



KARUNYA INSTITUTE OF TECHNOLOGY AND SCIENCES

Deemed University

NAAC A++

UGC Category :1



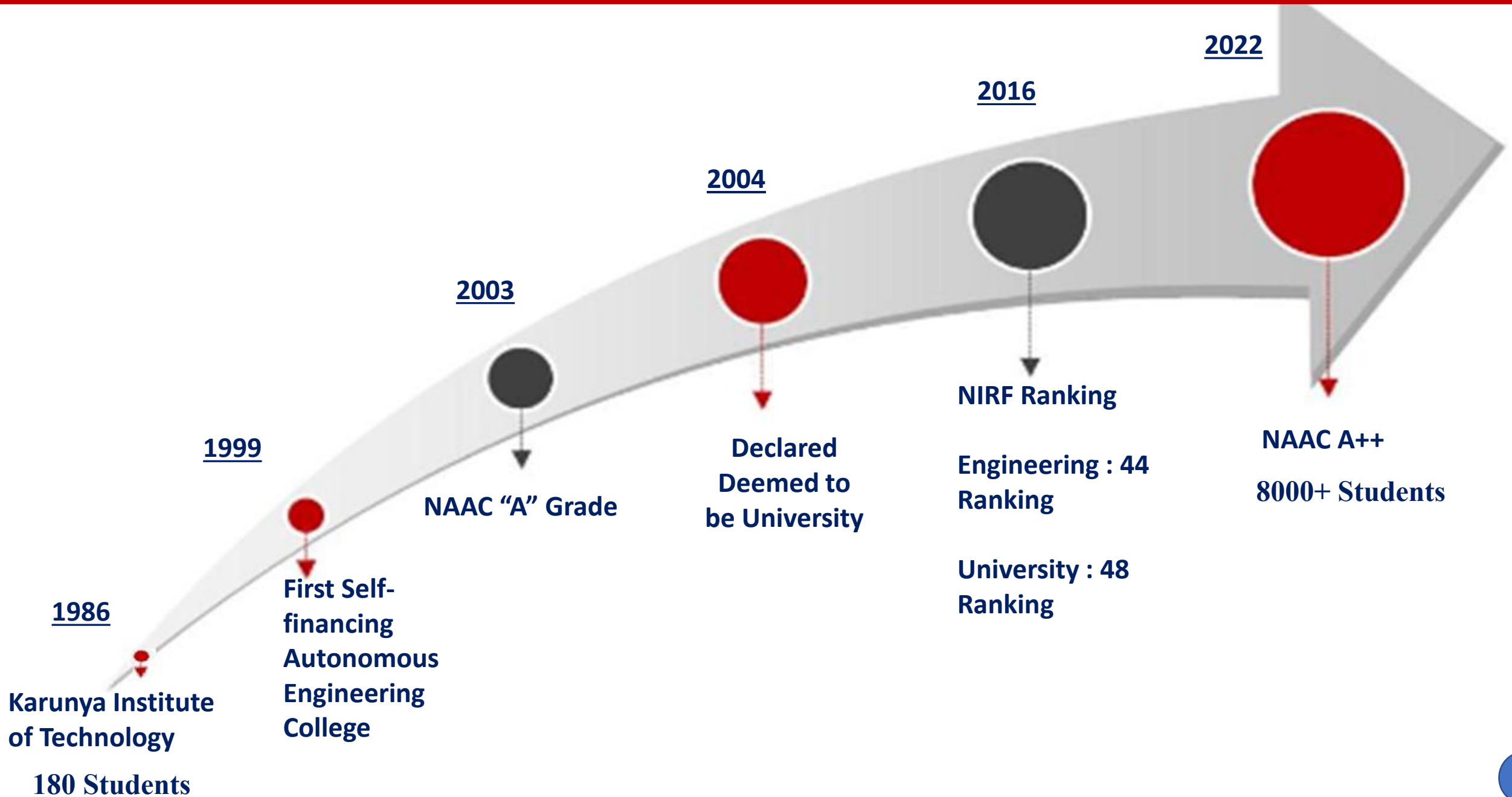
DRDO-Industry Academia Conclave-2026



Dr. K. Ashirvadam-HOD, Ex GTRE
Dr. Aldin Justin Sundararaj
Dr. J.J. Isaac-Adviser, Ex NAL
Aerospace Engineering



MILESTONE



School of

ENGINEERING AND TECHNOLOGY



Civil Engineering



Electrical and Electronics
Engineering



Electronics and Communication
Engineering



Robotics Engineering



Mechanical Engineering



Aerospace Engineering



Biomedical Engineering



Bio-Technology



Food Processing Technology

School of

COMPUTER SCIENCE AND TECHNOLOGY



Computer Science and
Engineering



Data Science and Cyber Security



Artificial Intelligence and
Machine Learning

Karunya School of

MANAGEMENT



Management Studies

School of

SCIENCES, ARTS AND MEDIA



Physical Sciences



Media & Communication



Digital Sciences



Commerce & International Trade



Criminology and Forensic Science

School of

AGRICULTURAL SCIENCES



Agriculture



**Water Institute, A Centre of
Excellence**

DEPARTMENT ACHIEVEMENT



Research



Rs. **782.1**
Lakh



Consultancy



Rs. **15**
Lakh



National & International Collaborations

Old Dominion University, USA



Publications & Patents

Journal Publications

120+

Book

3

Patents

Granted 10

Teaching – Learning Process



E-Learning

- Google Class room
- YouTube Videos
- Blended Learning
- Interactive Resources

Class Room Teaching

- Chalk & Talk
- Laboratory Practices

ICT-Enabled Teaching

- LCD / Smart Classroom
- Virtual Labs
- Project-based Learning

Self Learning

- Library
- SWAYAM / NPTEL

Collaborative Learning

- Industrial Visits
- Internships
- Value-Added courses

Experiential Learning

- Workshops
- Guest Lectures
- Competitions



FUNDED PROJECTS – AEROSPACE ENGINEERING

Sr. No	Project titles	Funding Agency	Amount
1.	Flame acceleration studies of hydrocarbon fuels using a deflagration to detonation transition tube- “Ongoing”	AR&DB	90.38 Lakhs
2.	Investigation of Ignition delay studies of given samples- Completed 2023	DRDL	9.8 Lakhs
3.	Investigation of ignition delay of Isrosene using Shock Tube as a tool- Completed 2017	AR&DB	9.2 Lakhs
4.	Waste to Energy lab- Completed in 2025	DST	650 lakhs
5.	Composite blade studies – Completed in 2024	GTRE	14 lakhs

TECHNICAL CAPABILITIES OF PROPULSION LABORATORY



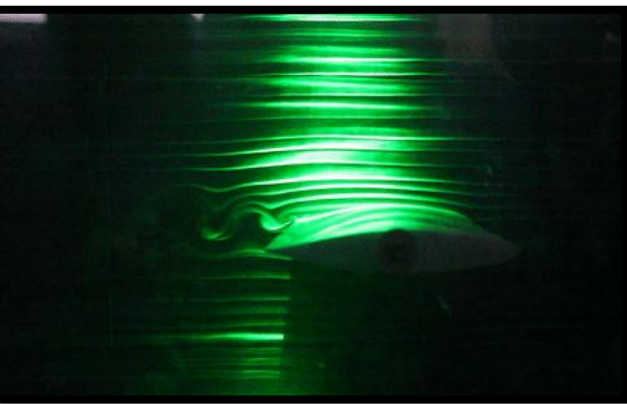
Igniter Qualification for LRE



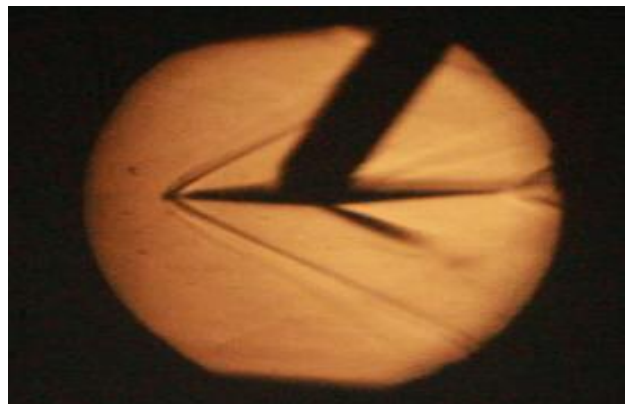
Semi-Cryogenic Rocket Engine Test Facility



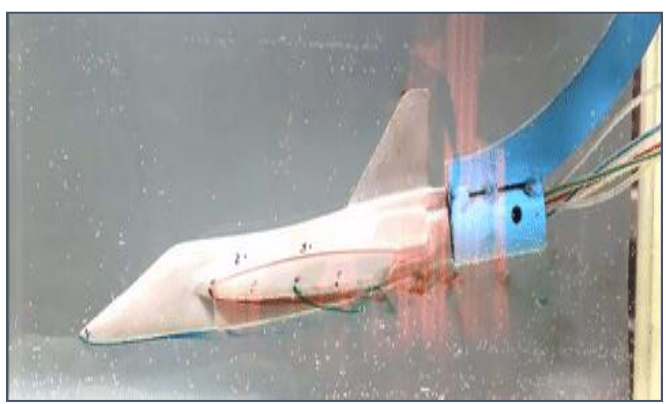
Hybrid Rocket Engine Test Facility



Flow over an aerofoil



Supersonic wind Tunnel $M=1.5-3.5$

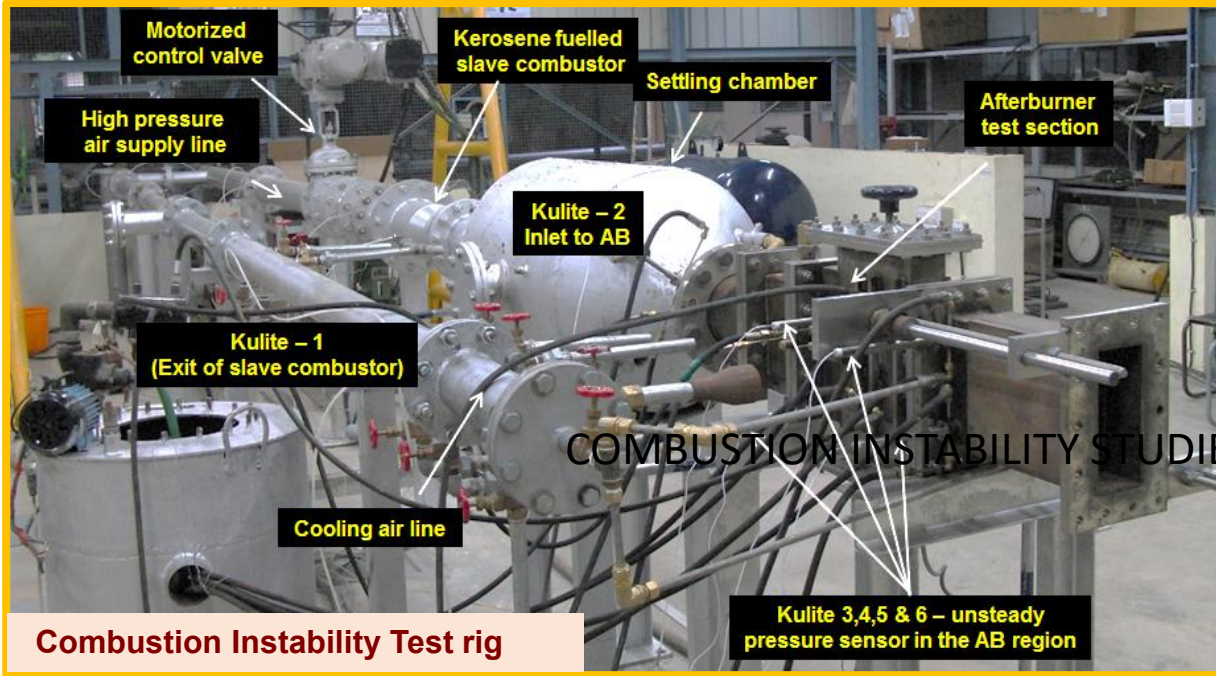


Water tunnel Test facility

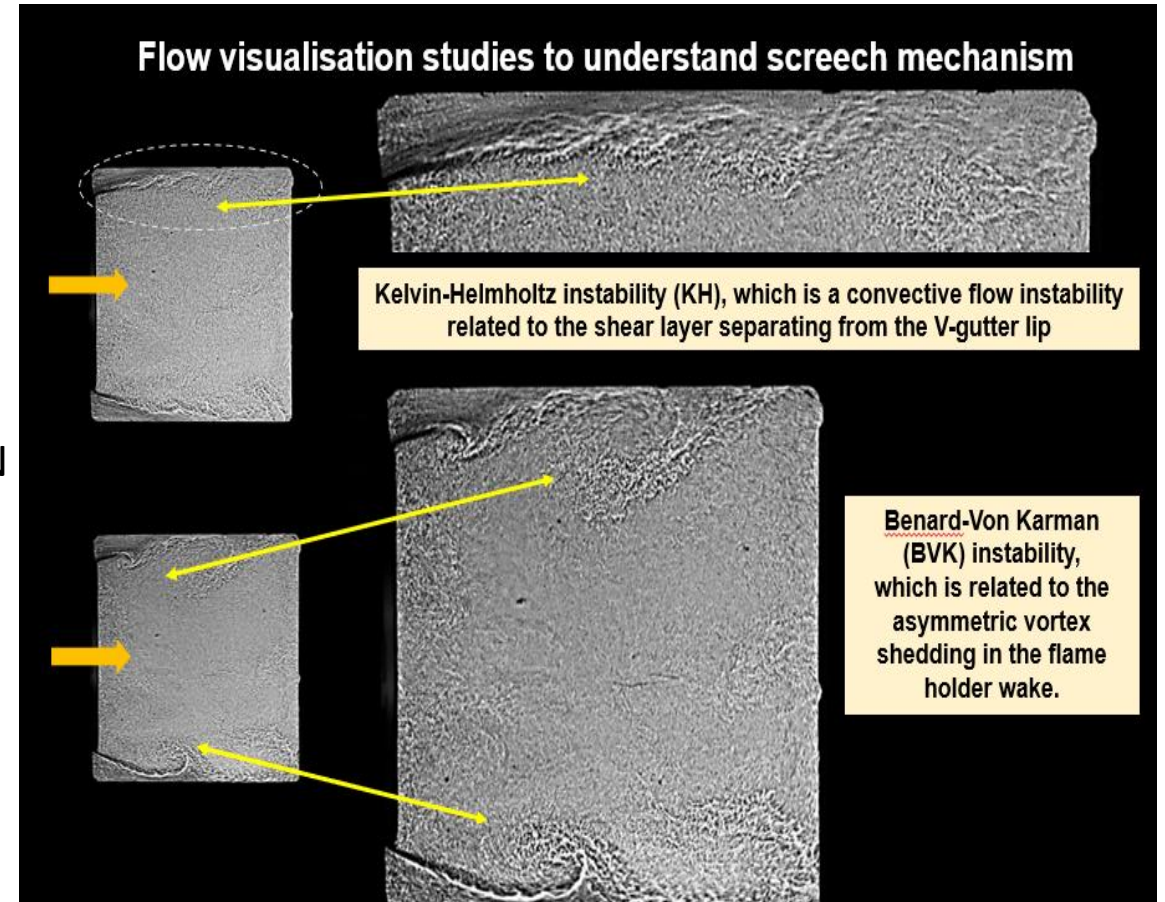
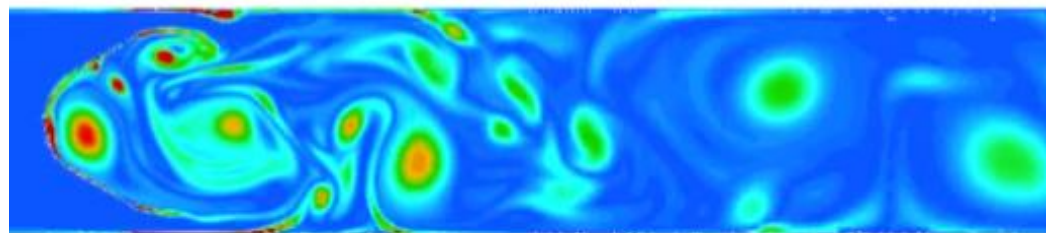
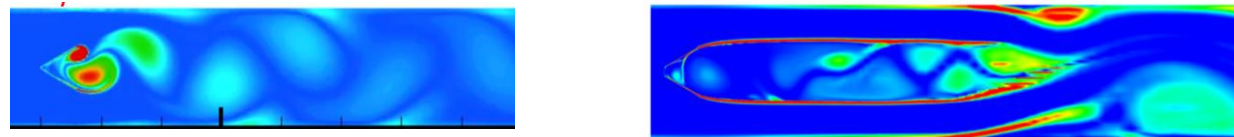


Semi-Cryogenic Engine Test Facility

COMBUSTION INSTABILITY STUDIES-THERMO-ACOUSTIC MODES

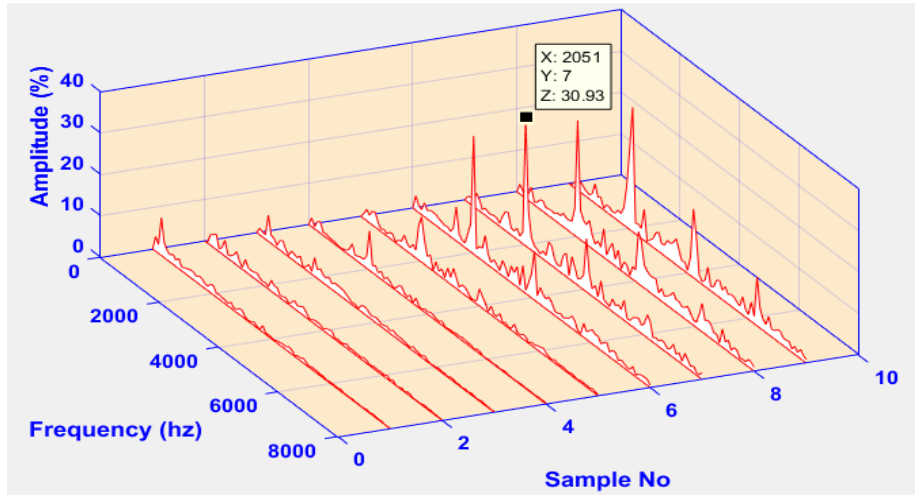


LES CFD Studies

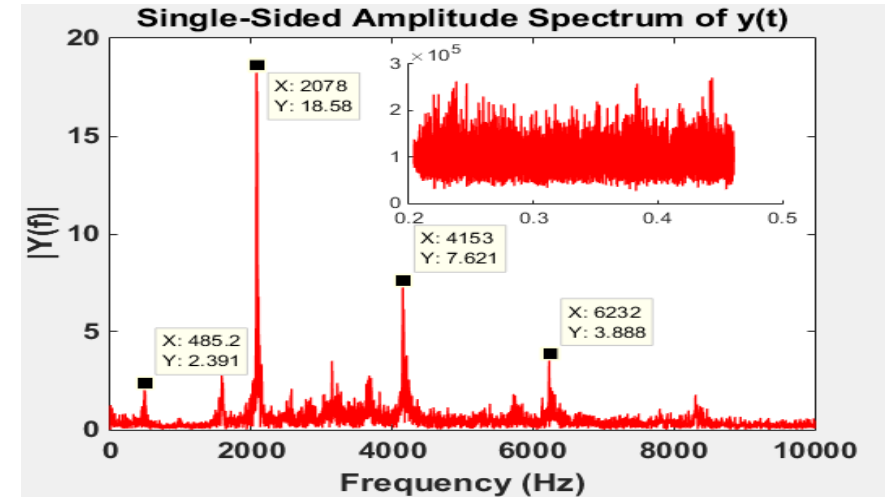


Local pockets of fuel-rich zones usually due to the creation and breakdown of coherent vortical structures could lead to such periodic heat release and if this in turn is in phase with the duct pressure fluctuations, the Rayleigh criterion could be met resulting in the onset of combustion instability.

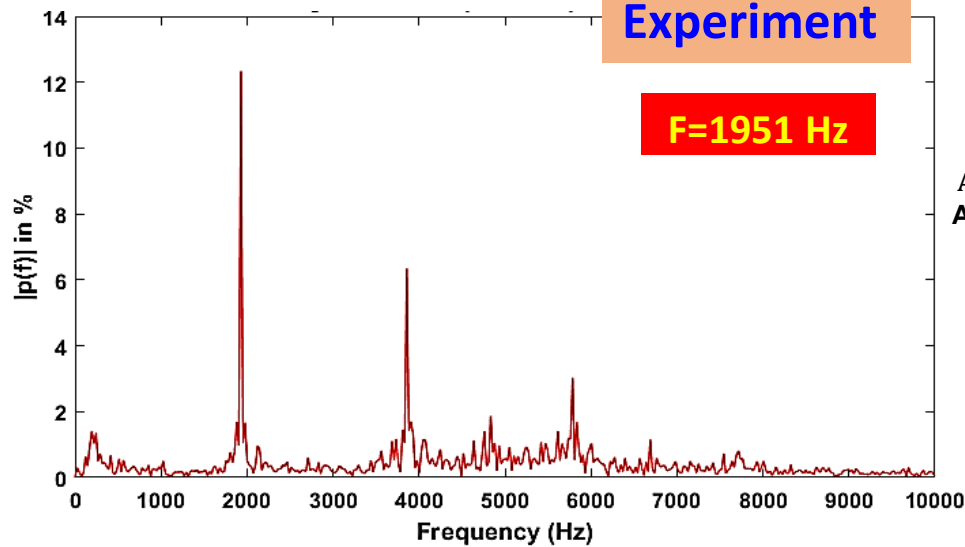
INSTABILITY IN GAS TURBINE ENGINE



LES

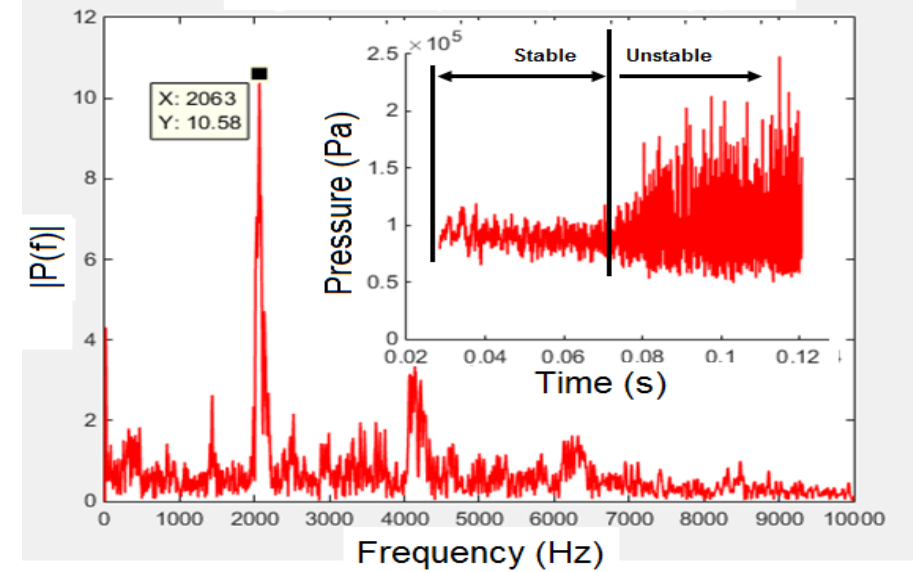


LES



AB inlet T = 600 K
 AB inlet P = 1.4 bar
 $\dot{m}_{air} = 1.15$ kg/s
 $\phi = 0.80$

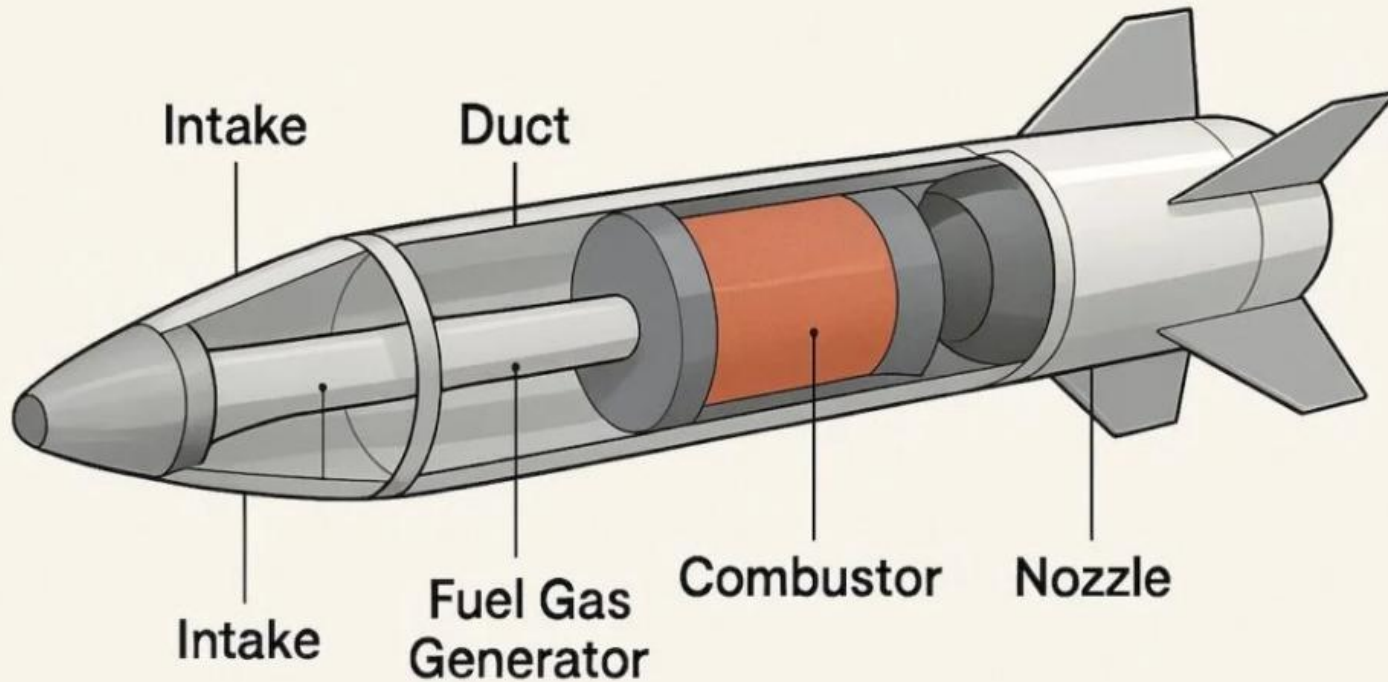
Fig.: FFT of the absolute pressure oscillation showing dominant frequency of oscillation (Rajashekar et. al [4])



LES

Fig : Evolution of the absolute pressure oscillation from stable to unstable combustion(LES)

RESEARCH ACTIVITIES RELATED TO SOLID FUEL DUCTED RAMJET

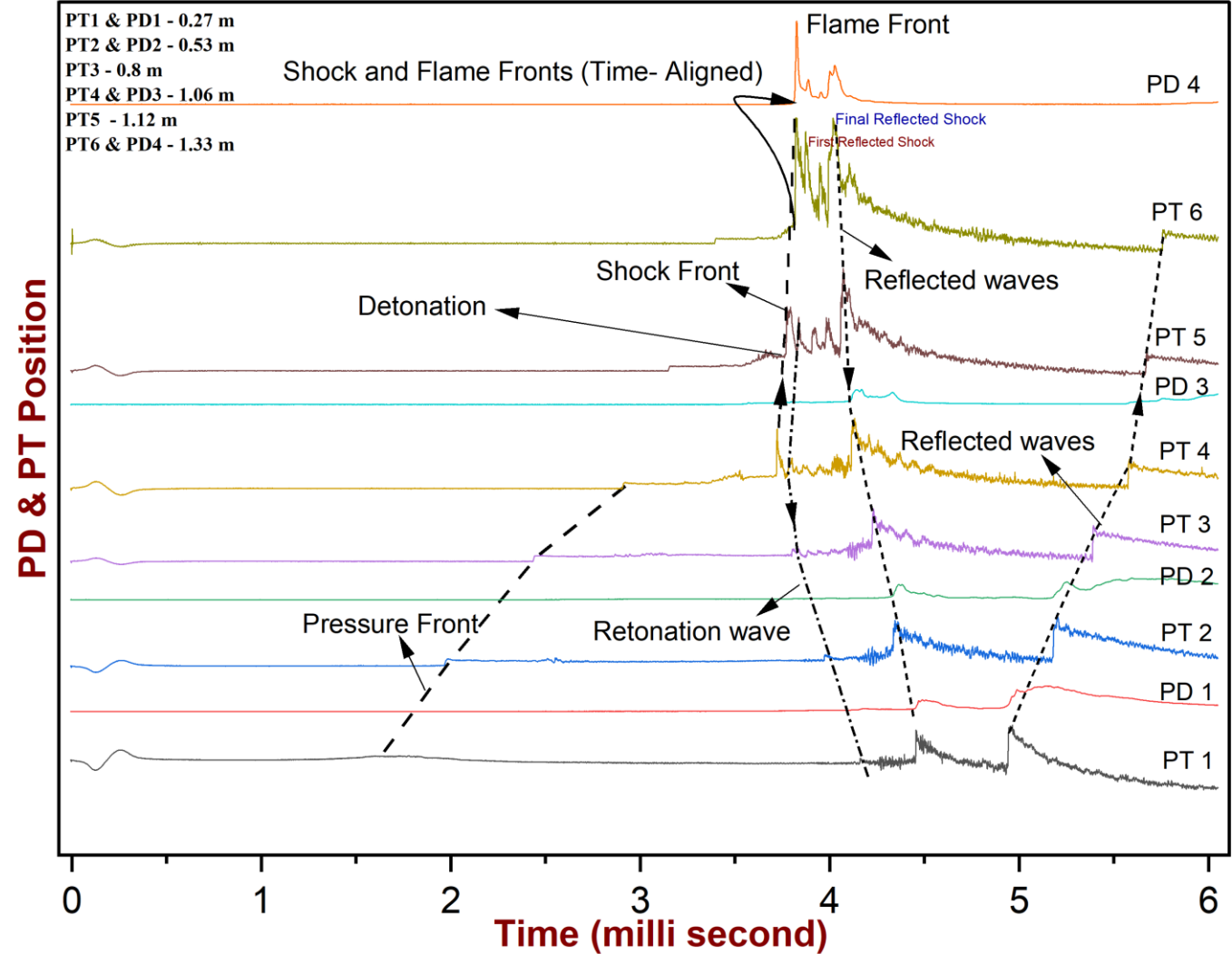
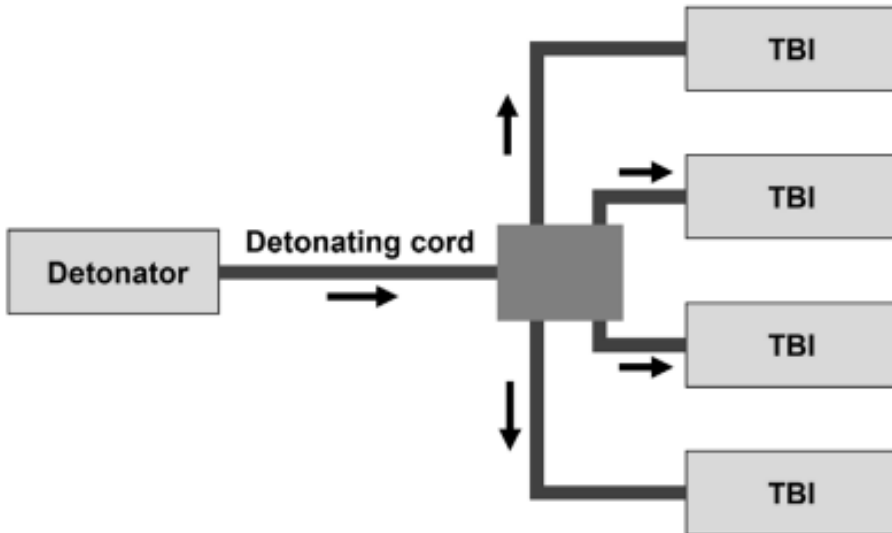
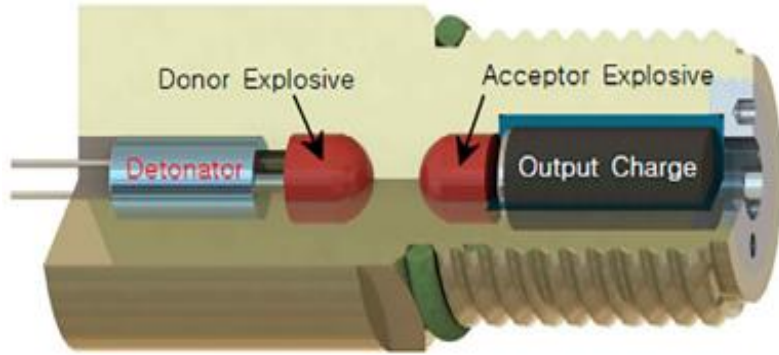


SFDR

1. Boron Combustion: (Ramjet sustainer fuel)
2. Hot gas valve - flow controller
3. Combustion Instability in solid rockets.
4. Management of thermal loads in the solid rocket nozzles.
5. Long duration rocket motor - sustainer applications
6. Bulkhead initiator

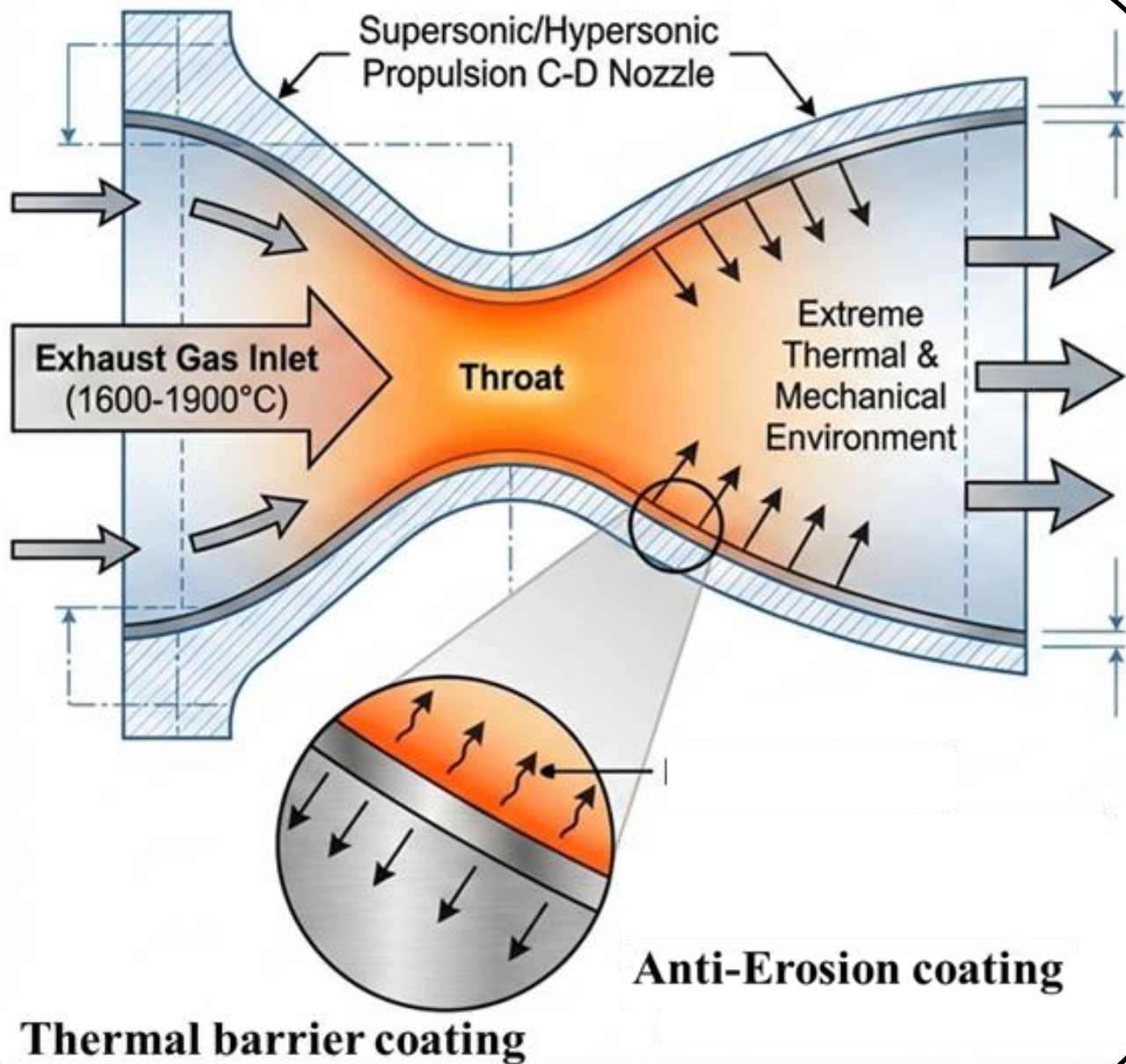
BULKHEAD INITIATOR & BORON COMBUSTION ANALYSIS

Bulkhead Initiator

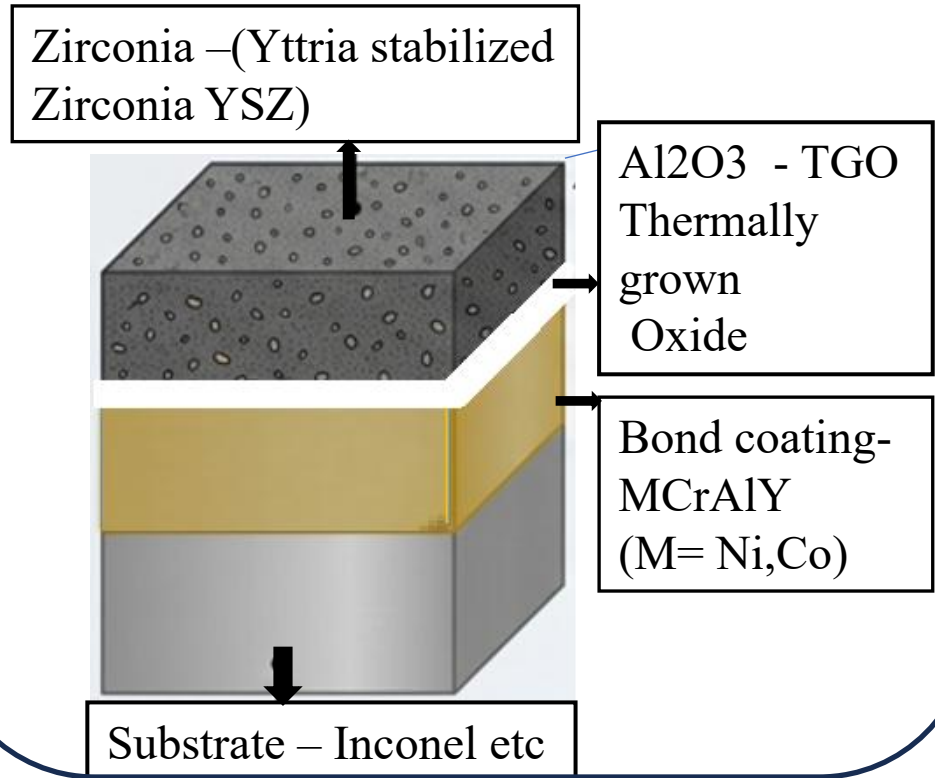


Detonation to Deflagration-
Ongoing Sponsored AR&DB
project + PhD work

Thermal Management in solid rocket and Nozzles



Thermal Barrier Coating



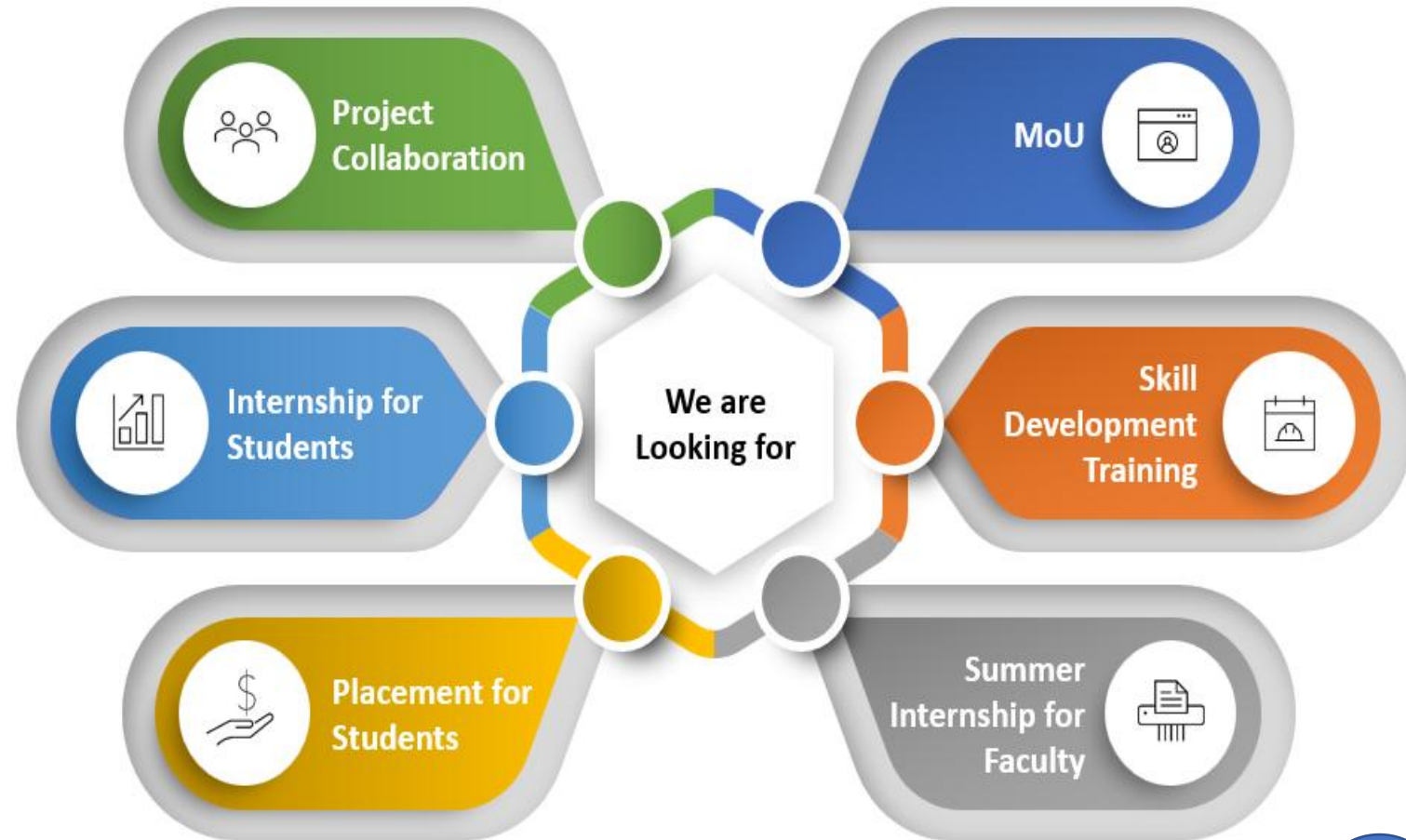
Anti-Erosion Coating

1. Ceramic & Metal Matrix coating
2. Conjugate heat transfer analysis

CONCLUSION

Karunya University is equipped to take high Tech Sponsored Projects in the following areas

1. Aerospace: Stealth, Aerodynamics Propulsion, Missiles
2. Mechanical: Heat Pipes, Additives Manufacturing
3. Robotics
4. AI ML
5. Electronics & Electrical
6. Semi conductor Technology



*Thank
you*

The background is a light cream color with a repeating pattern of small, faint floral motifs. Scattered throughout are small white stars, green dots, and orange dots. The text "Thank you" is written in a dark blue, elegant cursive font. A small green leafy branch is positioned above the letter 'k' and below the letter 'y'.