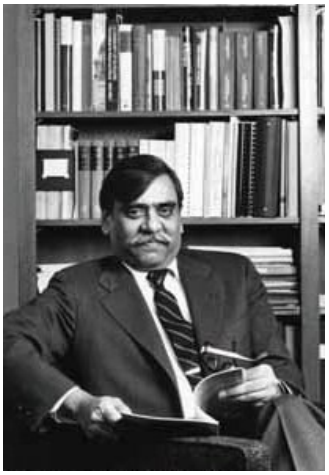
Mirza Abdul Baqi Bég



Mirza Abdul Baqi Bég was born on September 20, 1934, at Etawah, in the United Province of India. He migrated with his parents to Pakistan in 1947. Baqi Bég studied at the University of Sind, in Hyderabad, from where he earned a B.Sc.(Honors in Physics) in 1951, and at the University of Karachi, getting his M.Sc.(Applied Mathematics) in 1954. Subsequently, he proceeded to the University of Pittsburgh from where he got a Ph.D.(Theoretical Physics) in 1958 in nuclear physics. He did his first postdoctoral work (1958-1960) at the University of Birmingham, England, where he worked as a research fellow with Sir Rudolf Peierls, at the department of physics. He then moved to the Brookhaven National Laboratory at Upton, Long Island, where he worked as a research associate (1960-1962). He earned a membership at the Institute for Advanced Study, Princeton, and spent two very productive years at the IAS (1962-1964). At Brookhaven and Princeton, he developed an enduring interest in group theory and unitary symmetries and their applications in elementary particle physics, which remained his major preoccupation subsequently. In 1964, he joined the physics department at the Rockefeller University (at that time Rockefeller Institute) as an assistant professor in the Pais Lab, named after Abraham Pais who was the group leader in particle theory, becoming an associate professor in 1965 and a full professor in 1968. Later, he directed his own research group named Bég Lab after him. Rockefeller University remained his scientific home. He died in New York on January 30, 1990.

In 1964 Feza Gürsey and Luigi Radicati wrote the fundamental paper on the SU(6) symmetry by combining the SU(3) unitary symmetry(an internal space symmetry) with the spin symmetry, a space-time invariance concept. Baqi Bég was among the very first ones who understood the Gürsey-Radicati synthesis and the predictive power of the SU(6) symmetry. In an influential paper in 1964, Baqi Bég, Benjamin Lee and Abraham Pais showed that the magnetic moment ratio of the proton and neutron could be predicted from the SU(6) symmetry giving $\mu(n)=\mu(p) = -2/3$, in remarkably good agreement with the experimental value. This seminal work followed many illuminating papers on the role of the SU(6) symmetry in particle physics, written with Abraham Pais and with Virendra Singh.

After the gauge revolution in particle physics, for which the years 1964-74 played an essential role, the emphasis on the unitary symmetries had given way to dynamical theories of fundamental interactions involving quarks, leptons and gauge bosons embedded in the groups $SU(3)_c \otimes SU(2)_L \otimes U(1)_Y$ (the standard model of particle physics). Baqi Bég got intensely involved in the study of gauge theories and their implications in particle physics. Representative of this period are his influential review papers on gauge theories written with Alberto Sirlin. He was one of the early advocates of alternative theories of symmetry breaking as possible candidates for the mechanism of mass generation(the so-called dynamical theories of symmetry breaking, scrutinizing the theoretical consistency of the underlying framework and devising new experimental tests to distinguish the canonical (Higgs) methodology from competing scenarios). Baqi Bég was among the first who systematically investigated the question of the triviality (in the field theoretic sense) of the Higgs sector of the standard model.

Baqi Bég remained a firm believer of the maxim that science is a vehicle of upward mobility. This statement lends itself to interpretation both at a personal level, but probably more appropriately, in terms of the collective upward mobility of peoples and nations as a whole. He held the view that science, in particular fundamental science, is the best catalyst for inducing far reaching socio-political changes in contemporary societies and that it provides a universal opportunity to make a lasting contribution to human knowledge. We hope that the prize instituted in Baqi Bég's memory will motivate students and young scientists, in particular from developing countries, to contribute to world science, emulating the fine example left by him.