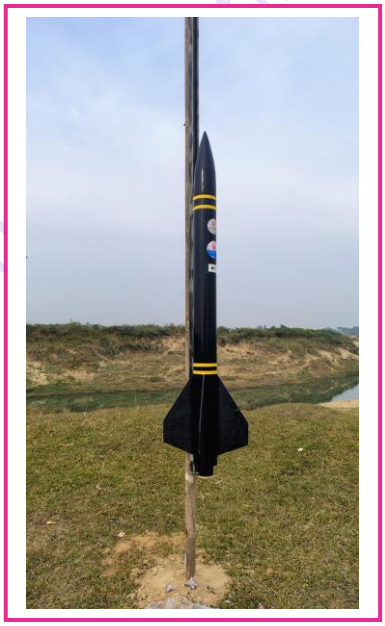
The rise of STEM education initiatives across the country, model rocketry can play a crucial role in driving interest in science and engineering among students from all backgrounds.

Moreover, model rocketry aligns with India's vision of promoting scientific literacy and innovation.

By making model rocketry accessible, affordable, and educational, students are equipped with the skills they need to contribute to India's future space missions, research, and technology development.

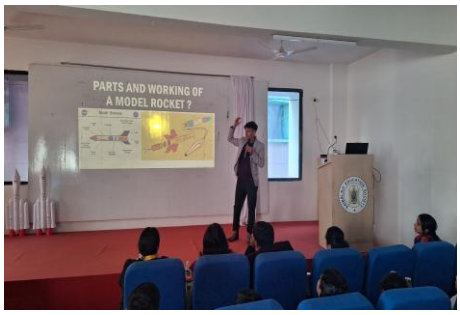






4. WORKSHOPS AND TRAINING PROGRAMS

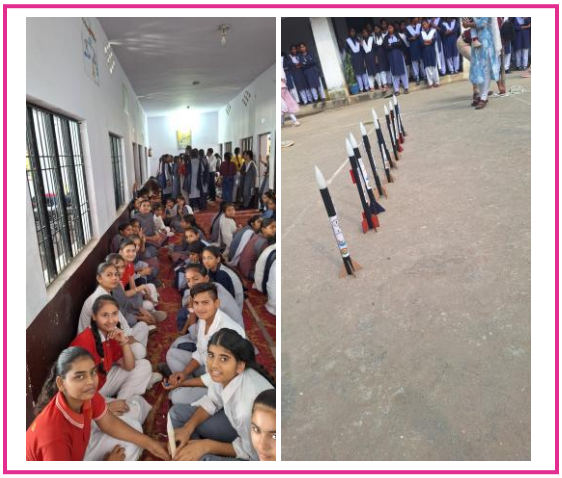
We conduct engaging and educational workshops that offer students hands-on experience in model rocketry. Our team arrives at your institution with all the necessary materials and expertise to facilitate a comprehensive learning experience.



Depending on the number of students, whether it's 200, 500, or 1000, we begin with an interactive theory session in an auditorium or classroom setting. This introductory lecture covers the fundamentals of model rocketry, its science, and the educational benefits it offers. We explain how concepts like aerodynamics, propulsion, and physics come into play during rocket construction and launch.

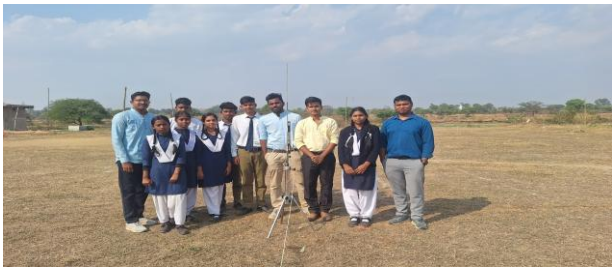
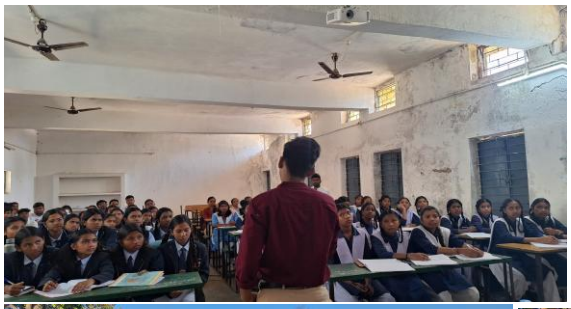
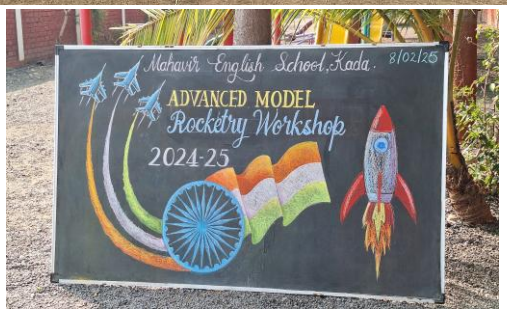
After the theory session, students get hands-on by building their own model rockets. We provide them with the necessary parts, including airframes, nose cones, and fins. Students are given guidance on designing and assembling their rockets.

For example, they are shown how to cut fins to specific dimensions, ensuring their rockets are stable and flight-ready. This design process encourages creativity and problem-solving, as students must think critically about how each component affects the rocket's flight performance.

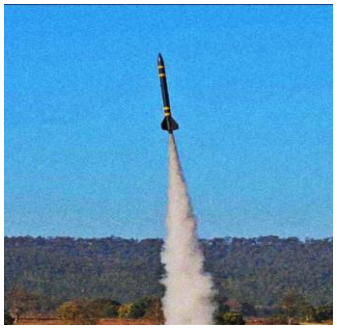
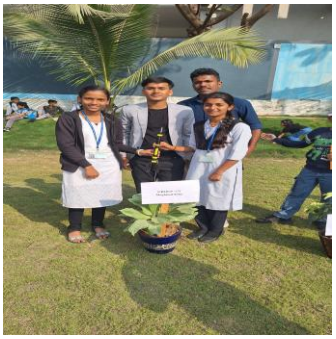


Once the rockets are assembled, we provide pre-made rocket motors, ensuring safety and reliability. Finally, we head to an open field where students get to launch their rockets, witnessing the practical application of their learning.

This experience not only inspires students but also gives them a tangible understanding of aerospace engineering and science.



5. PRODUCTS AND OFFERINGS

- We offer a range of 15 different types of model rocket motors, designed for various educational and recreational purposes. Our motors vary from the A7 class, which generates an average thrust of 7 Newtons, to the F62 class. **The F class represents motors with an impulse ranging from 40 to 80 Newton-seconds (Ns), while the "62" indicates an average thrust of 62 Newtons. These motors cater to a wide range of model rocket enthusiasts, from beginners to advanced users.**

- Our rocket motors are primarily sugar-based, using a mixture of potassium nitrate and sucrose, though we also use other sugars like dextrose, maltose, and lactose depending on the application. We rely heavily on sucrose and dextrose for most of our motors, ensuring a reliable and safe combustion process. This approach not only makes our motors cost-effective but also teaches students about the basic chemistry behind solid rocket propulsion.

- In addition to functional rocket motors, we offer detailed models and cross-sections of solid rocket motors, allowing students to visualize and understand the internal structure and operation of these engines.

- **We also provide transparent rocket motors, made from thick acrylic pipes, enabling students to observe the motor's working process during demonstrations. This visual learning tool makes it easier for students to grasp the science behind rocket propulsion.**

- Our full product catalog, including pricing and specific details, will be provided by one of our associates, whose contact information will be included in the proposal.

WORKSHOPS

PRITHVI

This is a one-day workshop that includes a 35cm long cardboard body tube with a 7cm PVC ogive-shaped nose cone.
It uses a Sugar rocket motor with 1mm plywood fins.
A team of 5 members can build and launch a rocket capable of lifting 120g to 600ft.

Cost: ₹30,000 excluding travel, food, and accommodation

Per student - 300 INR
Breakdown:

- ₹215,000: Materials for 30 rockets
- ₹13,000: Instructor fee (Ratnesh)
- ₹2,000: Motor labor, packaging, and delivery

PROTIUM

This is a one-day workshop that includes a 35cm long cardboard body tube with a 7cm PVC ogive-shaped nose cone.
It uses a C-class black powder rocket motor with 1mm plywood fins.
A team of 5 members can build and launch a rocket capable of lifting 120g to 1000ft.

Cost: ₹45,000 excluding travel, food, and accommodation

Per student - 300 INR
Breakdown:

- ₹27,000: Materials for 30 rockets
- ₹15,000: Instructor fee (Ratnesh)
- ₹3,000: Motor labor, packaging, and delivery

DEUTRIUM

This is a one-day workshop that introduces sugar-based motors with higher thrust, capable of lifting 120g to 1500ft.

The airframe design remains the same as PROTIUM.

Cost: ₹75,000

Per student - 500 INR

Breakdown:

- 44,000: Materials for 30 rockets
- ₹25,000: Instructor fee
- ₹6,000: Motor labor, packaging, and delivery

TRITIUM

An advanced two-day workshop offering both C-class and powerful F-class motors with recovery systems.

Participants design their rockets and engage in drag races on the second day.

Cost: ₹150,000 excluding travel, food, and accommodation

Per student - 1000INR

Breakdown:

- ₹100,000: Materials for 30 rockets
- ₹40,000: Instructor fee
-₹10,000: Motor labor, packaging, and delivery

HIGH POWER ROCKET LAUNCHES

Type A Rocket

Specifications:

Diameter: **90 mm**

Length: 890 mm

Material: Cardboard

Motor: 4 grain motor with 25.4 mm diameter

Motor length: 305 mm (fully finished)

Expected Apogee: **3,000 ft**

Cost of Launch: **20,000 INR** (excluding travel, accommodation, and food)

Type A+ Rocket

Specifications:

Diameter: **110 mm**

Length: 1,525 mm

Material: PVC or PVC-coated Fiberglass

Motor: 5 grain motor (PVC material) or 8 grain motor (Fiberglass material)

Motor Diameter: 50.8 mm

Motor Length: 533.4 mm

Expected Apogee: **7,000 ft**

Cost of Launch:

40,000 INR (if made with PVC)

60,000 INR (if made with Fiberglass)

(Excluding travel, accommodation, and food)

Type A++ Rocket

Specifications:

Diameter: **130 mm**

Length: 2,135 mm

Material: Fiberglass

Motor: 9 grain motor with 50.8 mm diameter

Expected Apogee: **12,000 ft**

Cost of Launch: **150,000 INR** (excluding travel, accommodation, and food)

Payment Terms

- **50% payment** must be made **30 days before the workshop.**
- Remaining **50%** must be paid **7 days before** the workshop.
- **Non-compliance will result in workshop cancellation.**

6. SAFETY AND COMPLIANCE

- Safety is our top priority during model rocketry workshops and demonstrations. We follow strict safety protocols to ensure a secure environment for both students and staff. Before conducting any workshop, we ensure that the hosting institution, such as a school or NGO, is equipped with essential safety measures, including fire extinguishers and a safe, open area for rocket launching. Additionally, we work closely with the institution to appoint range safety officers, who can be teachers or other trained personnel, responsible for supervising the safety of the participants. This guarantees that students are always at a safe distance from the rocket launch area.

- One of the key safety features of our workshops is the use of electrical ignition systems instead of traditional pyrotechnic fuses. This allows us to ignite model rocket motors from a safe distance of 20 to 40 meters, ensuring that both students and staff are well away from the launch site during ignition. Electrical ignition also minimizes waste and pollution, making it an environmentally friendlier choice.

- We also maintain a bag of sand at all launch sites to address any potential emergencies quickly. In the unlikely event of a fire or malfunction, this simple yet effective tool can be used to extinguish flames and prevent accidents. Furthermore, we make sure that all our model rocket motors can be safely neutralized if needed. By submerging the motors in water, they can be rendered inactive and disposed of without risk, adding an extra layer of safety.

IMAGE SOURCE - INTERNET

- Beyond these precautions, all participants are required to stay within designated safe zones during launches, and safety protocols are explained thoroughly to everyone involved before any activity begins. Our approach ensures that students can enjoy learning about rocketry in a controlled, safe, and exciting environment.

7. COLLABORATIONS AND PARTNERSHIPS

We focus on creating partnerships and collaborations with NGOs and educational institutions to promote model rocketry and scientific learning. We offer our rocket motors at an affordable cost, specifically designed for educational purposes. Whether it's high-power rockets for engineering institutions or simpler model rockets for general educational activities, we provide tailored solutions to foster STEM learning.

AFFORDABLE ROCKET MOTORS FOR NGOS AND EDUCATIONAL INSTITUTIONS

We offer rocket motors at affordable prices to NGOs and educational institutions. We provide high-power rockets specifically designed for educational purposes, focusing on both engineering and non-engineering backgrounds. These high-power rockets are designed to introduce students and participants to the complex yet fascinating world of rocketry, giving them hands-on experience with advanced rocket motors. **However, it is important to note that these high-power rocket motor facilities are only available to NGOs and educational institutions, not to individuals.**

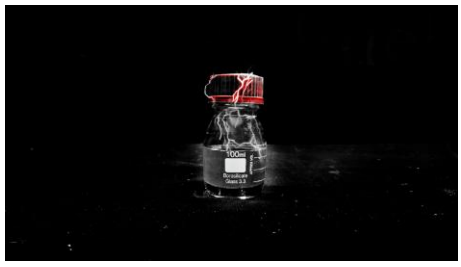
Our recent partnerships include collaborations with SPSTI (Society for Promotion of Science and Technology in India), Rocketeers India and IDYM-ISRO-AGA. Our founder, Ratnesh Soni, mentored over 1000 kids during a summer camp organized by SPSTI, covering regions such as Faridabad, Yamunanagar, and Panchkula in North India. These workshops focused on hands-on learning, where students designed and built their own model rockets under the guidance of our team.

IMAGE SOURCE - INTERNET

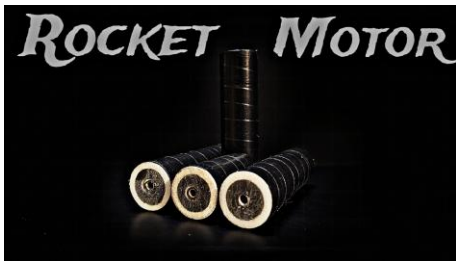
Additionally, we collaborated with schools like those in Gujarat for science exhibitions, where we provided custom rocket motors that worked efficiently and safely. We are also open to future collaborations with NGOs and educational institutions, offering opportunities for sponsorships and community engagement.

When conducting workshops or partnering with organizations, we encourage them to include our brand on their merchandise, alongside their own, to symbolize our collaboration. This helps in creating a joint branding effort while ensuring that both parties receive the recognition they deserve.

For any collaborations, our founder, Ratnesh Soni, who also runs a successful YouTube channel (**Series Experiments**) with 20,000+ subscribers, is always present in the field. He shares these experiences on his platform, giving our partners the opportunity to reach a broader audience and engage more effectively with the community.



SOURCE- SERIES EXPERIMENTS



SOURCE- SERIES EXPERIMENTS

IMAGE SOURCE – SERIES EXPERIMENTS

STRENGTHENING PARTNERSHIPS THROUGH CO-BRANDED MERCHANDISE

We are dedicated to cultivating strong, meaningful connections with our partners. As part of these collaborative efforts, we proudly offer to wear co-branded merchandise that reflects the partnership between Us and our collaborating NGOs or institutions during workshops, events, and public engagements.

For example, when we partner with an NGO or institution for a model rocket workshop, our team will wear merchandise that showcases both ours and our collaborator's branding. This co-branded apparel symbolizes the spirit of partnership, promoting both organizations to a wider audience. With thoughtful messaging such as "In Collaboration with Our Valued Partner," we highlight the mutual respect, shared vision, and commitment to working together.

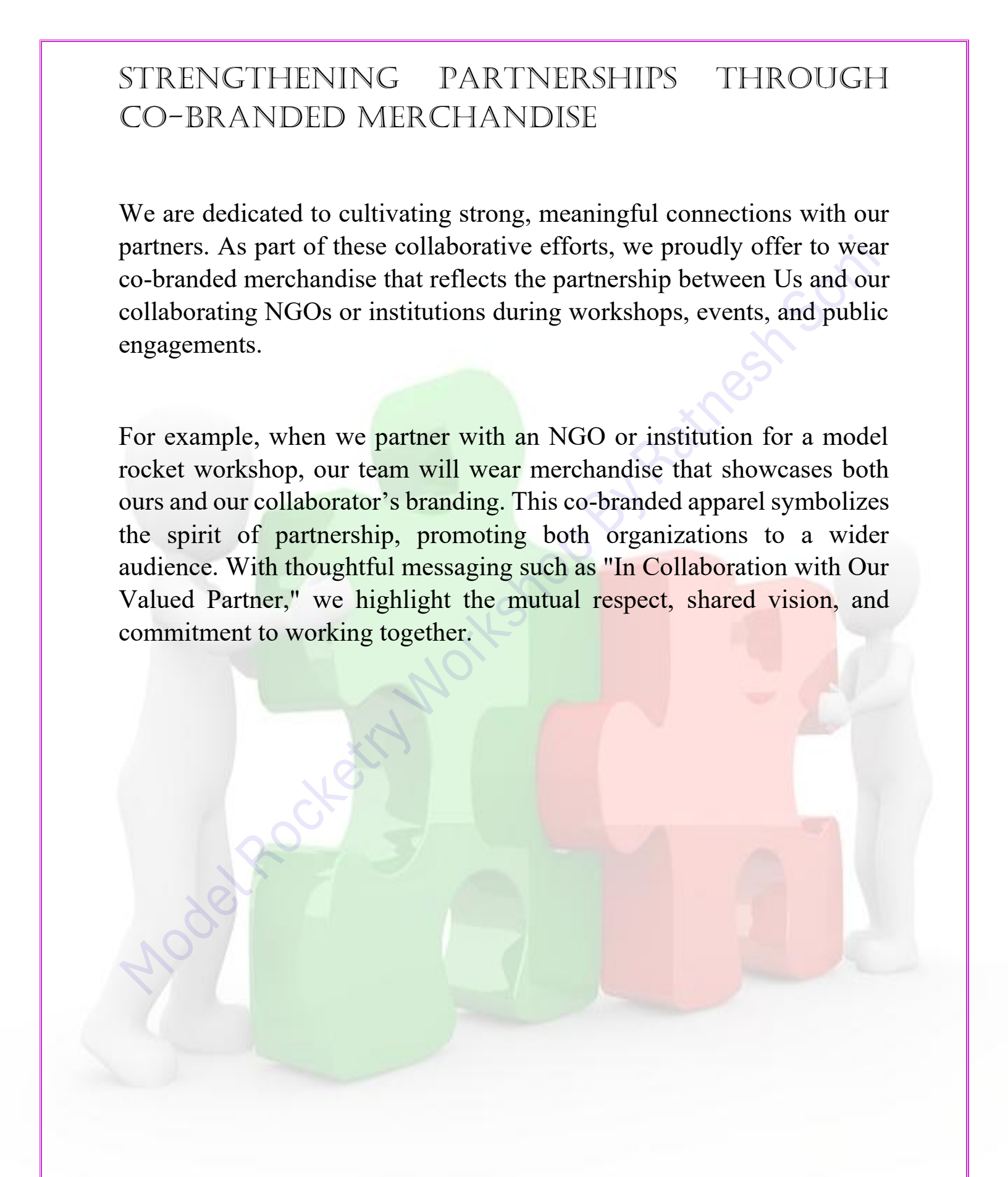


IMAGE SOURCE - INTERNET

8. CONTACT INFORMATION AND NEXT STEPS

For any inquiries, collaborations, or to learn more about how we can work together, feel free to reach out to us:

- **General Inquiries and Collaborations:** Call us at **+91-700747815** or mail us at **hrithiksoni1122@gmail.com**

- **Workshops and Rocket Motors:** Call us at **+91-9440467901** or email us at **hrithiksoni1122@gmail.com**.

We're eager to connect and set up meetings or workshops tailored to your needs. Let's work together to achieve something extraordinary.

Stay Connected: -

Follow us on social media for updates and behind-the-scenes content:

- X (formerly Twitter) - https://x.com/series_soni?t=I8lEkxcs76FZjTjC_MvWwg&s=08
- Instagram- https://www.instagram.com/soni.hrithik?igsh=a2dmdWtnNjRqY2cw
- Facebook - https://www.facebook.com/share/1ABukTtd1q/
- YouTube - https://youtube.com/@sciguy700?si=K6eW9qWgoQmEjytY

- Telegram - http://t.me/Series_1122
- WhatsApp - **+91-700747815**

WE LOOK FORWARD TO COLLABORATING WITH YOU!