

Dear Metalumnus,

The Alumni Association of North America hosted a wonderful meeting in Chicago in July this year (see details on the AANA website, www.iiscaana.org) where over a 150 alumni and their family members showed up at the event hosted by the Mid-West chapter. Our department representation was only about 10 but it was enjoyable to meet people, both young and old, spanning over 40 years of IISc graduates. Many views were exchanged between the Institute community, led by the Associate Director, N. Balakrishnan (Balki) and the alumni, particularly with regard to how the old students can engage with IISc. The alumni association will bring out a document by and by, which I will share with you. For the present, let me bring you up to date on events in our department.



Sridhar handing over cheque for KP Abraham appeal to Vikram Jayaram

The KP Abraham appeal which was launched at the time of the 1962 batch reunion received a big boost with a 10 lakh donation from Sridhar (1963, BE). I urge you all to contribute to the best of your ability. Our new building has now reached the ground (plinth) level and the pillars to support the building are nearly complete. This summer has seen a number of visitors, including Seshadri Seetharaman, formerly of KTH-Stockholm, and Brahm Prakash Chair Professors, Ganpati Ramanath of RPI-Troy and Javier Llorca, Director of IMDEA- Madrid.



Pillars erected on foundation of the new building

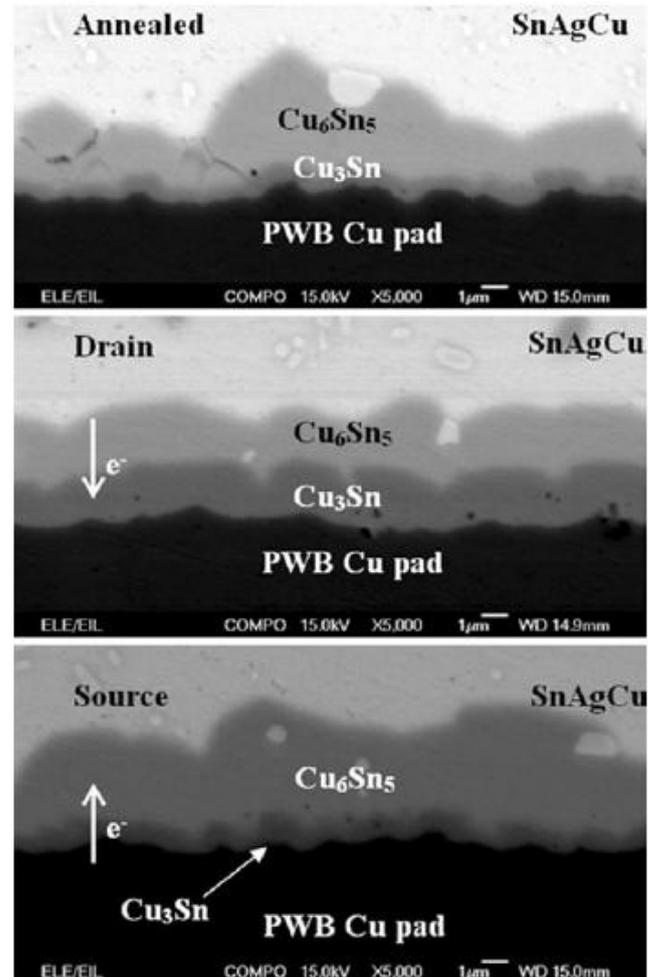
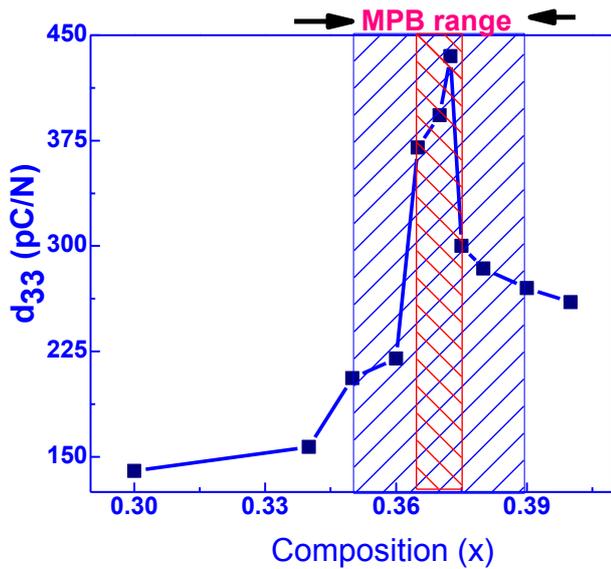
The 1963 and 64 BE batches have finalised their reunion plans for January 17-18, 2014 at the department. If any of you (and this includes people from other batches as well) will be here at that time, please let us know and join us.



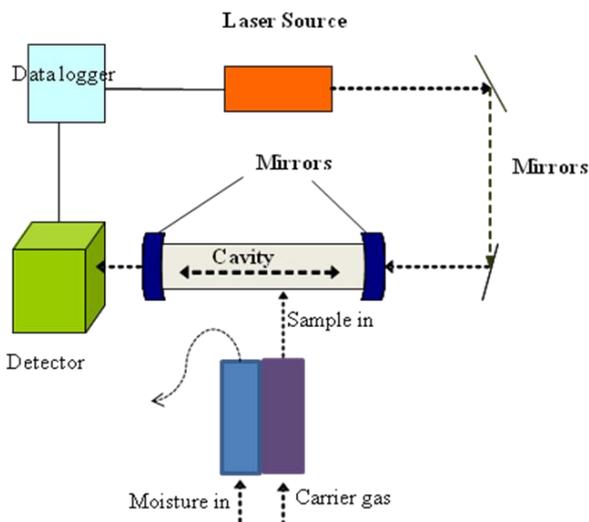
1962 batch Reunion

Research Snippets

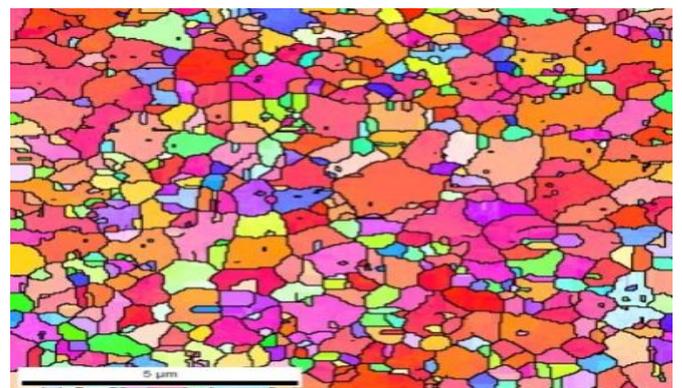
Rajeev Ranjan and his group are looking at the ferroelectric system $(1-x)\text{PbTiO}_3-(x)\text{BiScO}_3$ which is unique for its good piezoelectric properties combined with a high Curie temperature. They show through high resolution synchrotron x-ray powder diffraction and piezoelectric measurements on poled samples (see figure) that the maximum d_{33} is obtained in a narrow range *within* the two-phase morphotropic phase boundary in which the enhanced lattice polarizability of both the coexisting phases is greatly enhanced.



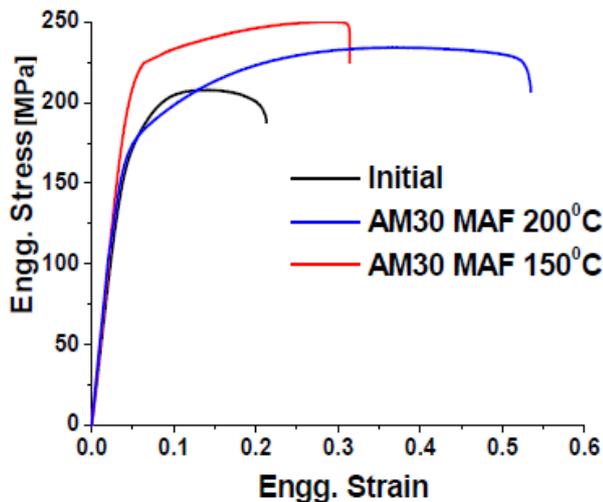
In the field of organic photovoltaics, **Praveen Ramamurthy** and his colleagues are looking at the problem of encapsulation of ambient sensitive polymers and also the vexing issue of continuous and absolute measurement of water vapour permeation rates as low as $1 \mu\text{g}/\text{m}^2/\text{day}$ using ultra sensitive *cavity ring down spectroscopy* which measures the characteristic decay time of laser radiation that has been scattered by water molecules that have permeated through a film over time.



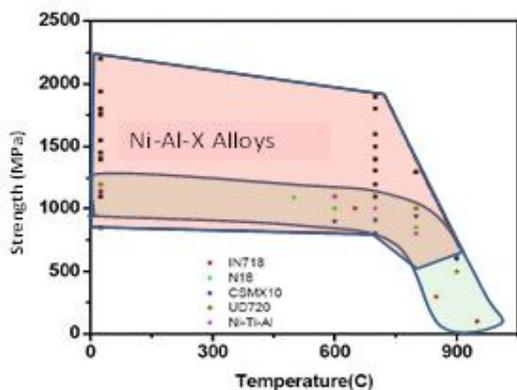
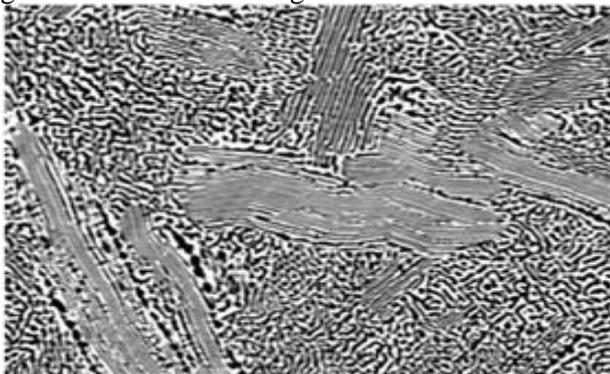
Satyam Suwas and co-workers show how to ductilise and strengthen Mg alloys through a combination of grain refinement and texture after multiaxial forging and ECAP.



Aloke Paul and Praveen Kumar have been looking at the synergistic effects of interdiffusion and current in solders. In particular, they show that the reaction products and thicknesses at Cu-solder junctions in interconnects are strongly biased by the direction of current flow in FET geometries.



Kamano Chattopadhyay and Dipankar Banerjee have developed ternary eutectics based on Ni-Al-Zr with 3 intermetallic phases that exhibit oxidation resistance and morphological stability leading to high temperature strength for potential applications as new generation materials for gas turbines.



New facilities have been approved through in-house funding. The biggest item is seed money for an aberration corrected TEM which will be accompanied by a second EPMA and x-ray tomography, all of which will join the other instruments at the Institute's Advanced Facility for Microscopy and Microanalysis. High resolution crystallography will get a boost with the sanction of a new diffractometer with in-situ measurements possible under applied electric fields.

Our **UGC-funded Networking Resource Centre** completed five years recently. I am happy to tell you that the empowered committee that reviewed it was very pleased with the way in which we defined our goals and went about accomplishing them. The mandate of this centre was to leverage our infrastructural and pedagogical resources to stimulate and engage other materials departments in Universities and NITs. A total of 30 research collaborations were initiated with 14 partners, 5 summer schools were held with hands-on exposure to experimental and modelling methods, 8 week-long workshops covered topics such as mechanical & structural characterisation, polymers, bio-materials and computational methods and 3 discussion meetings were held on advanced topics such as interfaces in mechanical behaviour. Altogether, over 400 participants from 120 institutions came under this umbrella which has already led to 20 joint publications and 2 externally funded projects.



Faculty participant at hands-on workshop on mechanical testing

Alumni News:

VA Ravi, (BE 1983), Department Chair of Chemical and Materials Engineering at California State Polytechnic University in Pomona was elected to the Board of Trustees of ASM International. **Ramamoorthy Ramesh (BE 1983)** has been appointed as Deputy Director of Oak Ridge National Laboratory of DoE, USA. He and **Subhash Mahajan (BE 1961)**, UC Davis received the Distinguished Alumnus Award of IISc for 2012 while **Seshadri Seetharaman (PhD 1971)** received the Distinguished Alumnus Award for 2013. **S. Ranganathan (BE 1962)** was awarded the Electron Microscope Society of India's Lifetime Achievement Award. **Baldev Raj (PhD 1990)** has been appointed as the next President of the Committee of Academies of Technology and Engineering Sciences.