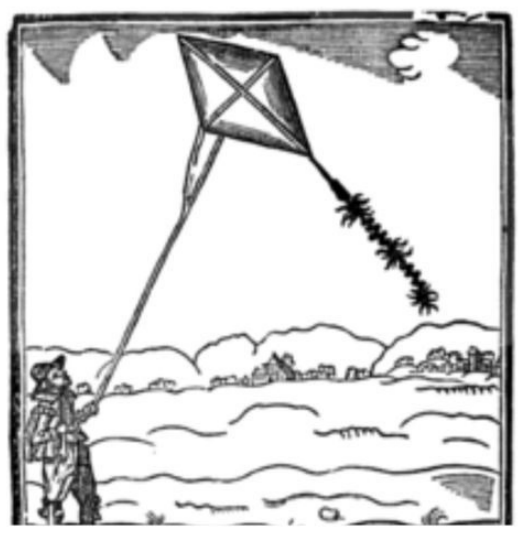
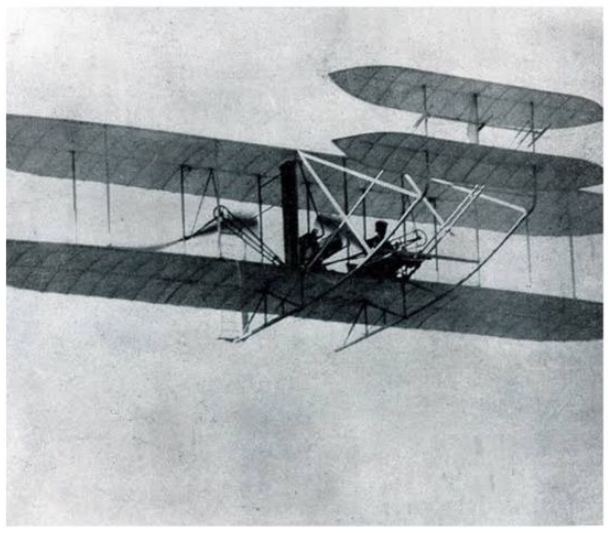
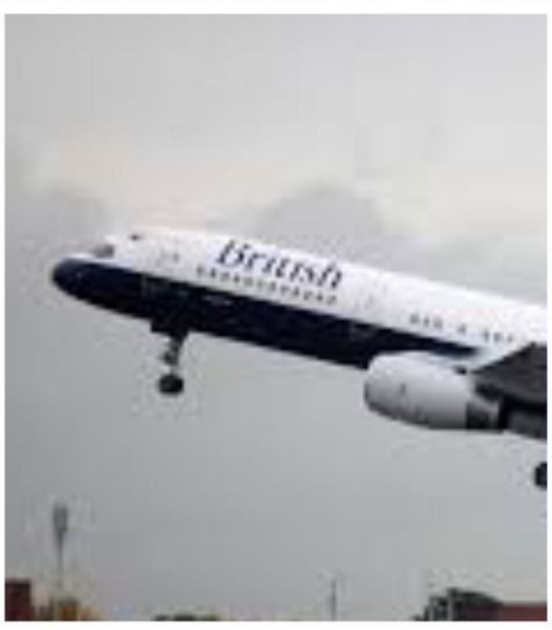
Issue 4

2021-22

ACHARYA





AERO MAGAZINE

2021-2022

"When in doubt, hold your altitude;
Nobody ever collided with the sky."

VISION

The Department of Aeronautical Engineering is committed to impart quality
education fostering excellence in academics, research and innovation to develop
globally competent aeronautical engineers contributing to the society.

MISSION

M1: To offer outcome-based learning that encompasses research and innovation.

M2: To promote interdisciplinary learning and interaction with the global community.

M3: To enable holistic education engrossed with social values.

EDITORIAL MESSAGE

I am very excited for the 4th issue of the Acharya Aero Magazine, which has for previous issues, as well as for future issues will continue to showcase the exemplary work done by our faculty and students alike. The milestones, the achievements, the awards and brave new steps towards excellence will all be recorded in these pages for a long time.

-Dr.S K Maharana
Chief advisor

The department of Aeronautical Engineering takes immense pride in unleashing the 4th installation of the department's "Acharya Aero Magazine."
Knowledge and experiences are always worth sharing.
I hope this platform shall be fruitfully used by the fraternity of Aeronautical Engineering to share and showcase their impeccable works

-Ms Steffi Thangachan
Chief editor

EDITORIAL MESSAGE

"COMING TOGETHER IS A BEGINNING, KEEPING TOGETHER IS PROGRESS AND WORKING TOGETHER IS SUCCESS."
-HENRY FORD

We the members of the editorial committee have endeavored to fill the magazine with a spectrum of budding potential from our students.

This is a glossary of pages expressing our talents and creative imagination to a new world filled with opportunities. The students of various culture brings in a diversity, which they are eager to share through poems, stories, artwork, etc.

We are grateful to the blessings bestowed on us by the Almighty.We would like to thank our Principal, HOD, Coordinators and our management for the continuous support and guidance in bringing out the talents of young mind.

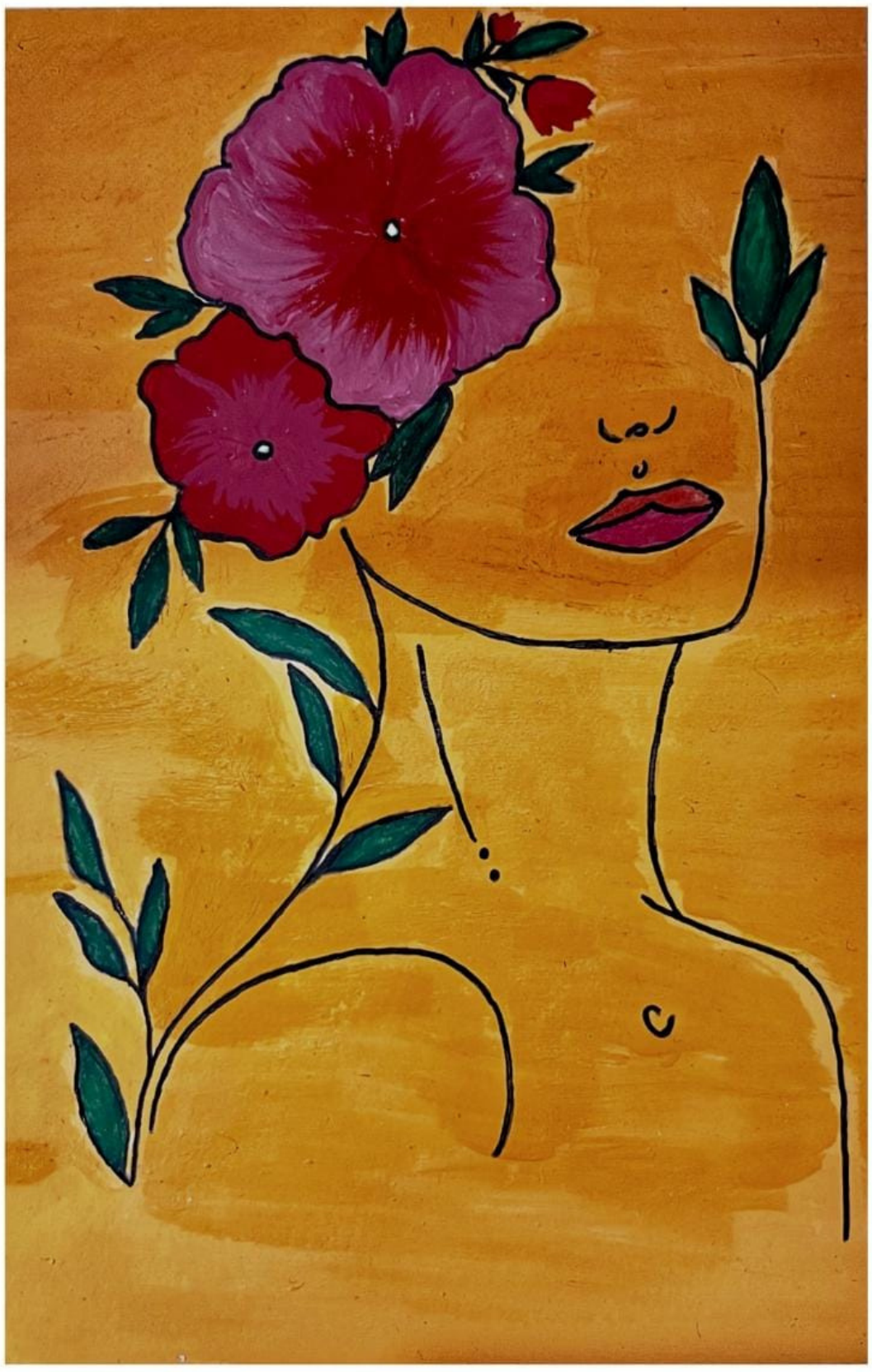
As we present the annual fruits of our toil, we are pleased to present the magazine for the year 2021-2022

Happy Reading!

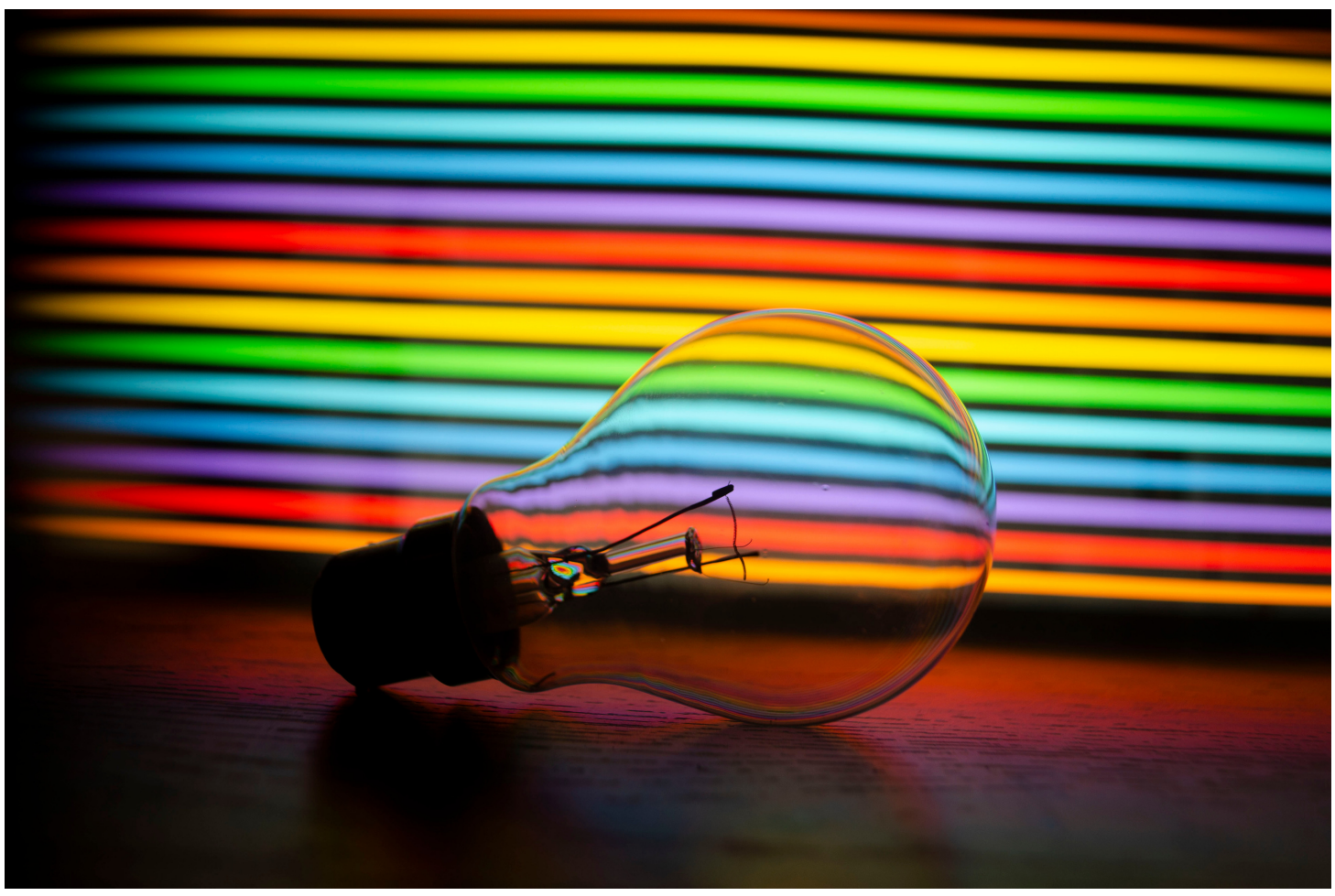
The Future of Aviation

-Tahir Ahmed
5th Sem AE

The pandemic has changed the airThere is a new idea of passenger travel experience, but over thejets flying faster than the speed of decades to come the actual planesound. Richard Branson's Virgin will change maybe by a little or by aGalactic has unveiled designs for lot.Mach 3 passenger vehicles
If you have travelled by anypowered by Concord Rolls-Royce commercial planes at any point inengines
the past, it is very likely that youBooms supersonic made a concept have travelled by either Airbus orjet named overture which could be Boeing. These are the majoritycarrying passengers by the end of manufacturers of the commercialthe decade with a cruising altitude aviation industry. of 60000 feet. They came up with a
These two heavyweights in thepretty ambitious claim that in the commercial aviation industry arefuture we can travel anywhere in planning for the future such that,the world in just 4 hour with just Airbus is making a fleet of aircrafts100$!
powered by hydrogen, eliminatingThe primary objective of these the need of pollution-causing-companies is to make aviation kerosene. According to the CTO ofefficient and at the same time Airbus it will reduce carboneconomical. They are also working emissions by 50%. Some of theon the fuels to make it more eco-design in Airbus zero e range isfriendly. The designs will also tend blended body or 'flying wing'. Thisto change in the future, which design is Unique and is made bymake it harder to attain stability of eliminating the tail section whichthe aircraft due to its complex contributes 5% to drag.shape, but with the help of growing
Boeing on the other hand isArtificial intelligence and
working on a sustainable fuel by thetechnology it is more likely to end of happen in the future.
this decade. It has invested heavily
on research and power sources
made from coconut to household waste. They are also working on their existing plan to make it lighter and more efficient.



- Sayeema Ifra
5th Sem AE



- Dakshith Shekar S
3rd Sem AE

AERONAUTICAL ENGINEERING DEVELOPMENT AND FUTURE SCOPE

-Tejashwini P
3rd Sem AE

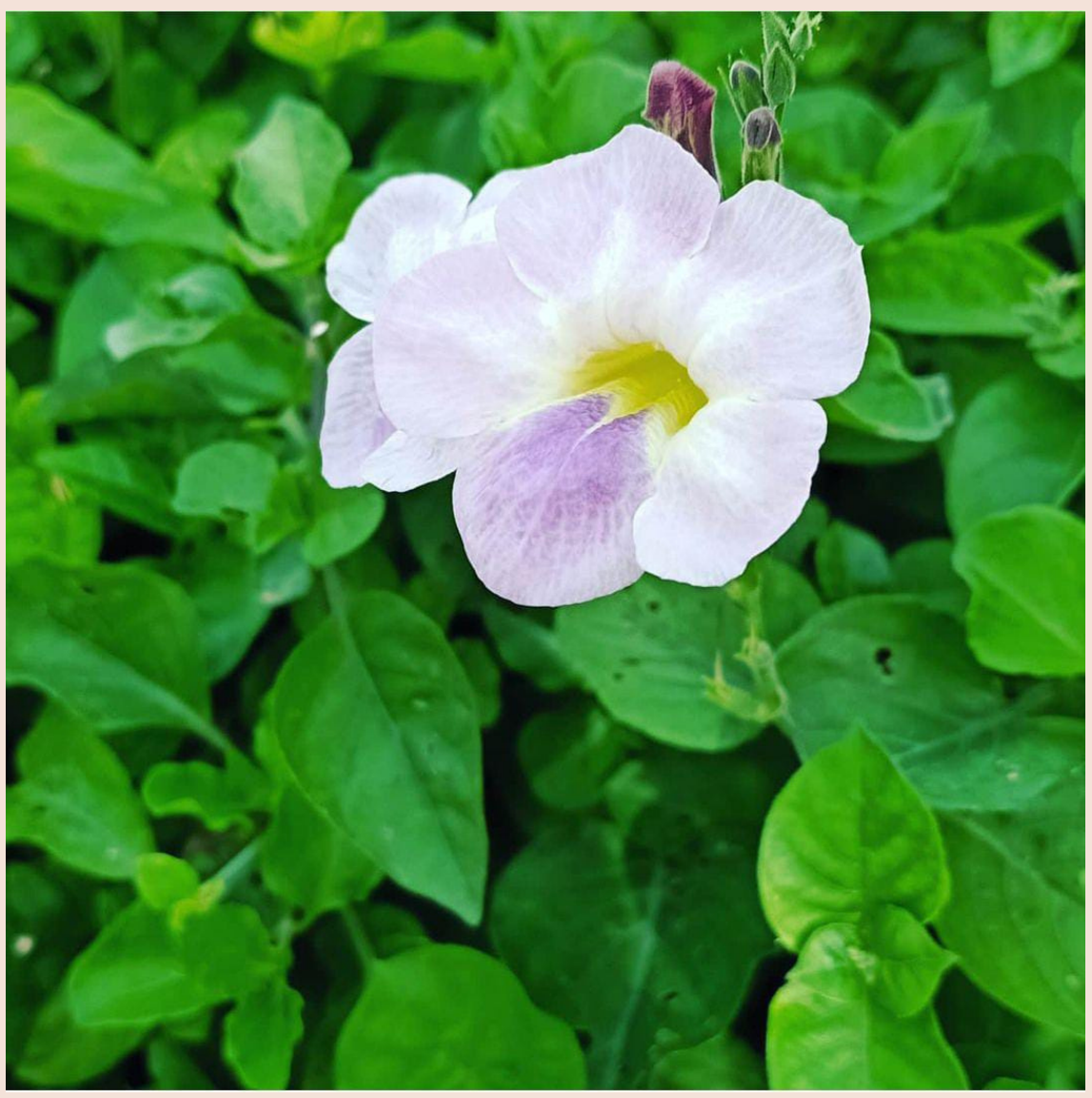
Aeronautical engineering is the study of design, manufacturing, production, preventive maintenance, and overhaul of the aircraft. It is one of the most popular and challenging fields among students who want to pursue their career in the aviation industry.

As an aeronautical engineer, career opportunities not only exist in design and production of an aircraft, but also in automobile industry, turbine applications, etc. Aeronautical engineers have huge contributions in all fields of engineering wherever there exists air interaction with the products, like racing cars and windmills.

Aerospace industry is one of the fastest growing industries in the world. The increasing popularity of air travel and space exploration require a high level of expertise and academic knowledge of aeronautical engineering subjects.

The exponential growth rate of this field, increases the demand for qualified and capable aeronautical engineers.

- Rakshith
5th Sem AE



-Akram Basha
5th Sem AE

ಪಯ ಗ

ಗು ರದ ಾ ಯ ,
ಪಯ ಸುವ ಪಯ ಗನು ಾನು.
 ೀರುವ ಊರನು ಕಂ ನು
ಾ ಯ , ಗದ ಗು ಯನು
ಮ ತು ೀರು ನು ಊರನು.
ೂ ರದ ಾ ಯ , ಮು ಸು
ಾ ಪಯಣವನು.

- ಾ ಥ

- Shashank Upparige
5th Sem AE

- Lohith M Raykar
3rd Sem AE

ೀ ೀ ೀ ? ಓ ಮನ ೀ

ಾ ದ ನಪ ಗಳ ನ ನಗು ೀ,
ಆ ನಗು ನ ೀ ಅ ಸು ೀ,
ೌನ ಸದು ಾಡು ೀ, ಾತ ಾಡಲು
ೌನ ಾಗು ೀ,
ನನ ನಪ ಗಳ ಸಂ ಯ ನ
ಪಯಣ ೀ, "ಅಲ ಅದು? ನನ ೌನ
ಮಸಣ ೀ,
ನ ನು ಅ ೃ ಸಲು ಾ ೂೀಲು ೀ, ಆ
ೂೀ ನ ೀ ನಗು ೀ,
ಅಥ ಾಗದ ನ ೀ ಶರ ಾಗು ೀ,
ನ ಪಯಣ "ಾ ಕೂ ೂಳ ೀ,
ಾ ಯ ನ ಸಹಪಯ ಗ ಾಗು ೀ,
ಆದರೂ ಈ ನ ೀ ೀಳ ೀ,
ೀ ೀ ೀ ಓ ಮನ ೀ ೀ
ೀ ..?!

- ಾ ಥ

Alternate Fuel Sources in Aviation

-Yatin Singla
5th Sem AE

The future of aviation will be shaped by growing mobility demand, limited fossil energy resources and by the need for climate protection. In recent years, renewable energy resources have become more important due to the rapid depletion of petroleum-based fuels. The aviation sector in terms of commercial and cargo transportation has an increasing need for conventional, as well as, alternative fuels. The use of sustainable alternative fuels is an important element of the basket of measures for reducing aviation's impact on the global climate and also on air quality.

Biofuels - a necessity

The most efficient and sought after alternatives are those which require in general no adaptation of the fuel distribution infrastructure, on-board fuel systems or combustion engines. Top of that list are Biofuels which have the potential to replace petroleum fuels and help with emissions are heavily investigated in developed countries for independency, creating a better environment and sustainability. Biofuels which are already used for ground vehicles could also be implemented in the aviation sector to reduce fuel cost and emissions. Numerous industrial initiatives have emerged to find alternative ways to attain bio-aviation fuels. According to the International Civil Aviation Organization's (ICAO) online platform, there are five pathways that have been approved under ASTM D7566 for producing alternative jet fuel and two airports are providing significant quantities of biofuel to their customers, demonstrating beyond any doubt the technical feasibility of producing alternative fuels for aviation that do not require changes to aircraft or fuel delivery infrastructure. While the technological feasibility for alternative jet fuels is proven, barriers to large-scale deployment of such fuels remain. The most significant challenge affecting the demand for alternative fuels is the tremendous price gap between conventional fuels and biofuels for aviation. Suppressed demand for alternative aviation fuels then, in turn, limits the investment in biorefineries that is needed in order to scale-up production.

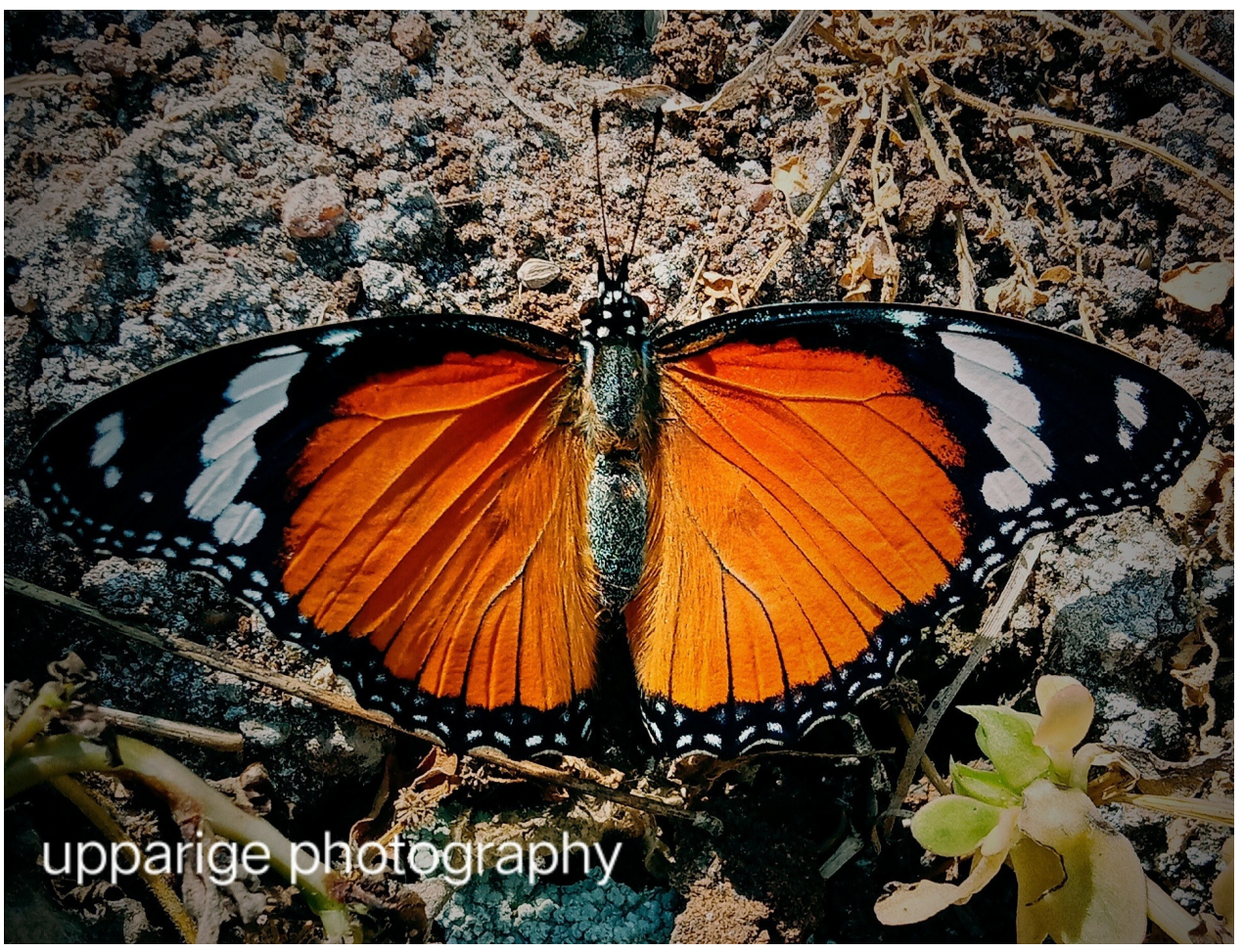
Alternatives

As opposed to fossil fuels or biofuels, there are other alternatives that are not compatible with today's transportation fuel systems and therefore cannot be used without major adaptations in infrastructure including fuel production, distribution and storage, and motive power system of the aircraft. A much discussed alternative to fossil kerosene is the implementation of hydrogen as a fuel for use in motive power systems such as air-crafts. Hydrogen can either be burned with oxygen from air within an internal combustion engine to produce shaft power or electrochemically converted to electricity within a fuel cell to produce shaft power by the use of an electric motor. Several advantages of hydrogen as a fuel for aviation include it's sustainable production through by the use of renewable energy sources and CO2-free cycle since water is the only emission. Although having been demonstrated as a working technology, storage of hydrogen still seems to present an issue regarding its use in mobile systems and is one of the technological challenges that need to be overcome for its widespread implementation.

Electric Aviation - the dream

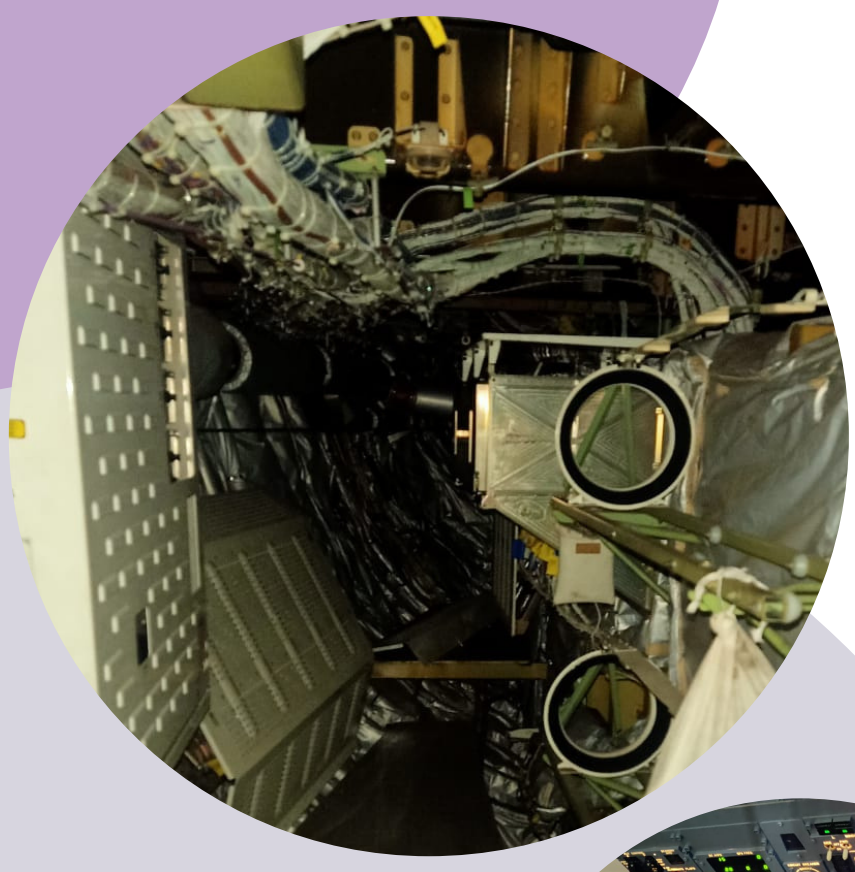
The all electric aircraft is the most radical approach in developing a new long term energy
perspective for aviation. Battery based power systems provide in-flight zero emission performance and the ultimate flexibility in the choice of primary energy (solar, wind, hydro,etc.) and potentially minimises the environmental footprint of aviation. By replacing traditional hydraulic and pneumatic systems with electric systems, aircraft can reduce the engine bleed air required to power these systems and use approximately 3% less fuel. It is estimated that large commercial and regional aircraft can reduce fuel burn by approximately 5% and 30%, respectively, when implementing hybrid-electric propulsion architectures. However, the feasibility of electric flying requires a careful analysis of future electric technologies. The feasibility perspectives and scaling properties of fully or hybrid electric motive power systems are governed by scientific developments outside the field of aviation.

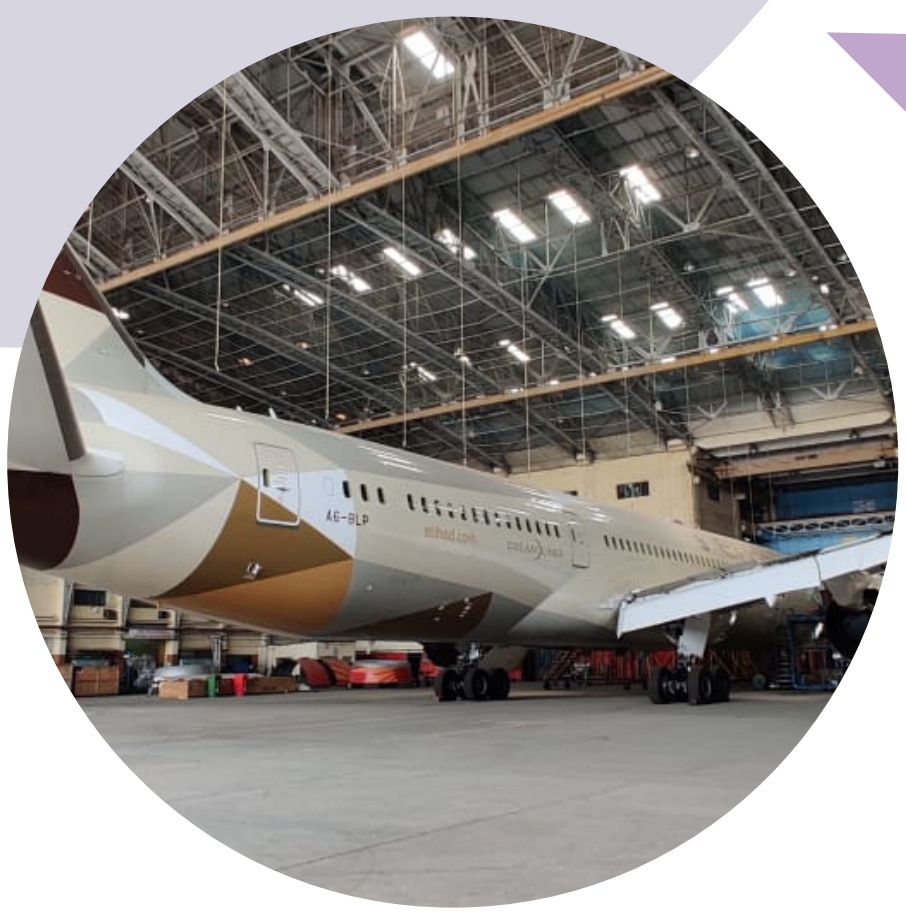
-Dakshith Shekar S
3rd Sem AE



-Shashank Upparige
5th Sem AE

AIESL, MUMBAI INDUSTRIAL VISIT





The Aeronautical department of Acharya Institute of Technology organized an industrial visit to Air India Engineering Services Limited (AIESL), Mumbai from the 14th of November to the 19th of November, in order to get a closer and physical experience of our field of study.

We left for Dadar Station in Mumbai on the fourteenth and reached after a twenty four hour journey. We reached the Air India maintenance facility at 9am on the sixteenth of November. After a quick breakfast, we were taken to the maintenance, repair and overhaul unit, where we got to see a number of Boeing aircrafts parked in the hangar belonging to the 777 and 787 series. We were then taken to the cockpit of a Boeing 787, and were lucky enough to receive from an experienced maintenance engineer, a detailed explanation on the avionics and the different systems, panels, communication devices, rudder pedals, thrust levers, etc. present in the cockpit. After a quick lunch, we were brought back to the hangar next to the runway, and we were given another interesting introduction by Sunil Waykar, another experienced maintenance engineer, to the avionics systems of a Boeing 777 model. We also got to look around the main fuselage and aisles of the aircraft, and we were shown around the facilities and emergency systems including the exit inflates for emergency landings.

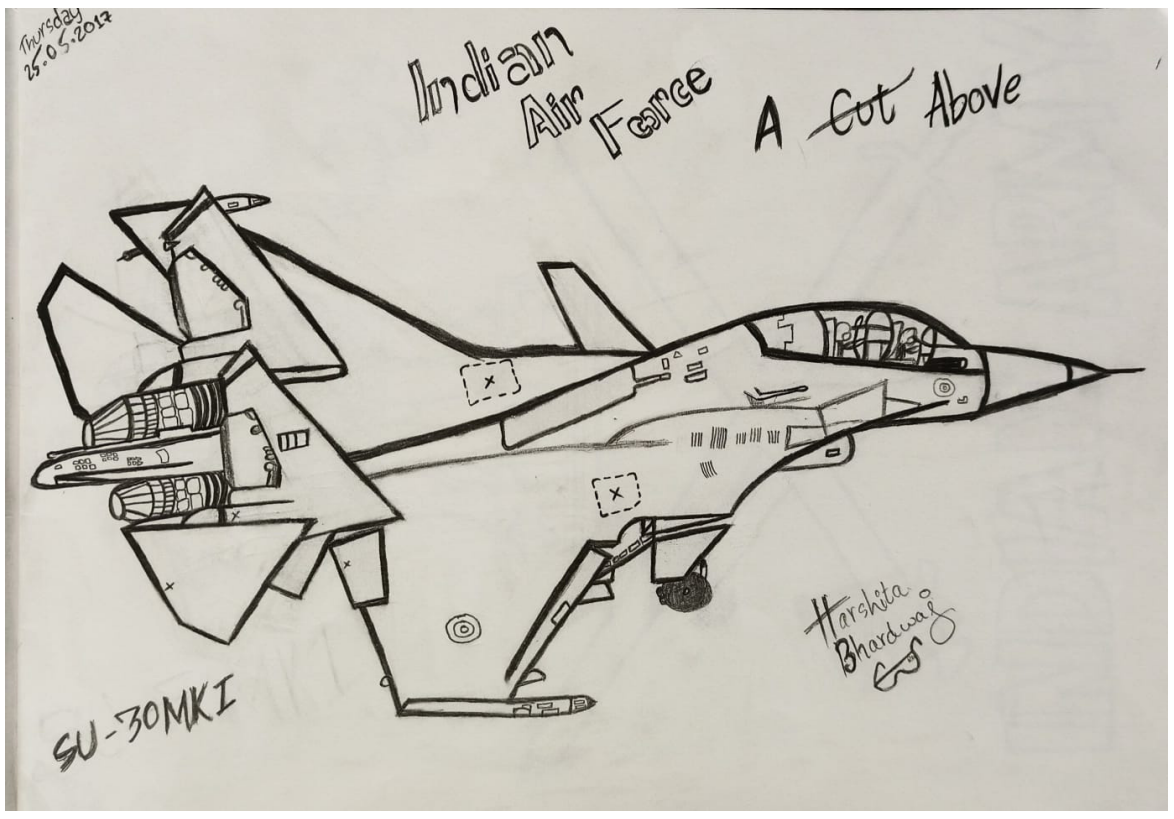
Next we were taken to the cargo section of the aircraft and were informed about the various mechanisms and the technicalities of loading and unloading cargo and the communication systems involved. We ended our first day of the industrial visit with some local sightseeing and a quick dinner before heading back to our dormitories.

We woke up the following day and started off our second day of the visit at the engine manufacture and maintenance workshop, where we got to see the parts and working of GE90 and GENX jet engines. We were taught about the technical aspects of the working and maintenance of those massive machines. We were then taken into a laboratory, where we got to see the inspection and detection of cracks and minor gaps in aircraft structures known as NDT (Non Destructive Testing). Soon after we ended our industrial visit with our last lunch provided at the Air India office canteen.

It was a lovely and highly informative two-day visit which helped bridge the gap between theoretical knowledge, and practical hands-on exposure. We are very grateful to our faculty for organizing and arranging the visit, as well as for ensuring our safety throughout the trip.

-Sayeema Ifra
5th Sem AE

-Rakshith
5th Sem AE



-Harshita Bhardwaj
3rd Sem AE

PEO

PEO1: Employability: Graduates of the program shall have necessary skills and competence to be employable in the core industry, academia and multi-disciplinary sectors

PEO2: Advancement: Graduates of the program shall advance professionally in the management, entrepreneurship and allied industries.

PEO3: Contribution: Graduates of the program shall have innovative idea and the potential to contribute to the expansion, maintenance and ongoing needs of the aviation industry.

PEO4: Lifelong learning: Graduates of the program shall possess an unrelenting interest in learning and adapt new technological advancements to the requirements of the evolving industrial contexts.

PSO

PSO1: Elements of Aircraft Components and their operations: Apply the foundations of aerodynamics, propulsion, aircraft structure and materials; Evaluate the performance and operation of components of aircrafts and flying vehicles.

PSO2: Flight Vehicle design and development: Demonstrate the flight vehicle design, integrate the aircraft systems and components and test the flight
.

PSO3: Aircraft Thermal and Fluid Structure Interaction: Apply the concepts of aerothermodynamics, energy conversion, heat and mass transfer in analyzing both internal and external flows; Demonstrate it for various aircraft engines and structures.

PSO4: Aircraft Avionics, Stability and Control: Apply the basic knowledge of avionics to communicate and control with the aircraft components; Evaluate the stability of the
overall aircraft.

EDITORIAL BOARD

The Principal,

Dr. M R Prakash

Acharya Institute of Technology

Chief Advisor

Dr. S K Maharana

Head of the Department, Aeronautical department

Chief Editor

Ms. Steffi Thangachan

Professor, Aeronautical Department

Assistant Chief Editor

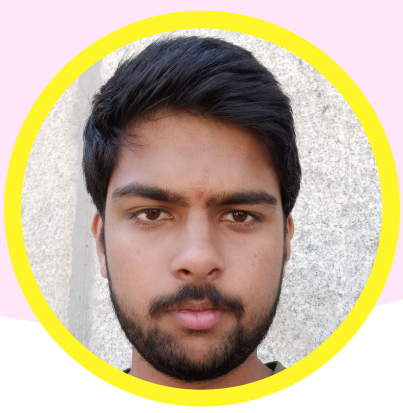
Darwin Vincent

Assistant Chief Editor

Leah George

Sub editor

Madhushree N P



Advisor

Shashank Upparige

Copy reader

Sayeema Ifra

Copy Reader

Samyak Kini

Copy Reader

Yatin Singla