Newsletter

Volume 5, Issue 2, February 2015

Mechanical Aspire

Achievements in Sports, Projects, Industry, Research and Education

All about Nobel Prize-Part 14

Life and work of Madam Curie

Marie Curie became the first woman to win a Nobel Prize and the only woman to win the award in two different fields (physics and chemistry). Curie's efforts, with her husband Pierre Curie, led to the discovery of polonium and radium and, after Pierre's death, the development of X-rays.

Early Life

Maria Sklodowska, better known as Marie Curie, was born in Warsaw in modern-day Poland on November 7, 1867. Her parents were both teachers, and she was the youngest of five children. As a child Curie took after her father, Ladislas, a math and physics instructor. She had a bright and curious mind and excelled at school. But tragedy struck early, and when she was only 11, Curie lost her mother, Bronsitwa, to tuberculosis.

A top student in her secondary school, Curie could not attend the men-only University of Warsaw. She instead continued her education in Warsaw's "floating university," a set of underground, informal classes held in secret. Both Curie and her sister Bronya dreamed of going abroad to earn an official degree, but they lacked the financial resources to pay for more schooling. Undeterred, Curie worked out a deal with her sister. She would work to support Bronya while she was in school and Bronya would return the favor after she completed her studies.

For roughly five years, Curie worked as a tutor and a governess. She used her spare time to study, reading about physics, chemistry and math. In 1891, Curie finally made her way to Paris where she enrolled at the Sorbonne in Paris. She threw herself into her studies, but this dedication had a personal cost. With little money, Curie survived on buttered bread and tea, and her health sometimes suffered because of her poor diet.

Curie completed her master's degree in physics in 1893 and earned another degree in mathematics the following year. Around this time, she received a commission to do a study on different types of steel and their magnetic properties. Curie needed a lab to work in, and a colleague introduced her to French physicist Pierre Curie. A romance developed between the brilliant pair, and they became a scientific dynamic duo.

Discoveries

Marie and Pierre Curie were dedicated scientists and completely devoted to one another. At first, they worked on separate projects. She was fascinated the work of Henri Becquerel, a French physicist who discovered that uranium casts off rays, weaker rays than the X-rays found by Wilhelm Roentgen.

Curie took Becquerel's work a few steps further, conducting her own experiments on uranium rays. She discovered that the rays remained constant, no matter the condition or form of the uranium. The rays, she theorized, came from the element's atomic structure. This revolutionary idea created the field of atomic physics and Curie herself coined the word *radioactivity* to describe the phenomena. Marie and Pierre had a daughter, Irene, in 1897, but their work didn't slow down.

Pierre put aside his own work to help Marie with her exploration of radioactivity. Working with the mineral pitchblende, the pair discovered a new radioactive element in 1898. They named the element polonium, after

Marie's native country of Poland. They also detected the presence of another radioactive material in the pitchblende, and called that radium. In 1902, the Curies announced that they had produced a decigram of pure radium, demonstrating its existence as a unique chemical element.

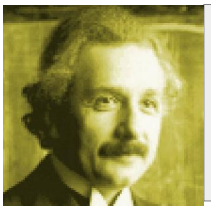
Science Celebrity

Marie Curie made history in 1903 when she became the first woman to receive the Nobel Prize in physics. She won the prestigious honor along with her husband and Henri Becquerel, for their work on radioactivity. With their Nobel Prize win, the Curies developed an international reputation for their scientific efforts, and they used their prize money to continue their research. They welcomed a second child, daughter Eve, the following year.

In 1906, Marie suffered a tremendous loss. Her husband Pierre was killed in Paris after he accidentally stepped in front of a horse-drawn wagon. Despite her tremendous grief, she took over his teaching post at the Sorbonne, becoming the institution's first female professor.

Curie received another great honor in 1911, winning her second Nobel Prize, this time in chemistry. She was selected for her discovery of radium and polonium, and became the first scientist to win two Nobel Prizes. While she received the prize alone, she shared the honor jointly with her late husband in her acceptance lecture.

Around this time, Curie joined with other famous scientists, including Albert Einstein and Max Planck, to attend the first Solvay Congress in Physics. They gathered to discuss the many groundbreaking discoveries in their field. When World War I broke out in 1914, Curie devoted her time and resources to helping the cause. She championed the use of portable X-ray machines in the field, and these medical vehicles earned the nickname "Little Curies." After the war, Curie used her celebrity to advance her research. She traveled to the United States twice— in 1921 and in 1929— to raise funds to buy radium and to establish a radium research institute in Warsaw.



“Not only did she do outstanding work in her lifetime, and not only did she help humanity greatly by her work, but she invested all her work with the highest moral quality. All of this she accomplished with great strength, objectivity, and judgment. It is very rare to find all of these qualities in one individual.”
-Albert Eisntein

Healing the World – The Radium Institute

Marie Curie became aware that the rays coming from radioactive elements could be used to treat tumors. She and Pierre **decided not to patent the medical applications of radium**, and so could not profit from it.

In her later years, Marie Curie’s dearest wish was to explore the use of radioactivity in medical applications. To do this, she established the Radium Institute. *At $120,000 per gram, radium was horrendously expensive* – millions of dollars in today’s money. Marie Curie could only afford 1 gram of it for use in cancer therapies at the Radium Institute.

In 1920, Marie gave an interview about her work at the Radium Institute to the American journalist Marie Mattingly Meloney, who was usually called “Missy.” Missy asked Marie how she could help the Institute. Marie said that American chemical companies had now isolated 50 grams of radium.

Her Institute desperately needed one more gram for medical research, but could not afford it.

Missy returned to the USA and became Chair of the Marie Curium Radium Fund, with the aim of getting Marie Curie her 1 gram of radium. Money was raised in small donations all over the country. The Standard Chemical Company of Pittsburgh agreed to supply the radium at the reduced price of $100,000.

On May 20th, 1921, President Warren G. Harding presented Marie with the radium in a lead-lined steel box at the White House.

Since then, the Radium Institute (it is now the called the Curie Institute) has gone from strength to strength. **Three of its workers have been awarded Nobel Prizes:** Irene and Frederic Joliot-Curie won the chemistry prize in 1935 and Pierre-Gilles de Gennes won the physics prize in 1991.

Irene was Marie and Pierre’s daughter. She shared the prize with her husband Frederic. The Curie Institute continues to do important research work today.

Final Days and Legacy

All of her years of working with radioactive materials took a toll on Curie's health. She was known to carry test tubes of radium around in the pocket of her lab coat. In 1934, Curie went to the Sancellemoz Sanatorium in Passy, France, to try to rest and regain her strength. She died there on July 4, 1934, of aplastic anemia, which can be caused by prolonged exposure to radiation. Marie Curie's own books and papers are so radioactive that they are now stored in lead boxes, which may only be opened by people wearing protective suits

Marie Curie made many breakthroughs in her lifetime. She is the most famous female scientist of all time, and has received numerous posthumous honors. In 1995, her and her husband's remains were interred in the Panthéon in Paris, the final resting place of France's greatest minds. Curie became the first and only woman to be laid to rest there.

Curie also passed down her love of science to the next generation. Her daughter Irène Joliot-Curie followed in her mother's footsteps, winning the Nobel Prize in Chemistry in 1935. Joliot-Curie shared the honor with her husband Frédéric Joliot for their work on their synthesis of new radioactive elements.

Today several educational and research institutions and medical centers bear the Curie name, including the Institute Curie and the Pierre and Marie Curie University, both in Paris.

Reproduced from the sites http://www.biography.com/people/marie-curie-9263538 and

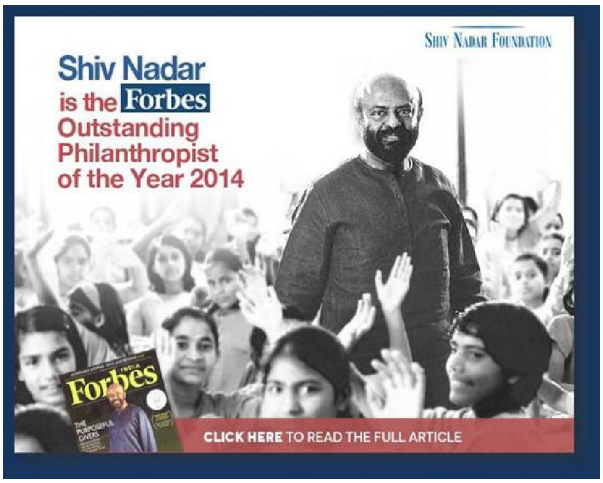
http://www.famousscientists.org/marie-curie/

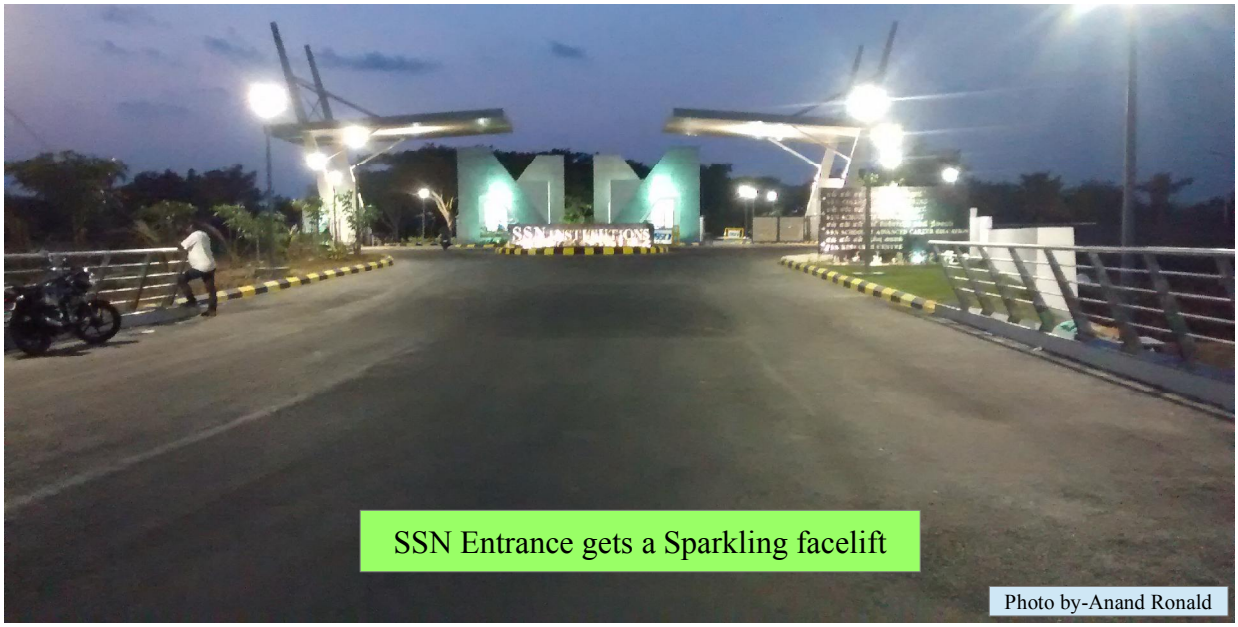
Info to Alumni- Campus Update

SSN Dramatic Club makes its mark

SSN Dramatic Club, 'Lights Out Please' **has won the first prize in SARANG** on 10th Jan a national level culture fest of IIT Madras , a very prestigious event in the country and bagged the cash prize of Rs. 30000/

They also won the first prize at **Dramalogue** an event done in collaboration with IIT Madras and creasakthi and held at Goethe institute on 11th Jan



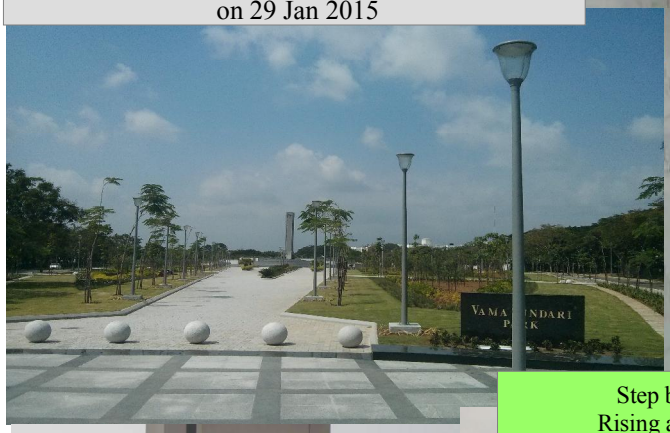


SSN Entrance gets a Sparkling facelift

Photo by-Anand Ronald

From Best Institution to also Best Looking Institution.. Inauguration of Vamasundari Park

Dr.Shiv Nadar declares open the Vamasundari Park, on 29 Jan 2015



Step by step
Rising above all
Towards timeless fame..

Photo courtesy: Vijaysekar, Alphin and Ronald

Info to Alumni- Department Update

External Recognition

Dr.A.K.Lakshminarayanan received an award letter for “Outstanding contribution in reviewing” from Taylor & Francis publishers in appreciating the reviewing efforts for 54 articles submitted to "Materials & Manufacturing processes".

Mr. Vimal Sam Singh, was invited to deliver a Guest Lecture on "Artificial Intelligence and Soft Computing " at the CSE Dept of Sairam Institute of Technology (26th Dec)

Research Activity

The research paper titled “Identification of Optimum Friction Stir Spot Welding Process Parameters Controlling the Properties of Low Carbon Automotive Steel Joints” authored by Dr. A.K.Lakshminarayanan, Dr. V.E.Annamalai and Dr. K.Elangovan is accepted for publication in the international Journal of Materials Research and Technology, Elsevier

K. Jayakumar had received his PhD degree during the graduation day, held on 10-01-2015 at NIT Calicut.

Dr.M.S.Alphin attended one day National workshop on wireless sensors organised by VIT, 23 Jan 2015.

Hari Krishna KL presented research paper entitled "Studies on microstructure and mechanical properties of GTAW, Laser and Friction stir welded ZM21 magnesium alloy" in the International conference on Sustainable energy resources, materials and technologies held at SSN College of Engineering, Kalavakkam, Chennai on 08.01.2015

Dr. K. Jayakumar presented two papers with following titles 1. Experimental analysis and forecasting of material removal rate and cutting force in end milling on A356 alloy-SiC metal matrix composites 2. Experimental study on the machinability of Inconel 718 alloy using coated carbide tool , in ISERMAT, 2015

Dr. M.Nalla Mohamed presented a paper entitled ' Energy enhancement of long cylindrical tubes with grooves subjected to axial impact' along with Final year students P.Yuvarajan and(312211114319) and M. Uma Shankar(312211114314) , in ISERMAT, 2015

Doctoral Committee Meetings

Dr.M.S.Alphin conducted the First PhD DC meeting for Mr Fantin Arokia Raj ,on 21 Jan 2014 . Dr Baskar, MIT, Chennai acted as the external expert from Anna University.

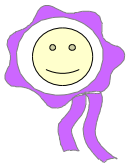
Dr.B.Anand Ronald conducted Ph.D., DC meeting for Mr.C.Arun Prakash, on 23-1-2015. Dr.A.Srinivasan, Scientist, National Institute for Interdisciplinary Science and Technology, Thiruvananthapuram.

Project Proposal Efforts

Dr. N. Lakshmi Narasimhan as Principal Investigator (PI) and Dr. V.E. Annamalai as Co-PI, submitted a Project Proposal to DST (SERB), titled "Studies on the Melting/Solidification of Nano-PCMs in the Presence of a Wire Mesh Inside a Spherical Enclosure" at an estimated budget of Rs. 25.02 Lakhs

Student Activity

K Sushinder , PR Shivaram , Nivedh Kannaa and Nisarg Gupta of Third year mechanical B presented a technical paper on "Investigation of Thrust forces, Torque and Chip microstructure during Drilling of Ti-6Al-4V Titanium alloy" in ISERMAT(International Conference on Sustainable Energy Resources, Materials and Technologies 2015). The project guide and co-author of this paper is Dr. Vijay Sekar KS. This paper has also been selected for publication in the Applied mechanics and materials journal.
They were also given the **best oral presentation award** in the machining and tribology session on January 9nth 2015.



Akshay Arvind First Year Mech A , was invited by the Ministry of HRD to observe RD Parade from Prime Minister's box. This, is a special honor to a chosen few. Akshay is the South Zone Topper in the CBSE examinations 2014.

V. Naren Balaji, of final year writes..
Under the guidance of Dr. S. Suresh Kumar we had worked on "Influence of Residual Stress on Stress Intensity Factor Estimation of Multiple Cracks in a Dissimilar welded Joint". I had presented the above mentioned paper in International Conference on Structural Integrity (ICONS-2014) at IGCAR, Kalpakkam in February, 2014. The paper was further processed by IGCAR and got published in Procedia Engineering. I have attached the paper with this mail.

Thank you Sir for your support and encouragement to involve ourselves in research activities.

ELSEVIER

CrossMark

Available online at www.sciencedirect.com

ScienceDirect

Procedia Engineering 86 (2014) 234 – 241

Procedia Engineering

www.elsevier.com/locate/procedia

1st International Conference on Structural Integrity, ICONS-2014

Influence of Residual Stress on Stress Intensity Factor Estimation of Multiple Cracks in a Dissimilar Welded Joint

S. Suresh Kumar*, V. Naren Balaji and P.M. Prrithvi

Department of Mechanical Engg, SSN College of Engg, Kalavakkam, Chennai-603110, India
**E-mail ID: ssk.iitm@gmail.com*

Naren Balaji

Guest Lectures

Dr.M.NallaMohammad, alongwith Dr.B.Anand Ronald and Dr.M.S.Alphin, organised two Guest Lectures, in Jan 2015

January 23,2015

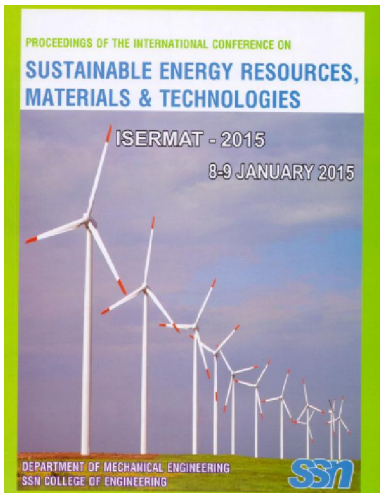
Dr.A.Srinivasan, Scientist, Material Science and Division, National Institute for Interdisciplinary Science and Technology (NIIST), Thiruvanthapuram delivered a talk on "Magnesium Alloys: Introduction, Applications and Issues". The first part of the lecture covered the common materials and its alloys. The next part addressed the Magnesium alloys and its application in various fields. The third part of the lecture covered the various issues rose during of processing of magnesium alloys. The lecture concluded with a brief note on various thrust areas available in magnesium and its alloys. The lecture was well received with interesting questions from the audience

January 28, 2015

Dr. D.Davidson Jebaseelan, Associate Professor, VIT-Chennai campus delivered a talk on 'Automotive safety'. The lecture started with an awesome introduction on automotive safety model emphasizing the safety regulations and its dimensions. The next part addressed active and passive systems used in cars and its significance. The lecture concluded with a brief note on crash testing, its importance, and a note on Environmental Protection Requirements. The lecture was well received with interesting questions from the audience

ISERMAT 2015- International Conference

The First International Conference conducted by Mech dept was a rich experience for all of us.....



Dr.S.Salivahanan

Prof.N.Nallusamy

Co-ordinators

Dr.M.Suresh

International Conference on the theme of Sustainable Energy Resources, Materials and Technologies (ISERMAT 2015) was organized by our department during 8th and 9th of Jan 2015. Keynote speakers were from countries like Japan, Malaysia, Oman and Australia.

Dr. Tsukasa Yoshida, Professor, Research Center for Organic Electronics, Yamagata University inaugurated the conference and released the conference proceedings. In his inaugural address, he emphasized on charge transfer crystal concepts for solar cells. He also pointed out that printable, unlimitedly mass-producible organic photovoltaic cells are the only hope to meet the demand. In future, they have to be as cheap as wrapping paper, unlimitedly fast produced and have the ability to convert the sunlight to electricity at 20% efficiency.

Dr.Velraj, Director, Institute of Energy studies, Anna University, the guest of honour for the conference, emphasized the theme of waste to wealth as a driver for environmental sustainability. He also hinted that in future, we may all have to shift to direct current devices due to the popularity of solar power.

Dr. Alawi Sulaiman, faculty of Plantation & Agro Technology from Universiti Teknologi MARA, Malaysia, Dr. S. Karuppuchamy from Department of Energy Science, Alagappa University, Karaikudi, Dr. Dinesh Shanmugam, Senior Mechanical Engineer from THALES Australia and Dr. K. Elangovan, Head of Section-Mechanical Engineering, Ibri College of Technology, Ibri, Ministry of Man power, Sultanate of Oman delivered keynote lectures during the conference.

The conference provided major technical sessions in the areas of Renewable Energy, Alternate Fuels, Environmental Systems, Electrical Energy Systems, Composite Materials and Manufacturing processes. 193 technical papers were presented by scholars, academicians, experts and researchers from India/abroad.

Prof.Tsukasa Yoshida

Dr.Alawi Sulaiman

Dr.Dhinesh Shanmugam

Dr.Velraj

Dr.S.Karuppuchamy

A warm reception.....

Dr.K.Elangovan

Internal Funded Project Presentation details at RAC (Research Advisory Council) Meet

Manikanda Balaji and S.Murugappan of Final Year mech had the rare honour of presenting their research work to the elite members of the RAC, in the presence of Dr.Shiv Nadar.

The students share their thoughts on the interaction....

Project on "Crashworthiness Determination of Aluminium Tube Structures"

The panel members, Mrs Kala Vijayakumar (President, SSN Institutions), Prof P. Ramasamy (Dean Research), Prof. N. Balakrishnan (IISc Bangalore), and Prof. Natarajan (IIT Madras) reviewed the project work and suggested their valuable ideas. The following points were suggested by the RAC committee.

1) The committee members appreciated the field of the research work chosen

2) Dr. Balakrishnan suggested to study the reasons behind the failure of the present popular passenger cars to meet crash characteristics. He also suggested to include literature review part in the presentation.

3) Dr. Natarajan asked about the numerical software used for the simulation work, importance of stress concentration factor and reasons for the Aluminium material selection.

4) The panel members suggested about the extension of the present idea to race cars which are subjected to multi axial crash.

5) The committee recommended to convert the present work into a usable form to the industry.

6) The committee appreciated the experimental work carried out and its correlation with numerical results.

7) The project students accepted their valuable suggestions and expressed their gratitude for the support rendered by the management.

The Simulation part is already published in Elsevier Journal. They are now working on verifying the data with actual Experimental values.

This project was guided by Dr.S.Sureshkumar

Catching them Young... BLP starts for First Year Mech...

Various streams of Mechanical Curriculum will be introduced by a session on Theory + Lab visit for Second Sem Mech students, during their free period parallel to their CAD Lab in Second Sem . Each class will be split into two batches. While one batch has the CAD lab, the other half will undergo this BLP training. Venue will be their respective classes.

The faculty shall meet the students, mark attendance and cover an agenda as below:

1.lecture session on Subjects that come in that stream, logic of why that sequence, what is the purpose of each subject , how it will be relevant to their objective of placement / higher studies , how this will be useful in selection of projects etc.

2.Visit to lab facility with simple demo of at least one experiment.

3.A few projects from final year or design fabrication projects or internally funded projects that have been done by seniors in that stream etc. (would be great if the student team can come and make a presentation during your session).

The expected outcome

Student should be able to understand what subjects form the stream, what kind of lab facilities exist for that stream and should be able to learn to use the knowledge for projects selection.

Dr.K.S.Vijaysekar, Dr.N.Lakshminarasimman and Dr.A.S.Ramana have started interacting with the students. Ramana reflects.....

BLP for a batch of the 2nd sem students was conducted today.

Lecture focused on importance of thermal Engg. subjects and different topics on thermal Engg. covered during the degree course, Dept. Students & Staff achievements & activities. In addition, need for innovation in energy problems & Institution & Dept. efforts to promote research culture, interesting & informative articles & events highlighted in Dept. Newsletter Aspire were also covered. Students were also briefed on e-learning, placement and higher studies opportunities in thermal engineering.

Need for setting SMART / S-Specific, M-Measurable, A-Achievable, R-Review, T Timebound / objective alongwith KAIZEN for continual improvement was also stressed.

Students were excited with enormous opportunities & responsibilities that confronts Mechanical Engineer.
ASR

Alumni Visit

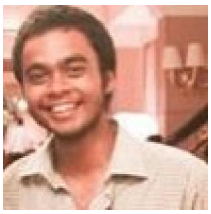
Musthafa and Siddarth Arumugam
addressed current students on "Going Abroad"

2013 passed out students- Saran (Stanford Univ), Musthafa M S in US univ), Govardhan (enterpreneur), Karthik (Ashokleyland), Karthikeyan (MS in US) at the Park

R.Ramkumar, of 2014 batch writes..

After campus placement..

I am happy to inform you that I have got placed in Samsung Electronics India Pvt.Ltd. as GET sir. Thanks a lot for being with me and supporting me for getting this wonderful opportunity in my life sir.



Gokulram Paranjothi (2009-2013), is now **Co -editor** for "Heat Transfer, 8th edition" and contributor, solutions manual for the same. Work involves editing work by the authors on their direction, and helping frame and solve problems for the textbook and solutions manual respectively.He is currently doing M.S. At University of Colorado, USA.

Vigneswaran Govindarajan- Completed Masters in Computational Mechanics at University of Duisburg, Germany. Interned at Numerical Simulation Research Department at JFE STEELS,JAPAN .

Now, **started full-time PhD program** in Computational Mechanics at IMT Lucca, Italy. His area of research will be near Multi-scale Simulation of phase transformation and crack growth in steels during plastic deformation.
MUSAM Research Unit, PhD student, IMT Institute for Advances Studies, Lucca, Italy

Alumni news -on conference presentation

Radheesh Danasegaran

Dear Sir,
It has been pretty late but I am certainly glad to share this unforgettable experience of mine for the second time which I attained during my presentation in the fifth International and **41 National Conference on Fluid Mechanics and Fluid Power (FMFP)** at IIT Kanpur on 12-14,December 2014.

FMFP is the highest society for researchers in the lively world of Fluid Mechanics in India had numerous topics like Fundamental Issues, Measurement Techniques, CFD, Turbulence, Turbomachinery, Multiphase flows, Fluid Structures & Interaction etc..

In this meet, my paper titled "**Computational Study On Pressure Side Film Cooling – Effect of Density Ratio With Combination of Holes"** is towards Gas turbine Heat Transfer (Turbomachinery).

This time, I was really firm while presenting my paper and also **I was given a standing ovation** with positive comments from my session chairs.

This conference provided a common podium for researches from various disciplines of engineering like Civil, Mechanical, Aerospace, Chemical, Bio-Medical etc. to interact and share their ideas.

Being a novice in this area, I had an opportunity to interact with esteemed Professors and Industrial researchers.

Further I extend my kind gratitude to Dr. Rajesh Kumar Panda (Power Grid Corp.) who guided this work even at and made me understand the sanctity of research and Seshan P, for being a better half of this research. Above all I would like to thank all my Professors for their benevolent nature and encouragements to pursue my desire.

Currently, I am involved in the same area of Turbomachinery flow and heat transfer and wish to explore this stimulating area of Fluid dynamics in the future.

I wish my juniors to take this as an intense area of research especially who are aspiring towards Aerospace engineering.

Alumni on a knowledge Sharing Mode- explains the relevance of what we study

I am Nitin Krishnan from 2009-2013 batch. I am doing my masters in the field of automotive technology.

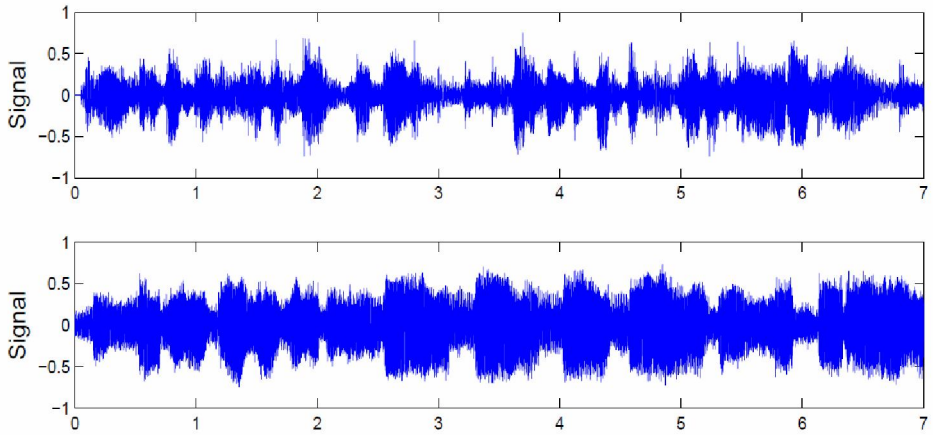
I want to write an article every month which will somehow answer the question “why am I studying engineering?”. I am not the correct person to write this article. But if I start it and if someone else tries to help me with this article. It will be a great use for all our juniors and our department. Any negative feedback or related articles are welcomed at nitinkrishnan92@gmail.com. I thank HOD sir for giving this opportunity.

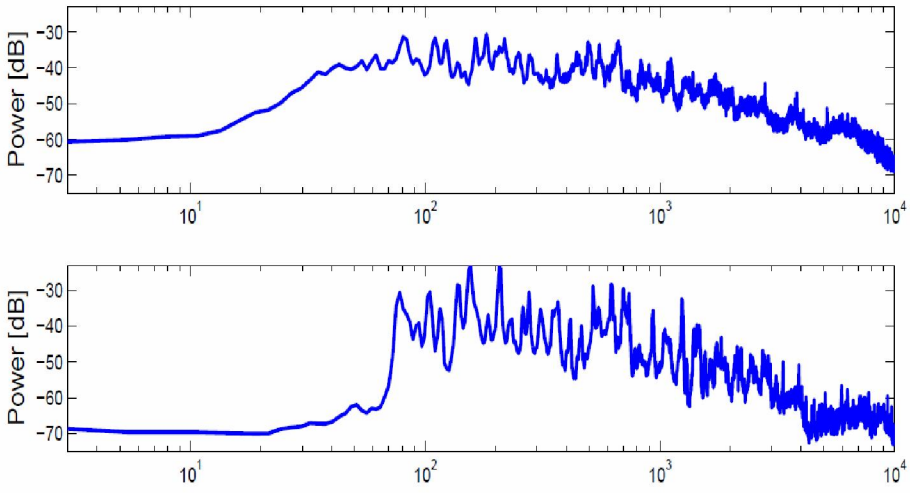
Every one of us should know or should ask our professors why is he teaching some formula or a problem. We need to relate it somehow to the practical application. There are some things which are in Anna university syllabus which are just history according to the remaining world. But there are lot of topics in the syllabus which have very powerful applications. But if 90 percent of you guys(100 percent-people who read this) already knew these things, you can inform me so that I can stop writing this article.

Laplace transform and Fourier transforms!!!!!

I will start with the basic mathematics which we studied in the first year of our college. Every one of us know how to solve a problem when asked “Write a laplace/fourier transform of this equation?”. But why does someone want us to study those formulas?.

These are two signals whose xaxis are time[s]. These are two sections of different songs. The similar kind of signals are shown in movies and in other sources. It is tough to say anything out of this . representation. It looks like a lot of signals are mixed together

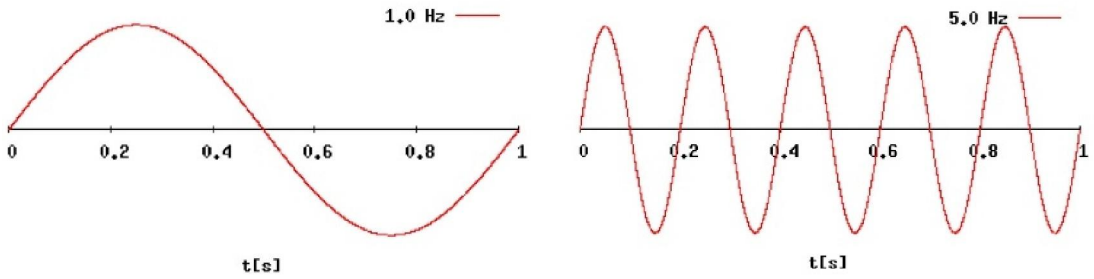




The same signals are represented in the frequency domain as given here.

So there is clear difference between both the signals and it can be seen that at low frequencies , the sound(dB) is too low and then it shows some behavior at high frequencies.

Wiki says that frequency is the no of repeating events per unit time.



The above figure shows a sine wave. The left figure has one complete cycle within one sec . So it repeats only once and it is 1.0 Hz. The right figure repeats itself 5 times within 1 sec. So it has 5Hz frequency. But the signals shown first(signal in time) are not just sine waves. It has different kinds of waves which have no patterns. Fourier just did this basic thing. He just used sine waves of different frequencies(lot) in order to represent any signal.

That is what you would have studied as

Any signal $x(t)$ of length T can be represented as a sum of harmonics.

$$x(t) = \sum_{k=0}^{\infty} \left[a_k \cos\left(2\pi \frac{k}{T} t\right) + b_k \sin\left(2\pi \frac{k}{T} t\right) \right]$$

- Simple sine wave and frequency concept have made him to introduce a formula which can analyze any signal.
- So if we use have a room built of some noise blocking device which absorbs sounds of certain frequencies alone, then you could clearly say from the second figure(signals in frequency domain), which part of the song will not be able to heard when the song is played inside that room.
- Laplace is just a derivative or extension of Fourier transform. If you want to analyze a signal ,we use Fourier transform to convert to frequency domain.
- But if we want to analyze a system, we write equations for the system.
- We generally analyze a system by giving some input to the system and measure the output. For example, we push(force) a cart and measure the distance and direction. We have to find the relation between the force applied and the distance moved by the cart.
- After this we will get some differential equation. If we take laplace transform of this equation as you know (1/dt=s , 1/dt^2 =s^2) we will get some denominator and numerator value in terms of “s” and other constants.
- Then if (s=jω) is substituted in that equation where ω can be any frequency. We can see the behavior of the system at any frequency.
- This has application even in automobiles. There are noise filters in the exhaust pipe. They analyze for every car the frequency at which the noise is maximum and they add filter in order to attenuate the noise only at that frequency.
- **If laplace and fourier transforms were not there, they should add filter at all frequencies which is waste of everything.**
- These two simple concepts which you study in your first year has N number of applications.
- This is called ENGINEERING. As I said, feedbacks and suggestions are welcome.

Corporate Story 2- The TVS Group

TVS was established in 1911 . As one of India's largest industrial entities, it epitomizes Trust, Value and Service. Today, there are over fifty companies in the **TVS Group**, employing more than 50,000 people worldwide and with a turnover in excess of USD 7 billion. These operate in diverse fields that range from two-wheeler and automotive component manufacturing to automotive dealerships, finance and electronics.Uniting these multiple businesses is a common ethos of quality, customer service and social responsibility.

Origin

The TVS Group traces its origins to a rural transport service, founded in 1911 in Tamil Nadu, by Shri. T V Sundaram Iyengar . It was called TVS bus Service. In southern districts like Pudokkottai and Madurai, the buses were so prompt that we used to correct our watches based on the bus arrival !

The Secret of being on time

In fact, in those days, without much technology, TVS had used creative but simple ways to manage being on time. Their only enemy was tyre getting punctured. So to avoid punctures, they used to have strong magnets attached to the bumper so that any nail will be attracted to the bumper and no nail will be left behind for the tyre!

Quality as the way of life

Regardless of the field they work in, TVS companies are known for their unwavering commitment to quality.

Most group companies have adopted Total Quality Management as a way of life. Robust processes and stringent controls underlie every activity, delivering tangible benefits to all stakeholders from customer to employee. While each company in the group has achieved significant milestones on its quality path, five companies have won the coveted Deming Award instituted by the Union of Japanese Scientists and Engineers.

Manufacturing Excellence

Their Mfg Excellence is driven by the Five Pillars of TQMThe management philosophy is based on five pillars of TQM (Total Quality Management) - Management Commitment, Customer Focus, Quality Costs, Quality Systems and Continuous Improvement - which rests on the foundation of Total Employee Involvement Program, Daily Management and Kaizen

Awards Galore

Deming Quality Award

- Sundaram Clayton
- Sundaram Brake Linings
- Brakes India
- Lucas-TVS
- TVS Motor Company

Japan Quality Medal

- Sundaram Clayton

TPM Excellence Awards

- Sundaram Fasteners
- TVS Rubber
- Brakes India
- TVS Tyres
- TVS Motor Company

GM North America, Best Supplier Award

Sundaram Fasteners (five consecutive years)

The Total Employee Involvement program ensures that responsibility for the company's performance is the shared responsibility of employees at all levels. It provides the employees with the opportunity to be involved in breakthrough activities and other improvements, over and above their daily routine.

Daily work management consists of defining and monitoring key processes, ensuring that they meet set targets, detecting abnormalities and preventing their recurrence.

TVS Motor encourages continuous improvement in all aspects of work, using Cross Functional Teams (CFT), Supervisory Improvement Teams (SIT) Quality Control Circles (QCC) and suggestion schemes

Innovation at the forefront-Always being first to develop and to market

TVS has brought in many firsts to the Automotive Industry in India
When only Bullet was ruling the roads, it was TVS who brought in the sleek TVS Suzukis in 1984.

TVS has been at the forefront in bringing a revolution in personal commutation since the 1980s. Beginning with launching a simple, easy-to-use moped for the middle class in India in the 1980s to launching 7 new bikes in a single day (first time in the history of the automotive industry in the world), TVS has often taken the unbeaten path to innovation.	
Ushering in the personal transportation revolution	
2013	TVS Jupiter launched
2012	TVS Phoenix 125 launched
2011	TVS Apache RTR ABS launched
2010	TVS Wego and TVS Jive launched
2009	TVS Apache RTR 180 and TVS Streak launched.
2008	TVS Flame, TVS Scooty Electric Vehicle and Three wheeler TVS King launched.
2007	Apache RTR - first two wheeler in India to have racing inspired engine and features.
2006	Launched TVS Apache - first bike to win 6 awards in a row
2004	Launched the revolutionary VT-I engine for the best in class mileage in TVS Centra
2001	Launched India's first fully indigenously designed and manufactured motorcycle.
2000	Launched India's first 150 cc, 4 stroke motorcycle - The Fiero
1997	Introduced India's first 5 speed motorcycle, Shaolin
1996	Introduced India's first catalytic converter enabled motorcycle, the 110 cc Shogun
1994	Launched India's First indigenous scooterette (sub - 100 cc variomatic) - TVS Scooty
1984	First Indian company to introduce 100 cc Indo - Japanese motorcycles
1980	Launched TVS 50, India's first 2 seater 50 cc moped

The latest arrival- Turbo Energy Ltd
Keeping pace with the latest Trends, TVS is now into Energy- with their Turbo Energy Ltd (TEL)
Turbo Energy Limited (TEL) was incorporated on 3rd May 1982, as a joint Venture between Brakes India Limited, Sundaram Finance Limited and BorgWarner Turbo System (formerly known as KKK - Germany).

The company is engaged in manufacture of turbochargers as well as parts of turbocharger. The products of the company find application in automobile, industrial and marine segments. The Company is a Part of TVS Group.TEL has achieved a sales turnover of Rs.7.8 billion in FY 2013-14.

Their HR Policy – Attract, Retain, Transform
It is a 100-year old group with a unique achievement - it has never faced a serious labour problem. The first company of the group, TVS & Sons, set up in 1911, has a strike-free record. So do most of the other 30-odd companies, including Sundaram Finance (started in 1954), Wheels India (1962), Sundaram Fasteners (1966) and Sundaram Brake Linings (1975).

- The people that make up the TVS Group work in an environment of shared ideas, efforts and responsibilities. The group's history, marked by long-standing relationships, is testimony to the fact that people have
  found careers with it and not just jobs.
- Recognized for its excellent human resource practices, the group addresses each individual's need to grow professionally and personally.
- Strong emphasis on employee welfare and systems for continuous training have allowed different businesses to attract, retain and develop outstanding talent.

Extraordinary Industrial relations

Soon after Independence, for instance, the then undivided Communist Party called a nationwide strike, shutting down production for three days. But **employees at the TVS workshop in Madurai chose to lock themselves inside the premises** - as travelling back and forth might have invited reprisals - **and continued to work**.

Voluntary wage cuts to avoid loss of jobs

Nearly 60 years later, during the global financial crisis of 2008, the management at TVS & Sons sought to temporarily reduce workers' wages, but left it to them to decide how much they would forgo. Far from protesting, employees agreed; while the management had expected a five per cent reduction proposal, the employees sprang a surprise by suggesting a 15 per cent cut. . When the downturn ended, the pay cut was restored.

First in providing welfare also

The group has also always been ahead of the pack in providing workers' benefits. It started a provident fund scheme in the early 1940s, before it became mandatory for private companies, after the Provident Fund Act was passed in 1952.

Similarly, it began paying gratuity to its employees from the mid-1960s though this became statutory only from 1975. It has always striven to give as much bonus as possible - much more than the legal minimum requirement of 8.33 per cent. They have paid maximum bonus for many years, even when the company did not have enough profits.

Long-term relationship-even after retirement
The TVS Group's relationship with an employee does not end once he retires.

"We worry about the employees even after they leave. They are still part of the family," is the philosophy.

Members of the top management meet employees when they retire; HR departments of the group companies help them plan their post-retirement finances, If an employee dies while in service, his dependents get not only his dues, but also the proceeds of a 'death fund' created for him, to which every employee of the company concerned contributes a day's salary and the management matches the contribution.

The TVS Group also **avoids lateral recruitment at senior levels, thus offering ample opportunities for career advancement within the companies.**

With cooperative employees, TVS companies have had no problems introducing modern manufacturing practices such as total quality management, total productive maintenance and lean manufacturing, enabling them to compete better. Sundram Fasteners was a **consistent winner of the best global supplier of the year award from General Motors** for years till a change in classification excluded it from qualifying.

The Growth Pattern ....

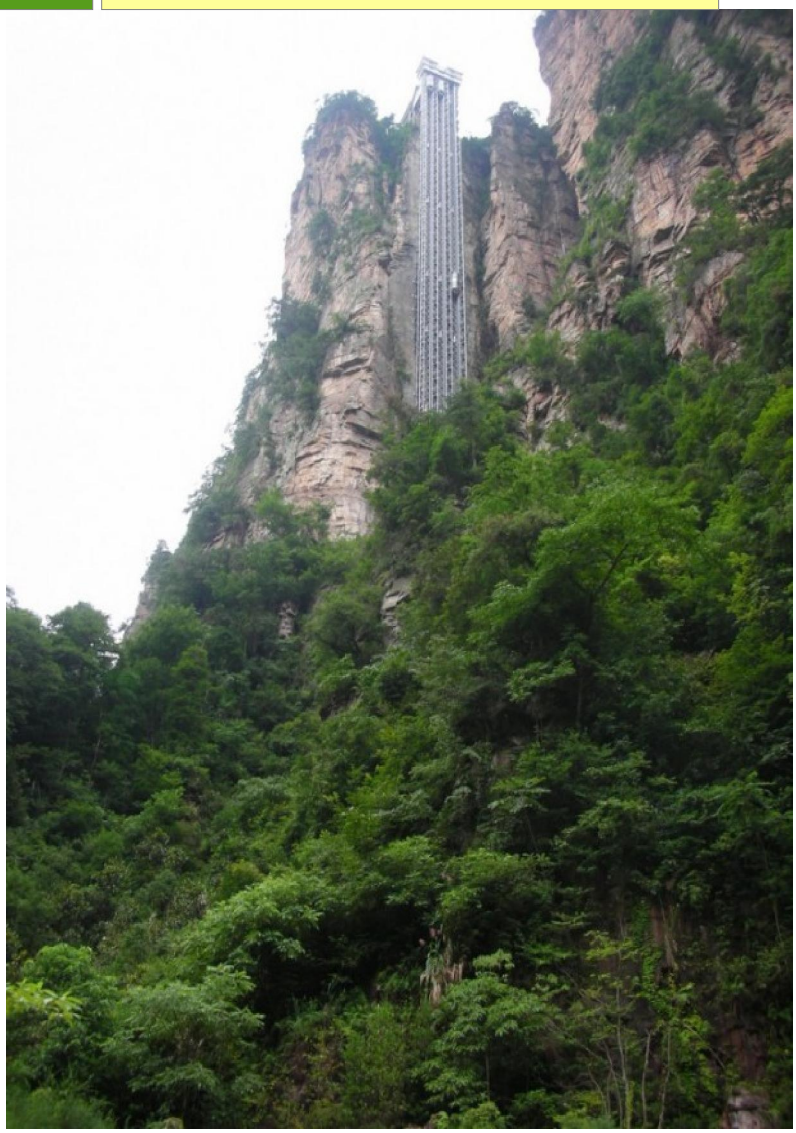
1911 TVS & Sons established in Madurai, Tamil Nadu
1912 Starts first rural bus service in Southern Tamil Nadu {from Pudukottai to Thanjavur }
1919 Forays into vehicle sales, service and spare parts
1929 Foray into Dealership Business representing General Motors
1930 Bus Body Building operations started
1936 Madras Auto Service acquired
1939 Southern Roadways started & Built TVS Service station, Biggest in Asia then
1943 Designs a unique gas plant that uses charcoal gas as fuel instead of petrol which was in short supply during World War II
1945 Sundaram Motors formed
1956 T V Sundram Iyengar honoured by the Union Government of India by unveiling busts in Bronze and in Marble in Madurai.
1996 Enters logistics business
2003 Enters customers centric car service business under brand name "MyTVS"
2004 Logistics business was hived off as a separate company called "TVS Logistics Services Limited"
2008 Forays into parts retail business for Heavy & Light Commercial Vehicle under brand name "TVS PartSmart"
2011 MyTVS, the Customer Centric Car services business hived off as a separate company called "TVS Automobile Solutions Limited"
2012 The All Car Services business of TVS Automobile Solutions Ltd expanded network into Kolkata & Gujarat through separate JV's
2012 Acquisition of Universal Component, United Kingdom

http://businesstoday.intoday.in/story/tvs-group-labour-problem/1/15784.html
philanthrophy at www.lvstvsschools.com
innovative service at http://www.mytvs.in/24x7-breakdown-assistance/available-services

Mech Marvel 2

The Bailong Elevator

Bailong Elevator, also known as the Hundred Dragons Elevator, is a glass elevator built into the side of a rocky mountain range full of thousands of sandstone columns that rise up thousands of feet in the Wulingyuan area of Zhangijiajie, Hunan Province, China.
At 1,070 feet (330m) high, construction of the elevator, started in 1999 and was completed in 2002. The project encountered intense opposition from environmental groups who cited the World Heritage Site designation as the main reason for their disagreement. The total investment for the project was 120million yuan, about $20 million.



To build the Hundred Dragon Elevator, tunnels and shafts had to be dug into the quartz sandstone column carefully chosen to house the elevator. With five million visitors to the region each year the area was already suffering from excessive tourism but work went on.

Following completion, this modern day creation, obtained not one but three Guinness Book of World Records awards! First, it's the tallest full-exposure outdoor elevator, second it's the world's tallest double-deck sightseeing elevator, and third it's the world's fastest passenger traffic elevator with the biggest carrying capacity.
The project has seen its share of setbacks. After the project was opened to the public in 2002 it was soon temporarily shut down to address safety concerns.

The project was an achievement of a team of many dozens of mostly Chinese contractors and suppliers.

For example, Qinhuangdao Photelectric provided the elevator load weighing control system, VIC card management, energy saving devices, an earthquake detector, and the entrance detectors for the elevator. controllers to provide accurate weighing of the elevators and their passengers.

https://www.youtube.com/watch?x-yt-cl=84924572&feature=player_embedded&v=vLuzkUMCPeY&x-yt-ts=1422411861
http://www.industrytap.com/highest-outdoor-elevator-in-the-world-hundred-dragons-elevator/328

Corporate wisdom 14	Choices we make

R.Ramakrishnan
Advisor, GMR Group

We have two choices in configuring our life.
We can be a Choice maker or
a Consequence Receiver.
The difference between these two is like
a Lion in the forest (Choice maker) or
a Lion in the Zoo (Consequence receiver)

Lion in the forest	**Lion in the Zoo**
Has to defend its territory Has to defend his cubs from other attacks Hunt for the food-does not know whether it will get good or starve for the day There is insecurity Hunter can kill the lion any time	Lion has its own space .Territory is already defined.Does not need to defend its territory Food is thrown into the cage For its food no one competes There is doctor in case it is sick . Cubs are taken care by the zoo No one can harm or kill the lion

In spite of all these things the Lion in Zoo does not have any freedom. The lion in a Zoo is a slave whereas Lion in the forest enjoys the full freedom and that is the reason it is called the " King of the Jungle"

Be a choice maker and enjoy the freedom around , rather than being a consequence receiver.

Have a wonderful day !