



**Annual Report
2022-23**

42. Mr. Jaydeep Joshi (ITER-IPR) has been adjudged as the Winner of the Fronius India Best Welding Engineer Competition for the year 2022.

❖ Digital Initiatives

New modules have been added to the IMS software to make it more flexible for assessing all the relevant data of the students and faculty by the staff of the HBNI Central office. New modules for submission of enrolment data / synopsis and result declaration for the PhD/M.Tech students of HBNI have been added to the Anuvidhya website. HBNI offered three unique courses on the Swayam-NPTEL platform which include, (i) Neutron Scattering for Condensed Matter Studies and (ii) Accelerator Physics and (iii) Nuclear and Radiochemistry.

❖ Courses Conducted by HBNI

During the year, three online courses were organized by HBNI. Details of these courses are given below.

(a) Online Course on Advanced Materials Chemistry

An online course on “Advanced Materials Chemistry” was conducted by HBNI from June to August 2022. Prof. A. K. Tyagi, Director, Chemistry Group and Senior Professor HBNI, was the course director. The broad topics covered under the course included general materials chemistry, characterization techniques, chemical, major, trace and ultra-trace analysis techniques, and functional materials. Sixty students from CIs/OCC of HBNI and other educational institutes from all over India attended the course and benefitted from it.

(b) Online course on Research Methodology, Research and Publication Ethics for HBNI Students

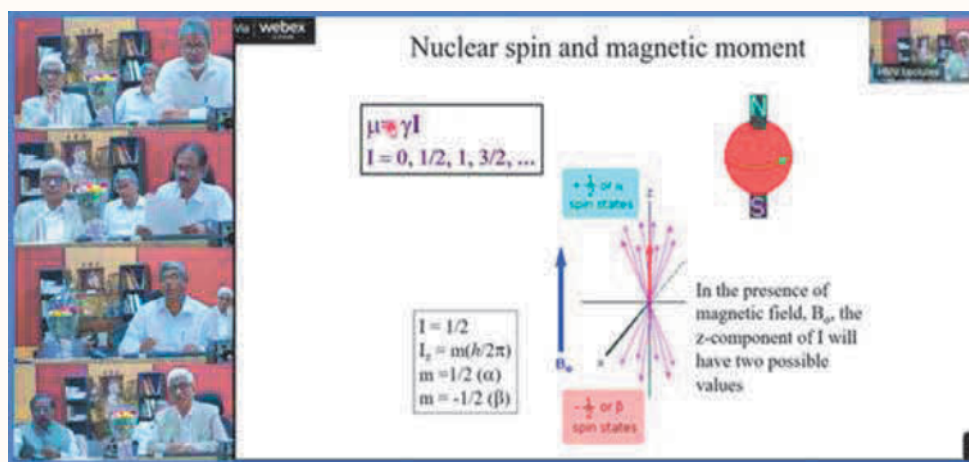
As per University Grants Commission guidelines applicable from December 2019, two credit Courses for the awareness about publication ethics and publication misconducts entitled “Research and Publication Ethics (RPE)” is mandatory for all Ph.D. students for their pre-registration course work. Accordingly, a 30-lecture course on Research Methodology, encompassing the RPE course, was conducted by HBNI Central Office during January-March 2023. The course had three modules, namely, (i) Module A: Research design and methods (15 lectures), and (ii) Module B: Research and Publication ethics (15 lectures). The lectures on Module A and B were delivered by Prof. B. S. Tomar, Prof. Prabuddha Ganguli, Prof. B. K. Nayak (Module A), and Prof. V. Siruguri (Module B). The course was attended by 389 Ph.D. students from different CIs/OCC of HBNI and was well received.

(c) Online Course on Advanced NMR Spectroscopy

An online course on “Advanced NMR Spectroscopy” is being conducted by HBNI presently. The course is formulated into two parts, Part-I and Part-II. The Part-I of the course was conducted during January 2023 to May 2023. The course is coordinated by Prof. Haridas Pal, Associate Dean HBNI and Raja Ramanna Fellow. The course was formally inaugurated by Padma Shri Prof. R. V. Hosur, Former Director, Centre for Excellence in Basic Sciences

(CEBS), Mumbai, on January 23, 2023. In his inaugural address, Prof. Hosur gave an overview on the NMR spectroscopy and its applications.

The major topics covered in the Part-I of the Advanced NMR Spectroscopy course included basic understanding of NMR spectroscopy and NMR instrumentation, heteronuclear NMR, multi-dimensional NMR, NMR for chiral and spin decoupled systems, NMR for diffusive systems, and solving of molecular structures using NMR studies. Research scholars and scientists from a variety of academic institutes and industrial establishments across the country participated in the Part-I of the course and got the benefit thereof. The Part-II of the course, which will cover the advanced aspects of NMR spectroscopy, will be conducted during July 2023 to September 2023.



Screenshot of the inaugural function of Advanced NMR Spectroscopy Course

❖ NPTEL Courses Introduced by HBNI

(a) Course on Neutron Scattering for Condensed Matter Studies

The course on “Neutron Scattering for Condensed Matter Studies” is curated by Prof. Saibal Basu, Ex-Associate Dean, HBNI. The course deals with the applications of neutron scattering to various condensed matter related problems. The short-range strong interaction of neutron with matter and the inherent magnetic moment of neutron, makes neutron scattering a unique probe in condensed matter research. Wavelength and energy of thermal neutron match with the lattice spacing and excitations in condensed matters and makes it an indispensable tool to study both structure and dynamics associated with condensed matters.

(b) Course on Accelerator Physics

The course on “Accelerator Physics” is curated by Prof. Pitamber Singh. The course discusses in details about the physics of direct current (DC), Linear and Cyclic accelerators, applications of accelerators in research, industry, medical science, national security, and environmental science, etc. and reviews high energy accelerators. A total of 1996 learners enrolled for the course and benefited from it.