Need of strategic international educational programmes

The Russian President Vladimir Putin has announced a Five Billion Rouble (US$ 165 million) Global Education Programme for the growth of the Russian scientific workforce and to stimulate international research collaboration. Through this programme approximately 2000 research students will get an opportunity to study in one of the top 300 universities around the world for which the Russian Government will bear the travel expenses, tuition fees and living expenses of the student. Russian students will be eligible for the scheme if they attend any university listed in the top 300 by each of the following three ranking schemes: the Times Higher Education World University Rankings (www.timeshighereducation.co.uk), the Academic Rankings of World Universities (www.arwu.org) and the QS World University Rankings (www.topuniversities.com)[1].

This scheme will initially operate for three years, but based on performance it may be extended further. Students in the field of science, technology, medicine, social science and business are eligible for the grant. They need to sign a contract to return to Russia and secure professional work there for at least three years after graduation, but they will also be obliged to pay back the full stipend if they choose not to return.

Similar steps taken by countries like China, Brazil, Kazakhstan, etc. have proven effective in achieving the same goal. In 2006, China had taken a major step in this direction when the China Scholarship Council announced 7000 government scholarships to study overseas with the objective of encouraging more innovation-minded and proficient scholars who can lead domestic academic research when they return to their native land[2]. In March 2011, the Brazilian President Dilma Rousseff announced that it was a top priority of the Brazilian Government to send at least 75,000 university students to spend some time in the US higher education institutions[3], and in June 2011 the Government launched a 'Science without Borders Programme' considering challenges like a low proportion of doctors in relation to the population, less interaction between the academicians and the business sector and the civil society, scientific publications with little international collaboration and a low rate of patent applications nationally and internationally which hampers innovation.

Similarly, the Kazakhstan Government has started 'The Bolashak Programme' (the Bolashak International Scholarship), a scholarship which is awarded to high-performing students from Kazakhstan to study overseas all-expenses paid, provided they return to Kazakhstan to work for at least five years after graduation (http://en.wikipedia.org/wiki/Bolashak). Since its implementation in 1993, more than 6000 students have been awarded the scholarship. Most of these students travel to study in the US, but also travel elsewhere around the world. Presently, students of Kazakhstan are granted the opportunity to study in 32 countries at 630 leading universities overseas. Overall, till 2009, 5950 students were awarded this scholarship and around 2000 are currently employed by the government and national companies.

According to Stephen Toope, President of the University of British Columbia and Chair of the Board of the Association of Universities and Colleges of Canada, 'Building prosperity in these challenging times requires that nations reach out beyond their borders, more than ever before, to establish strategic international connections. Increasingly, the right doors are being opened and the path to prosperity is being constructed through partnerships of universities in research, innovation and higher education. Canada's universities recognize the need to build and strengthen international collaboration with nations that are making bold investments in education and research. High on that list is Brazil. That's why 30 university presidents across Canada embarked on an unprecedented mission to Brazil from 25 April to 2 May 2012. The importance of this mission is underlined by the fact that Canada's Governor General David Johnston was asked by Canada's Prime Minister Stephen Harper to lead the mission.'

According to Kai Jiang, an Associate Professor at the Graduate School of Education, Peking University, 'China has become the major country sending students abroad: 178,900 students in 2008, followed by 229,300 students in 2009. Whereas China has trained more than 360,000 international students from 1950 to 2000 who later became experts in science, technology, education, diplomacy and administration in their countries. According to the outline of China's national plan for medium and long-term education reform and development (2010–2020), China will become the biggest hosting country in Asia and a major world destination for international students. Maintaining an annual growth rate of 7%, the number of international students will reach 500,000 by 2020. The Chinese government and universities are making efforts to create conditions for enhancing the proportion of international students in campuses.'

Similarly, because of the perceived potential of the education sector to contribute to Uganda's economic growth and export development, the Commonwealth Secretariat and the Uganda Export Promotion Board commissioned the 'Marketing Uganda Higher Education Project'. The project ran from October 2010 to March 2012 and focused on assessing the capacity of Uganda's universities to recruit more international students from across the East African and Common Market for Eastern and Southern Africa regions[4].

As far as India is concerned, there is great mismatch between the number of students going to Western countries and foreign students studying on Indian campuses. Great number of students of Indian origin are travelling abroad to pursue higher education, but they are mostly self-financed and hence will not return to India after completion of their studies. In 2006, of the 123,000 students studying outside India, 76,000 chose USA followed by UK. More than 70,000 Indian students are in USA but less than 1000 American students are in India; whereas China has more than 3500 foreign students on its campuses. In India, there is no database available which can provide information regarding Study Abroad Programmes; very few government scholarships are available for the students; few programmes that are sponsored by UGC, DBT, CSIR, etc. are mainly for permanent government employees but not for students, and

indigenous programmes to attract foreign students are few with the exception of Hyderabad Central University and Madras University.

In the era of globalization of education, it may be time for the Indian Government to consider the situation seriously and set the policies/programmes in such a way that maximum students can take the advantage of government scholarships and can come back to serve the country. Such collaborations not only give international exposure to students but they create better workforce, bring foreign revenue and help building mutual understanding between countries.

1. Schiermeier, Q., *Nature*, 2012, **485**, 295.
2. Xinhua News Agency, 8 December 2006.
3. Knobel, M., *University World News*, 2011.
4. Herrmann, K., *University World News*, 2012.

Jaimini Sarkar (*S. Ramaseshan Fellow*)
e-mail: jaimini_dhane@hotmail.com

MEETING REPORT

DAE solid state physics symposium 2011*

The symposium was inaugurated by S. Kailas (Physics Group, BARC, Mumbai), T. R. Pachamuthu (SRM University, Chennai) and S. L. Chaplot (BARC). About 748 papers were accepted for presentation at the symposium. The number of registered participants was 775 and 627 contributed papers were presented in the poster session. Six researchers were selected for the Young Achievers Award. Three awards were given for the best Ph D thesis and one for M Sc project. The highlights of the symposium were the theme seminars and 12 invited talks.

The theme seminar on the first day commemorating 100 years of superconductivity was coordinated by A. K. Grover (TIFR, Mumbai). K. Kadawaki (University of Tsukuba, Tsukuba) spoke on THz LASER using high-T_c superconductor $Bi_2Sr_2CaCu_2O_{8+d}$ mesa structures. V. P. S. Awana (NPL, New Delhi) spoke on superconductivity of Fe-based pnictides and chalcogenides. Lei Shan (Chinese Academy of Sciences, Beijing) presented a talk entitled, 'Evidence for multiple nodeless gaps and electron-mode coupling from scanning tunneling spectroscopy' in the iron-based superconductor $Ba_{0.6}K_{0.4}Fe_2As_2$. Grover delivered the last talk in this session: 'A fluctuating state and the critical behaviour at the de-pinning transition in driven vortex matter in superconductors'.

S. Ramakrishnan (TIFR) spoke on 'Condensed matter at ultra-low temperature'. He gave a detailed account of the travails and tribulations of setting up of the unique facility of the microkelvin fridge that enables study of condensed matter physics in the 300 K–39 μK range. Sanjeev Kumar (IISER-Mohali) spoke on 'Novel magnetic order induced by itinerant electrons in frustrated magnets'. This was followed by a presentation by P. S. Anil Kumar (IISc, Bangalore) entitled 'Tweaking the magnetic anisotropies in magnetic films and nanostructures'.

The post-tea session comprised of an invited seminar on solid state chemistry commemorating 100 years of chemistry coordinated by S. K. Ghosh (BARC). He made the first presentation entitled 'Chemistry of molecules to physics of materials: a unified density-based view through multiscale window'. The second presentation in this theme meeting was by Pradeep (IITM, Chennai) on 'Luminescent gold quantum clusters in protein templates'. He also talked about Bovine serum albumin clusters and their ability at targeting cancer cells. T. P. Radhakrishnan (Central University, Hyderabad) talked on 'Polymer–metal nanocomposite thin films: *in situ* fabrication and applications'. He discussed trapping of Hg cluster in polymers. These polymer–metal nanocomposites seem to have unique applications from being used as bacteriocidal coatings that can get rid bacteria from a glass of water and the exemplary use of Ag–PVA composites as dip catalysts.

The second day started with a talk by C. S. Sundar (IGCAR, Kalpakkam) entitled, 'Pressure induced metallization in $BaMn_2As_2$; possible pristine compound for new class of superconductors?' Kohlbrecher (Paul Scherrer Institute, Switzerland) talked on 'Magnetization reversal processes in composite perpendicular magnetic recording media'.

The post-tea morning session coordinated by S. K. Gupta (BARC) comprised of an invited seminar on: 'Organic semiconductor'. D. K. Aswal (BARC) spoke on 'Organic semiconductors for nano- and macro-electronics: status and promises'. This was followed by a presentation by M. Iwamoto (Tokyo Institute of Technology, Tokyo) on 'Modelling and visualization of carrier motions in organic devices by optical second harmonic generation'. Subhasis Ghosh (Jawaharlal Nehru University, New Delhi) spoke on the 'Anistropic growth and high performance organic thin-film transistor pthalocyanin: organic FET'. A. J. Pal (IACS, Kolkata) spoke on the topic, 'From organic electronics to molecular electronics'. He showed how a layer of donor over acceptor could lead to molecular rectification. He also showed how the magnetic field can be cleverly employed to orient a monolayer of molecules on a substrate to manipulate molecular orbitals and thereby the conductivity.

In the post-lunch session, Rajesh Ganapathy (JNCASR, Bangalore) talked on grain boundary dynamics in colloidal crystals. He used fast confocal microscopy to probe the dynamics of grain boundaries. This was an audiovisual commentary on the nature of grain boundaries, not so easily visualized in real crystals. Venu Gopal (TIFR) talked on plasmonic crystals for enhancing optical properties. He showed various examples from metal–dielectric interfaces and how the material properties can

*A report on the 56th DAE Solid State Physics Symposium held during 19–23 December 2011 at SRM University, Kattangulattur, Tamil Nadu. It was jointly organized by the Bhabha Atomic Research Centre, Mumbai and SRM University, Chennai and sponsored by the Board of Research in Nuclear Sciences, Department of Atomic Energy, Government of India.