
Aspire

Achievements in Sports, Projects, Industry, Research and Education

Monthly Newsletter

Department of Mechanical Engineering

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ssn

*Sri Sivasubramaniya Nadar
College of Engineering*

Rajiv Gandhi Salai, Kalavakkam, Chennai, Tamil Nadu, India



ANDREW Z. FIRE

[Source](#)

Andrew Zachary Fire is an American biologist and professor at the Stanford University School of Medicine. He was awarded the 2006 Nobel Prize for Physiology or Medicine, along with Craig C. Mello, for the discovery of RNA interference (RNAi).



Fire was born on April 27, 1959 at Stanford University Hospital in Santa Clara County, California. After spending most of his early years in nearby Sunnyvale, he enrolled at the University of California at Berkeley in the Fall of 1975, receiving an AB degree in Mathematics in 1978. Fire then entered the PhD program in Biology at MIT as a National Science Foundation Fellow in the Fall of 1978. Fire's PhD thesis, titled "In Vitro Transcription Studies of Adenovirus," was submitted in 1983. From 1983 to 1986, Fire received training in the *C. elegans* group at the Medical Research Council Laboratory of Molecular Biology in Cambridge, England, as a Helen Hay Whitney Foundation Fellow. During this time, Fire initiated research directed toward improvement of microinjection technology and development of assays for expression of foreign DNA in *C. elegans* worms.

During his last year at the MRC lab, Fire applied for a research position at the Carnegie Institution of Washington's Department of Embryology in Baltimore, Maryland. He also applied for an independent research grant "Gene Regulation during early development of *C. elegans*" from the US National Institutes of Health. Both applications were successful, and Fire moved to Baltimore in November of 1986. From his arrival at the Carnegie until 1989, Fire held the title of Staff Associate, an independent research position that was designed to facilitate the development of novel research programs in the absence of additional academic responsibilities. In 1989, Fire was appointed as a regular staff member at the Carnegie, with his group continuing to develop DNA transformation technology and collaborating on a number of studies to understand the molecular basis of gene activation in muscle cells.

During his tenure at Carnegie Labs, Fire found an ally in Craig Mello, who was also working on developing techniques for DNA transformation in worms. Together, and with the help of their colleagues, they reported that tiny snippets of double-stranded RNA (dsRNA) effectively shut down specific genes, driving the destruction of messenger RNA (mRNA) with sequences matching the dsRNA. As a result, the mRNA cannot be translated into protein. Fire and Mello found that dsRNA was much more effective in gene silencing than the previously described method of RNA interference with single-stranded RNA. Because only small numbers of dsRNA molecules were required for the observed effect, Fire and Mello proposed that a catalytic process was involved, which was confirmed in subsequent research.

This natural method of switching genes off has turned out to be a superb research tool, allowing scientists to understand the role of new genes by suppressing them. The method may also lead to a new class of drugs that switch off unwanted processes in disease. Two gene-silencing drugs designed to treat macular degeneration are already in clinical trials.

Campus Update

Shiv Nadar is ranked third among the richest person in India



HCL founder **Shiv Nadar** is ranked third among the richest person in India. He has a net worth of \$23.5 billion and on the global list, he is ranked 71st. In July last year, he had stepped down as chairman of IT giant HCL Technologies and handed over the reins to his daughter Roshni Nadar Malhotra.

India has the third-highest number of billionaires in the world after the US and China, according to recent data released by Forbes magazine. With 140 billionaires in 2021, India has gone past Germany (having 136 billionaires) to claim the third spot in countries with the most billionaires 2021, Forbes said. India's top three richest people have added over \$100 billion between them, the report said.

Admission Open for Shiv Nadar University Chennai

Application form opens	– 21st April 2021
Last Date to register for entrance exam:	- 18th May 2021
Entrance exam	- 17th May 2021 & 24th of May 2021
Personal Interview	- 21st May 2021 & 28th May
Merit list announcement	- 4th June 2021



SNUCEE (Entrance Exam)
Slot 1: 17th May | Slot 2: 24th May

Programs

B.Tech AI & Data Science	B.Tech CSE (IoT)	B.Com (Professional Accounting)	B.Com
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Application Process

It is mandatory for the applicant to appear for SNU C entrance exam. After registering you get an option to book a slot for either of the two dates on which the entrance exam is scheduled. Any applicant can appear in only one of the slots. First exam will be conducted on the 17th of May 2021, last date to apply is 10th May 2021. Second exam will be conducted on the 24th of May 2021, last date to apply is 18th May 2021. Personal Interview: Candidates shortlisted based on the entrance exam will be interviewed by a panel of experts. Interview Dates: 21st May (for the exam conducted on 17th May) & 28th May (for the exam conducted on 24th May) Merit list to be announced on 4th June.

Department Update

Placement Update



Glad to keep you updated that Our Final Mech Student - **Vishal Mohan** got placed in **Flender Drives** as Analysis Engineer with a CTC of about 5 lakhs per annum.

Came to know that it was a little bit tough selection process with FD this time and Vishal proved his merit with his sharp presence of mind at every stage during the selection process. Kudos to Vishal!!

Saint Gobin selection held for Both Final Years and Third Years. Only those with 9 & above CGPA are eligible.

Two of our Final Mech Students **Sai Prashanth R** and **Sairam S** got placed in **Technip Energies** with a CTC 5.8 lakhs per annum.

Both are placed in CTS/TCS. Sairam got Infosys too. So, no additions to the placement count. Ours Stands at 61.



Technip gave a priority to those who did projects in vibrations and who had some experience/knowledge in Six Sigma. Altogether, our priorities nurturing core skills on our students are getting validated through such core recruiters!! IT Motivates!!

Dr. N. Lakshmi Narasimhan

Publication in Science Citation Index (SCI) journals

Surulivel Rajan T, Geetha N.B and **S. Rajkumar** Parametric analysis of thermal behavior of the building with phase change materials for passive cooling, Energy Sources, Part A: Recovery, Utilization, and Environmental Effects, 1-13, 2021, Clarivate IF 1.184



This paper assesses the parametric analysis of thermal behavior of the building walls incorporated with phase change material (PCM). Two identical cubicles—one with PCM and another one without PCM are constructed and the thermal response of all the walls and roof of both the cubicles are studied for the climatic conditions of Chennai, India. The results indicated that the maximum temperature of all the walls and roof of the experimental cubicle with PCM is reduced to around 3°C to 4°C vis-à-vis the reference cubicle without PCM. Experimental results from the cubicle with PCM confirmed a significant reduction in an overall heat flux about 28.8%, a decrease in thermal amplitude around 46.05% to 65.63% including a drop in maximum temperature by 9.01% to 11.3% at different sides of the walls.



A. Karthik, R. Karunanithi, **S.A. Srinivasan**, S.P. Kumaresh Babu, R. Narayanan, Beneficial effect of CeO₂ on the corrosion behaviour of AA2219 squeeze cast composites – An experimental investigation, Materials Letters, 297,2021,129937, <https://doi.org/10.1016/j.matlet.2021.129937>, Clarivate, IF 3.204.

Nambiraj, K.M., **Rajkumar, K.** & Sabarinathan, P. A Novel Approach on Reusing Silicon Wafer Kerf Particle as Potential Filler Material in Polymer Composite. Silicon (2021).<https://doi.org/10.1007/s12633-021-00951-6>, Clarivate IF 1.499.



Gowtham Kumarasamy, **Poovazhagan Lakshmanan**, Geethapriyan Thangamani, Electrochemical Micromachining of Hastelloy C276 by Different Electrolyte Solutions, Arabian Journal for Science and Engineering, 46:2243–2259, 2021, Clarivate IF 1.71.

C. Gopinath, **Poovazhagan Lakshmanan**, S. C. Amith, Production of Micro-holes on Duplex Stainless Steel 2205 by Electrochemical Micromachining: A Grey-RSM Approach Arabian Journal for Science and Engineering 46:2769–2782 2021, Clarivate IF 1.71.

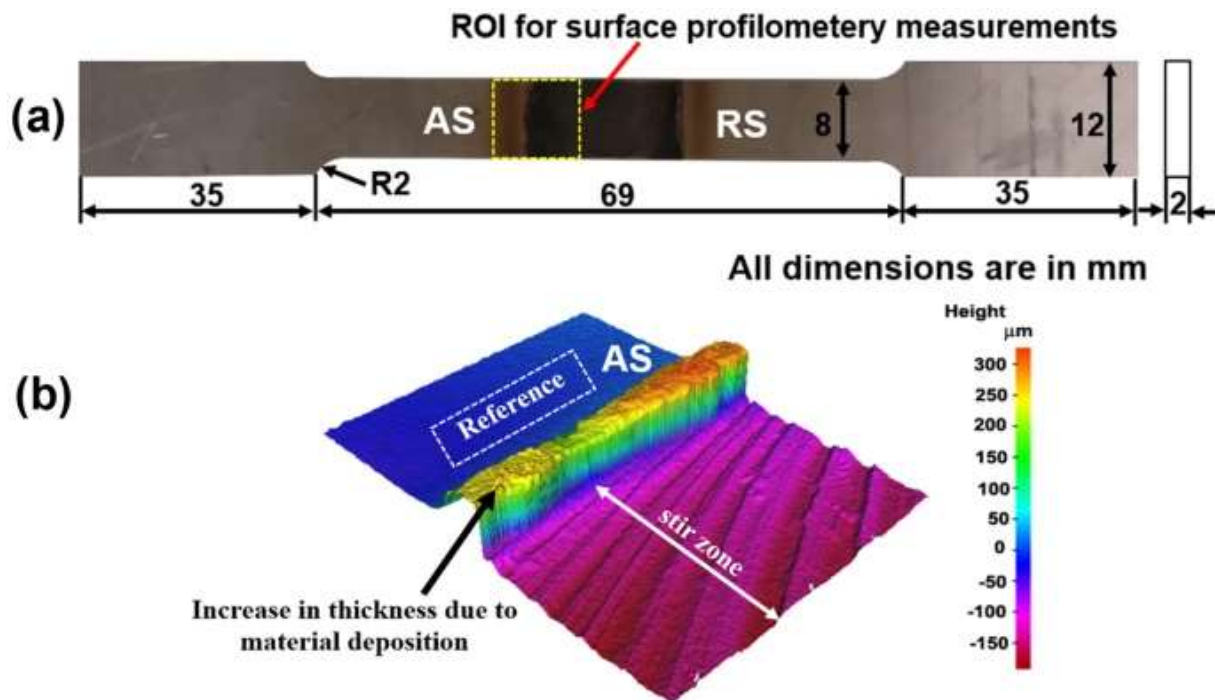


R Vimal Sam Singh, Achyuth Ramachandran, Anirudh Selvam, Karthick Subramanian, Python inspired Artificial Neural Networks Modeling in Drilling of Glass-Hemp-Flax Fiber Composites, FME Transactions, 49, 422-429, 2021

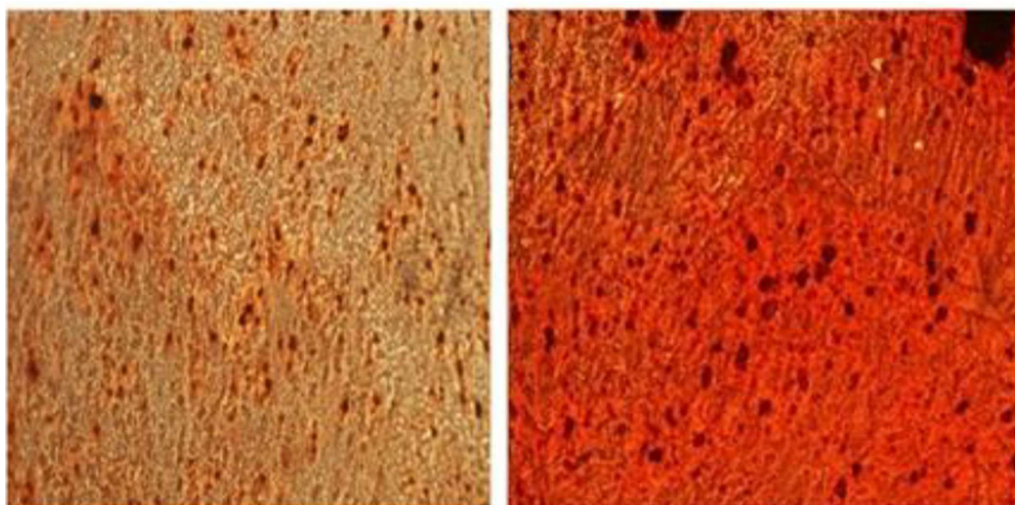




Ramachandran, S., Lakshminarayanan, A.K., Reed, P.A.S. et al. Application of Imaging Techniques to Determine the Post-Yield Behaviour of the Heterogeneous Microstructure of Friction Stir Welds. *Exp Mech* (2021). <https://doi.org/10.1007/s11340-021-00722-9>. Clarivate IF 2.496.



Prabakaran, M., Rajakannu, S., Lakshminarayanan A K. and Gupta, M. (2021), In vitro degradation, haemolysis and cytotoxicity study of Mg-0.4Ce/ZnO₂ nanocomposites. *IET Nanobiotechnol*, 15: 157-163. <https://doi.org/10.1049/nbt2.12032>. Clarivate IF 1.859.



The final year project work guided by **Dr. S. Suresh Kumar** in the year 2017, has been accepted for publication in the international Journal of Defense Technology, Elsevier publishers. (Clarivate Analytics, Impact factor: 2.637). The co-authors of the paper are, **Mr. Shankar P. A** and **Mr. Lalith Kumar K**.



Dr. S. Suresh Kumar



Mr. Shankar P. A



Mr. Lalith Kumar K

Title of the paper: Failure Investigation on High Velocity Impact Deformation of Boron Carbide (B4C) Reinforced Fiber Metal Laminates of Titanium / Glass Fiber Reinforced Polymer

In this paper, high velocity ballistic impact deformation behaviour of Titanium / GFRP Fiber Metal Laminates (FML) has been determined. Both single and multiple projectiles impact conditions were considered. Ti/ GFRP FML targets were fabricated with addition of 5% and 10% weight percentage of boron carbide (B4C) particles. High velocity ballistic experiments were conducted using Armour Piercing Projectile (APP) of diameter 7.62 mm and velocity ranging between 350 to 450 m/s. The presence of B4C (5% by weight) particles has significantly improved the ballistic resistance of the Ti/GFRP FML target by offering frictional resistance to the projectile penetration. Further addition (10% by weight) of B4C has reduced the ballistic performance due to agglomeration. None of the targets showed 'brittle cracking' or 'fragmentation'. Ti/GFRP FML showed lesser DoP compared to Aluminium (Al 1100/GFRP and Al 6061/GFRP) FMLs. Following fig.1 shows the deformed shape of the target.

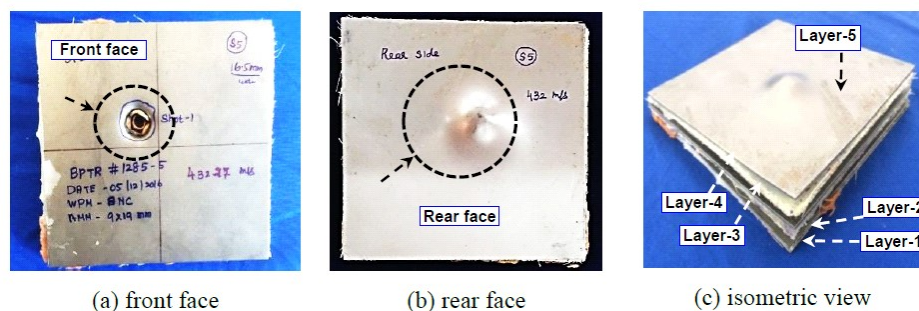


Fig.1 Details of deformed FML target

Mr. Shankar P. A completed MSc Applied Mechanics from Chalmers University of Technology, Sweden. Presently working "Kiwa Inspecta Technology", Sweden. Mr. Lalith Kumar K has completed MBA from BITS Pilani.

The final year project work guided by **Dr. S. Suresh Kumar** in the year 2020, has been accepted for publication in the International journal of Mechanics of Advanced Materials and Structures, Taylor & Francis Inc. (Clarivate Analytics, Impact factor: 3.517). The co-authors of the paper are, **Mr. Pranaav Sankar S, Mr. Vignesh Kumar S and Rakesh Kumar J**



Dr. S. Suresh Kumar



Pranaav Sankar S



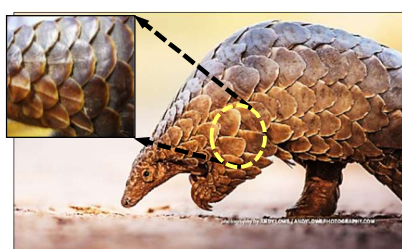
Vignesh Kumar S



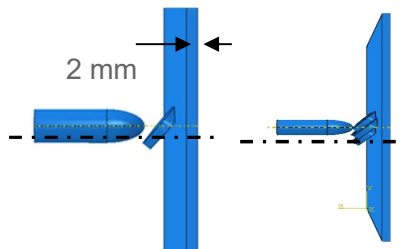
Rakesh Kumar J

Title of the paper: “Effect of bio-inspired surface pattern (Pangolin’s scales) and grooved mechanisms on the high velocity ballistic performance of aluminium 6061-T6 targets”.

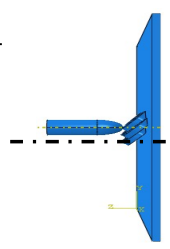
In this work, the individual influence of target dynamics, curvature, bio-inspired (Pangolin’s scale) surface pattern, and presence of external (‘V’-shaped) and spaced internal grooves (‘M’-shaped) on ballistic performance of lightweight aluminium (6061-T6) target has been investigated. Target thickness of 10 mm and an armour piercing projectile of 9 mm diameter, 7.85g weight were considered for the numerical simulation. The initial impact velocity of the projectile was varied in the range of 400 to 800 m/s. Compared to the static target, the exit velocity of the projectile was observed to be less (2.3%) for the dynamic target. When the target is moving, it significantly alters the penetration direction and increases the travel length of the projectile. Compared to all other cases, the spaced internal grooves (‘M’ shape) inside the target, enhanced the ballistic resistance (72%) for groove dimensions of pitch and width of 3.5 mm and 0.5 mm.



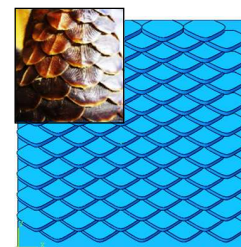
(a) Scales of a pangolin



(b) impact on three pangolin scale



(c) impact on seven pangolin scale



(d) 3D view of Bio-inspired Pangolin Target

Fig.3. Target with bio-inspired scale pattern

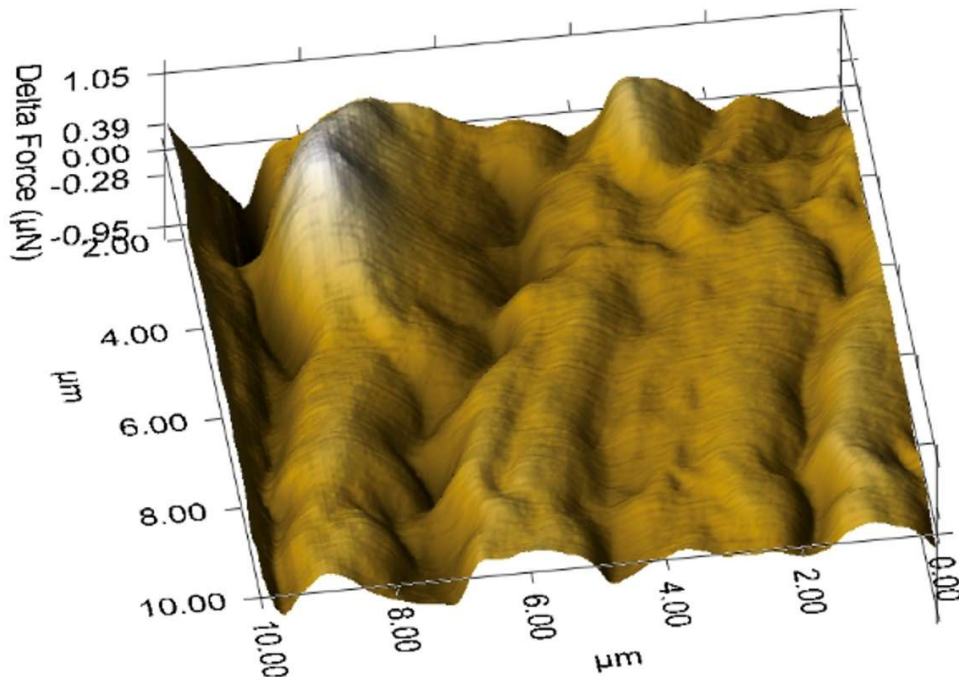
Present position of the co-authors: Pranaav Sankar S - **Hyundai Motor India,**

Rakesh Kumar J - **Technip India,**

Vignesh Kumar S - **Emerson, Chennai.**



V. Vignesh, S. Vijayan and G. Selvakumar, Nanometer-Scale Mechanical Properties of MWCNT-Mustard Oil Nanofluid as a Potential Base Stoke, Journal of Chilean Chemical Society Vol. 66, No. 1, Pp. 5051-5056. 2021 Clarivate IF 0.731.



AFM of matrix material lubricated by 0.2 wt% of MWCNT-Mustard oil nanofluid

External Recognition

Dr. Arunprakash C and Dr. R. Vimal Sam Singh played the role of Session Chairperson in the paper presentation event "Enrichment Enhancement and Empowerment" (E-Cube-21) conducted by Meenakshi Sundarajan Engineering College on 16th April 2021



Dr. G Selvakumar, Associate Professor / Mech was invited to act as an external expert member of Curriculum Advisory Committee (CAC) of Department of Mechanical Engineering, FX Engineering College, Tirunelveli, Tamilnadu.

Dr. G Selvakumar has conducted academic audit at the Mechanical Engineering department of Sri Sairam Engineering College, Chennai on 23-04-2021.

Dr. Alphin M S is an invited resource person to deliver a guest lecture in AICTE - ISTE Sponsored One Week Online Refresher Program on ""Strength of Materials - An Effective Teaching Methodology, organized by Nalla Narasimha Reddy Education Society's Group of Institutions, Hyderabad, 09.04.2021.



Dr. A.K. Lakshminarayanan, delivered a guest Lecture on "Recent Advances in Friction Stir Welding Technologies" in an international webinar Organised by Southern Institute for Materials & Manufacturing Academic Services (SIMMAS) and Indian Welding Society (IWS), Annamalai Nagar Chapter on 24th April 2021.

Patents from the Department



Dr. R.Vimal Sam singh (ASP/Mech) along with students S.Pranav Shnakar , Rahul B, Rakesh Kumar J , Sathyaseelan S published a patent on the Title "Weather based control for Automobiles" [Application Number:202141017843]



Dr. R.Vimal Sam singh (ASP/Mech) along with **Dr. S. Esther Florence** ASP/ECE and Ms. Sakthi Abirami SRF/ECE published a patent on the Title ""Quadband RF shield using a Mechanically Configurable Venetian Blind Structure"" [Application number: 202141010951]

Mr. Divya Zindani, Assistant professor, Dept. of Mechanical Engineering, filed patent for the invention titled "ECO-FRIENDLY DRAWER RAIL" bearing Application number: 342762-001



Research Funding Applied



Dr. D. Ananthapadmanaban, Associate Professor (Principal Investigator) and Dr.T.R. Vijayaram, Professor, Centre for Research, Centre for Materials Engineering and Regenerative Medicine (Co-Principal Investigator) have applied for a project entitled Processing and Characterization of Amorphous Boron, in April,2021. Possible funding agency is Armament Board, Defense Research and Development Organization.

Faculty Writeup

Guest lecture arranged for Mechanical Engineering students



Dr Nalla Mohamed and Dr. D. Ananthapadmanaban jointly organized a guest lecture on Advances in Foundry Technology and career opportunities on 11/03/21. The speaker was Mr. Sekar, CEO, RVJ Foundries Ltd. and a very senior person with a lot of teaching and Industrial experience in India and abroad. Mr. Sekar started by introducing the students to the casting processes, highlighting the various types of castings used practically. He mainly focused on Automation in Foundries with automatic charging, feeding, pouring and fettling machines. He talked about the various simulation packages like MAGMACAST and invited the students and staff for an industrial visit. We are planning on value added course, internship and projects with the help of Mr. Sekar's experience.

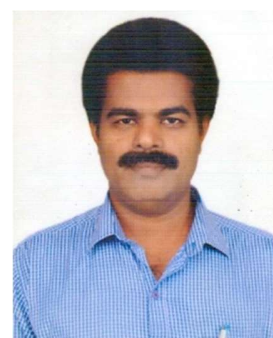


Dr Nalla Mohamed organized a guest lecture on "Methodological approach to injection molding process optimization & quot; on 16.04.21. The speaker is Mr.S.Jeevanantham, Supply chain management manager, Flextronics, Malaysia. Mr. Jeevanantham initiated the lecture by introducing injection molding process, types of molding used in industries environment. He highlighted advanced molding techniques, advanced conveying system and recent advanced molding machineries. The lecture was very interesting from the student point of view.

NAGARAJAN S, Lab Instructor writes

Completed Alison – Courses

1. Energy Efficiency and Quality
2. Introduction to Manufacturing Strategy
3. Physical Fitness - Fitness Tips and Workout Routines –Revised
4. Safety in the Workplace



Webinars Attended

1. Attended the webinar on **“Conservation of Water and Water Bodies”** as part of Swach Bharath - Clean and smart Campus initiative by Mr. Arun Krishnamurthy, Founder - Environmentalist foundation of India and conducted by the NSS Unit of SSN College of Engineering, Kalavakkam on 10th April 2021.
2. Attended the Webinar **“Strategies for VUCA World: Expert Tips to Make Change A Driver for Professional Growth”** by Sri Krishnan, Digital Innovation Consultant and former Senior Vice President at Robert Bosch Engineering, Wednesday, April 21, 2021.
3. Attended the Webinar **“Multilayer Finite Element Modelling of Advanced Gas-Cooled Reactor Fuel Bricks”** by Institution of Mechanical Engineers, 1 Birdcage Walk, Westminster, London, UK, on 22/04/2021.
4. Attended the Webinar **“The Power & Peril of Your Inner Voice: The World Has Changed”** by the TEDx Gateway on 23/04/2021.
5. Attended the Webinar **“Opportunity for Mechanical Engineers in a Sustainable Resource’s Future”** by Institution of Mechanical Engineers, 1 Birdcage Walk, Westminster, London, UK, on 26/04/2021.

Computer and English Course Participated

I got 4 Nos. of Computer courses like Communication Skills, English Vocabulary, Graphic Design, and Windows 7 from Study Section online Test, during the month of April 2021.

Other monthly Activities and Publications

M. Thomas Victor, G. Selvakumar, S.Surendarnath, and P.Ravindran, Mechanical Properties of magnesium hybrid composite reinforced with Al₂O₃ and MoS₂ particles through PM route, Materials Today: Proceedings, Vol. 37, Part 2, Pp. 2396-2400 2021 Scopus 0.3

N. Sankara Manikandan, M. Prem Ananth, L. Poovazhagan, B. Sudarsan, and A. Vishnuvarthan Friction and Wear Study of Laser Surface Textured Ti-6Al-4V Against Cast Iron and Stainless Steel Using Pin-on-Disc Tribometer, Lecture notes in mechanical engineering, 1, 845-854, 2021

C Prakash and K S Vijay Sekar, Finite element analysis of the slot milling of carbon fiber reinforced polymer composites, IOP Conf. Series: Materials Science and Engineering, 1128, 1-9, 2021

Arun Rajesh, Bala Kumar S S, Ashok R & Vijay Sekar K S Experimental Investigations on the Drilling of Titanium Metal Matrix Composite, IOP Conf. Series: Materials Science and Engineering, 1128, 2021

Dr G Selvakumar, Associate Professor/ Mech has conducted synopsis DC meeting (online mode) for his part-time PhD scholar Mr. Goutham Murari V P (Reg no. 1614299244) on 16.4.2021.

Dr.R.Vimal Sam singh , ASP/Mech conducted the First DC Meeting for his part time research scholar Mr.Bradley Bright on 15th April 2021

Dr. S.A.Srinivasan, Assistant Professor, attended One-week online AICTE Sponsored Short Term Training Programme (STTP) on "VIBRATION ANALYSIS AND MEASUREMENTS" Conducted by M.N.M JAIN ENGINEERING COLLEGE, CHENNAI from 01.03.2021 - 06.03.2021.

Mr. Divya Zindani, Assistant professor, attended, AICTE-MARGDARSHAN one-week Virtual Faculty Development Program on "OUTCOME BASED EDUCATION AND NBA ACCREDITATION FOR TIER COLLEGES" organized by S.R.K.R. Engineering College (Autonomous), Bhimavaram, Andhra Pradesh, from 29.03.2021-03.04.2021

Dr KS Vijay Sekar, Associate Professor, attended a webinar titled " India Faculty Summit" organised by Google on 23rd April 2021.

Dr. V.E. Annamalai and **Dr. Satheesh Kumar Gopal** attended the Virtual Stakeholders Meeting on Tamil Nadu Industry 4.0 Centre for Excellence held on 10th April 2021 between 02.30 pm to 04.30 pm.

Non-Teaching Staff Activities

Mr. Subramani R, completed Alison course - Internal combustion engine basics in Mechanical Engineering.

Mr. M. Giridharan /Lab Assistant/Mech completed Alison online course on "ISO Management systems Auditing Technics and Best practices"

Mr. P. Balasundaram / Lab Assistant /Mech Completed Online Course *Internal Combustion Engine* Alison Course on April Month.

Mr. P. Balasundaram / Lab Assistant /Mech Completed Online Course *Diesel Engine Basics* Alison Course on April Month.

Student Write-up

VIRTUAL RECRUITMENT

Hi, I am Sai Prashanth, and I'm sharing my experience with TechnipFMC's recruitment process. The recruitment drive consisted of two rounds. The process flow was as follows:



Round 1: AMCAT – Aptitude test

The first round was an Aptitude test which was conducted in AMCAT platform. It had 5 sections: Verbal Ability, Logical Reasoning, Quantitative Ability, Technical Aptitude and Personality Test.

Round 2: Interview

18 students from Mechanical were shortlisted for the personal interview. The shortlisted students were called for the personal interview. The interview was conducted on Microsoft Teams platform. It was a Technical cum HR interview and there were 3 members in the panel (2 Technical + 1 HR). The interviewer asked me to introduce myself and asked few questions about my family. This was followed by questions from my project. Then he moved on to the online courses that I had completed, asked me to explain what I had learnt from those courses. The interview completed with a few HR questions. The interview lasted for 30 minutes in total. The results were announced after a week and 2 students were selected from Mechanical.



Finally, I would like to thank Dr. Lakshmi Narasimhan N and the entire CDC team for ensuring that the placement process goes on smoothly even during this pandemic. I hope my experience helps you all for your impending interviews. All the best for your future endeavours.

How to get a summer research fellowship with an IIT?

Cynthia Joy (III yr. Mech) shares her experience in achieving an internship at IIT

Are you one of those people who wanted to know how it is to study in an IIT? Or are you one of those people who is extremely curious to know why are IIT's one of the world-renowned institutes? Or are you one of those people who missed getting admission into an IIT? If yes then this article is definitely for you. Every year IIT's offer undergraduate students (usually second- and third-year students) the chance to do a summer or winter research fellowship for about 5-8 weeks under the guidance of an IIT professor. You can apply for this internship either through the Indian Academy of Sciences Portal or the portal of the particular IIT that you are interested in. The portal usually opens in the month of November-December. However, the dates tend to vary. Therefore, it is important to check the website for updates! In the portal you will have to fill in your personal details and also upload copies of your semester mark sheet. You would also have to write a short paragraph stating which field you would like to work in and a Letter of Recommendation (LOR) from one of the professors. After a few months they declare the results and send out offer letters. Also, if you have plans in pursuing higher studies, doing research in an IIT is of advantage. The whole process is also completely free of charge and also gives students the chance to access high quality education.



An internship opportunity at TATA Advanced Materials...

Between the 20th of January and 1st of April we, the students from final year Mech-A have completed our Internship - final year project at TATA Advanced Materials Limited also known as TAML (Jigani, Bangalore) with utmost dedication and sincerity. TAML is a pioneer and leader in composite manufacturing and solutions, catering to the demands of the Aerospace, Defence, and Industrial composites realms across the globe. Their customer portfolio contains many industry-leading companies such as Boeing, Pratt & Whitney, Spirit Aerosystems, and SAAB Aerostructures.

We had worked in the Supply Chain Department which was of great exposure towards the practical understanding of material flow in industries, material management, and various quality standards in the industry. We aimed at identifying an Economical mode of Transportation which involved analysis of wide data collected in the logistics domain to come up with a methodology



to decide the optimal mode of transportation keeping in mind the various factors and developed an in-depth understanding of cost-cutting methods.

We had also addressed the current industry challenge of transportation of temperature-sensitive materials and provided a range of solutions by analyzing the methods of packaging owing to the present industry scenario and market standards.

We were very happy with the valuable guidance provided to us by the officials of TAML which helped us throughout this project and very satisfied to avail of this internship opportunity in the Supply Chain department being a crucial aspect of any organization which motivated us to gain experience in this Aerospace field.



Glaston Sekar

IVth Year, Mechanical



Ashwin Ballal

IVth Year, Mechanical



Madhav Prasad

IVth Year, Mechanical

Nithish Kumar R S, III-year, writes...

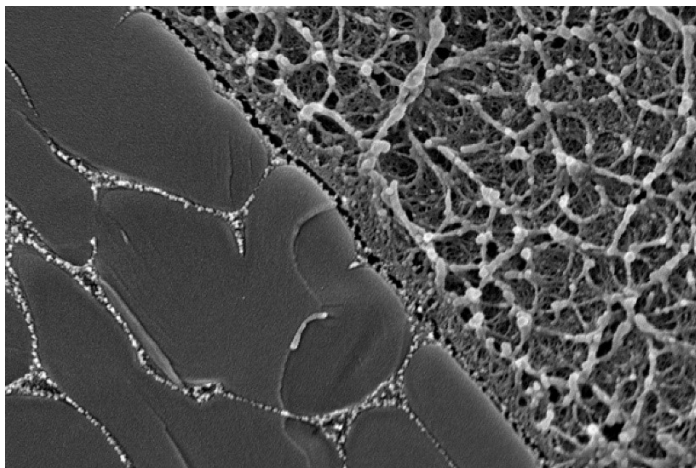
Hi, I am Nithish Kumar R S from 3rd year Mech B (181002104). I am a bodybuilder. I have won IRONMAN OF TAMIL NADU title and Mr. SOUTH INDIA title in bodybuilding this month. First, I went to the IRONMAN OF TAMIL NADU competition at Chennai on April 11, 2021 and won in the bodybuilding senior level classic category (75 kgs) and a got medal and certificate as awards. Then I went to Mr. SOUTH INDIA competition on April 23, 2021 at Karaikal, Tamil Nadu and won that too in the Junior level classic category (70+ kgs) and got the trophy and certificate. I am honoured and happy to share my achievements with the Aspire newsletter readers.



Mech Marvel

Living Materials

In joints like our knees, cartilage protects the ends of the bones, allowing them to travel easily against one another without wearing down the bone tissue beneath. It's made up of collagen fibres, proteoglycan proteins, and elastin protein fibres in a porous matrix. Synovial fluid, a viscous substance formed in the joints, is absorbed by that matrix. The fluid is progressively released from the interfacing cartilage surfaces as the joint moves, providing lubrication. At the same time, due to a hydroelastic effect, the absorbed fluid allows the cartilage to withstand being irreversibly deformed by compressive forces.



Although scientists have attempted to build artificial cartilage in the past, they have traditionally used soft hydrogels that cannot withstand such forces. Scientists from the University of Leeds and Imperial College London, led by Dr. Siavash Soltanahmadi, have taken a different approach. They're still using a hydrogel that can absorb and release a

lubricant – in this case, water – but it's now encased in a porous silicone-based polymer called polydimethylsiloxane (PDMS). As compressive force is applied to the hydrogel/polymer material, the polymer allows the lubricating gel to withstand 14 to 19 times more force than it could on its own. In fact, the elastic modulus of the material is similar to that of natural cartilage.

"We have now developed a material for engineering applications that mimics some of the most important properties found in cartilage, and it has only been possible because we have found a way to mimic the way nature does it," says Soltanahmadi. "There are many applications in engineering for a synthetic material that is soft but can withstand heavy loading with minimum wear and tear, such as in bearings."

An article about these findings was recently published in the journal [Applied Polymer Materials](#).

Corporate Story

Emflux Motors

Emflux Motors was created in 2016 by a group of technology enthusiasts who saw electric technology as having the potential to fully transform the world of transportation and mobility. They recognize that humanity has just started to scratch the surface of electric technology's enormous potential and opportunities. With their two-pronged market orientation, their goal is to empower 10 million electric two-wheelers in India by 2027: first, establish brand and loyalty by manufacturing high-performance electric motorcycles, and second, create an ecosystem of partner OEMs to whom they will become the technology and component supplier.



The Emflux One is India's first electric superbike, and is expected to hit the streets in December 2021. It appears to be a middleweight supersport with an internal combustion engine, but it is actually powered by electricity. It is said to accelerate from zero to 100 kmph in just 3 seconds, with a top speed of 200 kmph. The Emflux One features a liquid-cooled 60 kW AC induction motor with a maximum output of 53 kW (roughly 70 bhp) from the controller. The power source is a Samsung lithium ion 9.7 kWh battery, which charges from 0% to 80% in just over half an hour.

Their revolutionary motor design ensures a high level of power and performance. Our AC induction motor's optimal integration of key parts and new age streamlined design ensures that the total weight is kept low. An extended driving range and high torque capability are aided by the highly efficient gear technology. Their proprietary software offers adaptable solutions to meet the needs of a wide range of electric vehicles.

Amazing Innovation

O2 – MOST POWERFUL TIDAL TURBINE IN THE WORLD



Scotland's **Orbital Marine Power** (formerly **Scotrenewables**) has completed the build on what it claims will be the world's most powerful operational tidal turbine. Orbital's approach is targeted to keeping costs as low as possible. It uses floating turbines, installed in channels that accelerate tidal flows. These turbine platforms are moored to the ocean floor at four points using extremely strong

chains, meaning the undersea work to install them is quick, cheap and minimal. The turbines are joined to the main platform with huge arms, and their giant blades can be reversed in pitch between tide cycles to generate power whichever way the water's moving. Energy is sent back to shore through thick undersea cables, and the platform's arms can articulate to bring the turbines up out of the water for simple inspection and maintenance without any scuba gear required.

Source: <https://newatlas.com/energy/orbital-o2-tidal-turbine/>

LASER-POWERED AUTONOMOUS WEEDER ROBOT



Startup **Carbon Robotics** has wheeled out an autonomous machine that has these pesky plants in its cross hairs, using a combination of computer vision and high-powered lasers to comb fields and take out thousands of weeds an hour. Carbon Robotics has built a **9,500-lb (4,300-kg), four-wheeled robot that uses GPS and computer vision to trundle through crops on the lookout for weeds.** It

relies on an **onboard supercomputer** and **high-resolution cameras** to identify unwanted plants, and then eight simultaneously operating **150-W lasers** to kill them off with thermal energy by targeting their meristems, at a rate of more than **100,000 weeds an hour**. The fully autonomous machine runs on diesel and can operate around the clock, covering **15 to 20 acres (6 to 8 ha) per day**, while its lasers leave the surrounding soil undisturbed to preserve its microbiology.

Source: <https://newatlas.com/robotics/autonomous-weeder-robot-uses-lasers/>

Research news and Forthcoming event

Department of Health and Human Services Administration for Children & Families – ACYF/FYSB

Personal Responsibility Education Program Innovative Strategies (PREIS)

Last date for submission of the project proposal: **20-May-2021**

<https://www.grants.gov/web/grants/search-grants.html>

Department of Science and Technology (DST)

India-Sweden Collaborative Industrial Research & Development Programme 2020 on “Smart Grid” Request for Proposal (RFP), Common Application Form & Guidelines for Indian Participants

Last date for submission of the project proposal: **20-May-2021**

<https://dst.gov.in/sites/default/files/India-Sweden%20Collaborative%20Industrial%20Research%20%26%20Development%20Programme%202020%20on%20Smart%20Grid%20.pdf>

Department of Science and Technology (DST) – International Co-operation division

India Russia joint research Call 2021

Last date for submission of the project proposal: **15.06.2021**

<https://onlinedst.gov.in/Projectproposalformat.aspx?Id=India%20Russia%20Joint%20Research%20Call%202021>

National Aeronautics and Space Administration NASA Johnson Space Center

2020 Human Exploration Research Opportunities (HERO)

Last date for submission of the project proposal: **30-Jul-2021**

<https://www.grants.gov/web/grants/search-grants.html>

Department of Health and Human Services National Institutes of Health

BRAIN Initiative: Pilot resources for brain cell type-specific access and manipulation across vertebrate species (U01 Clinical Trial Not Allowed)

93.173 — Research Related to Deafness and Communication Disorders

93.213 — Research and Training in Complementary and Integrative Health

93.242 — Mental Health Research Grants

93.273 — Alcohol Research Programs

93.279 – Drug Abuse and Addiction Research Programs

93.286 — Discovery and Applied Research for Technological Innovations to Improve Human Health

93.853 — Extramural Research Programs in the Neurosciences and Neurological Disorders

93.865 — Child Health and Human Development Extramural Research

93.866 — Aging Research

93.867 — Vision Research

Last date for submission of the project proposal: **19-Oct-2021**

<https://www.grants.gov/web/grants/search-grants.html>

Department of Health and Human Services National Institutes of Health

NIAID Research Education Program (R25 Clinical Trial Not Allowed)

Allergy and Infectious Diseases Research

Last date for submission of the project proposal: **07-Dec-22**

<https://www.grants.gov/web/grants/search-grants.html>



19th annual Create the Future Design Contest is now accepting entries at www.createthefuturecontest.com. Submit your brightest ideas for a chance to win \$25,000 – our largest grand prize ever! There is no cost to enter.

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Inspiring Life Stories

Story of a Monk

Once there was a monk, who lived in a village. He was famous for his dance which used to cause rain. One day, four boys came to the same village from a city. They came to know about the magical dance of monk, but they



couldn't believe that how a man could make it rain by dancing. Out of curiosity, they asked the monk to dance and call the rain. But, the monk asked them to dance first and try if they could bring the same magic. One by one all of them danced, but there was no sign of rain. Then, the monk started dancing, he danced for an hour but nothing happened.

But, he didn't stop dancing. He continued to dance for four hours and suddenly weather started to change and it was raining. The boys were shocked to see it raining and asked him the secret of his magic. The monk replied, 'the secret of his magic is belief'. He started dance with a belief that it is going to rain and he wouldn't stop until it's raining. It is the power of belief that causes things to happen in our life. So, never stop until you are done because one day your hard work is going to pay off. You just have to put continuous efforts and believe in your hard work to reach your goal.

Source: <https://www.motivationnyou.com/2018/07/short-motivational-stories/>

Pic source: <https://www.dreamstime.com/illustration/dancing-monk.html>

Corporate Wisdom

From the desk of Ramki -- Aspire to Inspire

Happy Morning

Talent is not enough, champions have attitude and the strength to fight - P



Karoly Takacs was a sergeant in the Hungarian army. In 1938, the 28 year old was one of the best pistol shooters in the world and widely tipped to win gold in the upcoming Olympic games. And then one day, disaster struck. In an army training session, a hand grenade exploded in his hand. And blew it away. The potentially gold-winning right hand was gone. " Why me" Karoly would have been excused for asking the question most of us would have asked. He could have become a one handed recluse, cursed his fate, and wallowed in self-pity. Oh no, not Karoly. He was made of Stern Stuff.

STERN STUFF

Instead of focusing on what he had lost, Karoly decided to focus on what he still had : the determination to succeed, the Mental strength & of course - a healthy left hand.

Within a month, Karoly was back on the shooting range, learning to shoot with his left hand. The shoulder still hurt, the left hand was unsteady, but the mind was focused. Two successive Olympic games were cancelled due to the war, and finally the games came to London - ten years after Karoly's accident. Guess what ? Karoly Takacs was chosen to represent Hungary in the shooting event.

And he won the gold medal shooting with his left hand.

We all have moments in our lives when we seem to close go glory, but suddenly lose everything. Our dreams get shattered. We feel vanquished. Crushed, beaten and defeated.

When that happens, think of Karoly. In fact , think like him.

Winning a gold medal in shooting is less about the hand and more about the mind. Life is like that. Skills can be acquired. It is the mental toughness that is the tough bit. The winners' mind-set - that what matters.

My Learning

- It is not the critic who counts; not the man who points out how the strong man stumbles, or where the doer of deeds could have done them better.
- The credit belongs to the man who is actually in the arena, whose face is marred by dust , sweat and blood; who strives valiantly, who errs, who comes short again and again, because there is no effort without error and shortcoming, but who does actually strive to do

the deeds; who knows great enthusiasms, the devotion, who spends himself in a worthy cause; who at the best knows in the end the triumph of high achievement, and who at the worst, if he fails, at least fails while daring greatly, so that his place shall never be with those cold and timid souls who neither knows victory nor defeat.

#WishingMostAndMore

Have a wonderful day

R. Ramakrishnan

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