

A brief biography of Dr. P. A. Naik, Director RRCAT



Dr. Prasad Anant Naik, Distinguished Scientist (grade), and Director, Raja Ramanna Centre for Advanced Technology, Indore, is an outstanding laser and laser-plasma physicist who has made very significant research and development contributions to these areas.

Dr. Naik was born on March 17, 1959 at Nerul in Goa. He had his primary education at Pragati Vidyalay, Nerul and secondary education at Pragati High School, Verem (neighbouring village). He did his college education at Dhempe College of Arts and Sciences, Miramar, Panjim. He got his B.Sc. degree (Physics & Mathematics) from Mumbai University in 1979, where he topped in the university in Physics (Main) discipline. He got his M.Sc. (Physics) degree from the Indian Institute of Technology, Bombay in 1981, with First rank (CPI: 9.6/10). He graduated from the 25th batch (Physics, 1981-82) of BARC Training School, Mumbai, where he again secured First rank among the trainees of all disciplines, with a record percentage of 90% marks and was awarded “*Homi Bhabha Prize and Gold Medal*”. He joined the group on laser-plasma interaction in the Laser Section of BARC (led by Dr. D.D. Bhawalkar as Section Head) in 1982, and started working on physics problems related to schemes of Inertial Confinement Fusion and X-ray lasing. Very soon he acquired specialization in x-ray spectroscopy of high density, high temperature plasmas produced by lasers. He received Ph.D. degree on this work from the Mumbai University in 1991, with Dr. D.D. Bhawalkar as his guide.

Dr. Naik shifted to RRCAT in March 1990 with Dr. P.D. Gupta, and set up one of the best laboratories in India for study of laser-matter interaction. He spent two years a *Canada International Fellow* (1993-95) of the National Science & Educational Research Council of Canada, at the Department of Electrical Engineering of University of Alberta, Canada. Using the home-built high power laser systems and plasma diagnostics, he performed several original physics studies and obtained many important results which were published in reputed international journals. As a recognition of his important contributions in the fields of laser-plasma interaction, high intensity table-

top terawatt lasers, and x-ray & plasma diagnostics, he was conferred the “*Homi Bhabha Science and Technology Award*” by DAE in 2003.

Subsequently, he built a sophisticated laboratory based on Ti:sapphire ultra-short pulse lasers, to study laser-matter interaction at ultra-high intensities. Using these lasers, he has demonstrated acceleration of electrons to 150 MeV and production of collimated proton beam of up to 11 MeV, both using intense laser beam. He also made the first x-ray laser (46.9 nm) in the country based on fast discharge in argon filled capillaries. In April 2015, he was given concurrent charge of Indus Synchrotrons Utilization Division in addition to the Laser Plasma Division which he was heading from Aug. 2009. For his outstanding scientific and technological contributions, DAE awarded *Group Achievement Awards* to teams led by him, four times in 2010, 2011, 2012 and 2015 for 1) Ultrashort pulse laser-plasma interaction, 2) X-ray laser, 3) OPCPA based 40 TW Laser system, and 4) Enhanced usage of Indus beamlines, respectively.

Dr. Naik has also contributed significantly to the human resource development through teaching and education. He taught in the BARC Training School at Mumbai in 1983. Later on, he taught in the BARC Training School at RRCAT for nine consecutive years. He has guided several M.Sc./M.Tech. (15) and Ph.D. (7) students. He was given “*Best Faculty Award*” by the Homi Bhabha National Institute (HBNI) in 2015 for his teaching / guiding work and efforts put in to nurture the Ph.D. programme under HBNI at RRCAT. In 2017, he was elected a *Fellow of the National Academy of Science*, Allahabad.

He has so far made 560 research contributions comprising 184 papers published in international refereed journals, 92 papers presented in international conferences, 283 papers in national symposia (including 40 invited talks in India and abroad). He has also contributed to the “*Encyclopaedia of Spectroscopy and Spectrometry*” published by Academic Press, London, in 1999. His publication profile shows his proficiency in basic science as well as in frontline technology.

Dr. Naik is leading the Raja Ramanna Centre for Advanced Technology of the Department of Atomic Energy, as its Director, since Sept. 1, 2016. As Director, he has made several organization changes to decentralize administrative and financial powers in the Centre and to empower a large number of younger scientists/engineers at SOG / SOH level to take up leadership role.