

Brain Waves

Department of Mechanical Engineering
JEPPIAAR INSTITUTE OF TECHNOLOGY

"Self Belief. Self Discipline. Self Respect"

VISION

"Jeppiaar Institute of Technology aspires to promote futuristic technical education with the perspective of innovative industrial and social application for the betterment of humanity".



Department of
Mechanical Engineering



Release of ASME Newsletter Volume II



The ASME News Letter Brain Waves Volume II issue I of July 2015 was released by our beloved Director Dr. N.Marie Wilson. We thank Our Director and the college management for motivating and supporting us to conduct various ASME activities.

The student's body of ASME in our collage still acts as an eye opener to many aspiring mechanical engineers to lay proper path to their dreams. We also keep them excited and enchanted by conducting various events. Now our fellow members are striving for more knowledge and update in their very own mechanical stream.

Mech'o facts:

Do you know ??

1. Carbon fiber prosthetic blades for high-speed running.
2. On Venus it snows metal and rains Sulphuric acid
3. F1 racers have prolonged exposure to high G forces and temperature for little an hour. This results in average F1 drivers to lose 4kgs after just one race.
4. Before introduction of wheels, cars were steered using levers

Inside this issue:

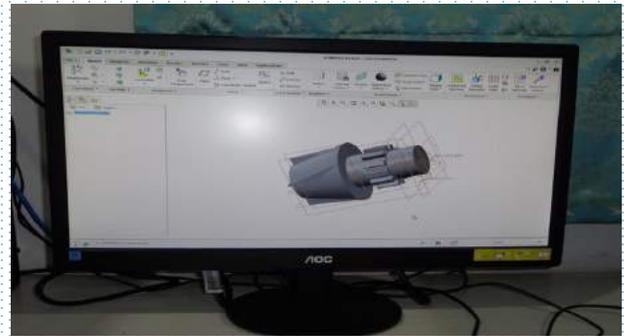
ASME Activities in JIT	1
Article's corner	4
Isreal's Data Collection	6
NanoTechnology	8
Dynamic DNA Nanomachines	9
Head Injuries	10
Biodiversity	11
Editorial Board	12

ASME EVENTS

1. 3D Modelling



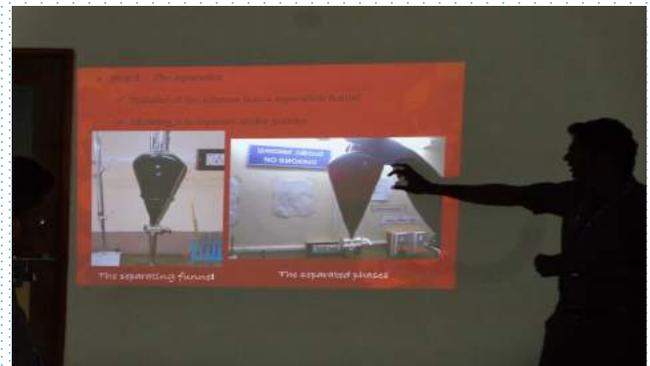
Competition	3D Modelling	Date: 22.07.2015
Winner	SYLENDRA BABU R	FINAL YEAR
First runner	RAVINDAR S	FINAL YEAR
Second Runner	ARUN V	PRE-FINAL YEAR



2. Paper Presentation



Competition	Technical Paper	Date: 05.08.2015
Winner	1. S. TAMILARASAN (Final Year)	2. M. MAHI (Final Year)
	1. M.JASHPHER SHARON FERDINAND (Final Year)	2. R.SARATH KRISHANAN (Final Year)
First runner	1. S.RAVIKUMAR (Final Year)	2. G.RAMKUMAR (Final Year)
Second runner	1. J.NOAH RAJAN (Pre-Final Year)	2. V.NAVIN KUMAR (Pre-Final Year)



3. Technical Quiz



Competition	Technical Quiz	Date: 19.08.2015
Winner	1. A.GOWTHAM (Final Year)	2. K.DINESH KUMAR (Final Year)
First runner	1.S.INFANT THARIC (Pre-Final Year)	2.R.DINESH KUMAR (Pre-Final Year)
Second runner	1.C.LOKESH (Final Year)	2.I.VINDJ KIRAN (Final Year)
	1.G.AADITH NATRAJ (Final Year)	2.J.JASPER FERDINAND (Final Year)



4 .Group Discussion



Competition	Group Discussion	Date: 16.09.2015
Winner	JASPER SHARDON FERDINAN.J	FINAL YEAR
First runner	SHARVAN KUMAR.M	FINAL YEAR
Second runner	PRAVEEN KUMAR.A	PRE-FINAL YEAR



Article's Corner

Article Name : **Upcoming Mechanical Engineering Events**

Article by : **Niranjan Kumar R (Pre Final Year)**

15 Oct 2015	DronSpark '15	Project Competition	Dronacharya College of Engineering	Gurgaon	Haryana
16 Oct 2015	TECHNOSCET-2K15	Technical Symposium	Swarnandhra College of Engineering and Technology	Narsapur	Andhra Pradesh
16 Oct 2015	SLDC 2015	Technical Symposium	Federal Institute of Science and Technology	Kochi	Kerala
16 Oct 2015	Rhythm 15	Cultural Fest	DeenBandhu Chhotu Ram University of Science and Technology	Sonepat	Haryana
16 Oct 2015	International Conference on Advancements in Engineering and Technology	Conference	International Institute of Scientific Research and Technology	Chennai	Tamil Nadu
16 Oct 2015	AXIS'15	Technical Festival	VNIT Nagpur	Nagpur	Maharashtra
16 Oct 2015	National Conference On Biometrics Trends & Its Applications 15	National Conference	Dronacharya College of Engineering	Gurgaon	Haryana
17 Oct 2015	Workshop on Wordpress - Web Development 15	Workshop	MANIT Bhopal	Bhopal	Madhya Pradesh
17 Oct 2015	Workshop on Dismantling of Complete Car 15	Workshop	MANIT Bhopal	Bhopal	Madhya Pradesh
17 Oct 2015	International Conference on Recent Developments in Engineering Research ICRDER-2015	International Conference	IIRDEM	Salem	Tamil Nadu
17 Oct 2015	IAETSD : International Conference on Developments in Engineering Research 15	Conference	IAETSD	Pune	Maharashtra

Upcoming EVENTS

17 Oct 2015	Metacognition	Technical Festival	Galgotias College of Engineering and Technology	Greater Noida	Uttar Pradesh
17 Oct 2015	Technosearch 15	Technical Symposium	MANIT Bhopal	Bhopal	Madhya Pradesh
17 Oct 2015	IAETSD : International Conference on Advances in Engineering and Technology 15	Conference	IAETSD	Chennai	Tamil Nadu
19 Oct 2015	Advances in Mechanical, Automobile & Production Engineering AMAPE 2015	National Conference	Skyline Institute of Engineering and Technology	Greater Noida	Uttar Pradesh
23 Oct 2015	Amiora 15	Techno Management Fest	MPSTME,NMIMS	Shirpur	Maharashtra
23 Oct 2015	Scrolls 15	Technical Paper Presentation Contest	Ajay Kumar Garg Engineering College	Ghaziabad	Uttar Pradesh
23 Oct 2015	Chakravayuh 2015	Sports Fest	IMS Engineering College	Ghaziabad	Uttar Pradesh
24 Oct 2015	Amalthea 2015	Annual Technical Summit	Indian Institute of Technology, Gandhinagar	Gandhinagar	Gujarat
26 Oct 2015	AutoKriti 7.0	Workshop	NIT Kurukshetra	Kurukshetra	Haryana
28 Oct 2015	Two Days IC Engine Workshop 15	Workshop	Quba College of Engineering & Technology	Andhra Pradesh	Andhra Pradesh
29 Oct 2015	techNITi'15 v.2	Techno Cultural and Sports Fest	NIT Jalandhar	Jalandhar	Punjab
29 Oct 2015	Momentum 2015	Annual Festival	The Northcap University Gurgaon	Gurgaon	Haryana
29 Oct 2015	Antaragni 15	Cultural Festival	IIT Kanpur	Kanpur	Uttar Pradesh

Israel's data collection



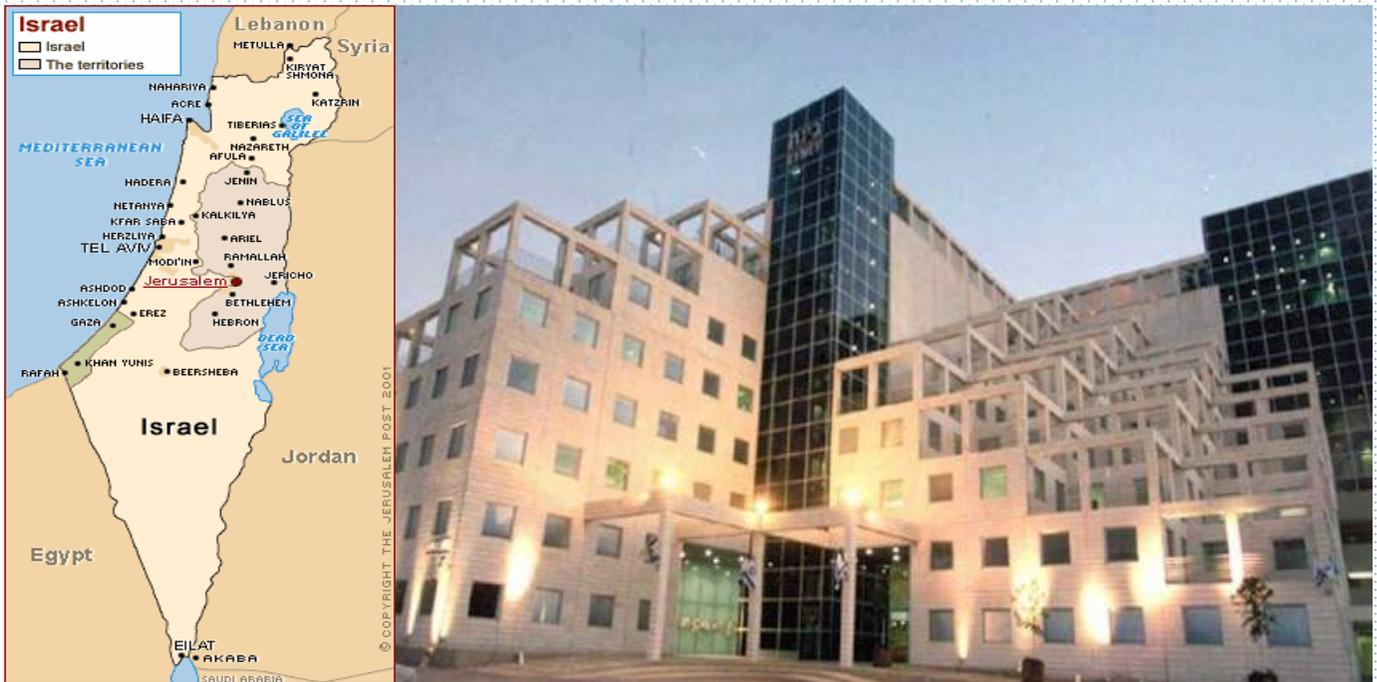
Deep below the streets of Jerusalem, a new project that will ensure Israel is able to continue functioning in the event of a catastrophic event — think all-out war, electromagnetic pulses, major earthquakes, and the like — is slowly but surely being implemented. Down below, servers (and the data they contain) will be well protected from disaster, natural or man-made, allowing the country — once the emergency is over — to quickly restore the many services that depend on data.

When the data center's first section goes online next year, the new data center in the Har Hotzvim hi-tech area will protect data for the banks, the large corporations, and the government offices that decide to store their servers and cloud systems in the new data center, said Alon Bar-Tsur, CEO of Bynet Data Communications.

Data centers host and manage a company's servers altogether, store backup data for business, or provide collocation services (where companies rent out space and services on the data center's own equipment). They are often located underground or in similar secure and out-of-the-way places, with their own electric generators, air-conditioning services, and so on.

Israel has numerous data centers (for security reasons, there are no specific statistics on many of them) spread throughout the country, but many of them are located in the Tel Aviv area. In addition, there are few that offer a full range of services, said Bar-Tsur, with most offering only collocation service. Security is better at some than at others; for example, three data centers run by Bezeq for private enterprise are located underground, while several government data centers are in office buildings.

Bynet is Israel's largest systems integrator and a major provider of information technology services, and is part of the Rad Bynet Group, which encompasses 24 companies working in a variety of tech areas. Bynet runs several data centers, but the new Jerusalem center will be the company's — and, in fact, the country's — largest; it is planned to eventually cover 17,000 square meters.



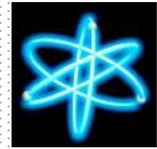
It will also be the country's most secure, said Bar-Tsur, 10 stories (35 meters, to be exact) below ground, with up to 100,000 servers, capable of providing all of Israel's current server, backup, and cloud-service needs. The center will provide a full range of services, and fulfill the most stringent security requirements, such as those of international banks, Bar-Tsur added.

Bynet has been speaking to potential customers already, said Bar-Tsur, and many have expressed interest. At this point, Bynet expects most of its customers to be private organizations — government servers are located in government data centers — but that could change, he said.

One group that will not be using the Jerusalem center is the IDF, which is building its own super-secure computing center in the Negev. Bynet will be handling construction of this center as well; at a recent event, Bynet's chairman Yehuda Zisapel announced that his company would be working with US company Lockheed Martin on construction of the facility, at an estimated cost of 1 billion shekels.

However, construction work on that facility won't take place for several years; for now, completing the Jerusalem data center is Bynet's priority. "The location of this center gives us excellent protection, as it is deeply embedded in Har Hotzvim," Bar-Tsur said. "Because it is essentially located inside a cave, less energy will be needed to cool it off, as it will be naturally cooler. In addition, the generally cooler and less-humid weather in Jerusalem will also contribute to energy savings."

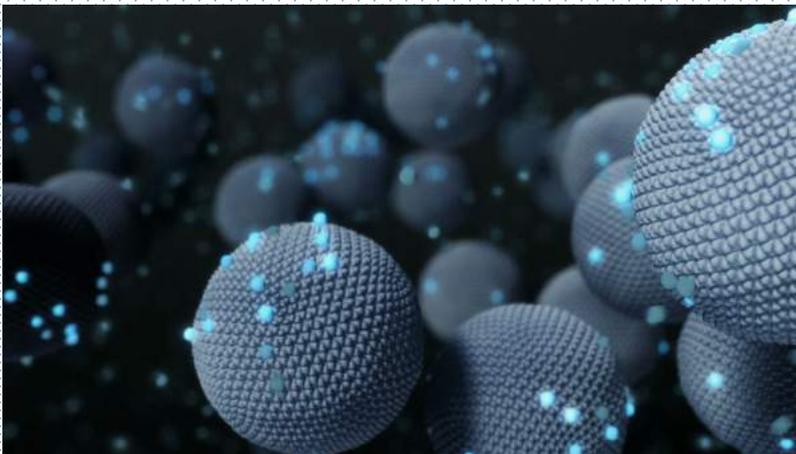
Considering that the nation's business center is in Tel Aviv, Jerusalem seems like an odd choice for a major data center — but it isn't, said Bar-Tsur. "Our studies show that Har Hotzvim, in northern Jerusalem, is one of the safest places in the country for a facility like this: It's easy to reach, with a great road system in the area; and it is a very defensible area. I would much rather have a data center in a place like this than, say, 10 stories under Tulkarm."



Nanotechnology

From the moment you wake up for work and put on a wrinkle-free dress shirt to the instant you head out the door and don a pair of scratch-resistant sunglasses, you have already encountered nanotechnology in your morning routine.

Nanotechnology - present in a variety of consumer and medical products - is the branch of science and engineering that manipulates matter at the nanoscale. The word 'nano' derives from the Greek word nanos for 'dwarf,' with one nanometer (nm) equaling one billionth of a meter. Putting these numbers into perspective, a single sheet of paper is roughly 100,000 nanometers thick.



Nanomaterials are present in over 1,600 products, including suntan oils and toothpaste. Nanotechnology is used in plastic food packaging to help keep oxygen out so that the food spoils at a slower rate and in paints to prevent the growth of mold and to provide insulation. Likewise, the technology appears in sunscreens and cosmetics to increase their translucence while maintaining protective properties against harmful UV rays.

For years, researchers have been turning to nature to observe nanoscale objects as a way of advancing the field. At the Leibniz Institute for New Materials (INM) in Saarbrücken, Germany, for example, researchers successfully created synthetic adhesives that mimic the notoriously sticky nanofibers in a gecko's foot hairs.

This newsletter explores other exciting advances in nanotechnology in Germany - from antibacterial nanosilver surfaces that can help prevent the spread of dangerous germs in hospitals to a groundbreaking new X-ray lens that will enable scientists to produce sharper and brighter images of the nano world. While nanotech offers tremendous potential for the future, it still has unknown risks, inconsistent disclosure, and an immature regulatory environment. Germany's new federal project nanoGRAVUR, also featured in this newsletter, is focused on investigating the environmental impact and health safety of nanomaterials.

Innovation: Dynamic DNA Nanomachines - New Flexibility in DNA Origami



Nanotechnology has the potential to transform numerous industries, including the field of the medicine. The future may bear witness to drug delivery systems that target a particular site in the body, thanks to basic research being done today. Some of the foundations for these future applications are being developed at the Technical University of Munich ([TUM](#)).

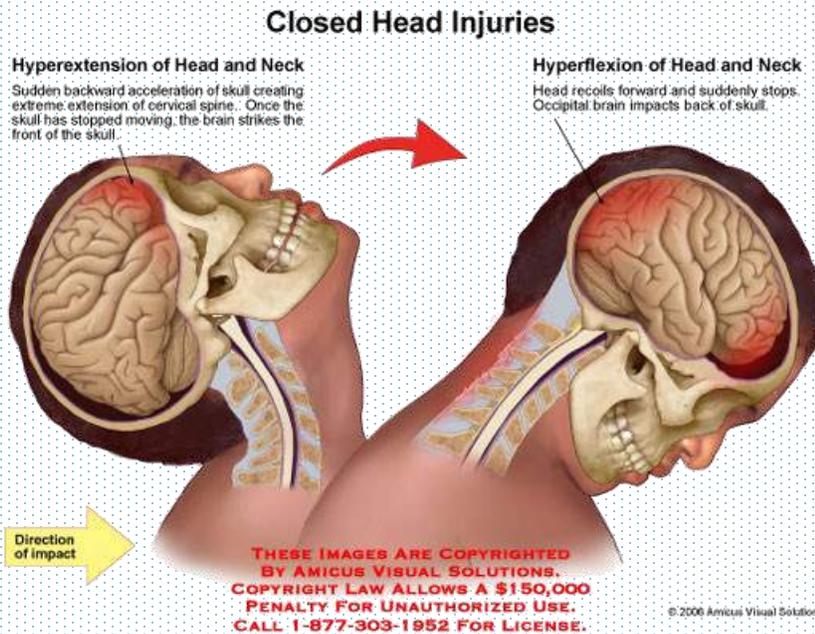
In reference to the traditional Japanese art of paper folding, the research field of TUM's [Prof. Dr. Hendrik Dietz](#) is called "DNA origami." By snapping together complementary shapes instead of zipping strings of base pairs, he has introduced a new method to the modular 3D nanostructure building toolkit. "Once you have built a unit with base pairs," Prof. Dr. Dietz explained, "it's hard to break it apart. So [until now] dynamic structures made using that approach tended to be structurally simple in order to limit the number of base pairs." To build more complex structures and structures with movable parts, his group adapted a weak, short-range binding mechanism called nucleobase stacking.

In nature, weak bonds can be formed when the RNA-based enzyme RNase P "recognizes" so-called transfer RNA. The molecules are guided into close enough range by their complementary shapes. This principle can be used to snap units in place. Three different methods are available to control the shape and action of devices made in this way. "What this has given us is a tiered hierarchy of interaction strengths," Prof. Dr. Dietz said, "and the ability to position - precisely where we need them - stable domains that can recognize and interact with binding partners."

Meanwhile, the team has produced a series of DNA devices - ranging from micrometer-scale filaments that might prefigure technological "flagella" to nanoscale machines with moving parts - to demonstrate their potential fields of application and to begin testing their limits.

Prof. Dr. Dietz ranks among the world's leading researchers in DNA nanotechnology. Earlier this year, he received Germany's most prestigious research award - the [Gottfried Wilhelm Leibniz Prize](#) - for his work on this project.

Brain Injuries



In recent years, sports-related brain injuries have become a major area of scientific investigation. Clinical research developments in neuroimaging have heightened public awareness, spurring greater industry action and regulation on the issue of better protecting players. The National Football League (NFL), for example, has been on the hot seat lately with lawsuits from former players alleging that it intentionally and fraudulently misrepresented and concealed medical evidence about the risks associated with traumatic brain injuries (TBI). The

consequences of these injuries range from short-term effects, like dizziness and nausea, to long-term effects, like depression, dementia, and memory loss. Research has also indicated that repetitive concussive and sub-concussive blows to the head in sports like football, hockey, and soccer increase athletes' risk of developing neurodegenerative diseases like chronic traumatic encephalopathy (CTE). While these new findings on CTE have captured the public limelight, other less visible areas of brain injury research are also making great headway both in the U.S. and in Germany.

Brain injuries can be classified into three main categories. Traumatic brain injuries, for example, are alterations in brain function caused by external forces, such as a fall, motor vehicle crash, gunshot wound, or a violent blow to the head or body. Acquired brain injuries (ABI), on the other hand, are neurological injuries that are neither hereditary, congenital, nor degenerative in nature; they are also not induced by birth trauma. Rather, this type of brain injury occurs after birth, such as by cerebral vascular accidents (commonly known as stroke) or by loss of oxygen to the brain (referred to as hypoxic brain injury). For brain injuries that are not considered to be traumatic or acquired, a third grouping exists for injuries either present at birth, such as cerebral palsy, or progressive in nature, like Alzheimer's and Parkinson's disease.

Both mild and severe brain injuries pose a variety of serious implications, including impaired functioning in neurologic, endocrine, neuromuscular, orthopedic, and/or neuropsychiatric areas. Researchers in Germany are tackling these issues head-on with a spectrum of holistic solutions ranging from preventive care, such as with stylish, flexible helmets designed to encourage usage, to recovery efforts, as with serious games intended to increase patient adherence to rehabilitation training.

Biodiversity



The rapid decline of biodiversity - or biological variety of life on earth - is of great concern. According to a World Wildlife Fund (WWF) report last year, 52 percent of the planet's biodiversity was lost between 1974 and 2010. Within that same time period, 76 percent of freshwater wildlife and 39 percent of marine wildlife disappeared whereas the human population nearly doubled.

This staggering demise is largely attributable to human activity. The clearing of forests, plowing of grasslands, and pollution of

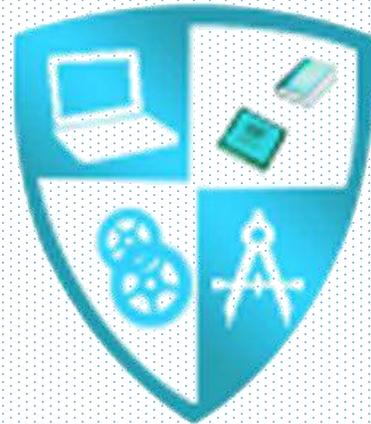
waters in addition to the overhunting of lands and overfishing of oceans have all contributed to habitat and biosphere destruction, transformation, and degradation.

From mangroves and old-growth forests to coral reefs and the deep sea, the earth's diverse natural habitats contain a wealth of vital resources and secrets. This value exists both in terms of ecosystem goods and services. Ecosystem goods are natural products ranging from the genes or parts of an organism to an entire organism itself. Many medicinal and health products, such as analgesics, antibiotics, and remedies for heart conditions, are of plant, fungi, or animal origin. Ecosystem services, on the other hand, offer direct or indirect benefits, such as pollination, natural pest control, carbon storage and climate regulation, erosion control, and pollution processing.

For years, German research organizations, such as the Leibniz Association, have been paving the way in biodiversity research. The Leibniz Network on Biodiversity - a Leibniz Research Alliance of 22 institutions - is one example of these efforts. With its diverse research institutes, natural history museums, and research collections, the Leibniz Association has been heavily involved in training junior researchers in the field of taxonomy, advising policymakers about biodiversity goals, and developing conservation programs and protected areas.

What's in our next issue?

1. ASME Activities
2. Wearable technologies
3. Water on mars
4. Actuators
5. Hyperloop



Jeppiaar Nagar, Kunnam, Sriperumbudhur tk,

Chennai-631 604

Ph. No: 044-27159000

www.jeppiaarinstitute.org

Editorial Board

1. Chief Mentor : **Dr.N.MARIE WILSON** B.Tech., M.B.A., Ph.D.
Director, Jeppiaar Institute of Technology.
2. Coordinator : **Dr.T.VENKATAMUNI**, HOD Mechanical Dept.
3. Chief Editor : **NIRANJAN KUMAR R** (Final Year)
4. Co-Editors : **SENTHIL KUMAR K** (Pre-Final Year)
ROHIT M (Pre-Final Year)

NEWSLETTER PUBLICATION SCHEDULE : JULY, OCTOBER, JANUARY, APRIL.

Mail your articles and Feedback to asme@jeppiaarinstitute.org

BRAIN WAVES, MECHANICAL DEPARTMENT, JIT, CHENNAI

