Dr. Dasannacharya began his talk with glowing tributes to our Founder, Dr. Homi Jehangir Bhabha on the occasion of Founder’s day. Dr. Bhabha, the visionary, laid the foundation for fundamental research in BARC. Dr. Dasannacharya focused on one such area of research: Neutron scattering. He spoke at length on the beginning, the development and the growth of Neutron scattering at BARC and the contributions of several researchers in the field, particularly Dr. P.K. Iyengar.

Sustained neutron research began in BARC in the 1950s under the guidance of Dr. Raja Ramanna, after the 1MeV Cockcroft-Walton generator was commissioned at TIFR. Dr. P.K. Iyengar concentrated on neutron scattering and after his initial training on the TIFR accelerator, was sent for further training to Canada under the Nobel Laureate B.N. Brockhouse, who was a pioneer on inelastic scattering. After his return to India, he started work on India’s first reactor, Apsara, which had become critical. It was at Apsara that neutron beams were exploited for studying condensed matter. The first automatic diffractometer became operational before 1960. Several papers were published in peer-reviewed journals on neutron beam research.

Later, CIRUS reached criticality on Jan. 16, 1961. Several instruments were installed at CIRUS. By the end of 1961, the neutron scattering group at BARC initiated work on the polarised neutron spectrometer and the crystallography diffractometer, under the stewardship of Dr. Satya Murthy and Dr. Chidambaram respectively. Dr. Dasannacharya described the initial efforts at BARC, to design and develop diffractometers and inelastic scattering
spectrometers, for conducting experiments. At the Second International Conference on inelastic scattering in Canada in 1962, the initial results on lattice vibrations in magnesium, measured on a triple-axis spectrometer, were presented. All the instruments at Apsara and Cirrus were upgraded. The Third International Conference on inelastic scattering of Neutrons, held in Mumbai, saw the culmination of efforts at neutron beam research in BARC. Other experiments at BARC were conducted on neutron scattering on liquid Argon, liquid methane, phonon in Magnesium and anharmonic nature of vibrations in NH$_4$Br. Under the leadership of Dr. Iyengar, BARC became a leading centre in the world on neutron scattering. After 1964, the pace of R&D picked up with the polarized neutron spectrometer becoming fully functional. A computer-based automatic single crystal diffractometer was developed by the Chemical Crystallography group. More sophisticated control systems for constant-Q measurements were built leading to newer and better world class results. A parallel development initiated by Dr. Ramanna and Dr. Iyengar was the Regional Collaboration Agreement in the South East Asian Region, under the aegis of the IAEA. Under this agreement, a diffractometer was installed at the Philippines Atomic Research Centre and several Scientists from Taiwan, Thailand, South Korea, Indonesia and India were trained, which resulted in the foundation of neutron research in the region.

By mid-sixties, the neutron scattering group at Trombay had received international recognition. Pulsed neutron sources were being experimented upon, for better quality neutron experiments. In 1967, a decision was taken to build a critical experimental facility at Trombay, as a precursor to help design a pulsed fast reactor at Kalpakkam. Techniques like small angle scattering, Interferometry, Spin echo spectrometry and the concept of Delta T Window analyzer were introduced and tested at Cirus. In fact, the design of the Delta T Window analyzer was selected for the pulsed neutron source being developed at the Rutherford Appleton Laboratory (SNS) at that time.

The commissioning of Dhruva in 1985 further boosted the capability of neutron beam research by an order of magnitude. The next generation of instruments with improved optics and beam tailoring devices further improved experimental efficiency. A diffractometer of an unconventional design was installed at Dhruva. During this phase, a large number of high Tc superconductors, minerals, magnetic oxides, and alloys, liquids and amorphous materials and some exotic systems were studied using diffractometry, polarized neutron scattering and depolarization, quasi-electron scattering and inelastic scattering.

Under the UGC-DAE Consortium, the facilities at Dhruva were made available to hundreds of scientists from several universities. Thus in a time span of five decades, neutron beam research had been firmly established at BARC.

Dr. Dasannacharya concluded his talk with a tribute to Dr. P.K. Iyengar in the words of Dr. G. Venkataram. “I, like many other first-generation settlers of Trombay, owe you a deep debt on many counts. You have led us, you have inspired us, fought battles for us and also alongside us. You demonstrated that all it takes is guts and an abiding faith in our selves. This was the message Raman gave to an earlier generation of Scientists in India. We learnt it from you, especially by watching what you yourself did. I am proud to acknowledge my debt publicly and to express my gratitude to you and I do hope that the values you hold dear would be cherished by future generation of scientists here and elsewhere in the country”.