




## Faculty Details proforma for College Web-site



Title	Dr.	First Name	V. Bhasker	Last Name	Raj	
Designation		Assistant Professor				
Address		Department of Physics, Acharya Narendra Dev College (University of Delhi), Govindpuri, Kalkaji, New Delhi 110 019				
Phone No Office		9654837998				
Email/ Web-Page		<a href="mailto:vbhaskerraj@andc.du.ac.in">vbhaskerraj@andc.du.ac.in</a> ; <a href="mailto:vbhaskerraj@gmail.com">vbhaskerraj@gmail.com</a>				
Educational Qualifications						
Degree	Institution				Year	
B.Sc.	Hans Raj College				2005	
M.Sc.	Hans Raj College				2007	
Ph.D.	University of Delhi				2012	
Career Profile						
Teaching experience of more than 11 years (16/01/12 - till date) as Assistant Professor in Physics department, Acharya Narendra Dev college (University of Delhi)						
Administrative Assignments						
Worked in several college committees (Time Table, Theatre, Fellowship, IT, Annual Events: Cultural and academic, NAAC, sports, proctorial).						
Areas of Interest / Specialization						
Surface acoustic wave sensors, Gas Chromatography, Chemical warfare agents, material science, Pattern recognition, Electronics						
Subjects Taught						
Digital Analog & Instrumentation, Communication Electronics, Digital Systems & Applications, Analog Electronics, Microprocessors & Microcontrollers, Linear & Digital Integrated Circuits						
Research Guidance						
Publications Profile						
<b>Research Papers in International Refereed Journals:</b>						
1. 'Enhancement of Carrier Mobility and Band Gap in Plastically Deformed Bi Single Crystal', Manisha Verma, V. Bhasker Raj, Sanjeeta Rani, Journal of Low temperature physics, 2023. (doi: <a href="https://doi.org/10.1007/s10909-023-02959-1">https://doi.org/10.1007/s10909-023-02959-1</a> )						

2. "Trace Detection of Nerve Agent Simulant in the Fuel Vapor Environment using Metal Oxide/Surface Acoustic Wave E-Nose", Jitendra Kumar, Harpreet Singh, **V. Bhasker Raj**, A.T. Nimal, Vinay Gupta, and Vinay Kumar Singh, Defence Science Journal, vol. 70, no. 5, page 520-528, 2020. DOI: 10.14429/dsj.70.14584
3. "Distinct detection of liquor ammonia by ZnO/SAW sensor: study of complete sensing mechanism", **V. Bhasker Raj**, Harpreet Singh, A.T. Nimal, M.U. Sharma, Monika Tomar, Vinay Gupta, Sensors and actuators B vol. 238, page 83-90, 2017.
4. "Sensitivity Enhancement Studies of SAW vapor sensor by oscillator tuning using Varactor diode", Harpreet Singh, Yashoda Parmar, **V. Bhasker Raj**, Haresh M. Pandya, Jitender Kumar, Meena Mishra, A.T. Nimal, M.U. Sharma, IEEE Sensors, vol 17 issue 5, page 1391-1398, 2017.
5. "SAW Mono Sensor for identification of harmful vapors using PCA and ANN", Harpreet Singh, **V. Bhasker Raj**, Jitender Kumar, Fahim Durani, Meena Mishra, A.T. Nimal, M.U. Sharma, Process Safety and Environmental Protection vol. 102, page 577-588, 2016.
6. "Novel scheme to improve SnO<sub>2</sub>/SAW sensor performance for NO<sub>2</sub> gas by detuning the sensor oscillator frequency", **V. Bhasker Raj**, A.T. Nimal, Monika Tomar, M.U. Sharma, Vinay Gupta, Sensors and actuators B vol. 220, page 154-161, 2015.
7. "Origin and role of elasticity in the enhanced DMMP detection by ZnO/SAW sensor at room temperature", **V. Bhasker Raj**, Harpreet Singh, A.T. Nimal, Monika Tomar, M.U. Sharma, Vinay Gupta, Sensors and actuators B vol. 207, page 375-382, 2015.
8. "Metal oxide SAW E-Nose employing PCA and ANN for the identification of binary mixture of DMMP and methanol", Harpreet Singh, **V. Bhasker Raj**, Jitender Kumar, Upendra Mittal, Meena Mishra, A.T. Nimal, M.U. Sharma, Vinay Gupta, Sensors and actuators B vol. 200, page 147-156, 2014.
9. "Effect of metal oxide sensing layers on the distinct detection of ammonia using Surface Acoustic Wave (SAW) sensors", **V. Bhasker Raj**, Harpreet Singh, A.T. Nimal, Monika Tomar, M.U. Sharma, Vinay Gupta, Sensors and Actuators B vol. 187, page 563-573, 2013.
10. "Oxide thin films (ZnO, TeO<sub>2</sub>, SnO<sub>2</sub>, and TiO<sub>2</sub>) based Surface Acoustic Wave (SAW) E-Nose for the detection of chemical warfare agents", **V. Bhasker Raj**, Harpreet Singh, A. Theodore Nimal, M. U. Sharma and Vinay Gupta, Sensors and Actuators B vol. 178, page 636-647, 2013.
11. "Realization of Surface Acoustic Wave (SAW) and semiconductor gas sensors for room temperature detection of NO<sub>2</sub> gas", Anjali Sharma, **V. Bhasker Raj**, Kajal Jindal, Monika Tomar, Vinay Gupta, Integrated Ferroelectrics, vol. 148 (2013) page 90-95.
12. "Investigations on the origin of mass and elastic loading in the time varying distinct response of ZnO SAW ammonia sensor", **V. Bhasker Raj**, A. Theodore Nimal, Yashoda Parmar, M. U. Sharma and Vinay Gupta, Sensors and Actuators B, vol. 166-167, page 576-585, 2012.
13. "Cross sensitivity and selectivity studies on ZnO surface acoustic wave ammonia sensor", **V. Bhasker Raj**, A. Theodore Nimal, Yashoda Parmar, M. U. Sharma and Vinay Gupta, Sensors and Actuators B, vol. 147, page 517-524, 2010.
14. "Nano-crystalline SnO<sub>2</sub> thin film based SAW sensor for selective and fast detection of NO<sub>2</sub> gas" **V. Bhasker Raj**, Monika Tomar, A. T. Nimal, Manoj U. Sharma, Vinay Gupta, Advanced science Letters vol. 20, page 1124-1128, 2014.

**Book Series:**

1. "ZnO Surface Acoustic Wave Sensor for the Orthogonal Detection of DMMP", **V. Bhasker Raj**, Monika Tomar, A. Theodore Nimal, Yashoda Parmar, M. U. Sharma and Vinay Gupta, Solid State Phenomenon, vol. 185, page 69-72, 2012. (Trans Tech publications)
2. "Utilization of mass and elastic loading in oxide materials based SAW devices for the detection of mustard gas simulant", **V. Bhasker Raj**, A.T. Nimal, Harpreet Singh, Monika Tomar, M.U. Sharma, Vinay Gupta, Advanced Materials Research, vol. 488-489 (2012) page 1558-1562. (Trans Tech publications)

**Research Papers published in Conference Proceedings:**

1. "Gauging the Nature and Magnitude of Particulate Matter (PM) Concentrations in Bengaluru, the IT Capital of India", Charu K. Gupta, Jatinder Pal Singh, Priya Chopra, **V. Bhasker Raj** and Arijit Chowdhuri, DU Journal of Undergraduate Research and Innovation, volume 3, issue 2, pp 71-81, 2017. [ ISSN: 2395-2334]

2. "SAW E-nose using single sensor with temperature modulation", Harpreet Singh, **V. Bhasker Raj**, Jitender Kumar, Upendra Mittal, Meena Mishra, Fahim Durani, A.T. Nimal, M. U. Sharma, IEEE conference proceedings, ICIIS, ISBN: 978-1-4799-6499-4, page 1-5, 2014.
3. "Data Analysis Using Principal Component Analysis", Shruti Sehgal, Harpreet Singh, Mohit Agarwal, **V. Bhasker Raj**, Shantanu, IEEE conference proceedings, Medcom, ISBN: 978-1-4799-5096-6, page 45-48, 2014.
4. "Effect of spinner rotation speed and post-annealing on the optical constants of ZnO thin film", Arijit Chowdhuri, Pinki Rehman, **V. Bhasker Raj**, Amit Garg, Advances in Applied Physical and Chemical Sciences-A Sustainable Approach- ISBN: 978-93-83083-72-5 2014. Int'l Conf. on Innovative Trends in Applied Physical, Chemical, Mathematical Sciences and Emerging Energy Technology for Sustainable Development (APCMET-2014), 19 – 20 April 2014, Jawahar Lal Nehru University, New Delhi, INDIA
5. "Multi –Sensor Array Employing PCA and ANN for the Detection of Chemical Warfare (CW) Agents", Manu Gupta, A.K. Singh, **V. Bhasker Raj**, Harpreet Singh, Upendra Mittal, A.T. Nimal and M.U. Sharma, ICCIT-2012, page 269-271, 2012. ISSN: [978-93-82338-02-4](#)
6. "Efficient detection of ammonia using SAW devices coated with oxide sensing layers, **V. Bhasker Raj**, A. Theodore Nimal, Monika Tomar, M. U. Sharma and Vinay Gupta, Proceedings of IMCS sensors (AMA), doi: 10.5162/IMCS2012/P1.2.4.
7. "Orthogonal detection of ammonia using ZnO based surface acoustic wave ammonia sensor", **V. Bhasker Raj**, A. Theodore Nimal, Yashoda Parmar, M. U. Sharma and Vinay Gupta, Lucknow Journal of Science, vol.8, no.1, page 592-596, 2011.

#### Conference / Presentations /Workshops

##### Presentations in International/National Conferences

1. "Classification of the vapors of fuels, simulants of nerve agents, and VOCs by optimizing Artificial Neural Network", at International e-conference on 'Mitigating environmental issues by sustainable approaches (ICMCESA-2022)' organized by Acharya Narendra Dev College (University of Delhi) from February 22-28, 2022.
2. "Green Finance: Sustainable Solutions to India's Green Endeavours" at International e-conference on 'Mitigating environmental issues by sustainable approaches (ICMCESA-2022)' organized by Acharya Narendra Dev College (University of Delhi) from February 22-28, 2022.
3. "SAW E-nose using single sensor with temperature modulation", at International Conference on Industrial and Information Systems (ICIIS-2014) held at Gwalior, India from 15-17<sup>th</sup> Dec 2014.
4. "Data Analysis Using Principal Component Analysis", at International Conference on Medical Imaging, m-Health and Emerging Communication Systems (MedCom-2014) held in Greater Noida from 7-8<sup>th</sup> Nov 2014.
5. "Effect of spinner rotation speed and post-annealing on the optical constants of ZnO thin film", in Krishi Sanskriti held in Delhi 2014.
6. "One magnon excitation in antiferromagnetically ordered NiO nanoparticles" in an international conference on Magnetic materials and applications (MAGMA-2013), IIT Guwahati, India from 5-7 December 2013.
7. "Nano-crystalline SnO<sub>2</sub> thin film-based SAW sensor for selective and fast detection of NO<sub>2</sub> gas" in an International Conference on International conference on nanoscience and nanotechnology (ICNN-2013), Lucknow, India from 18-20 November 2013.
8. "Selective detection of ammonia by varying the surface stress and porosity in ZnO thin films" in an International Conference on Emerging Technologies: Micro to Nano 2013 (ETMN-2013), Goa, India from 23-24 February 2013.
9. "Realization of Surface Acoustic Wave (SAW) and Semiconductor Gas Sensors for Room Temperature Detection of NO<sub>2</sub> Gas" in the 8<sup>th</sup> Asian Meeting on Ferroelectrics (AMF-8), 9-14 Dec. 2012, Pattaya, Thailand.

10. "Utilization of nanopores and stress in ZnO to control mass and elastic loading for selective detection of TIC" in 1<sup>st</sup> Winter Workshop on Engineering at Nanoscale: From Materials to Bio-sensors, Indian Institute of Technology Indore, India from 10<sup>th</sup> to 12<sup>th</sup> December, 2012.
11. "Multi-sensor array employing PCA and ANN for the detection of Chemical Warfare (CW) Agents" in an international conference on computing, communication and information technology (ICCCIT-2012), held at Thiruninravur, Tamil Nadu from 27<sup>th</sup> – 29<sup>th</sup> June 2012.
12. "Efficient detection of ammonia using SAW devices coated with oxide sensing layers" in an international meeting on chemical sensors IMCS-2012, held at Nuremberg, **Germany** from 20<sup>th</sup> May to 23<sup>rd</sup> May.
13. "Utilization of mass and elastic loading in oxide materials based SAW devices for the detection of chemical warfare agents", in an international conference entitled "International conference and workshop on Nanostructured ceramics and other Nanomaterials", held at University of Delhi, from 13<sup>th</sup> to 16<sup>th</sup> March 2012.
14. "Utilization of mass and elastic loading in oxide materials based SAW devices for the detection of mustard gas simulant" in an international conference entitled "International conference on key engineering materials (ICKEM-2012)" held at **Singapore** from 26 to 28 february 2012.
15. "Detection of simulants of chemical warfare agents by SAW E-nose" in 23<sup>rd</sup> Annual General Meeting on "Functional Materials for sustainable Energy and Advanced Technologies" held at Thapar University, Patiala from february 13-15, 2012.
16. "Distinct detection of ammonia by ZnO SAW sensor at room temperature", in an international conference entitled "International conference on Nanomaterials & Nanotechnology", held at University of Delhi, Delhi from 18<sup>th</sup> – 21<sup>st</sup> December 2011.
17. "Room temperature detection of DMMP (simulant of Sarin) by ZnO SAW sensor", in an international conference entitled "MRS Fall Meeting & Exhibit - 2011" held at Boston, **MA, USA** from 28<sup>th</sup> Nov. to 2<sup>nd</sup> Dec. 2011.
18. "ZnO Surface Acoustic Wave sensor for the orthogonal detection of DMMP", in an international conference entitled "International Conference on Materials for Advanced Technology (ICMAT-2011)" held at Suntec, **Singapore** from 26<sup>th</sup> june to 1<sup>st</sup> july 2011. **(Best poster presentation award)**
19. "Orthogonal detection of ammonia using ZnO based surface acoustic wave ammonia sensor" in "16<sup>th</sup> national seminar on physics and technology of sensors" held at lucknow from 11 to 13 february 2011. **(Best Oral presentation award)**
20. "Optimization of TeO<sub>2</sub> film thickness for temperature stable LiNbO<sub>3</sub> SAW devices" in a Mini-Colloquia on "Compact Modeling of advance MOSFET structures and mixed mode applications", Delhi University South Campus, Delhi, organized by IEEE-EDS Delhi, 5-6 Jan. 2008.
21. "Growth of TeO<sub>2</sub> thin film with negative TCD characteristics using rf sputtering", at a national conference ISSS-MEMS 2007 at CEERI Pilani from November 16-17, 2007.

#### **Conferences/Workshops/Training programs organized at A.N.D. college**

- **Organizing secretary** in the "Hands on training workshop on Semiconductor Devices Fabrication" organized by Miranda House college in collaboration with CIIDRET and DSSEED from 20<sup>th</sup> March to 3<sup>rd</sup> April 2023.
- **Organizing secretary and Session chair** in the international e-conference on "mitigating contemporary environmental issues by sustainable approaches (MCESA-2022)" from February 22-28, 2022.
- **Co-ordinator** in conducting the Intellectual Property Awareness program under National Intellectual Property Awareness mission (NIPAM) on January 19, 2022.
- **Resource person** in the Hands-on workshop on Digital Systems and Applications with Microprocessors and Microcontrollers organized by Department of Physics & IQAC, Acharya Narendra Dev College (20-27 October 2021)
- Worked as **organizing committee member** of one day inter-disciplinary exhibit presentation on "New Frontiers in Science", held on 22<sup>nd</sup> October 2022.

- Worked as **department coordinator** in the Inter-College hands-on workshop on “SPR & UV-Vis Spectroscopy” (under the aegis of Star College initiative) from 21-27 August 2019.
- Worked as a **resource person** in a two-day hands-on workshop on Arduino: Basic Programming & Applications [DBT STAR College scheme] on 11 – 12 April 2018.
- Worked as a **resource person** in a two-day symposium “Innovation Conclave: Nurturing research at the undergraduate level” held on October 25-26, 2016.
- Worked as a **resource person** in a two-day workshop “Science Pedagogy: Laboratory Learning to classroom teaching” held on January 20-21, 2016.
- Organized a workshop on “Science and technology of Sensors (physical, chemical and biological)” at Acharya Narendra Dev College (University of Delhi), 14-15<sup>th</sup> October 2013.

#### Workshops/FDPs/Webinars Attended

1. Participated in IP Awareness/Training program under National Intellectual Property Awareness mission (NIPAM) on January 19, 2022.
2. 1-week online Faculty Development Program on “Moocs and E-Learning in Context Of National Education Policy” organized by Delhi School Of Public Policy and Governance, Institution of Eminence, University of Delhi in Collaboration with National Law University and Judicial Academy Assam and Bhartiya Shikshan Mandal and National Institute of Open Schooling, Ministry Of Education, Government of India (18-24 October, 2021).
3. 2 weeks online Interdisciplinary Faculty Development Programme on ‘MOOC's, E-Content Development, Research Methodology and Statistical Tools in Open Education World’ organized by Kalindi College, University of Delhi in collaboration with Mahatma Hansraj Faculty Development Centre (3– 17 August 2021).
4. Attended a workshop on **3D printing** jointly organized by Centre for Science Education and Communication and Cluster Innovation Centre, University of Delhi during 28/02/15 to 01/03/15.

#### Research Projects (Major Grants/Research Collaboration)

#### Awards and Distinctions

- Cleared “National Eligibility Test (**NET**)/**JRF**” held on December 2006.
- Got **best poster presentation award** in an international conference entitled "International Conference on Materials for Advanced Technology (**ICMAT-2011**)" held at Suntec, Singapore from 26<sup>th</sup> June to 1<sup>st</sup> July 2011.
- Got the **best paper award** at the annual function of Solid State Physics Laboratory (DRDO) on 5<sup>th</sup> April 2011.
- Got **best oral presentation award** in 16<sup>th</sup> national seminar on physics and technology of sensors (**NSPTS-16**) at Lucknow from 11<sup>th</sup> to 13<sup>th</sup> February 2011.
- Got **all India rank of 55** in “Graduate Aptitude Test in Engineering (**GATE**)” in 2007.
- Got all India rank of **220** in “Joint Entrance Screening Test (**JEST**)” in 2007.
- Got all India rank of **223** in “Joint Admission Test (**JAM**)” in 2005.
- Got **national scholarship** under “**Centre of Advanced Studies**” during MSc. (2005-2007).
- Got **first rank in M.Sc.** (Previous) and fourth in final year in Hans Raj College (2006-2007).
- **1<sup>st</sup> rank** in SSLT Gujarat Sr. Sec. School (12<sup>th</sup>) and got various meritorious awards.

#### Association With Professional Bodies

#### Other Activities

**E-content developed**

[https://www.youtube.com/channel/UC9GupqOTWwJ4m5\\_aMqu3UJQ](https://www.youtube.com/channel/UC9GupqOTWwJ4m5_aMqu3UJQ)

Developed e-content (you tube videos) on the following topics:

1. SCILAB programming:
  - a. Quantum Mechanics
  - b. Statistical Mechanics
  - c. Numerical Methods
  - d. Mathematical Physics
2. Electronics (Boltzmann's constant, Zener diode regulator, Wien's Bridge Oscillator, Digital Storage Oscilloscope, Types of Capacitors etc.)
3. Optics (Numerical aperture, Planck's constant etc.)

Signature of Faculty Member

- You are also requested to also give your complete resume as a DOC and PDF file to be attached as a link on your faculty page.