Volume 1, Issue 4 (April, 2006)

AMEN

The Association of Mechanical Engineers

# NEWSLETTER

Published by the Association of Mechanical Engineers, IIT Kanpur

**In matters of style, swim with the current;
In matters of principle, stand like a rock.**

## 'APPING': IN HINDSIGHT

It all started with the summers following the fourth semester when everyone wants to do something or the other in the department that would add some worthy lines to an otherwise redundant resume. There are actually very few terms (which comprise the research interest of the faculty) that we would be able to comprehend; nonetheless each one of us succeeded in obtaining stay permission (and a summer project of course!!!). The research experience was quite different from classroom academics in terms of both preparation and performance. Factors such as commitment, the kind of project and the chemistry with the professor can be said to determine whether research really clicks your flavor. At this time, most of us decided whether to continue academics, switch on to management or take up a job.

Whilst almost no planning is required for appearing in job interviews, one has to decide and accordingly plan, well in advance, whether to apply for graduate studies. This includes significant thought in deciding the kind of courses to be taken up, crystallizing your area of interest, taking up the right kind of research projects and more importantly applying for a summer internship. By the time the summer internship is over and BTP's are decided, one has a clear idea as to whether to pursue graduate studies and the specific areas of one's interest.

Generally a completed application consists of the following components: GRE & TOEFL scores, official grade sheets, 3 or more recommendations (depends), a statement of purpose and a resume. Of these, recommendations and grades primarily decide whether your application is strong or weak. Excellent grades in the area of interest can always overshadow an otherwise unattractive grade sheet. It is very important that you know your recommenders well and vice versa. Good test scores never so much 'make' an application as bad test scores can 'break' it. Most universities prefer to look at the SOP more closely than the resume as it is believed that only a SOP can bring out your specific experience and credentials along with the commitment and the vision for graduate studies-so NEVER copy a SOP and try to make one that is original and individualistic.

There are other implicit factors that can improve your chances over and above your credentials. A very important component is coordinating with your batch mates (especially for matching areas of interest). Try to have as fewer representations to any university as possible. It is also advised that one researches the university well to find out the funding scenario and the previous trends.

The acceptance rate has been pretty favorable this year breaking some general notions. People ventured out into new upcoming areas and the response has been really positive. Whether to go for an MS or directly a PhD is something we would not discuss as the answers are highly specific and remains for one to figure it out themselves. HAPPY APPING!!!!!

**Amit Soni (Y2056) & Dhruv Singh (Y2138)**

## DID YOU KNOW?

The automobile gave women ample opportunity for invention! Prior to the manufacture of Henry Ford's Model A, Mary Anderson was granted her first patent for a window cleaning device in November of 1903. Her invention could clean snow, rain, or sleet from a windshield by using a handle inside the car. Her goal was to improve driver vision during stormy weather - Mary Anderson invented the windshield wiper. During a trip to New York City, Mary Anderson noticed that streetcar drivers had to open the windows of their cars when it rained in order to see, as a solution she invented a swinging arm device with a rubber blade that was operated by the driver from within the vehicle via a lever. The windshield wipers became standard equipment on all American cars by 1916. In 1923, of the 345 inventions listed under "Transportation" in the Women's Bureau Bulletin No.28, about half were related to automobiles and another 25 concerned traffic signals and turn indicators! Among these inventions were a

## FROM THE DEPARTMENT

Dr. S.G.Dhande gave a talk on "Emerging directions in design and manufacturing" as part of the colloquium series of the department, on the 7th March. He stressed on the role of information and communication sciences in the future of engineering. He also explained the key features of MEMS and NEMS and manufacturing of nano devices. These nano devices are manufactured using Fixed Ion Beam machine which is available in our institute as well near the NET building. He also mentioned that the institute is pumping a lot of funds for research in the field of nanotechnology.

## INTERVIEW

Dr. Srikumar Banerjee, Director of BARC, was at IITK to deliver a lecture as part of the departmental distinguished lecture series, on “Engineering challenges in the Indian Nuclear programme.” Following are the excerpts from an informal discussion we had with him.

***What are your views on non-conventional forms of energy like Solar and Wind energy vis-à-vis Nuclear energy?***

India needs to harness all forms of energy...There are wind mills in India, but they are highly underutilized due to weak wind currents...There are basically two forms of energy – Concentrated and Spread out (Distributed). Solar and wind are of the second type. Spread out forms of energy cannot sustain the urban social structure and cannot be used for an industrial production unit. Conventional power plants have a very low efficiency. Therefore Nuclear energy is the best possible alternative. Nuclear energy can also be used for isolated areas by the development of small power packs and passive and compact systems. Unfortunately, nuclear energy for civilian purposes has been pushed back because it has military connotations. Intense forms of energy can always be used for destructive purposes. But it is coming up as the world wants to free itself of the monopoly of the oil producing countries. France went Nuclear long back and it has done well.

***How do you see the present Indo-US Nuclear Deal affecting India’s nuclear capability?***

The deal has a good potential for the development of Nuclear energy in India. It will open up the possibility of import and export of fuel and technology. It will result in an immediate growth of nuclear energy production in India. By becoming 3% nuclear we can save up to 20% oil! There are concerns of about military use of Nuclear energy. But we must remember that every country is protected by a nuclear umbrella. We were pushed to the corner by China once. So we need to have a nuclear deterrent.

***What are the external factors that affect the Nuclear Programme?***

International pressure has a big effect in the course of nuclear programme. But it has given us strength. We have indigenously developed our nuclear programme from scratch. We have been able to master a lot of technologies on our own. India can today sell Nuclear power plant technology to other nations.

***Please tell us about the kind of work you outsource.***

We outsource a number of projects. Many groups in IITK are working on our projects. Outsourced work could be related to, for example, Thermal Hydraulics, Stress Analysis and Material Integrity.

***How do you see nuclear fusion as an alternative to fission for production of energy?***

It has a widely available energy source with essentially unlimited supply and manageable environmental impact. India has become a member of the ITER (international project to design and build an experimental fusion reactor) and is supplying both hardware and software towards the development of the Fusion Reactor.

***How do you think should one decide his/her career?***

There are two ways people look at education. Some think it is just a way of getting one’s thinking logical. Some people want to use their knowledge to do something creative. It is advisable to look for what you like to do. Do not do something just because it is in fashion. It is important to realize one’s interest. You can develop a liking for research only if you have been involved deeply in a problem for a substantial amount of time. You get satisfaction only on doing things in a concentrated and devoted fashion. Now-a-days there is lack of motivation in engineering education. The IIT system lacks an element of creativity. There is a lot of peer pressure. I have seen people change, when they go abroad. The system there helps you in getting pleasure in doing research. But the crux of the matter is that you should not do things superficially.

## SPEAK UP

When in school, I used to think that the seven wonders of the world are located in beautiful cities of the world except for Agra, which is a bin of garbage (It also happens to be my hometown). By reading newspapers and talking to people I realized that, it was not the Government or the Bureaucracy that could be held responsible, but some influential (and non influential too) people of city. This made me decide on taking up science and engineering for my education and to use it later to make my city world class. When I read about "Renaissance in Europe in Middle Ages" I came to know that science is not just physics, chemistry or biology but a means of developing a thought process that helps us in questioning the world around us. I read how scientific thinking and engineering skills has led to the development of the countries that today are developed. This has instilled in me, fervor to carry out a similar experiment in my life (i.e. use engineering and science for the development of society). When I entered IIT I was relieved that I had cleared the first phase of my goal and the journey towards achieving it would be easier with the company of like minded people. But I was disheartened to find that many of us have no concern for our country and society.

I have seen our alumni, with significant achievements abroad being given great recognition. I wonder what is so great in setting up a company in the US or to carry out significant scientific achievements in US universities. If these people are really great, then why has the IIT system not been able to produce a single Nobel Laureate till date? Why has an IITian not been able to script success stories like McKinsey, Samsung, Ford, Reliance etc? The answer to these questions is that most Indians (IITians) always try to secure their future and in this process exhaust their talent and time. We are satisfied by meager success only, which comes through hard work (but within comfort levels) and have never seen a dream to rule the world. If you think that you need to be a technocrat or you do not have enough support then think of the likes of LN Mittal, Dhirubhai Ambani and Sunil Mittal. If they can, then why can't we? After all there is no shortage of funds or of talent, here.

I believe Indian market is one of the worst served markets of the world and I am confident that a company serving consumer interests will always do well here. Therefore there is immense scope for all of us to do something big and use our knowledge to change things around. I hope that I shall be able to walk this path that not many have treaded. **Ankit Rathore (Y3054)**

## SUDOKU

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