भारत सरकार /Government of India
परमाणु ऊर्जा विभाग / Department of Atomic Energy
होमी भाभा राष्ट्रीय संस्थान / Homi Bhabha National Institute
राजा रामन्ना प्रगत प्रौद्योगिकी केन्द्र
Raja Ramanna Centre for Advanced Technology

HBNI Faculty Profile

Name	*Anand Moorti*	
Designation	*Professor*	
Research Area	*Ultra-short laser plasma interaction, Laser Plasma Accelerators: Laser Wakefield Electron Acceleration; Fast Electron Generation and Transport; Proton/Ion Acceleration; Ultra-short intense x-ray generation.*	
Research Profile	*Currently leading experimental investigations on ultra-short, ultra-intense laser plasma interaction with aim towards development of advanced particle (electron/proton/ion) accelerators, which provides acceleration gradient of ~GV - TV/cm (much higher than RF acceleration) and hence is a potential technique to develop compact and low cost accelerators. Laser plasma electron accelerators could also be used to set up compact laser synchrotron x-ray/gamma-ray sources. Using high-power (150 TW), ultra-short duration Ti-sapphire laser, acceleration of electrons to >500 MeV energy in a gas-jet plasma length of 4mm, betatron x-ray generation in plasma channel, using thin metal targets fast-electron (several MeV) generation and transport, and proton acceleration (few MeV) and nuclear reactions were studied.*	

Ten Selected Recent Publications

1.	*Addressing Key Aspects of JxB Driven MeV Fast Electron Generation in Ultra-short Ultra-intense Laser Foil Interaction, T. Mandal, V. Arora, A. Moorti, A. Upadhyay, and J. A. Chakera, Physics of Plasmas, 30, 023106 (2023).*
2.	*Online monitoring and active control of alignment errors in a tiled grating assembly using single wedge plate, D. Daiya, R.K. Patidar, A. Moorti, N.S. Benerji, and K.S. Bindra, Optics and Lasers in Engineering 161, 107355 (2023).*
3.	*Enhanced betatron x-ray emission in a laser wakefield accelerator and wiggler due to collective oscillations of electrons, S. Mishra , B. S. Rao, A. Moorti , and J. A. Chakera, Physical Review Accelerator and Beams 25, 090703 (2022).*
4.	*K-α x-ray measurements and their applicability for fast electron generation and transport studies in ultrashort intense laser foil interaction, T Mandal, V Arora, A Moorti, and J A Chakera, Plasma Phys. Control. Fusion 63, 095009 (2021).*

5.	*An experimental and GEANT4 simulation study on design of a broad energy-range magnetic spectrograph for laser plasma accelerator, S. Mishra, D. Hazra, A. Moorti, and J.A. Chakera, J. of Instrumentation 15, P01034 (2020).*
6.	*Direct laser acceleration of electrons in a high-Z gas target and the effect of threshold plasma density on electron beam generation, D Hazra, A Moorti, S Mishra, A Upadhyay and J A Chakera, Plasma Phys. Control. Fusion 61, 125016 (2019).*
7.	*Experimental investigation on nuclear reactions using a laser-accelerated proton and deuteron beam, M Tayyab, S Bagchi, A Moorti and J A Chakera, Plasma Phys. Control. Fusion 61, 115007 (2019).*
8.	*Electron radiography with different beam parameters using laser plasma accelerator, D. Hazra, S. Mishra, A. Moorti and J. A. Chakera, Physical Review Accelerator and Beams 22, 074701 (2019).*
9.	*Experimental study of fast electron generation from intense laser irradiated mylar foil with thin metal coating on front or rear surfaces, T. Mandal, V. Arora, A. Moorti, A. Upadhyay, and J. A. Chakera, Phys. Plasmas 26, 013103 (9 Jan.2019);*
10.	*Betatron resonance electron acceleration and generation of relativistic electron beams using 200fs Ti:Sapphire laser pulses, D. Hazra, A. Moorti, B. S. Rao, A. Upadhyay, J. A. Chakera, and P. A. Naik, Plasma Physics and Controlled Fusion, 60, 085015, June 2018.*