Dear Metalumnus,

The last time I wrote to you, I hinted at major impending changes in our department. The greatest imperative was in recruitment, both in faculty as well as in students. I am delighted to tell you that we have added 3 new faculty members in 2011.

Suryasarathy Bose (above) comes to strengthen our expertise in the field of polymers. Surjo finished his PhD in chemical engineering from IIT-B and joined us after a postdoc in Katholieke Universiteit, Leuven. His areas of interest include polymer blends, thermodynamics, kinetics of phase separation and nanocomposites.

Kaushik Chatterjee (above), who has been awarded the Ramanujam Fellowship of DST, jumped to biomaterials at Penn State after a classical metallurgical upbringing at BE College and University of Virginia and is setting up a laboratory to carry out tissue engineering, scaffolds and the like.

Praveen Kumar (above), a mechanical engineer from IIT-K, comes to us after a PhD in University of Southern California and a postdoc at Washington State with interests in combined stress and field effects on deformation and fracture, particularly in electronic devices.

The student strength of our department has soared to over 140, including 100 PhD and some 40 odd masters students. The monthly signing of scholarship bills has become another source of acute metacarpal syndrome. I was also surprised at a recent audit which disclosed that we had some 50 temporary project staff working at any given time and these do not include the usual rush of summer student interns. The research students come from backgrounds ranging from metallurgy, ceramics, chemistry and physics to biotechnology, chemical and mechanical engineering. This breadth in intake is a true reflection of the diversity of our research and of how the discipline of materials engineering has evolved in the last decade. While traditional alloy design and mechanical behaviour continue to dominate, significant groups are emerging in biomaterials, polymers, and electronics with collateral expertise in a variety of numerical modelling methods.

The two major academic initiatives are our UGC-funded Networking Resource Centre in Materials (NRC-M) and the undergraduate (UG) programme. NRC-M is a Rs. 10 crore programme awarded to

run workshops and develop other forms of networking that will leverage our department's strengths to mentor and assist other postgraduate centres of education in materials across the country. Three workshops, both hands-on as well as classroom style lectures are held to enthusiastic participation from staff and students across the country every year on a variety of subjects including characterisation, mechanical behaviour, polymers, modelling and biomaterials.

Laboratory session during workshop on Biomaterials

Lecturers are drawn from other institutions as well as from our own faculty. Over a dozen collaborative research projects allow students and faculty at partner institutions to visit us for periods of up to a month and use all our facilities. Extensive upgradation and maintenance of equipment has been made possible through this generous initiative of UGC.

The undergraduate programme will arrive at our department in January 2013. It is safe to say that nothing in the past 100 years of our history has had the potential to change the character of the Institute as much as this recent decision to welcome school leaving students. After years of public discussion and advisory reports from scientific committees on the desirability of a uniform 4-year UG degree, Indian Institute of Science has finally taken the bull by the horns and launched a BS in science with engineering components. The 84 students admitted in August last year will complete 3 semesters of common courses in Physics, Chemistry, Biology, Mathematics, Engineering and Humanities before choosing one of 6 majors for specialisation, including Materials. Your department has been given the responsibility of coordinating the curriculum for the major in materials, a discipline which lies on the border between science and engineering. This initiative poses twin challenges for us. The first imperative is to design a curriculum that reflects the likely evolution of our discipline over the next few decades; in other words, provide an answer to the vexatious question, *"what should be taught to undergraduates in materials science and engineering*". The second challenge lies in making the product attractive for career options, whether in industry or in teaching / government laboratories, line management or entrepreneurship, in manufacturing or in R&D. New laboratories and classrooms will be set up, dedicated to UG students and more details may be found at http://www.iisc.ernet.in/ug/

As you can imagine, the expansion of our activities has not been without its down side. The most serious constraints have come in space. If you visit our department now, apart from rooms with close packed people and equipment, you may be surprised to see that the bay that housed ore dressing and electro slag refining has disappeared! (see picture below)

A new 4 storeyed building with about 2000 square metres of space has been approved and we hope construction will

start soon. Needless to say, the prospect of a building appearing in 2 years does not help our immediate requirements and we were fortunate to acquire space in 2 other locations: in the old MRDG building next to the foundry and in the former high voltage engineering department. In fact, all around campus, there is an on-going wave of construction with new hostels, re-location of departments and a new guest house.

New polymer lab in former MRDG dept.

The department continues to attract major funding for research from the usual government agencies along with industries such as GM, Boeing, Tata Steel and BHEL. Among the important new initiatives that will involve our faculty, I must mention three. On the occasion of the centennial of Bhabha's birth, the Department of Atomic Energy has signed a major MoU with IISc to set up a Homi Bhabha Centre at a cost of Rs. 150 crores for joint research.

Signing of IISc DAE MoU. From left to right, P. Balaram (Director, IISc), S. Banerjee (Chairman, Atomic Energy Commission) and R. Grover (Director, Homi Bhabha National Institute)

Activities envisaged in this centre include the study of materials in extreme environments, thermal loops and control systems. The Institute is also a member of the successful consortium in the bid for projects in the area of solar energy funded by the Indo – US Forum and the US Department of Energy and has also been awarded a major contract by the Ministry of Non-Renewable Energy in developing a hybrid solar thermal – gas based power generation system. And finally, a bio-engineering programme has been launched with faculty drawn from engineering as well as biology departments to carry out research with close clinical connections and also, incidentally, begin a PhD programme.

NMD – ATM 2010, Bangalore

In addition to networking with peers and funding agencies, we also have a responsibility to strengthen the roots of our discipline. In 2010 we played host to the annual meeting of the Indian Institute of Metals, NMD-ATM with over 600 participants. Every year around Founder's Day in March, we throw our gates open to school students and entertain them with movies, live demonstrations and posters that illustrate the exciting world of materials. More details can be found at http://materials.iisc.ernet.in/~openhouse/

Visitors experiencing the strain rate dependence of rheology of corn starch

Exhibition during the Founder's Day celebration

With the coming of undergraduates and the newly formed ASM Advantage Student Chapter, I look forward to more such initiatives that will take our field to schools and to the public at large. Later this year, we play host to two important conferences: the International Conference on Strength of Materials and Alloys (ICSMA 16) and the annual meeting of the Electron Microscopy Society of India.

We are continuously enriched by the numerous visitors to our department through the many endowed chairs. Tony Rollett (CMU), Lars Arnberg (NTNU) and John Banhart (TU-Berlin) are 3 of the Brahm Prakash Chair professors who are coming this year. The Aaronson chair, in memory of Hubert Aaronson, was instituted recently to bring young scientists in the field of phase transformations and the first 3 incumbents have been R. Balamuralikrishnan (DMRL), Sandip Ghosh Chowdhury (NML) and Martin Wagner (Chemnitz). P. M. Ajayan (Rice University) is now here as the DST Centenary Professor, while Knut Urban (Julich, Germany) will be coming in September.

Coming to alumni matters, let me first thank all those who responded to our Manish Narayan Memorial Fund appeal. We are now able to support 5-6 students every year to the tune of Rs. 25,000 for attending conferences. It is always a pleasure to meet old students and in this regard I must tell you how delighted we were to host Eric Adcock and his family. Eric, who is the son of the first head of department, Frank Adcock, regaled us with stories from when he grew up on campus in the early 1950s and you can see him in the meeting room named after his father in the picture below.

It is important that we have up – to - date information on our alumni. May I urge all of you to forward this newsletter to classmates and friends and ask them to register themselves with us? In many cases, even if you receive this message, our information on where you work and live may be out of date. I strongly recommend that you send us a simple reply with the following information:

Name:
Year joined:
Year Graduated:
Degree Programme:
Current postal and e-mail address, mobile:
Your employer, job designation, family (optional), etc:

E-mails can be sent to office@materials.iisc.ernet.in or to chairman@materials.iisc.ernet.in . Alternatively, go to the "alumni registration" link on http://materials.iisc.ernet.in

With best wishes,

Vikram Jayaram