Brief Biodata

Name:

Designation:	**Sr. Principal Scientist**	 **Photo**
DP No. and Name:	**2.04,**	
DU No. and Name:	**Electrical & Electronics Metrology**	
Email:	**husalesc@nplindia.org**	
Date of Joining CSIR-NPL:	**07-03-2011**	
Phone ***(office)***	**01142342424**	
Mobile ***(optional)***		

Research Area/ Interest

Topological insulators (TI), Weyl semimetals and 2D materials: Synthesis and transport studies through nanodevices, Proximity induced superconductivity, fabrication and study of quantum phase slip devices and single photon detectors, Hardware fabrication and Majorana Fermion based quantum computation studies, broad spectral phodetection in 2D nanomaterials/ layered materials, heterostructures, optical tweezers and nanobiotechnology.

Educational Qualifications

(Please write latest qualification first)

Degree	**Subject**	**University/ Institute**	**Year**
1.PhD (Summa Cum Laude 06/06)	Experimental Biophysics	Institute of Physics, Basel University, Switzerland	2005
2. M Phil	Physics	Pune University	2001
3. M.Sc.	Physics	Pune University	1997
4. B. Sc	Physics	Pune University	1995

Academic / Research Experience

Grade / Post	**Institute**	**Duration**		**Research Field**
		From	**To**	
Sr. Principal Scientist	CSIR_NPL	2022-	Till date	Physics and Engineering of Nanodevices
Principal Scientist (**Merit Promotion**)	CSIR_NPL	2017	2022	Physics and Engineering of Nanodevices
Sr. Scientist (**Merit Promotion**)	CSIR_NPL	2014	2017	Physics and Engineering of Nanodevices
Scientist	CSIR_NPL	2011	2014	Physics and Engineering of

				Nanodevices
Scientist	EPFL, Switzerland	March 2009	Jan 2010	Nanofabrication and biosensing
Harvard University, postdoctoral fellowship	Harvard University, USA	Feb2006	Feb2009	Nanofabrication and biosensing

No. of Publications

No. of Publications in SCI Journals	No. of Publications in non-SCI Journals	No. of Publications in Conference Proceedings	Books	Total
87		07	02	96

Selected Publications

Recent Selected publications:

1. Verma, S.; Yadav, R.; Pandey, A.; Kaur, M.; Husale, S., Investigating active area dependent high performing photoresponse through thin films of Weyl Semimetal WTe2. *Scientific Reports* **2023,** *13* (1), 197.
2. Kumar, A., Sharma, A., Pandey, A., Saravanan, M.P. and Husale, S., Room-temperature photoconductivity in superconducting tungsten meander wires. Materials Advances. 2023
3. Pandey, A.; Banerjee, S.; Yadav, R.; Kumar, S.; Jewariya, M.; Chowdhury, D. R.; Lalla, N.; Husale, S., Broadband THz absorption using nanosheets of Bi 2 Te 3 grown on a transparent conductor. *J. Mater. Chem. C,* 2023,11, 1448-1456
4. Yadav R, Bhattacharyya B, Pandey A, Kaur M, Gupta A, Husale S. Observation of unconventional proximity induced superconducting effects in Bi2Se3 flakes. *Physica Scripta*. 2022 Oct 17;97(11):115812.
5.Pandey A, Sharma A, Vashistha N, Kumar S, Yadav R, Kaur M, Kumar M, Husale S. Ultrafast carrier and phonon dynamics in thin films of bismuth telluride on a flexible substrate. *Optical Materials*. 2022 Jun 1;128:112294.
6. Pandey, A., Yadav, R., Kaur, M., Singh, P., Gupta, A. and Husale, S., 2021. High performing flexible optoelectronic devices using thin films of topological insulator. *Scientific reports*, *11*(1), pp.1-8. **(TI Device Physics - photodetection)**
7. Bhattacharyya, B., Sharma, A., Kaur, M., Singh, B.P. and Husale, S., 2021. Highly responsive broadband photodetection in topological insulator-carbon nanotubes based heterostructure. *Journal of Alloys and Compounds*, *851*, p.156759. **(TI Device Physics - photodetection)**
8. Yadav, R., Bhattacharyya, B., Pandey, A., Kaur, M., Aloysius, R.P., Gupta, A. and Husale, S., 2020. Accessing topological surface states and negative MR in sculpted nanowires of Bi2Te3 at ultra-low temperature. *Journal of Physics: Condensed Matter*, *33*(8), p.085301 **(TI Device Physics-Transport)**
9. Bhattacharyya, *B.,* Singh, *B.,* Aloysius, R. P., Yadav, *R.*, Su, *C.,* Lin, *H.,* Auluck S., Gupta, *A.,* Senguttuvan, *T. D.,* and **Husale, *S.,*** Spin-dependent scattering induced negative magnetoresistance in topological insulator Bi_2Te_3 nanowires. *Scientific Reports 9, 7836,* **2019, (TI Device Physics-Transport)**
10. Sharma, A..; Senguttuvan, T.; V, N, Ojha.; and **Husale, S.**, Novel synthesis of topological insulator based (Bi_2Te_3) nanostructures demonstrating high performance photodetection . *Scientific Reports* **2019,** *9*, 3804. **(TI Novel Synthesis)**
11. Bhattacharyya, B.; Awana V.P.S.; Senguttuvan, T.; Ojha, V.N. and **Husale, S.**, Proximity-induced

supercurrent through topological insulator based nanowires for quantum computation studies. *Scientific Reports 8 (1), 17237,* **2018 (Hardware fabrication for fault tolerant quantum computation studies)**

12.Bhattacharyya, B.; Gupta, A.; Senguttuvan, T. D.; Ojha, V. N.; **Husale, S.**, Topological Insulator Based Dual State Photo-Switch Originating Through Bulk and Surface Conduction Channels. *physica status solidi (b)* **2018,** *255* (9), 800340. **(TI Device Physics -Transport and photodetection)**

13. Sharma, A.; Srivastava, A.; Senguttuvan, T.; **Husale, S.**, Robust broad spectral photodetection (UV-NIR) and ultra high responsivity investigated in nanosheets and nanowires of Bi 2 Te 3 under harsh nano-milling conditions. *Scientific Reports* **2017,** *7*(1), 17911. **(TI Device Physics- Robust Photodetector application)**

14. Kumar, R.; Sharma, A.; Kaur, M.; **Husale, S.**, Pt-Nanostrip-Enabled Plasmonically Enhanced Broad Spectral Photodetection in Bilayer MoS2. *Advanced Optical Materials* **2017, 5, 1700009**. **(2D material Device Physics- Photodetection)**

15. Bhattacharyya, B.; Sharma, A.; Sinha, B.; Shah, K.; Jejurikar, S.; Senguttuvan, T.; **Husale, S.**, Evidence of robust 2D transport and Efros-Shklovskii variable range hopping in disordered topological insulator (Bi 2 Se 3) nanowires. *Scientific Reports* **2017,** *7* (1), 7825. **(TI Device Physics - Transport)**

16. Sharma, A.; Sharma, C.; Bhattacharyya, B.; Gambhir, K.; Kumar, M.; Chand, S.; Mehrotra, R.; **Husale, S.**, Plasmon induced ultrafast injection of hot electrons in Au nanoislands grown on a CdS film. *Journal of Materials Chemistry C* **2017,** *5* (3), 618-626. **(Photodetection and energy harvesting studies)**

17. Bhattacharyya, B.; Sharma, A.; Awana, V. P. S.; Senguttuvan, T. D.; **Husale, S.**, FIB synthesis of Bi2Se3 1D nanowires demonstrating the co-existence of Shubnikov-de Haas oscillations and linear magnetoresistance. *Journal of Physics-Condensed Matter* **2017,** *29* (7). **(TI Device Physics - Transport)**

18. Sharma, A.; Kumar, R.; Bhattacharyya, B.; **Husale, S.**, Hot electron induced NIR detection in CdS films. *Scientific Reports* **2016,** *6*, 22939. **(Photodetection and energy harvesting studies)**

19. Bhattacharyya, B.; Sharma, A.; Awana, V.; Srivastava, A.; Senguttuvan, T.; **Husale, S.**, Observation of quantum oscillations in FIB fabricated nanowires of topological insulator (Bi2Se3). *Journal of Physics: Condensed Matter, Volume 29, Number 11* **2016**. **(TI Device Physics -Transport)**

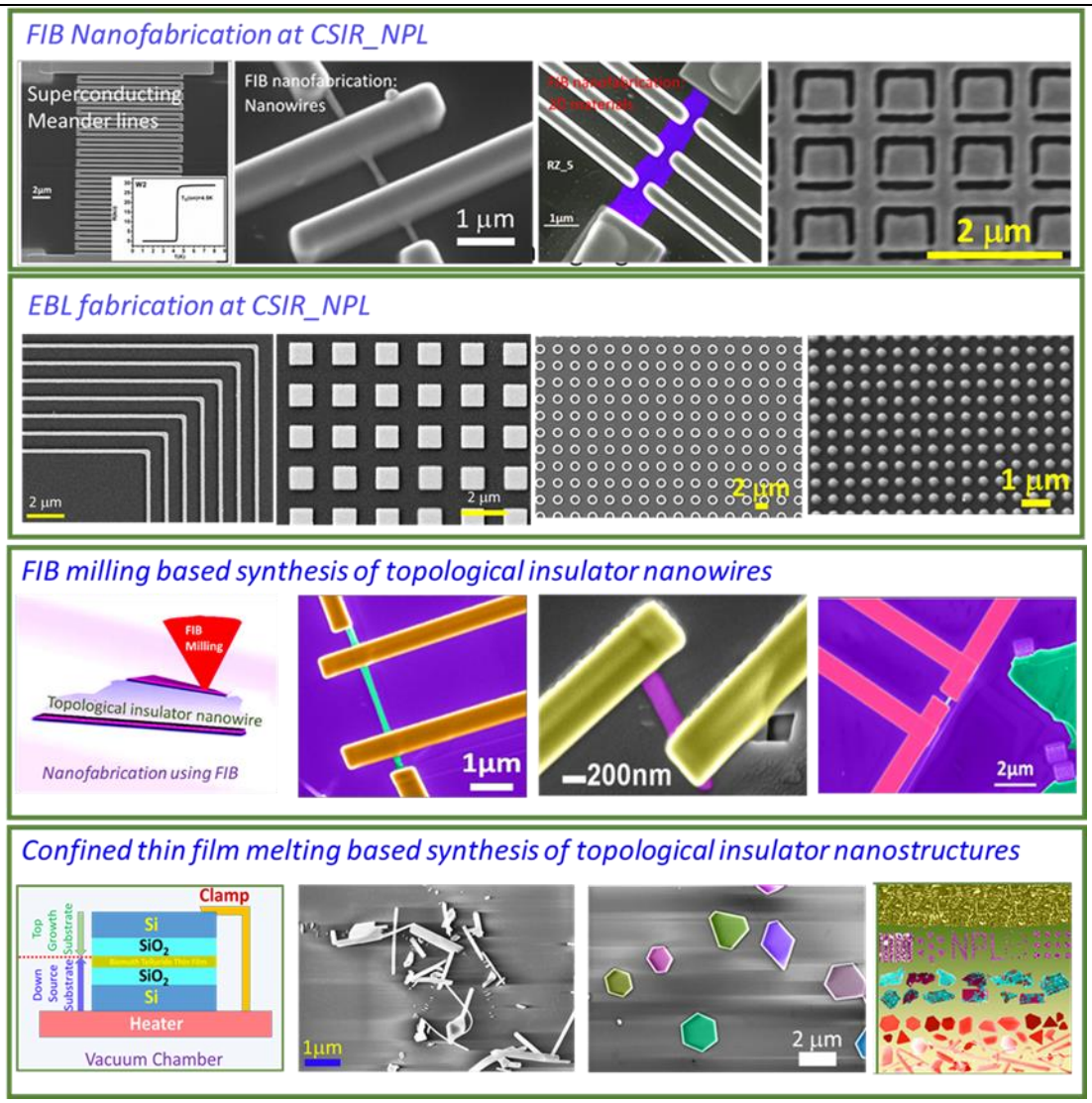
20. Sharma, A.; Bhattacharyya, B.; Srivastava, A. K.; Senguttuvan, T. D.; **Husale, S.**, High performance broadband photodetector using fabricated nanowires of bismuth selenide. *Scientific Reports* **2016,** *6*, 19138. **(TI Device Physics- Photodetector application)**

Selected publications in high-impact factor journals

- **S. Husale**, H. Persson and O Sahin (2009), Nature, 462, 1075-1078.
- M. Dong, **S. Husale**, O. Sahin (2009), Nature Nanotechnology, 4, 514-517
- Sangeeta Sahoo*, S. Husale*, S. Nayak, S. P. Karna, and P. M. Ajayan, J. Am. Chem. Soc., 2011, 133 (11), pp 4005–4009. * equal contribution.
- Sangeeta Sahoo, **S. Husale** et al (2009) ACS Nano, 3 (12), pp 3935–3944.(cover page)
- **S. Husale**, W. Grange, M. Karle, S. Burgi, and M. Hegner (2008), Nucleic Acids Res. 36(5), 1443-49.
- W. Grange*, M. Duckely*, **S. Husale***, S. Jacob, A. Engel, and M. Hegner (2008), PLoS Biol. 6(2), e44. * equal contribution.

Patents

Current Activities



Honour(s)/Award(s)/ Fellowship(s)

Fellowship: Harvard University USA, Postdoctoral (2006-2009)
Fellow: Royal Society of Chemistry, FRSC (UK)
Fellow: Institute of Physics, FInstP (UK)
Fellow: Institution of Engineering and Technology, FIET (UK)

Contributions to AcSIR

M Tech Student guided : 01,
PhD Student guided : 03
PhD students under supervision: 03

Membership of Professional Societies/ Institutions

Electron Microscope Society of India

Any other Information

(Not more than 100 words)

Other Service : Editorial Board Member : Scientific Reports
Reviewer for: Advanced Functional Materials. 2D materials, Advanced optical materials, Langmuir, Applied physics letters, Journal of applied physics, journal of material chemistry C, ACS omega, RSC advances, Nanotechnology, Journal Material Science, ACS applied materials, ACS applied surfaces and Interfaces, Scientific Reports, Carbon, Materials Today Physics, etc