

SPARK

Newsletter of the
Department of Chemical Engineering



Edition 22

May, 2017



From HOD's Desk



It is with great pleasure that I am writing this message wishing the team who worked for this newsletter. The department has continued to be progressive in the first quarter of this New Year 2017. The department has organized fair number of conferences, workshops and seminars during the months of Jan - April. The international conference RACEEE-2017 was conducted in a grand manner and speakers of different nationalities have participated and shared their research insights. I congratulate Dr.V.Jaikumar, Dr.K.Jagannathan and Dr.K.Sathishkumar for coordinating this conference in a successful way. Our faculty Dr.J.Dhanalakshmi has received a research grant from DST during the month of January. I would like to congratulate her and also wish her a great success in her future endeavor. Prof.G.D.Yadav, a renowned Chemical Engineer and Vice Chancellor of the prestigious ICT-Mumbai, graced our department by his presence during the National Conference GCPST-2017. I appreciate the efforts of Dr.R.Anantharaj, Dr.K.Sathishkumar and Dr.B.Ambedkar who coordinated the aforementioned conference.

Our students made us proud as always by excelling in academic and extra-curricular activities. Final year student Mr.Pavan Kumar has secured 87th rank in GATE-2017 exams and 9 other students have also secured good ranks in the same. I congratulate all the GATE scorers and wish them good luck. Our students have also been admitted in world's renowned universities viz, Stanford, Georgia Tech, Texas, Purdue, Arizona, Buffalo, Pennsylvania, Delft and many more.

The academic year 2016-17 has come to the end and the department is looking forward a great year ahead. With plenty of planned activities, we definitely thrive to become the best of SSN.



EDITORIAL

On the wings of the Firebird

This new edition of “Spark” is another evolution of the department. Students of our department make us climb the tallest peaks of the mountains of the moon. We fly on their wings and they are our firebirds.

We planned to give a detailed insight in to the modern era research by an article in every edition henceforth. This edition contains an article on nanotechnology, the wonder science and the modern age drone based commercial deliveries. An interesting branding history based article is also added in this edition. In non-technical section, Madhu from final year explains about emotions we have always had and want to talk about. Ajay writes on being an introvert. In alumni corner Ms. Malavikha and Mr.Kaushik shares their experiences with SSN. We have also mentioned the achievements of our students and faculty. We strongly anticipate your support and feedback to improve and perform well in the future.

Editorial Board	
Chief Editor	Dr.R.Parthiban, Prof.& Head
Editor	Dr.K.P.Gopinath, Associate Professor
Student Editors	Ms.B.Madhumeetha & Ms.Neela Saraswathi
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Rank Holders

GATE-2017 Rank Holders

Student	Percentile	All India Rank		Student	Percentile	All India Rank
Pavan Kumar R 	75.67	87		Siddarth S 	74.01	120
Lokesh V 	64.70	454		Suraj S 	62.35	603
Ramanan S 	60.34	794		Sharmada M 	57.68	999
Sairam S 	51.35	1650		Mugilan R 	51.34	1662
Ravikanth G 	50.03	1819		Sruthi V 	47.71	2093



Vishnu Priya C N of 3rd year B.Tech Chemical Engineering has secured 3rd Rank in 2nd Indian Engineering Olympiad.

Shyamala B of 3rd year B.Tech Chemical Engineering has secured 21st Rank in 2nd Indian Engineering Olympiad

Solai N of 3rd year B.Tech Chemical Engineering has secured 22nd Rank in 2nd Indian Engineering Olympiad.

Charanya G of 3rd year B.Tech Chemical Engineering has secured 78th Rank in 2nd Indian Engineering Olympiad



Students' Higher Studies Details

Sl. No.	Name of the Student	Admit obtained from various Universities	University Opted
1	N ABHINAV CHANDRASEKAR	Ulm University, Germany	Ulm University, Germany
		Norwegian University of Science and Technology (NTNU), Norway	
2	M AKSHAY KRISHNA	The Ohio State University, Columbus, USA	The Ohio State University, Columbus, USA
		Rutgers University, New Brunswick, New Jersey, USA	
		Arizona State University, Arizona, USA	
		University of Illinois, Chicago, USA	
3	K ANTHONY ARVIND	Hamburg University of Technology, Hamburg, Germany	Delft University of Technology, Netherlands
		Delft University of Technology, Netherlands	
4	S ATHREYA	University of Texas, Austin, USA	University of Texas, Austin, USA
		Arizona State University, Arizona, USA	
		Georgia Institute of Technology, Atlanta, USA	
		Delft University of Technology, Netherlands	
		Carnegie Mellon University, Pittsburgh, Pennsylvania, USA	
5	R PAVITHRA	Stanford University, California, USA	Stanford University, California, USA
		Arizona State University, Arizona, USA	
		Georgia Institute of Technology, Atlanta, USA	
		Purdue University Graduate School, West Lafayette, USA	
		Carnegie Mellon University, Pittsburgh, Pennsylvania	
		Texas A&M University, Texas, USA	
6	K ROHIT NARAYANAN	University of Pennsylvania, Philadelphia, USA	University of Pennsylvania, Philadelphia, USA
		University of Cincinnati, Cincinnati, USA	
		Arizona State University, Arizona, USA	
		University of Southern California, Los Angeles, USA	
		Rutgers University, New Brunswick, New Jersey, USA	
		University of Florida, Gainesville, USA	
		NC State University, Raleigh, USA	

7	R SAHANA	Georgia Institute of Technology, Atlanta, USA	Georgia Institute of Technology, Atlanta, USA
		University of Illinois, Chicago, USA	
		North Eastern University, Boston, USA	
		University at Buffalo SUNY, New York, USA	
		Rutgers University, New Brunswick, New Jersey, USA	
		Arizona State University, Arizona, USA	
8	S J SHREEKANTH	University of Twente, Netherlands	University of Twente, Netherlands
		University of Groningen, Netherlands	
		Norwegian University of Science and Technology (NTNU), Norway	
		University of Windsor, Windsor, Ontario, Canada	
9	S SIDDARTH	Indian Institute of Science, Bangalore	Indian Institute of Technology, Bombay, India
		Indian Institute of Technology, Bombay	
10	S SRI SAI JANANI	University of Maryland College Park, USA	University of Maryland College Park, USA
		Purdue University Graduate School, West Lafayette, USA	
		Oregon State University, Corvallis, USA	
11	S SURAJ	University of Petroleum & Energy Studies, Dehradun, India	University of Petroleum & Energy Studies, Dehradun, India



Dr.J.Dhanalakshmi (PI) and **Dr.B.Ambedkar** (Co-PI), Associate Professor received a grant from DST-SERB Project titled "*Potential Applications of Ionic Liquids in CO₂ Capture Process for Sustainable Energy and Environment*" under Early Career Research Award Scheme.



Dr.P.Senthil Kumar, Associate Professor received the "*Best Researcher Award*" during the SSN Research Day Function.

Also he received the First Prize for making UG/PG students to publish their research works in Int. Journals during the SSN Research Day Function.



STUDENTS Beyond GRADES

Conferences, Seminars, Workshops & Other Events

- ❖ R.Badri Narayan, R. Goutham, B. Srikanth and A.Ram Prasath of 3rd year chemical engineering have presented a paper in International Conference on “*Nano for Energy and Water*” & Indo-French workshop on “*Water Networking*” held at University of Petroleum and Energy Studies (UPES), Dehradun, on February, 22-24, 2017.



- ❖ R.Ananya and Akshaya of 3rd year chemical engineering have presented a paper in International Conference on “*Nano for Energy and Water*” & Indo-French workshop on “*Water Networking*” held at University of Petroleum and Energy Studies (UPES), Dehradun, on February, 22-24, 2017.
- ❖ Sangeetha. R Iyer & V.Samynaathan of 2nd year chemical engineering have presented a paper entitled “*Nanostructured carbon black as electrodes for electric double layered capacitors*” in International Conference ICNETS held at VIT, Chennai, on March, 23-25, 2017.

- ❖ P.L. Sriram and M. Danish John Paul of 2nd year chemical engineering have presented a paper entitled in 3rd International Conference on Bioenergy, Environment and Sustainable Technologies (BEST 2017) held at Arunai Engineering College, Tiruvannamalai on January, 23-25, 2017.

- ❖ P. L. Sriram of 2nd year chemical engineering presented a paper and won **2nd place** in Chemfluence held at Anna University on 21.3.17.

- ❖ P.L. Sriram of 2nd year chemical engineering presented a paper and won **1st place** in Syllogic 2k17 held at Kongu Engineering College, Erode on 15.2.17.

- ❖ Harish C of 2nd year chemical engineering Won **verbal mention award** in MOP Model United Nations competition held during the month of February 2017.

- ❖ K.Anshuman of 2nd year chemical engineering Won second place in the events Riveria and Vibrance, held at VIT, Vellore. He secured 1st place in the event Collosseum, held at SASTRA University and got 1st place in the event Revels, held at MIT, Manipal.

Mayuri. N of 2nd year Chemical Engineering was the winner of Womens' Squash championship held at VIT, Chennai and she has been announced as a "**College Sports Person of the year 2016-17**"



PUBLICATIONS

Dr. R. Parthiban, Professor & Head and **Dr.P.Senthil Kumar**, Associate Professor in collaboration with Sathyabama University published a research article titled "*Sorption Of Cu(II) Ions By Nano-Scale Zero Valent Iron Supported On Rubber Seed Shell*" in an Int. Journal titled "**IET Nanobiotechnology**" (IF: 1.562), IEEE Journal.



Dr. K. Jagannathan, Associate Professor, submitted the research manuscript titled "*Microbubbles Size Distribution at Different Palm Oil Mill Effluent (POME) Temperatures for Oil Recovery Study*" for an International conference titled "The 3rd International Conference on Science and Social Research (CSSR2016,) Putrajaya, Malaysia" and it has been accepted.



Dr.P.Senthil Kumar, Associate Professor along with our M.Tech EST student **Mr. P. Sundar Rajan** published a research article titled "*Computation of adsorption parameters for the removal of dye from wastewater by microwave assisted sawdust: Theoretical and experimental analysis*" in an International Journal titled "**Environmental Toxicology and Pharmacology**", Vol. 50, pp. 45-57, 2017, Elsevier (IF:2.187).

Dr.P.Senthil Kumar, Associate Professor in collaboration with King Saud University, Saudi Arabia published a research article titled "*NTEE-D-16-00032R2 - Fabrication and characterization of a nanocomposite hydrogel for combined photocatalytic degradation of a mixture of malachite green and fast green dye*" in an International Journal titled "**Nanotechnology for Environmental Engineering**", Springer



Dr.P.Senthil Kumar and Dr. K. P. Gopinath, Associate Professors published a research article titled "*Antimicrobial activity of Mukia maderasapatna stem extract of jujube seeds activated carbon against Gram-positive / Gram-negative bacteria and Fungi strains: Application in heavy metal removal*" in an Int. Journal titled "**Desalination and Water Treatment**" (IF: 1.272).

Dr.P.Senthil Kumar Associate Professor along with **B.Tech Chemical Engg Students Mr. K. Anish Kumar, Mr. Sai Madhusudanan, Mr. P. Vignesh, Mr. P.R. Vignesh, Mr.A. R. Sankaranarayanan** published a research article titled "*A simplified model for evaluating best biodiesel production method: Fuzzy analytic hierarchy process approach*" in an Int. Journal titled "**Sustainable Materials and Technologies**", Vol. 12, pp. 18-22, 2017(Elsevier).

Dr.P.Senthil Kumar, Associate Professor along with our B.Tech Chemical Engineering Students **Mr. R. Kameshwar and Ms. K. Prapanchana** published a research article titled "*Screening of novel actinobacteria and characterization of the potential isolates from mangrove sediment of south coastal India*" in an Int. Journal titled "**Microbial Pathogenesis**" (IF: 1.888), Elsevier

Dr.P.Senthil Kumar, Associate Professor and **Dr. R. Parthiban**, Professor & Head, in collaboration with Sathyabama University published a research article titled "*Sorption Of Cu(II) Ions By Nano-Scale Zero Valent Iron Supported On Rubber Seed Shell*" in an Int. Journal titled "**IET Nanobiotechnology**" (IF: 1.562), IEEE Journal.

Dr.P.Senthil Kumar, Associate Professor in collaboration with **King Saud University, Saudi Arabia** published a research article titled "*Fabrication and characterization of a nanocomposite hydrogel for combined photocatalytic degradation of a mixture of malachite green and fast green dye*" in an International Journal titled "**Nanotechnology for Environmental Engineering**", Vol. 2 (4), pp.1-7, 2017, Springer.

Dr. K. P. Gopinath and Dr.P.Senthil Kumar, Associate Professors published a research article titled "*Antimicrobial activity of Mukia maderasapatna stem extract of jujube seeds activated carbon against Gram-positive / Gram-negative bacteria and Fungi strains: Application in heavy metal removal*" in an Int. Journal titled "**Desalination and Water Treatment**" (IF: 1.272).



B. Ambedkar* and **Dr. J. Dhanalakshmi** along with B.Tech final year students **A. Joseph Wilson, M. S. Ken Saroven, and D. Murugesh**, published a paper titled "*Beneficiation of Indian Coals: Process Intensification by Power Ultrasound*", International Journal of **Emerging Research in Management and Technology** - Accepted. (Impact Factor - 1.49)



Dr.R.Anantharaj, Associate Professor, published a paper entitled on "*Interaction energy of pyrrole and pyridine with 1-ethyl-3-methylimidazolium ethyl sulphate*". **Journal of Molecular Liquids**, 231, (2017) 56-63.





Faculty Interaction

1.	Dr. R. Parthiban, Prof & Head was the resource person for the AICTE sponsored QIP programme on "Recent Advancements in Alternative, Renewable Energy Technology and Management" organized by the Department of Chemical Engineering, Coimbatore Institute of Technology , Coimbatore.
2.	Dr. V. Jaikumar , Associate Professor acted as Judge in National conference on "Sustainable Energy and Environmental Science, Engineering & Technology (SEESSET)", Conducted by Dept. of Chemical Engg., SSNCE
3.	Dr. K. Jagannathan , Associate Professor, had delivered an invited lecture on "Biodegradation of organic pollutants" for one day National Conference on "Advances in Chemical, Biological and Environmental Engineering" at the department of Chemical Engineering, SSN College of Engineering
4.	Dr. K. Jagannathan , Associate Professor, had delivered a Plenary Lecture On "Biodegradation of Hazardous waste" in the National Conference on "Recent Trends in Biotechnology and its Applications" at the School of Engineering, Vels University , Chennai.
5.	Dr. K. Jagannathan , Associate Professor, was appointed as External Assessor of applicants for the post of Lecturer at the National University of Malaysia (UKM, Kuala Lumpur)
6.	Dr. P. Senthil Kumar , Associate Professor has given the guest lecture and attended the All India National Seminar on "Bio-Degradable Material and Biotechnology for Environmental Protection for Chemical Industry" organized by The Institution of Engineers (India) Hosur Local Centre , Hosur along with Adhiyamaan College of Engineering, Hosur.
7.	Dr.P.Senthil Kumar , Associate Professor gave the invited talk titled " Role of Wastewater Management - In Research Aspects " during the One Day National Conference on " <i>Advances in Chemical, Biological and Environmental Engineering (ACBEE)</i> ".
8.	Dr.P.Senthil Kumar , Associate Professor gave the guest lecture titled " Research on Wastewater Treatment " in the Department of Chemical Engineering, Sathyabama University , Chennai.
9.	Dr.P.Senthil Kumar , Associate Professor gave the invited Technical Talk titled " <i>Research on Water and Wastewater Management</i> " during the UGC SAP DRS II sponsored National Workshop on "Water Resource and Environmental Systems" held at Annamalai University , Chidambaram.
10.	Dr. B. Ambedkar delivered a invited guest lecture on " <i>Current Research Scenarios in Energy, Environmental and Chemical Engineering</i> " TEQIP - II Sponsored Workshop (03.02.2017) organized by Department of Chemical Engineering, NIT Trichy .
11.	Dr.R.Anantharaj , Associate Professor, was given a invited talk on "Evaluation of Performance of Deep eutectic solvent for Denitrification of liquid fuels" at Current Research Scenarios in Energy, Environmental and Chemical Engineering", NIT Trichy , Tamilnadu, India.



Conferences, Workshops, Seminars & FDPs

International Conference -RACEEE-2017

Department of Chemical Engineering organized a **2nd International Conference on Recent Advancement in Chemical, Environmental and Energy Engineering (RACEEE-2017)** on **23-24 Feb 2017** (Thursday and Friday) in the **Central Seminar Hall, New ECE Block, SSN College of Engineering, Chennai - 603110**.



Inauguration of the conference was held at 09.30 am. **Prof. Dr. Eric Van Hullebusch** from UNESCO-IHE, The Water institute, The Netherlands, was the chief guest and **Mrs. Kala Vijayakumar**, President, SSN Institutions and **Prof. S. Salivahanan**, Principal, SSN College of Engineering presided over the function in the presence of **Prof. R. Parthiban**, Conference Chair & Head of Department of Chemical Engineering and **Dr. V. Jaikumar**, Associate Professor & Convener-RACEEE-2017.



Conference proceedings released by dignitaries

Valedictory function was held at 1.00 pm and the **Best Paper Awards** were given to the participants by the chief guest **Prof. Dr. Eric Van Hullebusch, UNESCO-IHE, The Netherlands**.



Chief guest giving away best paper awards

Other Events:

S.No	Date	Name of the Event	Coordinators
1.	02 nd Feb '2017	3 rd National Level Conference on "Sustainable Trends in Energy and Environmental Resources (STEER)"	Dr.B.Ambedkar Dr.R.Anantharaj
2.	09 th Feb 2017	National Conference on "Advances in Chemical, Biological and Environmental Engineering: (ACBEE)"	Dr.J.Dhanalakshmi Dr.B.Ambedkar Dr.R.Anantharaj
3.	03 March 2017	National conference on "Sustainable Energy and Environmental Science, Engineering and Technology"	Dr.B.Ambedkar Dr.R.Anantharaj Dr.J.Dhanalakshmi
4.	17 th & 18 th March 2017	National Conference on "Green Chemical Process and Sustainable Technologies" (GCPST 2017)	Dr.R.Anantharaj Dr.K.Sathish Kumar Dr.B.Ambedkar
5.	17 th February 2017	One day national workshop on "Writing Scientific Research Paper - Phase III"	Dr.P.Senthil Kumar Dr.K.P.Gopinath Dr.D. Gnanaprakash



Prof.G.D.Yadav, Vice Chancellor of ICT- Mumbai, felicitated by our Principal, **Dr.S.Salivahanan** during National Conference GCPST-2017, on 17th March, 2017



Conference proceedings released by the dignitaries during National Conference STEER-2017, on 2nd, February, 2017



Dr.P.Senthilkumar, Associate Professor, delivered a lecture on "Writing scientific research papers" during the workshop on 17th February, 2017



Prof. Dr. Eric Van Hullebusch, UNESCO-IHE, The Netherlands felicitated by Prof. & Head, Chemical, Dr.R.Parthiban during RACEEE 2017, on 23rd February, 2017



Size Matters: Bridging the Gap between Blue-Sky Research and Applied Research

Research on nanoparticles is witnessing a significant rise day-by-day. With the number of research articles being published in this area raising exponentially, the issue of scalability of nanoparticles to an industrial level is essential, for it to create tangible effects on industrial manufacture.

Goutham R, 3rd Year, Samynaathan V, 2nd Year

One of the credos of nanotechnology is the fact that the physical and chemical properties of substances change with size, and as one reaches the nanometre scale, new properties start to appear. This is largely the main idea of doing science at this scale. The modern scientific know-how allows one to manipulate and control nano-objects — even one at a time in many cases — to produce the intended effect or a property that cannot be achieved in the bulk. The popularity and the large appeal of nanoscale, is almost pervasive in science, because nanotechnology offers the unique opportunity to understand physical and chemical processes at the most fundamental and smallest level. In essence, this idea is essential for the improvement and optimisation of any system under investigation.

But despite these paramount advances, nanotechnology continues to be confronted by a significant bottleneck. The scientific and technical fraternities are still struggling to translate the fundamental advances reported in the scientific literature into palpable technological applications that can be appreciated and used at the neophyte's level. This problem can be analysed in two levels. Primarily, the properties of nanoparticle reverts back to those of bulk, as they are scaled up; in short, the level of control that can be

placed at the nanoscale or at the single-object level tends to decrease at the meso- and macroscales or when dealing with a large number of objects. And secondly, no industries are ready to risk and venture into the arena of developing a new large-scale process, until they are capable of guaranteeing a sizeable profit returns.

This situation is worsened due to the lack of integration between the lab-scale and industrial level experimentation and investigation, irrespective of the fields.

To help ease this disparity in the research fraternity from different backgrounds, the United States Department of Energy created the Materials Engineering Research Facility (MERF) at the Argonne National Laboratories in the year 2010. The lab employs around 20 researchers, who mostly have a strong industrial experience. The facility primarily aims to develop a manufacturing process that produces promising materials from the laboratory scale (usually made on the order of milligrams) to the kilogram scale. In spite of many calling this to be a fairly poor quantity for a typical process industry, this quantity is reported to be enough to get industrial partners interested to pilot their own large-scale production process.

The whole process of scaling up the research takes place in three stages, where in the material production is scaled up by an order of magnitude each time.

The researchers make a large number of batches and must hence ensure that each of these batches shows consistent performances, and that the performances do not decrease much with scaling up of the process.

In this regard, it becomes interesting to find out the other possible reasons for this problem. It was observed that some of the issues that often come into play include the amount of waste and energy consumption, possibility of recycling, material safety, and hazard level during production – all of which have a profound impact on the final cost of the process. At any point in time, if the researchers observe that the material is unlikely to be suitable for industrial up-scaling either due to poor performance or high cost, the scaling-efforts are stopped. However, if the process is successful, then MERF provides a technology transfer package to a potential licensee for the large-scale production of the nanomaterial.

Many such scientists report that, nano materials are the trickiest substances to scale-up due to the frequent degradation in the performance and batch-to-batch variability. To compound the problem, the product produced does often not meet the requirements of the consumer.

Hence a major risk exists with regards to the fact that, large portions of applied research in nanomaterials carried out in academia could become irrelevant to the development of future technologies, even though they are often interesting enough to get published in a scientific journal.

There is therefore a real risk that large portions of applied research in

nanomaterials carried out in academia could become irrelevant to the development of future technologies, even though they are often interesting enough to get published in a scientific journal. Blue-sky research is a scientific research in domains where "real-world" applications are not immediately apparent. Though such kind of research studies are not expected to produce immediate practical applications, they still might be valuable in a different sense.

In this regard, the works by research centres and groups such as MERF are to be appreciated mainly not only for their diurnal studies, but also, more generally, because they help to proliferate an appreciation for exploring the real-world needs within the purview of academic environment. In this regard, well established initiatives such as supporting technology transfer, stimulating start-ups, initiating collaborations with industrial partners, and allowing industry to sponsor new centres on campus will come a long way in achieving the goal of scaling up nano-scale studies to the industrial scale appropriately, so as to suit the requirements of the larger public.

However, having a clear demarcation between fundamental and applied research is not so simple, principal investigators doing research in an applied field, especially in nanomaterials where scalability is an inherent problem, should take advantage of any of these opportunities and encourage their students to think more in terms of real-world applications. This attitude will improve the chances that, at some point in near future, science will be relevant and accessible at layman's level.

After all, the very process of measuring impact of a research by using the number of publications and citations as the primary yardsticks, might be the detrimental factor in applied research.



From Flying Burritos to Printing Candy

Neeraja B, 3rd Year

Food technology has made our lives easier, much more than we realize. From canned foods to pasteurization of wine and milk, it has enhanced productivity and improved public hygiene. Food technology is a branch of food science dealing with production processes that make food. While initial research concentrated on food preservation, the current focus is on packaging and nutrition.

Instantized milk powder, decaffeination of coffee and tea are technology breakthroughs in the past that have changed lives of the present generation. Recent research and advancements in food technology have proved to be highly interdisciplinary. Biotechnology, electronics, mechanical and chemical engineering are now a significant contributor to food tech advancements. Start-ups have played an important role in converting scientific small scale research to commercial technologies. The last decade has seen many breakthroughs which are highly exciting. Some of them are mentioned here.

Printing your own food. A company called 3D systems introduced the *Chefjet* and *Chefjet Pro*, which can make chocolate and other sugar products with fun patterns and designs. The machines make confectionery shaped in ways that would be difficult to produce using traditional methods.

High pressure pasteurization. The pressure applied in high-pressure pasteurization (HPP) systems, help in cold-pasteurizing meats, juices, ready-to-eat meals and other premium food products. These would suffer under high-temperature pasteurization. Microorganisms such as salmonella and listeria are killed in HPP by collapsing their cell walls. The food product is largely unaffected if it has tough packaging.



Scanning food. Handheld food scanners allow users to get the nutritional values and ingredients of food. These increase transparency by challenging food companies to improve quality. Canadian company *TellSpec* introduced their first model in 2016, which informs users about specific ingredients and macronutrients.

Recycling food wastes. Whirlpool Zera home recycler can take on almost any kind of food waste. Food scraps go in the counter-height machine and in 24 hours, prime fertilizer comes out with 95%

efficiency. The Zera won a CES 2017 Best of Innovation Award, and Engadget crowned the Zera its best connected home product.

Avoiding an upset stomach. The handheld app-connected gadget by Foodmarble works like a breathalyzer test for gas, and can identify foods that trigger GI distress in individual consumers so they can avoid future upset stomachs.

Pizza delivery robots and flying burritos. In Australia and New Zealand, Domino's created a pizza delivery robot that can carry 10 pizzas and make deliveries

Testing for gluten. Nima Sensor created by a California based company was unveiled in March. A user inserts a portion of their meal into the triangle-shaped device, and within two minutes, the portable tool will determine whether that food contains gluten.

Osmotic dehydration. Osmotic dehydration can be considered as the most eligible energy-saving method for the partial removal of water from foods, if and even as a method of preservation in case of candy preparation. It can cause reduction in the moisture content of the foods before they are subjected to further processing steps such as drying, freezing, or frying.

Ultrasound to preserve food. This uses the bactericidal action of sonication combined with other techniques such as heat, ultraviolet light, and the use of a biocide to preserve food. Low power ultrasound methods have proven to be more effective in nutrient retention.

within a 20-mile radius. Chipotle began testing airlifted burrito deliveries using drones in conjunction with Virginia Tech, although just for a limited time.



Antifreeze proteins. They are proteins that are produced by many cold-climate organisms, are presently being explored for use in the food processing industry as a means to improve both quality and nutritional value of food kept in cold storage. Ice growth inhibition may eventually allow food products that are prone to serious damage from freezing to be maintained in supercooled states at temperatures below the freezing point.

In a fast paced world like ours, reduction in food processing time can improve quality of life for everyone. Food technology is now a potential medium to eradicate poverty and sickness in the world. With acute food scarcity continuously threatening the existence of many living species, such innovations in food technology are a much needed blessing. They give us hope for a sated, healthier future.

Eat good, feel good!



The Story of Invista

Sowmya Seshadri, 2ND Year

In today's world, all that we see around is made of one or the other kind of polymer. There is a high demand for fabrics and plastics.

INVISTA, the world's largest integrated fiber, resin and intermediates company, contributes a lot to fulfill these demands. It is headquartered in Wichita, Kansas, United States.



Started by DuPont originally, it was known by the name, "DuPont Textiles and Interiors". It handled the company's textile fibers division in 2003. Soon after establishing the company, it was given the trademark name, INVISTA.

In April 2004, the company was bought by Koch Industries. Koch's subsidiary, KoSa was combined with INVISTA to expand the production.

INVISTA is famous for the fiber and fabric production. It also produces various polymers and plastics. Specialty chemicals are also produced by the company to fulfill the consumer demands.

INVISTA has more than 4,400 trademark registrations worldwide. Being a multi-tasking company, it's diverse collection of brands offer the best solution for various industries.

The company, also considers the environmental protection aspects. It was

recognized by EPA in 2009 for self-reporting environmental violations. It has won several awards and accolades from prominent environmental organizations. The company was also recognized for the Corporate Social Responsibility statements, to which it adheres.



INVISTA's fiber and fabric section takes care of the production of apparels, flooring, home interiors, automotive and outdoor and travel. It also produces fabrics required for various industries.

Famous Fiber and Fabric Brands

- LYCRA® Fiber
- DACRON® Fiber
- COOLMAX® Fiber
- THERMOLITE® Fiber
- TRUSOFT™ Fiber
- STAINMASTER® Carpeting Brand
- ANTRON® Carpet Fiber
- CORDURA® Fabric
- SUPPLEX® Fabric

The company's specialty chemicals and intermediates are used in the production of printing ink, glossy coatings, insulations etc..



Specialty Chemicals and Intermediates Brands

- ADI-PURE® Adipic acids
- DYTEK® Idea Intermediates
- FLEXISOLV® Solvent Solutions
- TERATE® Polyols
- TERRIN® Polyols
- TERATHANE® Polyether Glycol

INVISTA is also known for polymer and plastic production. Its products find application in the production of computer screens, food packaging etc..

Polymer and Plastic Brands

- NOVADYN™ High Performance Polyamides
- OXYCLEAR® Barrier Resin
- POLYCLEAR® PET
- POLYSHIELD® Resin

Green Corner

Do you know...?

Saalumarada Thimmakka is an Indian environmentalist from the state of Karnataka, noted for her work in planting and tending to 384 banyan trees along a four-kilometre stretch of highway between Hulikal and Kudur.



**Non Technical**

Emotions

Madhumeetha. B, 4th Year

I have been having these feelings lately, feelings that are so common that nobody really wonders how we actually feel them. Rather why we actually feel them. It's very strange. Most of the time we really don't have a particular reason (valid reason) to have these feelings. A human mind works in a very strange way. It expresses ideas and emotions based on only what the mind as an entity can perceive. Usually, an emotion like jealousy or sadness affects the human mind without it's knowledge. But imagine if we are able to assess emotions before we can feel them. What if i can choose what emotions we would like to experience? We would feel happy all the time. The funny thing is emotions don't work that way. It is an impulsive thing. We don't understand our body and mind are a single entity and often consider what the mind simply feels. Our body faces these consequences in various forms. Imagine if the mind always felt negative for some reason, the body would probably undergo something like an accident. Accidents don't happen accidentally. It was destined to happen. Rather we are who we want to be. Recently, my friend met his destiny in the form of an accident. At 21 years, I am sure he wasn't destined die. But what caused his death? I ponder about it every day. It has been two months. I am still searching for an answer that i could conveniently categorize as fate. Unfortunately, it has been hard for me to accept that it was emotions and his mind that caused the accident. We are insignificant in this cosmos. We are

merely tools for evolution and growth to happen. A confused mind has its impact in this environment in the form of "Society".

My friend was in a state of confusion and wished to seek clarity from the people around him. His mind was all over the place. I observed as everyone talked to him by tempting him that their story would offer him clarity. Opinion after opinion, emotions like guilt, negativity crept in. I understood why someone instigates an emotion like guilt in you, it is because they want you to feel guilty. We are made to believe that we are guilty and wish to believe the same. I strongly feel the kind of words a person uses not only define them but their understanding about life. Words are the strongest tool any human can have on their side. It makes them strong or weak. It limits the thinking or expands the thinking. It motivates or de-motivates. It makes us kind or cruel. It allows one to convey ideas or misinterpret ideas. I attained a certain form of clarity during the course of the day. Lots of thoughts crossing my mind, while only one idea kept coming back-Human beings don't react after thinking but react to regret actions or thought later. As humans we shouldn't feel bad when our friend wins something or has accomplished something in life. Is that what always happens? There will always be a slight insecurity in us when we hear about such things. We eventually understand it was never our cup of tea (or coffee)! Not all of us have the luxury to analyze

how our human mind works. We forgive people who break our hearts because we love them in spite of their indifferences. We allow multiple chances to our friends. We criticize people we dislike because we

can always find a way to find fault in them. We are living examples of ironies. Human mind is the simplest complicated thing god ever created! Irony much?!

Being an Introvert... Is it a Boon or a Bane?

Ajay Krishna, 2nd Year

It all started when "The psychoanalyst" Carl Jung termed those with the gregarious personality type as Extroverts and those with a mellowed personality type as Introverts, though he never made any mention of one being better than the other.

Introverts are mostly assumed to be people who are shy and are quite reticent about sharing their thoughts. Introversion is not all about being shy. Shyness is fear of social judgement. Introversion is more about how one responds or reacts to stimulation. Extroverts long for stimulation while Introverts feel comfortable in quieter environments.

In present situation, the Schools are designed for extroverts and we live in a society where people think successful personalities arise from a group of gregarious people in a classroom.

But it isn't really the case. Research shows Introverts are more likely to succeed in life than Extroverts and also one in two people we meet are Introverts.

The conclusion which is suitable is from a book called "QUIET" where the quote says "the secret of life is to put you in the right lighting for some its roadway spotlight and for others it is the lamp lit desk.

The pros of being an Introvert

Introverts have a strong ability to focus and are people who don't need stimulation.

Introverts are people who make deeper connections with people because

whenever they communicate with people they focus a lot and hence get into deeper and stronger relationships.

Introverts like to be Independent and have self-efficiency and don't need constant approval because they are Independent.

Introverts can become Extroverts when the situation demands them to be but the vice versa is not possible.

Introverts when they become successful, they become extreme Introverts whereas extroverts who become successful become extreme Extroverts.

Another thing about Introverts is that they never hog the limelight and are down to Earth.

Throughout out their lives, the Introverts are made to believe that they are useless when the fact is that being an introvert is not so bad and has all the pros listed above and it is an Introvert who must believe in oneself and bring out the success.

As already mentioned nearly 50 % of people in India are Introverts and wanting them to change is like wanting nearly 0.6 billion people to change from who they are. So there is no harm in being an Introvert and is definitely a boon to be an Introvert and if someone feels bad about being an Introvert and if he/she starts envying the qualities of an Extrovert, they must think that there are 0.6 billion people in this country similar to them and most have tasted the success and have gotten into the fame.



Alumni Corner

Malavikha Rajivmoorthy (2012-16)

Graduate Student

Advanced Steel Processing and Products Research Center

Molecular Theory Group

Colorado School of Mines

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College life is the best four years any one can have!", I was advised to enjoy the ride that was in store for me before I joined SSN. As a hopeful little girl who had just finished school, I looked forward to what lay ahead, and fair enough, looking back, it's been such an amazing journey for both my academic and personal life. Met the most amazing people, developed friendships that would most surely last a lifetime, and also took classes with very inspiring faculty.

Academically, chemical engineering at SSN laid the foundation for me to take forward my career in the direction of materials science. Research experience inside and outside SSN led me to choose this path, and also motivation and guidance from the faculty played a great role in helping me channel my thoughts. Even today, I look up to the faculty to seek advice in matters of importance. As a part of a lovely batch, I am also proud of all our achievements: we have a huge number of students pursuing higher studies abroad in institutes of great repute, and we have also produced an amazing number of university rank holders including the coveted gold medallist! We were a competitive and

friendly batch, and always had each other's back.

Being with a lovely set of classmates and juniors, one of the fondest memories in the department was kick-starting and organizing the national conference on Sustainable Trends in Energy and Environmental Research (STEER) as a part of the IChE-SSN Student Chapter. Outside the department I was also a part of the college dramatics club, "Lights Out Please", and the department was also supportive in terms of encouraging to participate in extracurricular activities.

To sum up, it was an enjoyable journey both academically and non-academically; SSN helped me grow so much as an all-round individual. The chemical bonds of friendship will forever stay strong; the well wishes and encouragement of the faculty is what forms the department a close knit family-a family that I will always be proud to have been a part of! I'd give anything to relive all of these moments!



Alumni Corner

Koushik Balaji (2012 - 16)

Graduate Assistant
Department of Chemical and Bio-Chemical Engineering
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Pursuing a degree abroad helps us in many ways. It makes us independent, help us get global exposure in the field we are into. It has always been my dream to do my post-graduation abroad. At Rutgers University, I was associated with Continuous Pharma manufacturing process. It was a great experience working with the Pilot Plant. We are working on the challenges of Batch Operations and trying to replace it with continuous mode. I am working with the Process Analytical Technology Team.

The Department of Chemical engineering at SSN has channelized me on to the right track. The Department, equipped me towards my goal. The state of art of Facility that I was exposed to in the Department was of International standards. The Professors played a pivotal role in guiding me through initial stages of research and taught me how it had to be done. They have always encouraged me to do more learning beyond the classrooms. The Department was generously funded by the Management and SSN Research Centre and we were all

provided individual funds to carry out our own projects.

Apart from research, I was strongly encouraged to attend and conduct academic events like International Conferences, Symposiums. Once a month, we used to have guest lectures, where many renowned industrialists and professors from other reputed organizations used to present us with current advancements in several disciplines of Chemical Engineering. The Department strongly encouraged the students to attend Internships and Implant trainings in the vacation to boost students profile. In addition to that, Department usually organises plant visits every semester. The concepts taught in the classrooms of SSN gave me a formidable edge in handling the advanced courses at Rutgers University. Even after graduating from SSN, the professors in the department were always available for us to sort our queries.

I cherish every moment I spent in the Department. It makes me proud to say, I am a chemical engineer from SSN.

Tentative Schedule of Events for the academic year 2017 - 18

S.NO	Month	Date	Name of the Event	Coordinators
1.	July	21-07-17	National Workshop On "Writing Scientific Research Paper - Phase IV"	Dr. P. Senthil Kumar Dr. K. P. Gopinath Dr. D. Balaji
2.	August	02-08-17 03-08-17	National Conference on "Ionic Liquids in Green Chemical Process & Sustainable Technologies"	Dr.R Anantharaj Dr.M.Subramaniam Dr.K.Sathish Kumar
3.	August	10-08-17 11-08-17	National Conference on "Sustainable Energy, Environment and Biological Processes"	Dr.J.Dhanalakshmi Dr.B.Ambedkar
4.	September	15-09-17	National Conference on "Future Technologies in Energy & Environmental Engineering"	Dr.D.Gnanaprakash Dr.K.P.Gopinath Dr.P.Senthil Kumar
5.	September	21-09-17 22-09-17	Workshop on "Green Chemical Process & Sustainable Technologies"	Dr.K.Sathish Kumar Dr.Anandaraj
6.	September	29-09-17	National Workshop on "Environmental impact on Energy systems"	Dr.D.Balaji Dr.P.Senthil Kumar Dr.K.P.Gopinath
7.	November December	29-11-17 30-11-17 01-12-17	Workshop on "One day 10 steps to become a CFD expert"	Dr.B.Ambedkar Dr.J.Dhanalakshmi
8.	January	22-01-18 To 26-01-18	FDP on "Chemical Engineering and Thermodynamics applications"	Dr.R Anantharaj Dr.M.Subramaniam Dr.K.Sathish Kumar
9.	February	15-02-18 16-02-18	International Conference on "Recent Trends in Chemical, Environmental and Energy Engineering"	Dr.P.Senthil Kumar Dr.K.P.Gopinath Dr.D.Gnanaprakash
10.	March	03-03-18	Hands on Training on "Environmental Analysis"	Dr. K. P. Gopinath Dr. P. Senthil Kumar Dr. D.Gnanaprakash