

Information and Announcements



Indian Association for the Cultivation of Science

Among all the modern scientific research institutions in India, Indian Association for the Cultivation of Science (IACS) is the oldest. It was founded in 1876 by Mahendra Lal Sircar who had the firm conviction “that if our country is to advance at all... it can only be by means of Science”. He established IACS ‘unaided by the (British) government’ using only private donations. He wanted the institute ‘to be solely native and purely national’ and always insisted on complete ‘freedom for the institution’. Through his life-long effort Mahendra Lal was able to complete the construction of the building and the laboratory of IACS and organised many scientific lectures at IACS. Unfortunately real research did not begin at IACS before his death in 1904 mainly because the idea of original research was still rather new in India. Three years after Mahendra Lal’s death, in 1907 C V Raman came to Calcutta as an officer in the Finance Department of the Government of India. Finding IACS well equipped for modern research Raman started doing research at IACS in his spare time. Due to Raman’s single handed effort IACS became the cradle of Indian Science. In 1917 under the invitation of Asutosh Mukherji, Raman joined the newly founded Science College of the Calcutta University as its first Palit Professor of Physics but continued his research at IACS. Attracted by Raman’s fame a legendary group of brilliant and dedicated students from all parts of India gathered at Calcutta and started their scientific careers at IACS. They included S K Banerji, S K Mitra, K S Krishnan, K R Ramanathan, L A Ramdas, S Bhagavantam, K Banerjee, to name only a few. It was in the laboratory of IACS, Raman effect was discovered on February 28, 1928 and for which Raman received the Nobel Prize in 1930. In 1933 before leaving Calcutta to join Indian Institute of Science, Bangalore as its first Indian Director, Raman created the M L Sircar Chair, the first full time academic position at IACS and selected Krishnan as its first occupant.

The modern era of IACS began in 1946 just before Indian independence when as President of IACS, M N Saha developed it into a full fledged research institute with various departments and full time positions. Under his leadership IACS was shifted from its original premises at 210 Bowbazar street to the present spacious campus at Jadavpur in 1951. Saha joined as the first full time Director of IACS on January 1, 1953 and held that post till his untimely death on February 16, 1956.



At present the research activities of IACS are organised in 8 departments and 3 units. In chemistry there are 4 departments devoted to biological, inorganic, organic and physical chemistry while polymer science unit concentrates on polymer chemistry. In the 4 physics departments research is carried out in material science, solid state physics, spectroscopy and theoretical physics while energy research and MLS Professor units focus respectively on the solar energy devices and the nanomaterials. In many departments there is a good and healthy mixture of theory and experiment. For example, apart from the theoretical physics department there are very active theory groups in the physical chemistry, spectroscopy and material science departments, while many of the pure experimental groups extensively use various theoretical models. There are a number of central facilities such as the 300 MHz NMR, several electron microscopes, liquid nitrogen and helium plant, X-ray diffractometer, a computer centre etc. One of the most important assets of IACS is its library which is used apart from the students and faculties of IACS, by many faculties and students of neighbouring universities, research institutes and colleges. IACS also publishes the *Indian Journal of Physics* started by C V Raman in 1926.

At present the total number of faculty of IACS is about 75 while there are more than 200 PhD students. Students with MSc or equivalent degree can apply to become research fellows at IACS provided they qualify in the national eligibility tests (NET or GATE). IACS provides fellowships to about 100 students. The rest get their fellowships from different projects or directly from CSIR/UGC. There is no course requirement for Ph.D. students at IACS though informally many courses are arranged. The major funding of IACS comes from the Department of Science and Technology, Government of India with a matching grant from the West Bengal State government. The scientists of IACS procure funds also from many national and international agencies through various projects.

Several research groups in the material research, solid state physics and spectroscopy department and the energy research, MLS professor and polymer science units work on the development, synthesis and study of the various properties of an extremely wide range of materials with varied applications. These include nanostructural materials, sol-gel glass, thin films, Langmuir-Blodgett films, amorphous and nano-crystalline silicon for solar energy devices, perovskite oxides exhibiting giant magneto-resistance (GMR), high T_c superconductors, liquid crystals, conducting polymers and various polymer blends/composites.

In the organic, inorganic and biological chemistry departments synthesis of a variety of molecules are carried out. These include natural products with potential application as drugs, molecules with unusual magnetic, red-ox and thermochemical properties,



bioinorganic molecules mimicking proteins and many important carbohydrate molecules. Besides these several groups are engaged in the development of novel synthetic strategies utilising various surfaces, microwaves etc.

The role of methylglyoxal in malignancy and of complex carbohydrates isolated from bacterial sources in immunochemistry and the isolation and characterisation of lectins, glycoproteins and allergens are the subjects of research of several groups in the biological chemistry department.

In the physical chemistry and the spectroscopy departments different groups use cw, nano- and picosecond lasers for the study of many molecular phenomena at various surfaces, LB films, in supersonic jets, ordinary solutions and many organised assemblies using time resolved absorption and emission, ordinary Raman, surface enhanced Raman and surface second harmonic generation.

In the theoretical physics department several groups work on electron (positron)-molecule, ion-atom and ion-ion scattering. Dynamics of random heteropolymers with implications in protein folding and spin-glass systems and critical diffusion in finite geometries are some of the topics of research in statistical physics at IACS. Condensed matter theories, elementary particle physics and nuclear physics are also pursued in the theoretical physics department. In the physical chemistry department theoretical investigation on a number of chemical phenomena is carried out using many body methods and new optimisation strategies while a group in the spectroscopy department investigates highly stripped atoms. The interaction of intense laser light with matter and its implications in non-linear dynamics, chaos and quantum optics is studied by one group in the physical chemistry department while other aspects of laser physics such as multiphoton ionisation, autoionisation and lasing without population inversion are investigated in the material science and the spectroscopy departments.



Kankan Bhattacharyya

Physical Chemistry Department

Indian Association for the

Cultivation of Science

Jadavpur, Calcutta 700 032