❖ Center for Innovation, Incubation & Entrepreneurship Development (CIIED)

RIT has initiated setting up "Centre for Innovation, Incubation and Entrepreneurship Development". It provides an ecosystem for early-stage techno-start-ups, which contributes to social and strategic sectors besides being responsible for employments and economic value. This mechanism has helped our students, faculty and community to turn their entrepreneurial vision onto reality.

CIIED targets to help in the development of RIT's entrepreneurial ecosystem by enabling easy and efficient interaction between its major components spanning students, working professionals, aspiring and existing entrepreneurs, mentors, angel investors, venture capital firms and corporate through initiatives like interactive sessions, competitions, conferences.

Under CIIED following cells are initiated and all cells are collaboratively working with Incubation Centre:

- E-Cell for students

- SPACE Club

- ED Courses

Incubation Facilities

At the CIIED, each incubatee has access to the following facilities.

1. Physical office space based on the requirements

2. Access to college Wi-Fi facilities.

3. Meeting rooms and G.B. meeting hall access to conduct company meetings.

4. Access to all the labs to conduct tests / experiments and available software.

5. Access to library.

6. Access to Central Workshop.

7. Access to cafeteria/ Guest House.

8. Access to UG/PG students for project allocation/internships.

9. Power supply with UPS/ DG back up

10. Parking

11. Gayatri Guesthouse (lodging) at discounted rate.

12. 24 x 7 access with physical security.

Services offered by CIIED

At the Center for Innovation Incubation and Entrepreneurship (CIIED), each incubatee gets the following services on request.

1. Legal help through an independent legal advisor on panel of CIIED.
2. Project Report preparation & financial management assistance through Chartered Accountants on panel of CIIED.
3. Taxation Assistance through third party resource.
4. Facilitation of broad band through local BSNL office.
5. Print services (small loads)
6. Guest visits facilitation through on campus resources.

CIIED Activities Conducted in year 2023-24

1. **5 Days Bootcamp on Entrepreneurship Development in association with EvolvingX Services Pvt. Ltd., Pune, during 20th February 2023 to 24th February 2024.**

Photo 1: Inaugural of 5 Days Bootcamp on 'Entrepreneurship Development'.

Photo 2: Resource person Mr. Amol Nitave conducting session in a 5 Days Bootcamp on 'Entrepreneurship Development'.

This 5 Days Bootcamp on 'Entrepreneurship Development' was organized jointly by Centre for Innovation, Incubation and Entrepreneurship Development (CIIED) and NETRARIT Foundation as an academic requirement of Final Year B.Tech and SY MBA (2023-24) ED track students. In addition, other students from Engineering, MBA-IEV, BBA, interested faculties, ED track mentors and external participants were allowed to attend the bootcamp. The bootcamp was conducted by Mr. Amol Nitave (CEO-EvolvingX Services, Pune).

Mr. Amol Nitave is a Social Entrepreneur and experienced Program Management Officer with a decade of vast experience in the Social Sector and IT Industry. He carries a vast and varied exposure to Youth Empowerment through Skilling - Employability, and Entrepreneurship. He is a Software Engineer by qualification, and Innovation Enthusiast & Social Catalyst by choice. He is also a Thought Leader, Orator, and Emerging Author. Team EvolvingX is on a mission to empower millions of youths to make this world a better place!

Objectives: To train ED students & mentors in areas identified in review in the journey to become successful entrepreneur.

Topics covered were:

- Context Setting, Introduction to Entrepreneurship & Startup Ecosystem, identification of problem statement.
- Epicenter of Excellence for Startups or Business, Vast & Varied Exposure required for the Excellence in Startup Ecosystem, Optimized Operations for successful startups.
- Local Challenges & Opportunities, Value Creation & Value System for Startups.
- Networking & Partnerships for scale up.
- Governance Structure for Startups during scale up stage.
- Pitch by all participants, Conclusion of the bootcamp.

❖ Entrepreneurship Development Cell, RIT

E-Cell – for students

Entrepreneurship Development Cell RIT (E-Cell RIT), is a Student Activity Cell (SAC) of CIIED RIT. E-cell is Inaugurated on 14th Feb 2019 with the vision-"To develop an ecosystem that will nurture the development of the Entrepreneurial mindset of the RIT community".

Missions:

1.To provide efficient interaction between its major components spanning students, working professionals, aspiring and existing entrepreneurs, mentors, angel investors, venture capital firms and corporate through initiatives like interactive sessions.

2.To provide basic resources required for an Enterprise.

3.To provide the necessary training programs for the E-Cell community.

4.To provide an efficient channel of communication between the E-Cell community and external institutions.

5. To help the E-cell community identify, solve and deliver solutions profitably, with an entrepreneurial attitude.

Objectives:

1.To work on R&D for Industry mainly for local small and medium enterprises.

2.To address local problems & and innovative and viable solutions.

3.To promote culture of IPR, Technology Transfer & Commercialization.

4. To nurture and promote creative ideas for its conversion into successful products & Technologies.

5.Interfacing and networking between Academic, R&D institutions, Industries, and Financial Institutions.

6.To create new techno-startups.

Events in 2023-24

Sr. No.	Name of The Event	Date
1)	Entrepreneur Of The Month(EOTM)	13/09/2023
2)	Meetup with Dr . Udayagiri Chandrasekhar	25/09/2023
3)	Orientation Program	26/10/2023
4)	Concept craft Competition	08/11/2023
5)	Recruitment Process	24/11/2023 to 30/11/2023
6)	Transfer of positions at E-cell	23/12/2023
7)	Visiting E-Summit 2023	03/02/2024 – 04/02/2024

8)	Session with Mr. Indrajeet (Founder TGP bioplastic)	28/02/2024

1.Entrepreneur of the month

Mr. Dhruva Paknikar Founder of 'Dominix Global Design Pvt. Ltd'

Mr. Dhruva Paknikar sir told us the challenges in the start-up ecosystem at the Startup Conclave. having worked with a lot of start-ups, the journey is beautiful in itself. They believe that with the right efforts, the startup and the business ecosystem in India will be enhanced further, made better! This is for anyone having a dream of starting up and making a huge business. They give one piece of advice: explore different fields and follow your passion. They emphasized to the students that while formal education provides the foundation for learning, true knowledge is acquired through a blend of education and hands-on experience.

2.Meetup with Dr. Udayagiri Chandrasekhar

This meetup is with Dr. Udayagiri Chandrasekhar who is an Indian researcher and educator currently Program Director-Add Wize at Wipro 3D, Bangalore, Karnataka. They encourage us to do variety of activities within the E-cell, including workshops, seminars, networking events, and startup competitions. This helps members of club to a well-rounded understanding of entrepreneurship. They gives us important suggestions about ONDC platform also told us that embrace the ONDC platform as a transformative force for digital commerce. Leverage its open and interoperable architecture to create innovative solutions, foster collaboration among stakeholders, and ensure inclusivity in the digital economy.

3. Concept craft Competition

The purpose of a concept craft activity for students is to foster creative thinking, problem-solving skills, and innovation. Through hands-on projects and students can apply different concepts. This activity aims to instill an entrepreneurial spirit, encouraging students to explore new ideas, cultivate the skills needed for future business endavors. There are 30 students were participate and do very well. Concept craft competition gives us idea about how road map for any organization can made so it will be successed in define timeline. This competition was very interesting and unique. The competition was turn around 45min. Time is very important to deliver content on page with less space and properly manage with all content.

4.Recruitment Process

Orientation Program & Interview

As part of any organization recruitment process is one of most important process. The recruitment set the future direction of any organization. So, we design this recruitment process into two part. First one is orientation program where new recruitment members can know better about E-Cell RIT. This orientation program is of 45 min., while aptitude test is for 1hr. Then we took their interview to know better about them. This interview was mainly focus on their mindset and team working attitude such kind of things. For this Recruitment process 30 students where register and 20 students where shortlist from them.

5.Transfer of position at E-cell

The senior members of team identifies potential of junior members who have demonstrated leadership skills, dedication, and a strong understanding of the e-cell's goals and values. They also mentors and provides knowledge about various sectors. They also helps to understand the responsibilities of the position and guiding us in developing necessary skills. Once the transition is complete and we are ready to assume the position, an official announcement is made to the ecell members and highlighting the transfer of leadership. Even after the transfer of the position, the senior member may continue to provide mentorship and support until we fitting into the new role.

6. National Startup Day Celebration

Celebrating National Startup Day! On January 16th, NRIT TBI and E-Cell RIT came together for an inspiring celebration at RIT. The event featured engaging interactions with innovative startups like Orobot Technologies and Starktech Ventures.

E-Cell RIT took the stage to present our dynamic student club, sharing our vision for seizing opportunities in the startup ecosystem. Grateful for the exchange of ideas and the vibrant entrepreneurial spirit that fills our community. Here's to a future filled with endless possibilities.

7. Entrepreneurship Visit: E-Summit 2024

Place: IIT Bombay, Powai

Attending the 2024 edition of the E Summit at IIT Bombay was an immersive journey into the heart of entrepreneurship and innovation. Renowned speakers like Bhavish Aggarwal, Rajat Sharma, Abhi and Niyu, Sanjeev Kapoor , Pratham Mital graced the stage, sharing their invaluable insights and experiences, which served as guiding lights for aspiring entrepreneurs. This E-summit conducted for 2 days i.e. 3 and 4 Feb. Reflecting on our experience at IIT Bombay's E Summit, we are filled with gratitude for the enriching insights gained and the connections made. It was more than just an event; it was a transformative experience that has empowered us to pursue our entrepreneurial aspirations with renewed vigor and determination.

8. Interaction with Founder of TGP Bioplastic Mr. Indrajeet Nikam

Founder Indrajeet Nikam pitching Satara (Maharashtra) based TGP Bioplastics – that has developed a biodegradable plastic packaging which can replace retail packaging like carry bags and some industrial packaging, at 25% cheaper prices than current biodegradable plastic. The interaction with Mr. Indrajeet is very beneficial for us they clear all doubts in our mind about the growing business and also helps to think beyond limit.

A Report on Space Club activities

SPACE Club

Established on 27th June 2017, Since Space Club has been at the forefront of research and development in rocketry and satellites. Our dedication and passion have driven us to create groundbreaking projects, including rockets like phoenix, EPLV, Vaibhav, and Dhruva series. Our expertise extends beyond rockets to satellite innovations, following with HABs (High altitude balloon satellite) and Can-SAT.

Objectives:

Since 2017, Space Club RIT has been at the forefront of research and development in the fields of rocketry, satellite, and communication systems. Our primary objective is to advance space exploration through the design, development, and launching of innovative amateur rockets and satellite systems.

- Conducting experimental launches to gather data and improve rocketry designs.
- Developing robust launch vehicles capable of carrying payloads to designated altitudes.
- Designing and constructing reliable deployment systems to ensure the safe return of rockets and payloads.
- Establishing a comprehensive ground station to facilitate effective satellite communication.
- Innovating high-quality components for satellite construction.
- Engaging in continuous research to improve the performance and capabilities of satellites and rockets.
- Education and Awareness: Promote education and awareness in the field of rocketry and space research through workshops, seminars, and hands-on projects. Inspire and educate the next generation of space scientists and engineers by providing hands-on learning opportunities and mentorship.

Vision:

"We want to create a culture of fearlessly thinking, designing, and building ideas in the field of space research. Just like space, we will never have any boundaries on thinking, which will lead us toward the great ideas. We will work honestly and morally to bring those ideas into the motion. We want to spread the power of optimism in the community where we serve, and we will expand the community day by day."

Mission:

Our mission is to pioneer the forefront of space exploration and technology through experimental launching of amateur rockets, the development of launch vehicles, and the creation of robust deployment systems. We aim to build our own communication systems and ground stations to facilitate satellite communication, design and develop working satellite models to expand our knowledge, and produce high-quality components for satellite use.

❖ **Space Club _2023-24 Events**

Sr. No.	Events and Programs	Date
1)	Event ‘CHANDRAPRASTHA’	27-Sep-2023
2)	SPIRIT Launch (500 m Rocket)	05-Nov-2023
3)	DHRUVA 1.0 Launch (1500 m Rocket)	10-Dec-2023
4)	DHRUVA 2.0 (1500 m Rocket)	06-Jan-2024
5)	Cambrian labs Workshop	31-Jan-2024
6)	Event ‘ANTARIKSHA’	27-Mar-2024
7)	DHRUVA 2.0 (1500 m Rocket)	05-Apr-2024
8)	LTAs Competition	29-Jun-2024
9)	DHRUVA 2.0 (1500 m Rocket)	11-Aug-2024

1.Evrnt ‘CHANDRAPRASHTA’ _Sep 2023

(‘CHANDRAPRASTHA’ Event)

In the vibrant month of September 2023, our organization proudly orchestrated an exceptional event dubbed "Chandraprastha" to celebrate the monumental achievement of Chandrayan 3. This captivating event served as a platform to delve into the depths of space exploration, featuring a rich tapestry of sessions meticulously crafted to cater to both the technical aficionados and the creatively inclined.

Chandraprastha was a dynamic event, blending technical prowess with creative flair. Attendees were treated to a detailed presentation highlighting ISRO's remarkable achievements and ambitious future endeavors. The presentation hall itself transformed into a space exploration wonderland, with meticulously crafted models of iconic space vehicles like the PSLV, GSLV, Rover, and Lander, offering attendees an immersive journey through the cosmos.

Chandraprastha wasn't just about technical showcases; it was a celebration of curiosity and imagination. Participants were invited to unleash their creativity in a riveting painting competition, where the canvas became a playground for artistic expressions inspired by the wonders of space. The atmosphere buzzed with excitement as participants embarked on a thrilling treasure hunt, navigating through a maze of clues and challenges that seamlessly blended adventure with intellectual stimulation.

From the awe-inspiring presentations to the hands-on activities, Chandraprastha captivated the hearts and minds of participants from all walks of life, making it an unforgettable experience that celebrated both the achievements of ISRO and the spirit of exploration and innovation.

2.SPIRIT Rocket Launch _Nov 2023

(SPIRIT)

In the month of November 2023, our 8th Generation team launched SPIRIT Rocket. Meticulously engineered for a targeted altitude of 500 meters.

Focusing on structural aspects, the rocket stands at length 98.4cm with diameter 6.5cm and mass of 2.6 kg. For recovery, we implemented a single parachute deployment method, strategically chosen for its reliability and efficiency. It is equipped with an I-class motor boasting a motor impulse of 800 Ns. The fuel used is table sugar/sucrose, and the oxidizer is potassium nitrate in a ratio of 65:35. It utilizes cylindrical grains with a circular core. The casing is made of aluminum, and the grains are protected with a PVC liner.

SPIRIT's avionics system features an advanced safety actuation system with precision and has a compact design.

3.DHRUVA _December 2023

(DHRUVA 1.0)

Objective: To build launch vehicle which will carry a payload/satellite and deploy at the apogee.

Description: 'DHRUVA' is the first launch vehicle designed to carry a payload/satellite to an apogee of approximately 1500 meters and deploy the payload for environmental studies. This launch vehicle's flight computer consists of an inertial measurement unit ***(IMU),*** a global navigation satellite system ***(GNSS),*** an advanced safety actuation system, and a wireless communication system, making it a robust launch vehicle in the field.

Addressing the structural aspects, the rocket stands at a length of 148 cm with a diameter of 9 cm and a mass of 6811 g. It features trapezoidal fins, and a nose cone designed in an ogive shape.

DHRUVA 1.0 featured a unique structural design for the electronics bay, which acted as a coupler ***(E-bay as a Coupler)*** for joining the two bodies to form the fuselage. The primary advantage of this design was the easy mounting of the electronics bay. However, there was a significant

disadvantage to this design. The angle of attack of the drag force acted directly on the coupler, i.e., the electronics bay. This resulted in the coupling being weakened, as it was crushed between the drag force and the opposing force of the motor thrust. Because of the e-bay acting as a coupler, our mountings were sequenced as follows motor, e-bay, followed by both bodies' parachutes—first the main body's parachute, then the satellite's parachute with its payload. DHRUVA 1.0 is designed to carry a payload and deploy it at the apogee. The payload will then have its own drift and slow descent for effective environmental monitoring. The monitored parameters include pressure, temperature, altitude, gyration, latitude, longitude, and a gas sensor for detecting CO2.

4.DHRUVA 2.0 _Jan 2024

Description: We built another version of Dhruva 2.0 to address the challenges faced by the previous versions. The bulkheads of the motor were not strong enough to withstand the motor's pressure, causing it to pass through and damage the entire body. We solved this problem by using an aluminum block integrated with wood. This method allowed us to maintain the weight while significantly increasing the strength of the bulkheads, effectively addressing the previous issue.
However, during the launch of the improved Dhruva 2.0, we encountered a new challenge with the construction of the fin can. One of the fins had a structural weakness and cracked during lift-off due to the opposing drag force.

(DHRUVA 2.0)

5.Cambrian labs Workshop _Jan2024

(Cambrian labs Workshop)

From January 30th to February 1st, we participated in a rocketry workshop at the

Cambridge Institute of Technology in Bengaluru. Spanning three days, the event featured sessions on various aerospace engineering topics, including satellites, avionics, structures, and propulsion systems. Experts from organizations like DRDO and DRDL facilitated the workshops, enriching our understanding of rocket technology.

On the concluding day of the workshop, we were privileged to deliver a presentation showcasing our club's achievements and aspirations. This presentation provided us with a platform to share our journey and vision with fellow students and dignitaries in attendance. It was a moment of pride for us to represent our club and demonstrate our commitment to the field of aerospace engineering in front of such esteemed audience.During our presentation, we offered a comprehensive overview of our rocketry initiatives, providing foundational knowledge about our projects. Furthermore, we proudly showcased the successes of our previous rocket launches, highlighting notable achievements such as the Vaibhav, Spirit, and Dhruva missions.

Overall, all the sessions proved immensely beneficial to us. We gleaned a wealth of new knowledge and insights from each session, enriching our understanding of various aspects of rocketry and aerospace engineering.

6.Event 'ANTARIKSHA'

(ANTARIKSHA Event)

The Antariksha Event, a stellar initiative organized by the Space Club in collaboration with E-cell, Idea Lab, and IIC, saw enthusiastic participation from both RIT College and other institutions. With a total of approximately 100 participants, the event aimed to ignite curiosity and foster innovation in the realms of space exploration and technology.

The inaugural ceremony of Antariksha, an event focused on space science and exploration, commenced with an inspiring speech by Mr. Harshad Patil, CEO of Netra RIT. Joined by CIID In charge Mr. P.A. Patil and Space Club Coordinator Mr. Sachin Kumbhar, Mr. Patil set the tone for the event. The day featured an engaging session on astrophysics led by Mr. Rushikesh, sparking enthusiasm among attendees.

Two competitions, Rahasya and Mudra, highlighted teamwork and technical prowess. Rahasya

challenged participants to decode clues.

The event received a distinguished visitor in the form of Director Dr. P.V. Kadole, who graced the exhibition with his presence. Informative posters detailing satellite systems and launch vehicles by ISRO, coupled with meticulously crafted models of PSLV, GSLV, and SSLV, enriched the educational experience. Participants enthusiastically explained the exhibits, further enhancing the learning environment.

The event aimed to educate participants on space science, engage them in hands-on activities, facilitate networking, showcase recent achievements, and inspire career pursuits in space-related fields.

7.DHRUVA 2.0 _Apr 2024

Figure 4.2(DHRUVA 2.0)

Description: Addressing the challenges faced by DHRUVA 1.0, we switched to the traditional method of rocket mountings by placing the e-bay inside the fuselage. Due to the satellite's separate parachute, we decided to place the main parachute between the e-bay and the motor, coupling it to that joint to eject the parachute from the coupler. For the satellite, this time we uniquely placed the electronics inside the nosecone to optimize space, followed by its parachute, ensuring adherence to the thumb rule of length-to-diameter ratio of the rocket. The flight computer of the DHRUVA 2.0 was indeed similar to that of the 1.0, but this time the mounting sequence was changed: it now follows with the motor, then the parachute, the e-bay, and finally the payload with its parachute. For the communication system we used gsm technology for the payload and LoRa technology for main body.

8.Lighter than-air system (LTAs) _ June 2024

Objective: Developing a system that is lighter than air with a controlled propulsion system.

Figure 5.1 (AIRSHIP)

Description: LTAs was developed for 'Regatta' competition organized by iit Bombay. The competition was focused on the design and operation of a lighter-than-air system, specifically an airship with a controlled propulsion system.

In our airship, shown in Figure 5.1, we have incorporated an automatic adjustment system integrated onboard and a self-developed ESC with reverse switching for the propulsion system. To ensure lightweight components, we used bio foam for the fins and balsa wood for the propulsion mountings, which helped in reducing the overall weight of the airship.

9.DHRUVA 2.0 _Aug 2024

Figure 4.4 (DHRUVA 2.0)

Description: We are currently in the process of launching the next version of Dhruva in August, aiming to address every challenge we have faced so far. One significant issue we've encountered is that the CO2 data collected by the payload is not as valuable as initially thought, since CO2 levels need to be monitored daily to make accurate predictions. However, changing the entire payload was not feasible. To overcome this, we decided to shift our focus to reading H2S gas. Additionally, we will use patches of sampler paper on the collar of the nosecone to detect CO2.

To implement this solution, we have designed nosecones with hollow patches on the collar. This will allow us to detect CO2 without altering the payload significantly.

Furthermore, we have integrated camera modules into both bodies of the rocket to capture views and study the onboard environment. Moving forward, we have also made significant improvements to the rocket's structural components. We are now using aluminum 6061 pipes for motor casing instead of stainless steel. The stainless-steel pipes could not handle the peak pressure generated by the fuel, leading to structural integrity issues. The seamless aluminum pipes offer a better solution, providing the necessary strength and durability to withstand the high pressures during flight**.**

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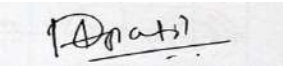

Dr. Pratik A. Patil

Coordinator, CIIED.