



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	<i>Shreyashkar Dev Singh</i>	
Designation	<i>Associate Professor</i>	
Research Area	<i>Ultra-wide bandgap oxide semiconductors, Epitaxial thin films, Optical properties, Photoelectron and X-ray absorption spectroscopy, XRD</i>	
Research Profile	<i>Shreyashkar Dev Singh joined RRCAT, Indore in 2001, after graduating from 44th Batch of BARC training school. Initially, he worked on MOVPE growth of III-V semiconductors and obtained his Ph.D. on growth and characterization of InP/GaAs type-II quantum structures in 2013. Currently, his research mainly focuses on Ultra-wide bandgap oxide semiconductors like β-Ga₂O₃ and β-(Al_xGa_{1-x})₂O₃ including bulk and epitaxial thin films. His prime interest is to understand structural and electronic structure of oxide semiconductors using x-ray scattering techniques.</i>	
Ten Selected Recent Publications		
1.	<i>Bhattacharjee, J., Gupta, R. K., and Singh, S. D., Assessment of bonding characteristic of β-(Al_xGa_{1-x})₂O₃ alloys from photoluminescence and x-ray absorption near edge spectroscopy, Appl. Phys. Lett. 122, 152104 (2023)</i>	
2.	<i>Bhattacharjee, J., and Singh, S. D., Observation of mixed-mode behaviour of Raman active phonon modes for β-(Al_xGa_{1-x})₂O₃ alloys, Appl. Phys. Lett. 122, 112101 (2023).</i>	
3.	<i>Bhattacharjee, J., Sagdeo, A., and Singh, S. D., Determination of Al occupancy and local structure for β-(Al_xGa_{1-x})₂O₃ alloys across nearly full composition range from Rietveld analysis, Appl. Phys. Lett. 120, 262101 (2022)</i>	
4.	<i>Bhattacharjee, J., and Singh, S. D., Temperature dependence of red luminescence in pure β-Ga₂O₃: an estimation of electron-phonon interaction, Solid State Communications 352, 114831 (2022).</i>	
5.	<i>Ghosh, S., Nand, N., Kamparath, R., Gupta, M., Phase, D. M., Jha, S. N., Singh, S. D. and Ganguli, T., Electronic structure modification in Fe substituted β-Ga₂O₃ from resonant photoemission and soft x-ray absorption spectroscopies, J. Phys. D: Appl. Phys. 55, 185304 (2021).</i>	



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6.	<i>Bhattacharjee, J., Ghosh, S., Pokhriyal, P., Gangwar, R., Dutt, R., Sagdeo, A., Tiwari, P., and Singh, S. D., Bandgap bowing parameter and alloy fluctuations for β-(Al_xGa_{1-x})₂O₃ alloys for $x \leq 0.35$ determined from low temperature optical reflectivity, AIP Advances 11, 075025 (2021).</i>
7.	<i>Baraik, K., Bhakar, A., Srihari, V., Bhaumik, I., Mukherjee, C., Gupta, M., Yadav, A. K., Tiwari, P., Phase, D. M., Jha, S. N., Singh, S. D., and Ganguli, T., Structural, optical and electronic properties of Ni_{1-x}Co_xO in the complete composition range, RSC Adv. 10, 43497 (2020).</i>
8.	<i>Ghosh, S., Baral, M., Kamparath, R., Srivastava, H., Rao, P. N., Nand, M., Tiwari, P., Srivastava, A. K., Jha, S. N., Rai, S. K., Singh, S. D. and Ganguli, T., Investigations on epitaxy and lattice distortion of sputter deposited β-Ga₂O₃ layers on GaN templates, Semicond. Sci. Technol. 35, 085024 (2020).</i>
9.	<i>Ghosh, S., Baral, M., Kamparath, R., Singh, S. D. and Ganguli, T., Investigations on band commutativity at all oxide p-type NiO/n-type β-Ga₂O₃ heterojunction using photoelectron spectroscopy, Appl. Phys. Lett. 115, 251603 (2019).</i>
10.	<i>Ghosh, S., Baral, M., Kamparath, R., Choudhary, R. J., Phase, D. M., Singh, S. D., and Ganguli, T., Epitaxial growth and interface band alignment studies of all oxide α-Cr₂O₃/β-Ga₂O₃ p-n heterojunction, Appl. Phys. Lett. 115, 061602 (2019).</i>