

CURRICULUM VITAE

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1. Educational Qualifications

- **Doctor of Philosophy** (Physics): from *Bhabha Atomic Research Centre under aegis of Homi Bhabha National Institute*, Awarded January 2013.
- **One-year Orientation Course in Physics**, BARC Training School 2008-2009.
- **M. Sc (Physics)** with first divisions from HNB Garhwal University, Srinagar.
- **B. Sc (PCM)** with first division from HNB Garhwal University, Srinagar

2. Awards/Achievements

- **Qualified Graduate Aptitude Test in Engineering (GATE)**-2007 and 2009.
- **Joint Entrance Screening Test**-2009
- **JRF Fellowship Award** in 2008.
- **Best Poster Presentation Award, Indian vacuum society symposium** on Thin Film: Science and Technology, Bhabha Atomic Research Centre, Mumbai, November 09-12, 2011.
- **UGC-Dr. D.S. Kothari Postdoctoral Fellowship Award**-2013.
- **Got selected for post of "Scientist B" (panel position one) at Centre for Materials for Electronic Technology (C-MET), Pune, December 2017 (declined the position).**
- **Best Oral Presentation Award, 9th Conference of India Science Congress Association on Future India Science & Technology, October 2018.**

3. Experiences

- Assistant Professor at CLM Roorkee, Haridwar (Uttarakhand Higher Education) January 2018-till date.
- Scientist (QHF) at CSIR-National Aerospace Laboratories, Bangalore, 2014- 2017.
- Assistant professor at S.R. Institute of Chemical Technology, Ankleshwar, 2013- 2014.

4. Research Field

Charge transport studies in organic semiconductor films and heterostructures, chemical sensors, antireflective surfaces, synthesis of metal nanostructures, hybrid nanomaterials

5. Patent

1. **Arvind Kumar**, Harish C. Barshilia, An improved process for the fabrication of nanoporous microstructure on glass and a product produced thereof, Indian Patent No. 1843DEL2015 (Granted in June, 2020).

6. Publication

In peer reviewed journal

1. **Arvind Kumar**, Soumen Samanta, Ajay Singh and D.K. Aswal Fabrication of organic-inorganic nanostructured interface for high-sensitive low powered photodetector (submitted).
2. Rohit Singh Chauhan, **Arvind Kumar**, Pradnya Prabhu Synthesis of palladium tellurolate complexes derived from hemi-labile tellurolate ligands and studies their reactivity as gas sensing materials, *Inorganica Chimica Acta*, 487, 395, (2019). (Corresponding Author)
3. **Arvind Kumar**, KMSK Praveen, Harish C. Barshilia, Synthesis of silver nanowires towards the development the ultrasensitive AgNWs/SiNPLs hybrid photodetector and flexible transparent conductor *Materials Science in Semiconductor Processing*, 75, 239, (2018).
4. Prajith Karadan, Santanu Parida, **Arvind Kumar**, Aji A. Anappara, Sandip Dhara and Harish C. Barshilia, Charge transport studies on Si nanopillars for photodetectors fabricated using vapor phase metal assisted chemical etching, *Applied Physics A*, 123 681 (2017)
5. **Arvind Kumar**, Soumen Samanta, A.K. Debnath, Ajay Singh, K.P. Muthe, Harish C. Barshilia, Enhanced Cl₂ sensitivity of cobalt-phthalocyanine film by utilizing a porous nanostructured surface fabricated on glass, *RSC Advances*, 7, 4135, (2017).
6. K.P. Sibin, N. Selvakumar, **A. Kumar**, Arjun Dey, N. Sridhara Design and development of ITO/Ag/ITO spectral beam splitter coating for photovoltaic and thermoelectric hybrid system, *Solar Energy*, 141, 118, (2017).
7. **Arvind Kumar**, Soumen Samanta, Niranjana Ramgir, Ajay Singh, A.K. Debnath, K.P. Muthe, Harish C. Barshilia, Improved H₂S sensitivity of cobalt phthalocyanine film fabricated on plasma treated flexible poly ethylene terephthalate substrate, *Sensor Letter*, 15, 104, (2017).
8. **Arvind Kumar**, P. Veerender, Harish C. Barshilia, Fabrication of high aspect ratio broadband antireflection porous nano-network on glass using candle soot as a sacrificial layer for solar energy utilization, *Journal of Renewable and Sustainable Energy*, 8, 63701, (2016).
9. **Arvind Kumar**, Shiva V. Yerva, Harish C. Barshilia, Broadband and wide angle anti-reflective nanoporous surface on poly (ethylene terephthalate) substrate using a single step plasma etching for applications in flexible electronics, *Solar Energy Materials and Solar Cells*, 155, 184 (2016).
10. **Arvind Kumar**, Soumik Siddhanta, Harish C. Barshilia, Extraordinary high broadband specular transmittance of sodalime glass substrate by vapor phase etching, *Solar Energy*, 129, 147 (2016).
11. **Arvind Kumar**, Harsh Chaliyawala, Soumik Siddhanta, Harish C. Barshilia, Broadband quasi-omnidirectional sub-wavelength nanoporous antireflecting surfaces on glass substrate for solar energy harvesting applications, *Solar Energy Materials and Solar Cells*, 145, 432 (2016).
12. Vishal Balouria, **Arvind Kumar**, S. Samanta, A. Singh, A.K. Debnath, Aman Mahajan, R.K. Bedi, D.K. Aswal, S.K. Gupta, Nano-crystalline Fe₂O₃ thin films for ppm level detection of H₂S, *Sensors and Actuators B: Chemical*, 181, 471 (2013).

13. Ajay Singh, Ashwini Kumar, **Arvind Kumar**, S. Samanta, Nirav Joshi, Vishal Balouria, A.K. Debnath, R. Prasad, Z. Salmi, M.M. Chehimi, D.K. Aswal, S.K. Gupta, Bending stress induced improved chemiresistive gas sensing characteristics of flexible cobalt-phthalocyanine thin films, *Applied Physics Letters*, 102, 132107 (2013)
14. Ajay Singh, Soumen Samanta, **Arvind Kumar**, A.K. Debnath, R. Prasad, P. Veerender, Vishal Balouria, D.K. Aswal, S.K. Gupta, Implication of molecular orientation on charge transport and gas sensing characteristics of cobalt-phthalocyanine thin films, *Organic Electronic*, 13, 2600 (2012).
15. Ajay Singh, **Arvind Kumar**, Ashwini Kumar, S. Samanta, A.K. Debnath, P. Jha, R. Prasad, Z. Salmi, S. Nowak, M.M. Chehimi, D.K. Aswal, S.K. Gupta, Flexible cobalt-phthalocyanine thin films with high charge carrier mobility, *Applied Physics Letters*, 101, 222102 (2012).
16. **Arvind Kumar**, A.K. Debnath, S. Samanta, A. Singh, R. Prasad, S. Singh, S. Basu, D.K. Aswal, S.K. Gupta, Enhanced Cl_2 sensitivity of ultrathin bi-nuclear cobalt-phthalocyanine/iron-phthalocyanine films, *Sensors and Actuators B: Chemical*, 171, 423 (2012).
17. A.K. Debnath, **A. Kumar**, S. Samanta, R. Prasad, A. Singh, S. Singh, S. Basu, D.K. Aswal, S.K. Gupta, Fluorinated copper-phthalocyanine/cobalt-phthalocyanine organic heterojunctions: Charge transport and Kelvin probe study, *Applied Physics Letters*, 100, 142104 (2012).
18. S. Samanta, **Arvind Kumar**, A. Singh, A. K. Debnath, S. Basu, R. Prasad, D.K. Aswal, S.K. Gupta, Metal-semiconductor transition in ultrathin cobalt-phthalocyanine films grown on SrTiO_3 single crystal substrates, *Applied Physics Letters*, 100, 162101 (2012).
19. **Arvind Kumar**, Ajay Singh, S. Samanta, A.K. Debnath, D.K. Aswal, S.K. Gupta, Metallic-like conduction in Co-phthalocyanine/Fe-phthalocyanine composite films grown on sapphire substrates, *Applied Physics Letters*, 99, 112102 (2011).
20. S. Samanta, **Arvind Kumar**, A. Singh, A.K. Debnath, D.K. Aswal, S.K. Gupta, Influence of adsorbed oxygen on charge transport and chlorine gas sensing characteristics of cobalt phthalocyanine thin films, *Chemical Papers*, 66, 484 (2012).
21. S. Samanta, A. Singh, **Arvind Kumar**, A.K. Debnath, D.K. Aswal, S.K. Gupta, J.V. Yakhmi, Improved charge conduction in cobalt-phthalocyanine thin films grown along 36.8° boundary of SrTiO_3 bicrystals, *Applied Physics Letters*, 98, 143301 (2011).
22. **Arvind Kumar**, A. Singh, S. Samanta, K. Vasundhara, A. K. Debnath, D. K. Aswal, S.K. Gupta, J.V. Yakhmi, Charge transport in ultrathin iron-phthalocyanine thin films under high electric fields, *Journal of Physics: Condensed Matter*, 23, 355801 (2011).
23. Vishal Balouria, **Arvind Kumar**, A. Singh, S. Samanta, A.K. Debnath, Aman Mahajan, R.K. Bedi, D.K. Aswal, S.K. Gupta, J.V. Yakhmi, Temperature dependent selective H_2S and Cl_2 chemiresistive gas sensing properties of Cr_2O_3 thin films, *Sensors and Actuators B: Chemical*, 157, 466 (2011).
24. **Arvind Kumar**, Ajay Singh, A.K. Debnath, Soumen Samanta, D.K. Aswal, S.K. Gupta, J.V. Yakhmi, Role of central metal atom and chemisorbed oxygen in gas sensing mechanism for cobalt-phthalocyanine thin films, *Asian Journal of Physics*, 19, 207 (2010).
25. Ajay Singh, Soumen Samanta, **Arvind Kumar**, A.K. Debnath, D.K. Aswal, S.K. Gupta, J.V. Yakhmi, Y. Hayakawa, S.K. Deshpande, Role of structure disordered in charge transport properties in cobalt phthalocyanine thin films grown by molecular-beam epitaxy, *Organic Electronics*, 11, 1835 (2010).

26. **Arvind Kumar**, A. Singh, A.K. Debnath, S. Samanta, D.K. Aswal, S.K. Gupta, J.V. Yakhmi, Room temperature ppb level Cl₂ sensing using sulphonated copper phthalocyanine films, *Talanta*, 82, 1485 (2010).

In Conference proceedings

1. **Arvind Kumar**, Praveen Kumar, Srinivas G., Jakeer Khan GH, Siju, Harish C. Barshilia, Fabrication of broadband quasi-omnidirectional antireflective surface on glass for photovoltaic application, *AIP conference proceeding*, 1731, 080009 (2016).
2. **Arvind Kumar**, R. Prasad, A.K. Debnath, Ajay Singh, S. Samanta, D.K. Aswal, S.K. Gupta, Growth and electrical transport properties of organic semiconductor thin films, *Solid State Phenomena*, 209, 1 (2014).
3. **Arvind Kumar**, A. Singh, S. Samanta, R. Prasad, A.K. Debnath, D.K. Aswal, S.K., Gupta, Trap free space charge limited conduction and high mobility in cobalt phthalocyanine-iron phthalocyanine composite thin films, *Solid State Phenomena*, 209, 52 (2014).
4. **Arvind Kumar**, Soumen Samanta, Ajay Singh, A.K. Debnath, D.K. Aswal, S.K. Gupta, Charge transport and Kelvin probe study of organic semiconductor heterojunction, *AIP Conference Proceedings*, 1451, 286 (2011).
5. **Arvind Kumar**, Soumen Samanta, Ajay Singh, A.K. Debnath, D.K. Aswal, S.K. Gupta, Reverse rectification behavior in NiPc/F₁₆CuPc heterojunction, *AIP Conference Proceedings*, 1447, 755 (2012).
6. **Arvind Kumar**, Soumen Samanta, Ajay Singh, A.K. Debnath, R. Prasad, D.K. Aswal, S.K. Gupta, Chemi-resistive gas sensing properties of cobalt-phthalocyanine /iron-phthalocyanine composite films, 1st International Symposium on Physics and Technology of Sensors (ISPTS-1), Pune, India, (2012).
7. **Arvind Kumar**, Soumen Samanta, Ajay Singh, A.K. Debnath, D.K. Aswal, S.K. Gupta, Mechanism of charge transport in cobalt and iron phthalocyanine thin films grown by molecular beam epitaxy, *AIP Conference Proceedings*, 1393, 15 (2011).
8. A.K. Debnath, **A. Kumar**, S. Samanta, A. Singh, D.K. Aswal, J.V. Yakmi, Implication of structural disorder in the charge transport properties of cobalt-phthalocyanine thin films, *AIP Conference Proceedings* 1349, 1047 (2011).
9. S.K. Gupta A. Singh, S. Samanta, **Arvind Kumar**, A.K. Debnath, D.K. Aswal, Charge transport characteristics of cobalt phthalocyanine thin films grown by molecular beam epitaxy, *AIP Conference Proceedings* 1313, 60 (2010).
10. Adrica Kyndiah, **Arvind Kumar**, S. Samanta, Ajay Singh, A.K. Debnath, J.V. Yakhmi, Priya Maheshwari, P.K. Pujari, Electrical and positron study of the interface of organic semiconductor heterojunction, *AIP Conference Proceeding*, 1313, 409 (2010).

Edited Book

1. 1D Semiconducting Hybrid Nanostructures: Gas Sensing and Optoelectronic Applications, **Arvind Kumar, Nirav Joshi, D.K. Aswal, Publisher: Willey-VCH, Germany** (In process)

Book Chapters

1. **Arvind Kumar**, Murali Krishnan, Vipul Singh, Soumen Samanta, Niranjan S. Ramgir Room Temperature Chemi-resistive Gas Sensing Characteristics of Pristine Polyaniline and Polyaniline/TiO₂ Nanocomposites, *Functional Nanomaterials: Advances in Gas sensing* (pp 383-397), **Springer Nature Singapore, Pvt. Ltd. (2020) ISBN 978-981-15-4810-9.**
2. **Arvin Kumar**, Nirav Joshi Self-powered Environmental Monitoring Gas Sensors: Triboelectric and Piezoelectric Approaches, *Nanobatteries and Nanogenerators*, 1st Edition (pp 463-489), **Elsevier Publisher (2020) ISBN 978-0128215494.**

8. Others

- Oral Presentation in 9th *Conference of India Science Congress Association on Future India Science & Technology*, October 2018.
- Oral Presentation in National Conference on Science and Technology: Rural Development: organized by *India Science Congress Association*, April 2020.
- One Month Faculty Induction Programme, HRDC-JMI-Delhi, October-November 2020.
- Participated International Faculty Development Programme, (duration One week)-June 2020.