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	*Dr. Sunil Verma*	
Designation	*Professor*	
Research Area	*Development of materials in single crystal, polymer-composite & nanomaterials forms for biomedical applications; Biophotonics; Biomaterials & Detector materials; Applied Optics; Materials characterization.*	
Research Profile	*Current focus is on developing novel biomaterials (crystals, polymer composites and nanomaterials) and deploying them for biophotonics based healthcare applications, such as biosensing, bioimaging, medical detectors etc. Also, working on developing crystal and plastic scintillators for neutron detection and TL dosimetry. Successfully grown bulk crystals of KDP, ZTS, trans-stilbene, L-cysteine hydrochloride monohydrate, undoped & doped versions of Lithium Niobate, Lithium Tetra Borate and Tri-Glycine Sulphate using solution, Czochralski and Bridgman growth techniques. Defects structure of these crystals was investigated using advanced optical and x-ray techniques, and correlated with their NLO, photorefractive, thermoluminescent, ferroelectric and detector properties. In addition, developed multi-modal optical imaging facility involving interferometry, tomography and shadowgraphy for in-situ & real-time growth studies.*	

Ten Selected Recent Publications

1.	*C. Debnath, **Sunil Verma**, S. Kar, K.S. Bartwal, V.S. Tiwari, A.K. Karnal, Investigations of electric field on SHG properties of LiNbO3/PMMA nanocomposites, Applied Physics B 127 (2021) 29 (1-10).*
2.	*M.S. Pandian, **Sunil Verma**, P. Ramasamy, G. Singh, S.M. Gupta, V.S. Tiwari, A.K. Karnal, Growth of [010] oriented urea-doped triglycine sulphate (Ur-TGS) single crystals below and above Curie temperature (Tc), and comparative investigations*

	of their physical properties, Applied Physics A 126 (2020) 492 (1-10).
3.	*M.S. Pandian, **Sunil Verma**, P. Pareek, P. Ramasamy, K.S. Bartwal, Laser shadowgraphy and Mach-Zehnder interferometric imaging of convection, concentration and growth kinetics during unidirectional solution growth of benzophenone crystal, Optics & Laser Tech. 132 (2020) 106491 (1-15).*
4.	*S. Kar, L.A. Joseph, C. Debnath, **Sunil Verma**, V.P. Dhamgaye, G.S. Lodha and K.S. Bartwal, New scheme for dual readout of dose in polycrystalline $Li_2B_4O_7$ irradiated with synchrotron X-rays from Indus-2, Radiation Measurements 67 (2014) 55-58.*
5.	*C. Debnath, S. Kar, **Sunil Verma**, K.S. Bartwal, Investigations on crystalline structure and optical band gap of nearly stoichiometric $LiNbO_3$ nanoparticles, Optical Materials 37 (2014) 804-809.*
6.	*S. Kar, S. Bairagi, C. Debnath, **Sunil Verma**, K.S. Bartwal, Thermoluminescence studies on γ-irradiated Mn:$Li_2B_4O_7$ single crystals, Appl. Phys. Lett. 101 (2012) 071904.*
7.	***Sunil Verma**, Y.M. Joshi, K. Muralidhar, Optical interferometers: Principles and applications in transport phenomena, Chapter 13 in "Interferometry Principles and Applications", Mark E. Russo (Ed.), (Nova Publishers, New York, USA, 2012) pp. 353-414.*
8.	***Sunil Verma**, S. Kar, K.S. Bartwal, Interferometric techniques for investigating the refractive index homogeneity, birefringence and indicatrix of optical crystals, Chap. 19 in "Interferometry Principles and Applications", Mark E. Russo (Ed.), (Nova Publishers, New York, USA, 2012) pp. 537-560.*
9.	*S. Dinakaran, **Sunil Verma**, S. Jerome Das, S. Kar, K.S. Bartwal, P.K. Gupta, Investigations for obtaining enhanced SHG element of KH_2PO_4 crystal, Physica B: Condensed Matter 405 (2010) 1809-1812.*
10.	***Sunil Verma**, Paul J. Shlichta, Imaging techniques for mapping of solution parameters, growth rate and surface features during the growth of crystals from solution, Prog. Cryst. Growth & Charac. Materials 54 (2008) 1-120.*