




भारतसरकार/Government of India
परमाणुऊर्जाविभाग / Department of Atomic Energy
होमी भाभा राष्ट्रीय संस्थान/ Homi Bhabha National Institute
राजारामन्नाप्रगतप्रौद्योगिकीकेन्द्र
Raja Ramanna Centre for Advanced Technology



HBNI Faculty Profile

Name	<i>Dr. Soma Banik</i>	
Designation	<i>Assistant Professor</i>	
Research Area	<i>Investigation of electronic structure of Topological magnetic metals, 2D magnetic semiconductors and semimetals, Strongly correlated electron systems, Narrow band gap semiconductors.</i>	
Research Profile	<i>Research activity involves understanding the properties of diverse materials that have applications in the field of thermoelectricity and spintronics. The main interest is to probe the changes in the electronic structure, with a particular emphasis on the magnetic phase transition driven by topological effects, changing correlation effect or bandwidth, doping level and physical parameter like temperature. Experimental probes consists of a wide range of electron spectroscopies using synchrotron and laboratory based facilities, such as angle resolved photoemission (ARPES), resonant photoemission (RPES), X-ray photoemission (XPS), ultra violet photoemission (UPS), X-ray absorption (XAS) and X-ray absorption near edge structure (XANES). These experiments are supplemented by the crystal structure, transport, magneto-transport, thermopower and magnetic measurements.</i>	
Ten Selected Recent Publications		
1.	K. Vijay, D. S.Vavilapalli, A. Arya, S. K. Srivastava, R. Singh, A. Sagdeo, S. N. Jha, K. Kumar, and Soma Banik , 2023, Magneto-strain effects in 2D ferromagnetic van der Waal material CrGeTe ₃ , Nature Scientific Reports, In press (2023).	
2.	K. Vijay, L. S. Sharath Chandra, K. Ali, A. Sagdeo, P. Tiwari, M. K. Chattopadhyay, A. Arya, and Soma Banik , 2023, Tunable magnetoresistance driven by electronic structure in Kagome semimetal Co _{1-x} Fe _x Sn., Applied Physics Letters, In press (2023).	



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3.	Soma Banik , K. Vijay, S. Paul, N. Mansuri, D. K. Shukla, S. K. Srivastava, A. Sagdeo, K. Kumar, S. Tripathi and S. N. Jha 2022 , Spin reorientation transition driven by polaronic states in Nd_2CuO_4 , Materials Advances 3, 7559 (2022).
4.	R. Kumar, Soma Banik , S. Sen, S. N. Jha and D. Bhattacharyya 2022 . Theoretical and experimental investigations on Mn doped Bi_2Se_3 topological insulator, Physical Review Materials 6, 114201 (2022).
5.	Soma Banik , P. I. Samina, P. N. Rao, H. Srivastava, A. Sagdeo 2021 . Probing interband and intraband transitions in magneto-optical FeT (T= Cr, Co, Ni) alloys from electronic structure studies., Applied Surface Science 546, 148896 (2021).
6.	Soma Banik , M. K. Chattopadhyay, S. Tripathi, R. Rawat, S. N. Jha. 2020 , Large positive magnetoresistance and Dzyaloshinskii–Moriya interaction in CrSi driven by Cr 3 d localization, Nature Scientific Reports 10, 12030 (2020).
7.	Soma Banik , A. Arya, A. K. Sinha 2020 , Direct hybridization gap from intersite and onsite electronic interactions in CeAg_2Ge_2 . RSC Advances 10, 24343 (2020).
8.	D. S. Vavilapalli, Soma Banik , R. G. Peri, B. Muthuraaman, M. Miryala, M. Murakami, M. Murakami, K. Alicja, Asokan K., Ramachandra Rao M. S. , S. Singh 2020 , Nitrogen Incorporated Photoactive Brownmillerite $\text{Ca}_2\text{Fe}_2\text{O}_5$ for Energy and Environmental Applications, Nature Scientific Reports 10, 2713 (2020).
9.	Soma Banik , P. P. Kumar. 2020 ., Investigation of electronic structure of transition metal silicides $\text{MnSi}_{1.75}$ and CoSi for enhanced thermoelectric properties., Solid State Communications 307, 113807 (2020).
10.	Soma Banik , P. K. Das, A. Bendounan, I. Vobornik, A. Arya, N. Beaulieu, J. Fujii, A. Thamizhavel, P. U. Sastry, A. K. Sinha, D. M. Phase & S. K. Deb, 2017 , Giant Rashba effect at the topological surface of PrGe revealing antiferromagnetic spintronics. Nature Scientific Reports 7, 4120 (2017).