ANTHARIKSH

The Space...

DEPARTMENT OF AEROSPACE ENGINEERING

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

MYLAVARAM, ANDHRA PRADESH, INDIA.

Vision of the Department:

To achieve academic excellence and produce highly competent professionals in the field of Aerospace Engineering

Mission of the Department:

DM1: To impart high quality education in Aerospace Technology through class room teaching and laboratory practice
DM2: To develop indigenous Aerospace Technology by carrying out research in collaboration with industry and research organizations
DM3: To train and inspire the student community to possess effective communication and leadership skills with ethical values
DM4: To harness the technological development by being consistently aware of societal needs and challenges

Program Educational Objectives (PEOs)

PEOs	Statement
PEO1	To provide students with sound mathematical, engineering and multidisciplinary knowledge to solve Aerospace and Allied Engineering problems
PEO2	To prepare students to excel in higher education programs and to succeed in industry/academia profession.
PEO3	To inculcate ethical attitude, leadership qualities, problem solving abilities and life-long learning for a successful professional career

PROGRAM OUTCOMES (POs)

PO1: Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.

PO2: Problem Analysis: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

PO3: Design/Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigation of Complex Problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.

PO5: Modern Tool Usage: Create, select and apply appropriate techniques, resources, and modern engineering and IT tools including predictions and modeling to complex engineering activities with an understanding of the limitations.

PO6: The Engineer and Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and Sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project Management and Finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long Learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO1: To apply the knowledge of Aerodynamics, Propulsion, Aircraft structures and Flight Dynamics in the Aerospace vehicle design

PSO2: To prepare the students to work effectively in Aerospace and Allied Engineering organizations

FOCUS AND SCOPE

Anthariksh is a department magazine, bridges the gap between students and faculty. Typically, a department magazine consists of Technical articles, ideas, project outcomes, language skills, literary articles, technical updates, success stories, career tips, academic advice, the latest events and happenings related to campus. Cover-stories have to be written in an engaging format. We can also include interviews of former students who have achieved success through dedication and hard work.

PUBLICATION FREQUENCY:

Magazine is published Half-yearly appearing in the months of April and October.

Send your articles to the following mail ID.

E-Mail: anthariksh.lbrce@gmail.com

Disclaimer

Some of the contents published in this magazine are from open sources. The contents of this magazine are for information purposes only, enabling the faculty and students to have easy and quick access to information and do not have any legal sanctity. This magazine is intended for circulation among students of the department of Aerospace Engineering of LBRCE only.

FROM HOD's DESK

You are truly as important as and just as needed as everyone else in this world. Do not sit around waiting for things to happen miraculously, because they just will not. Your day is now, and it is here! Seize it and go create the world you want for yourself. We all know life is short, but it is even shorter than we think. So, if you are forever waiting for tomorrow, the window for you to do all the things you have always wanted to do will silently close, and by the time you realize it has, it will be too late.

The tears we cry can sometimes clear our eyes so we can see the possibilities that lie in front of us. Always leave room in your life to make way for the new. The truth is that the old is gone, and it is not coming back. Accepting this fundamental reality and embracing change as it comes will set you up for lasting success. During this journey, we may fail at times. Whenever we fail in life, we should take it as a blessing. This is because, failures act as indicators that we need to try something else. So, learn what you can from a failure and move on. One baby step at a time is what will get you ahead in life. Eventually, these baby steps build on top of each other and lead to our most glorious and defining moments. Remember not to settle for anything less than you deserve.

Although the greatest life challenge is the sound discovery of who you really are, the second greatest is finding happiness and peace with yourself. You should always stay true to your own goals and dreams to find happiness and peace. If people disagree with you, it is not necessarily a bad thing – it just means you are standing your own ground and finding your own way. Do not worry about whether people think you are doing something crazy. Negative people always find faults. They are best avoided as they can foist their bad attitudes on you and even get to you. When you find yourself excitedly losing track of time, you will know in your heart that you are on the right path.

A life that revolves around selfish pursuits and egotism is not a life well-lived. You will be remembered by what you have done for others and the world at large, rather than what you have done for yourself. So, be selfless, compassionate and try and give back whenever, whatever and wherever you can.

If you want to know why your life is the way it is, look at your past. If you want to know how your future is going to be, look at your actions in the present. The choice is yours – do you want to look back on what you have achieved with pride, or do you want to make a whole myriad of excuses for the things you have not?

Dr. P. Lovaraju

AIRCRAFT ACCIDENT INVESTIGATOR

M. Bhuvaneshwari,
Asst. Professor.

Who are they? An aviation accident investigator may also be called an air safety investigator. They investigate study and report on airplane crashes to figure out how and why they happened. Aviation accident investigators cover a myriad of areas and try to discover the cause of accidents. This is done through various means including interviewing survivors, reviewing and analysing flight and maintenance records, studying human performance issues and operations, examining engines, systems, instruments and other airplane parts to try and figure out what caused an accident.

What they do? A major portion of the work an accident investigator does will be at the accident scene. The average working day is eight hours, but during an accident investigation, hours may stretch up to 15 hours. Typically, NTSB (National Transportation Safety Board) accident investigators are "on call" 24 hours a day, 365 days a year and travel to all corners of the world to investigate significant accidents. Accident sites can be set in remote areas with rugged terrain, and can be in a variety of physically challenging conditions including swamps, deserts, or mountains. Travel to the accident site may require strenuous walking, hiking and climbing in adverse topographic, weather, and atmospheric conditions. Once at the accident scene, you must be able to physically manoeuvre around the accident site, which may include climbing in and out of various parts of the wreckage.

Since assignments can pose hazards to your health, you may be required to wear and operate appropriate personal protective equipment. You are required to carry all necessary equipment, tools and instruments to document all findings as you may photograph, video tape, make measurements and take notes while at the accident scene. NTSB accident investigators interview survivors and witnesses and examine aircraft parts, instruments, and engines. They also review maintenance and flight records to determine the probable cause of airplane accidents. Travel and field work typify the investigator's position.

What are the requirements? Entry Level or trainees typically must have one year of specialized experience demonstrating knowledge of civilian aircraft design, manufacture and maintenance operations or civilian aircraft operational requirements, practices and procedures. This experience may include work as a pilot for scheduled air carrier, A&P Mechanic or certified flight instructor. Possession of a valid commercial pilot certificate with instrument rating. Requirements of higher level positions may include experience as an entry level or broad knowledge of aviation accident investigations, practices, procedures, and techniques. Specialized experience may also include that of a flight safety officer, flight operations supervisor, aircraft maintenance supervisor, designated pilot examiner, flight instruction supervisor, or flight test pilot. Typically accident investigators must have a high school diploma as well as specialized training in their area of transportation. A college degree is not always required however; most accident investigators possess a vocational or community college diploma. Military experience, degrees in engineering, and law, and military accident investigation schools are helpful.

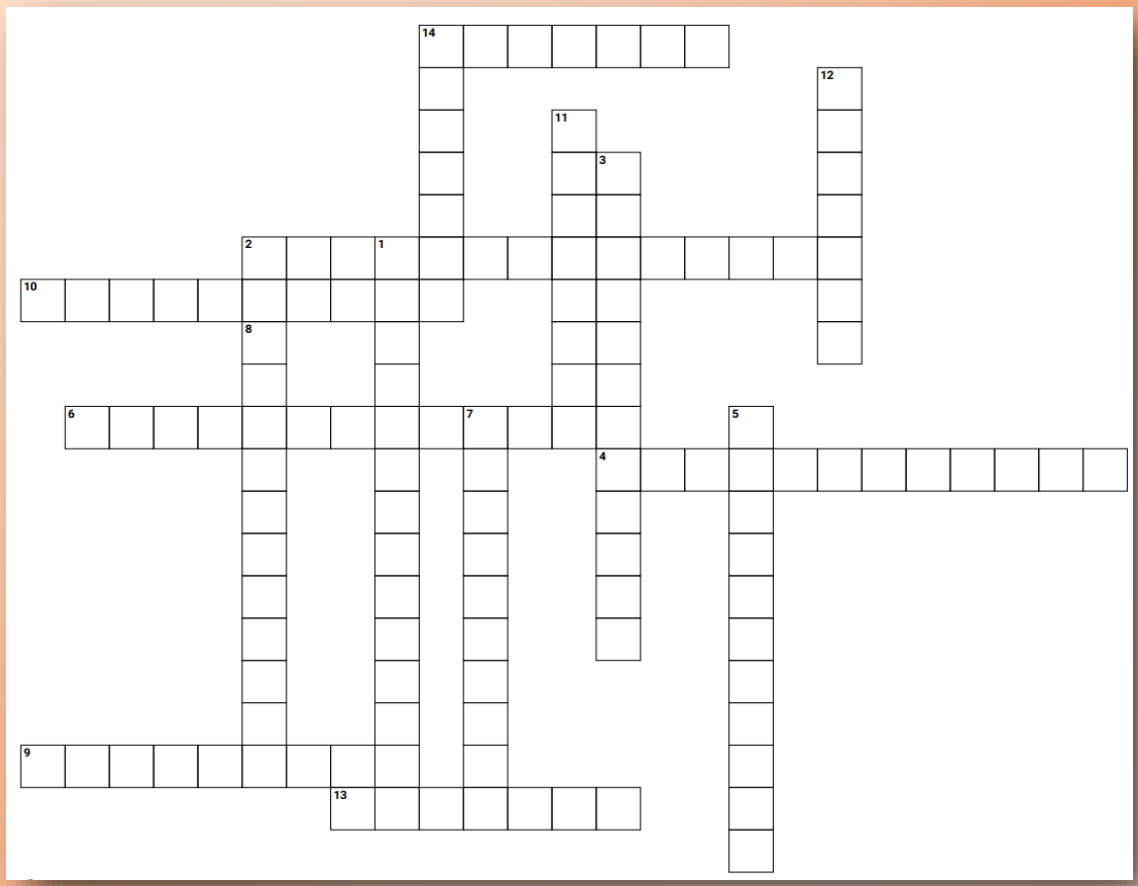
Accident investigators need to be in good physical shape to meet the requirements of the job. Must have excellent organizational and technical writing skills, and ability to effectively speak and write English. The information taken from the accident scene must be assembled and or organized into logical factual and analytical reports. You must also be able to make effective oral presentations about your findings upon request. A valid state driver's license and have the ability to qualify for a US Government issued travel charge card. Aviation related engineering, medical and/or operational experience is required for a variety of professional positions with this safety related organization.

Who hires? If you're considering work as an accident investigator, you will be employed by a Federal agency such as the National Transportation Safety Board (NTSB) or the Federal Aviation Administration (FAA), or by insurance companies. Within the FAA, the Office of Accident Investigation (AAI) is the principal organization which investigates aviation accidents. There are many job opportunities within the FAA's accident investigative teams.

Once at the accident scene, you must be able to physically manoeuvre around the accident site, which may include climbing in and out of various parts of the wreckage.

CROSS WORD PUZZLE

A. Venkata Sai Kumar
19765A2102



Across :

2. Father of Indian Space Program
4. 1st Indian to space
6. Missile woman of India
9. prints("AEROSPACE" ,%d);
10. line joining the leading edge to trailing edge
13. Missile made indigenously by India and Russia
14. India's 1st indigenously Developed Missile

Down :

1. Ratio of Inertial forces to Viscous forces
3. Rover sent to Mars recently by NASA
5. Speed of sound is completely dependent on
7. Title of our Magazine
8. 1st Satellite sent to Space by India
11. what does "U" stands in UAV
12. Flaps and Slats are secondary control surfaces used while Take-off and
14. Name of Rover sent to moon by ISRO

THE STORY OF MARS PARACHUTE DEPLOYMENT

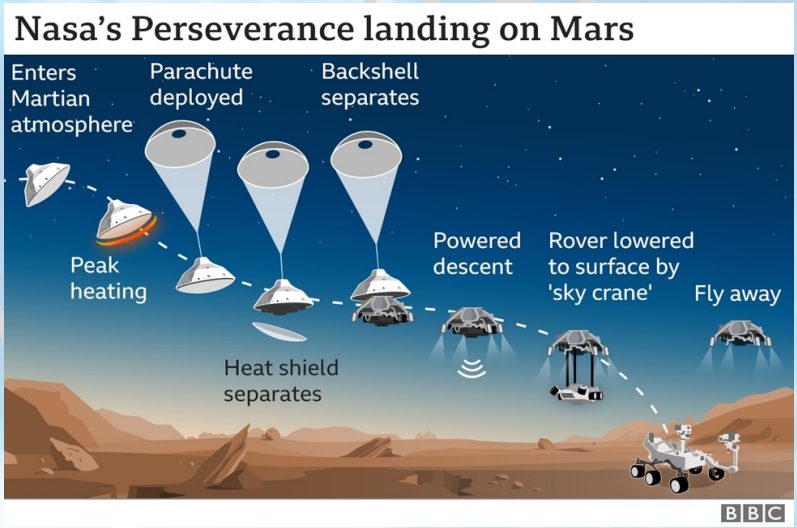
Shaik Vanhar Ali,
17761A2132 .

Testing spacecraft components prior to flight is vital for a successful mission. Rarely do we get a do-over with a spacecraft after it launches, especially those bound for another planet. We need to do everything possible to get it right the first time. Three successful sounding rocket missions from NASA's Wallops Flight Facility in Virginia in 2017 and 2018 to test a SUPERSONIC PARACHUTE proved their worth with the successful landing of the Perseverance mission on the Red Planet.

After traveling 293 million miles (472 million kilometers), the SUPERSONIC PARACHUTES, designed to slow the rover's descent to the planet's surface, successfully deployed and inflated. They made the smooth touchdown of Perseverance possible.

This mission required a design to build a 72-foot parachute that could survive inflating in a Mach 2 wind in about half a second. This is an extraordinary engineering challenge, but one that was absolutely necessary for the mission. To ensure they worked at Mars under those harsh conditions, NASA had to test the parachute designs here at Earth first. Replicating the Martian environment meant that they needed to get their payload halfway to the edge of space and go twice the speed of sound. Sounding Rockets were critical to their testing and ultimately their landing on Mars. The NASA team tested the parachute three times in Mars-relevant conditions, using BLACK BRANT IX SOUNDING ROCKETS. The final test flight exposed the chute to a 67,000-pound (300,000-Newton) load – the highest ever survived by a supersonic parachute and about 85% higher than what the mission's chute was expected to encounter during deployment in Mars' atmosphere.

In the case of the Mars 2020 parachutes, the first flight was a test to see if the right conditions can be achieved during the flight to simulate what the parachutes will encounter descending through the Mars' atmosphere. The second flight, 6 months later in March 2018, was the first full test of the parachute. The final successful test, conducted in September 2018, provided the results needed for the Perseverance parachute team to be confident that the design was ready for the Mars 2020 mission. Suborbital vehicles – either a sounding rocket or a scientific balloon – are being examined for testing the ascent vehicle. About 5% is the astral bodies are their remaining are the rest of all the absolute darkness. In this there are two major classifications are done **1.Dark energy** ,and **2.Dark matter** these two are comes from the **Dark Universe**. Dark energy is about 75% and the Dark matter about 25% of the total universe.



SPACE DEBRIS

P.R.V.V. Narahari,
17761A2128.

Since the number of satellites in Earth orbit is steadily increasing, space debris will eventually pose a serious problem to near-Earth space activities if left unchecked, and so effective measures to mitigate it are becoming urgent. Equipping new satellites with an end-of-life de-orbit or orbital lifetime reduction capability could be an effective means of reducing the amount of debris by reducing the probability of the collisions between objects. On the other hand, the active removal of space debris and the retrieval of failed satellites by spacecraft are other possible measures. In reality the situation will be worse than the "no new launches" scenario because satellite launches will continue. Post-mission disposal (such as a 25-year decay rule) will help, but will be insufficient to prevent the self-generating phenomenon from happening. To preserve the near-Earth space for future generations, remediation measures, such as Active Debris Removal (ADR), must be considered.

What is space junk? Space junk, or space debris, is any piece of machinery or debris left by humans in space. It can refer to big objects such as dead satellites that have failed or been left in orbit at the end of their mission. It can also refer to smaller things, like bits of debris or paint flecks that have fallen off a rocket.

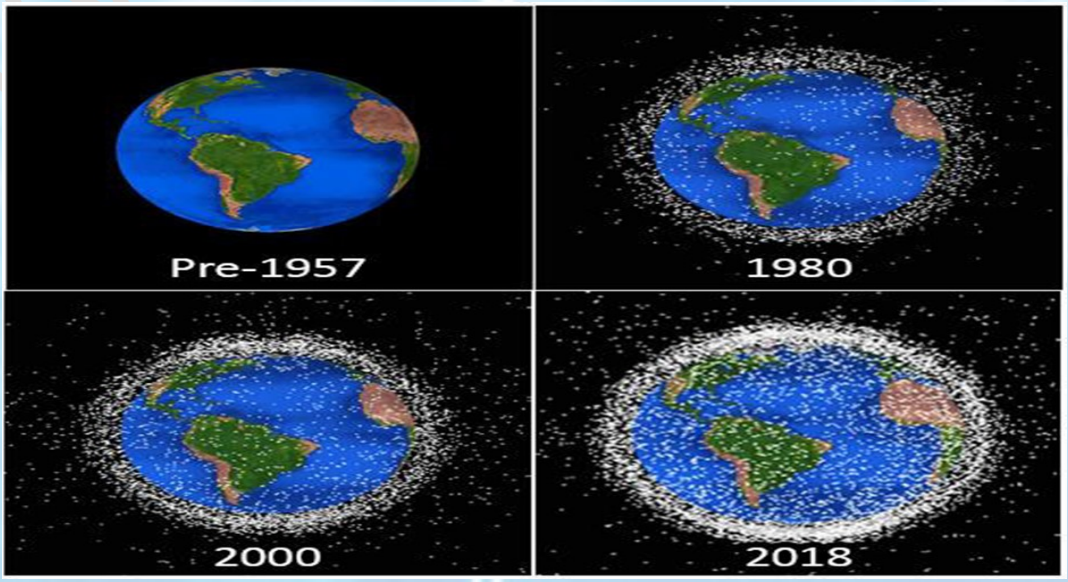
How much space junk is there? While there are about 2,000 active satellites orbiting Earth at the moment, there are also 3,000 dead ones littering space. What's more, there are around 34,000 pieces of space junk bigger than 10 centimeters in size and millions of smaller pieces that could nonetheless prove disastrous if they hit something else.

How does space junk get into space? All space junk is the result of us launching objects from Earth, and it remains in orbit until it re-enters the atmosphere. Some objects in lower orbits of a few hundred kilometers can return quickly. They often re-enter the atmosphere after a few years and, for the most part, they'll burn up - so they don't reach the ground. But debris or satellites left at higher altitudes of 36,000 kilometers - where communications andweather satellites are often placed in geostationary orbits—can continue to circle Earth for hundreds or even thousands of years.

What risks does space junk pose to space exploration? Fortunately, at the moment, space junk doesn't pose a huge risk to our exploration efforts. The biggest danger it poses is to other satellites in orbit. These satellites have to move out of the way of all this incoming space junk to make sure they don't get hit and potentially damaged or destroyed. In total, across all satellites, hundreds of collision avoidance manoeuvres are performed every year, including by the International Space Station (ISS), where astronauts live.

How can we clean up space junk? This is tricky to enforce, though, because satellites can (and often do) fail. To tackle this problem, several companies around the world have come up with novel solutions. These include removing dead satellites from orbit and dragging them back into the atmosphere, where they will burn up. Ways we could do this include using a harpoon to grab a satellite, catching it in a huge net, using magnets to grab it, or even firing lasers to heat up the satellite, increasing its atmospheric drag so that it falls out of orbit.

Will space junk be a problem in the future? By making sure that satellites are removed from orbit in a reasonable amount of time once they are no longer active, we can mitigate the problem of space junk in the future. Earth's orbit allows us to study our planet, send communcations and more. It's important that we use it sustainably, allowing future generations to enjoy its benefits, too.



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