Curriculum Vitae

Title (Ms/Mr/Dr/Prof)	**Dr.**	First Name	**V. Bhasker**	Last Name	**Raj**	Photograph

Designation	Assistant Professor
Department	PHYSICS
Address (Official)	Kalindi College, East Patel Nagar, New Delhi – 110008
Phone No.	9654837998
Email	vbhaskerraj@kalindi.du.ac.in

Education

Subject	Institution	Year	Details
Ph.D.	University of Delhi	2014	Material Science
M.Sc.	Hans Raj College (University of Delhi)	2007	Physics with Electronics
B.Sc.	Hans Raj College (University of Delhi)	2005	Physics

Career Profile

Organisation/ Institution	Designation	Duration	Role
Kalindi College	Assistant Professor	26 Feb. 2024 – Present	Teaching
Acharya Narendra Dev College	Assistant Professor	16 Jan. 2012- 24 Feb. 2024	Teaching

Research Interests/Specialization

- Thin Film technology
- Surface Acoustic Wave devices
- Sensors
- Pattern Recognition
- Gas Chromatography
- Chemical Warfare agents and industrial pollutants

Administrative Assignments / Contribution to corporate life

- Member, AQAR committee, May 2024
- Member, Prize committee, May 2024
- Co-Convener, Physithon society, 2024-25

- Member Attendance Committee, 2024-25
- Co-Convener, Development of E-Content, 2024-25

Teaching Experiences (Subject/Courses taught) ~ 12.5 years

Courses: B.Sc. (H) Physics, B.Sc. Physical Sciences

Subject: Solid State Physics, PCB designing and Fabrication, Microprocessors & Microcontrollers, Network Analysis and Analog Electronics, Linear & Digital Integrated Circuits, Digital Analog & Instrumentation, Communication Electronics, Digital Systems & Applications, Analog Electronics, Personality development and Communication, Art of being Happy.

Research Guidance

NA

Publication (Peer Reviewed/Indexed Journals)

Year of Publication	Title	Journal (Name of the Journal. Vol Issue ISSN)	Co-Author
2024	High gain NiO/ZnO heterojunction photodiodes operated in Deep-ultraviolet region	Thin Solid Films vol 798, 140389	Manisha Tyagi, **V. Bhasker Raj** and Monika Tomar
2023	Effect of ferrite nanomaterials on the thermal stability of biopolymer and graphene oxide blend	Rasayan: Journal of Chemistry, vol 16, no.3, 1495-1502	Sunita Hooda, Sanjeeta Rani, **V. Bhasker Raj**, Arijit Chowdhuri, Drashya Gautam and Manisha Verma
2023	Complex dielectric-impedance spectroscopic studies of magnetite added chitin biopolymer	Applied Chemical Engineering, vol 6(1), page 59-67	Sanjeeta Rani, Sunita Hooda, Neelu Dheer, **V. Bhasker Raj**, Ishwar Prasad Sahu, Manisha Verma
2023	Enhancement of Carrier Mobility and Band Gap in Plastically Deformed Bi Single Crystal	Journal of Low temperature physics, vol 211, issue 3-4, page 138-155	Manisha Verma, **V. Bhasker Raj**, Sanjeeta Rani
2020	Trace Detection of Nerve Agent Simulant in the Fuel Vapor Environment using Metal Oxide/Surface Acoustic Wave E-Nose	Defence Science Journal, vol. 70, no. 5, page 520-528. DOI: 10.14429/dsj.70.14584	Jitendra Kumar, Harpreet Singh, **V. Bhasker Raj**, A.T. Nimal, Vinay Gupta, and Vinay Kumar Singh

2017	Distinct detection of liquor ammonia by ZnO/SAW sensor: study of complete sensing mechanism	Sensors and actuators B vol. 238, page 83-90.	**V. Bhasker Raj**, Harpreet Singh, A.T. Nimal, M.U. Sharma, Monika Tomar, Vinay Gupta
2017	Sensitivity Enhancement Studies of SAW vapor sensor by oscillator tuning using Varactor diode	IEEE Sensors, vol 17 issue 5, page 1391-1398.	Harpreet Singh, Yashoda Parmar, **V. Bhasker Raj**, Haresh M. Pandya, Jitender Kumar, Meena Mishra, A.T. Nimal, M.U. Sharma
2016	SAW Mono Sensor for identification of harmful vapors using PCA and ANN	Process Safety and Environmental Protection vol. 102, page 577-588.	Harpreet Singh, **V. Bhasker Raj**, Jitender Kumar, Fahim Durani, Meena Mishra, A.T. Nimal, M.U. Sharma
2015	Novel scheme to improve SnO2/SAW sensor performance for NO2 gas by detuning the sensor oscillator frequency	Sensors and actuators B vol. 220, page 154-161.	**V. Bhasker Raj**, A.T. Nimal, Monika Tomar, M.U. Sharma, Vinay Gupta
2015	Origin and role of elasticity in the enhanced DMMP detection by ZnO/SAW sensor at room temperature	Sensors and actuators B vol. 207, page 375-382.	**V. Bhasker Raj**, Harpreet Singh, A.T. Nimal, Monika Tomar, M.U. Sharma, Vinay Gupta
2014	Metal oxide SAW E-Nose employing PCA and ANN for the identification of binary mixture of DMMP and methanol	Sensors and actuators B vol. 200, page 147-156.	Harpreet Singh, **V. Bhasker Raj**, Jitender Kumar, Upendra Mittal, Meena Mishra, A.T. Nimal, M.U. Sharma, Vinay Gupta,
2014	Nano-crystalline SnO2 thin film-based SAW sensor for selective and fast detection of NO_2 gas	Advanced science Letters vol. 20, page 1124-1128.	**V. Bhasker Raj**, Monika Tomar, A. T. Nimal, Manoj U. Sharma, Vinay Gupta
2013	Effect of metal oxide sensing layers on the distinct detection of ammonia using Surface Acoustic Wave (SAW) sensors	Sensors and Actuators B vol. 187, page 563-573.	**V. Bhasker Raj**, Harpreet Singh, A.T. Nimal, Monika Tomar, M.U. Sharma, Vinay Gupta

2013	Oxide thin films (ZnO, TeO2, SnO2, and TiO2) based Surface Acoustic Wave (SAW) E-Nose for the detection of chemical warfare agents	Sensors and Actuators B vol. 178, page 636-647.	**V. Bhasker Raj**, Harpreet Singh, A. Theodore Nimal, M. U. Sharma and Vinay Gupta,
2013	Realization of Surface Acoustic Wave (SAW) and semiconductor gas sensors for room temperature detection of NO2 gas	Integrated Ferroelectrics, vol. 148 page 90-95.	Anjali Sharma, **V. Bhasker Raj**, Kajal Jindal, Monika Tomar, Vinay Gupta
2012	Investigations on the origin of mass and elastic loading in the time varying distinct response of ZnO SAW ammonia sensor	Sensors and Actuators B, vol. 166-167, page 576-585.	**V. Bhasker Raj**, A. Theodore Nimal, Yashoda Parmar, M. U. Sharma and Vinay Gupta
2012	ZnO Surface Acoustic Wave Sensor for the Orthogonal Detection of DMMP	Solid State Phenomenon, vol. 185, page 69-72.	**V. Bhasker Raj**, Monika Tomar, A. Theodore Nimal, Yashoda Parmar, M. U. Sharma and Vinay Gupta,
2012	Utilization of mass and elastic loading in oxide materials-based SAW devices for the detection of mustard gas simulant	Advanced Materials Research, vol. 488-489 page 1558-1562	**V. Bhasker Raj**, A.T. Nimal, Harpreet Singh, Monika Tomar, M.U. Sharma, Vinay Gupta
2010	Cross sensitivity and selectivity studies on ZnO surface acoustic wave ammonia sensor",	Sensors and Actuators B, vol. 147, page 517–524.	**V. Bhasker Raj**, A. Theodore Nimal, Yashoda Parmar, M. U. Sharma and Vinay Gupta

Publications (in Conference Proceedings)

1. "SAW multi sensor array for the detection of different vapors by applying Artificial Neural Network", S. Rani, M. Verma, **V. Bhasker Raj**, A. Chowdhuri, A.T. Nimal, Sensors and Electronic Instrumentation Advances-2022, pp 91-92; ISBN: 978-84-09-43854-9

2. "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]

3. "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.

4. "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.

5. "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

6. "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, ICCCIT-2012, page 269-271, 2012. ISSN: 978-93-82338-02-4

7. "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.

8. "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.

Books: NA

International/National Conference presentations:

1. "Room Temperature Detection of NO2 Using A Portable Quartz Crystal Microbalance (QCM) Device With WO3 Coating", Jatinder Pal Singh, Anjali Sharma, V Bhasker Raj, Monika Tomar, Arijit Chowdhuri, ICMAT 2023, 26-30 June 2023, Suntec, Singapore.
2. "SAW multi sensor array for the detection of different vapors by applying Artificial Neural Network", S. Rani, M. Verma, V. Bhasker Raj, A. Chowdhuri, A.T. Nimal; International conference on Sensors and Electronic Instrumentation Advances (SEIA-2022), Corfu, Greece, 21-23 September 2022.
3. "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.
4. "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.
5. "SAW E-nose using single sensor with temperature modulation", at International Conference on Industrial and Information Systems (ICIIS-2014) held at Gwalior, India from 15-17th Dec 2014.
6. "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 7-8th Nov 2014.
7. "Effect of spinner rotation speed and post-annealing on the optical constants of ZnO thin film", in Krishi Sanskriti held in Delhi 2014.

8. “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.
9. “Nano-crystalline SnO2 thin film-based SAW sensor for selective and fast detection of NO2 gas” in an International Conference on International conference on nanoscience and nanotechnology (ICNN-2013), Lucknow, India from 18-20 November 2013.
10. “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.
11. “Realization of Surface Acoustic Wave (SAW) and Semiconductor Gas Sensors for Room Temperature Detection of NO2 Gas” in the 8th Asian Meeting on Ferroelectrics (AMF-8), 9-14 Dec. 2012, Pattaya, Thailand.
12. “Utilization of nanopores and stress in ZnO to control mass and elastic loading for selective detection of TIC” in 1st Winter Workshop on Engineering at Nanoscale: From Materials to Bio-sensors, Indian Institute of Technology Indore, India from 10th to 12th December, 2012.
13. "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 27th – 29th June 2012.
14. "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 20th May to 23rd May.
15. “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 13th to 16th March 2012.
16. “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.
17. “Detection of simulants of chemical warfare agents by SAW E-nose” in 23rd Annual General Meeting on “Functional Materials for sustainable Energy and Advanced Technologies” held at Thapar University, Patiala from february 13-15, 2012.
18. “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 18th – 21st December 2011.
19. "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 28th Nov. to 2nd Dec. 2011.
20. "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 26th june to 1st july 2011.
21. “Orthogonal detection of ammonia using ZnO based surface acoustic wave ammonia sensor” in “16th national seminar on physics and technology of sensors” held at lucknow from 11 to 13 february 2011.
22. “Optimization of TeO2 film thickness for temperature stable LiNbO3 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.
23. “Growth of TeO2 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/contributed)

- Co-convener of national seminar on "Rising Stars: Exploring Futures together" on 17th May 2024 at Kalindi 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 20th March to 3rd April 2023.
- Organizing secretary and Session chair in the international e-conference on "mitigating contemporary environmental issues by sustainable approaches (IMCESA-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 (AND College).
- 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)
- Organizing committee member of one day inter-disciplinary exhibit presentation on "New Frontiers in Science", held on 22nd October 2022 (AND College).
- 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 (AND College).
- Resource person in a two-day hands-on workshop on Arduino: Basic Programming & Applications [DBT STAR College scheme] on 11 – 12 April 2018 (AND College).
- Resource person in a two-day symposium "Innovation Conclave: Nurturing research at the undergraduate level" held on October 25-26, 2016 (AND College).
- Resource person in a two-day workshop "Science Pedagogy: Laboratory Learning to classroom teaching" held on January 20-21, 2016 (AND College).
- Organized a workshop on "Science and technology of Sensors (physical, chemical and biological)" at AND College (University of Delhi), 14-15th October 2013.

Participations in FDPs/Webinars/Workshops

- "NEP Orientation & Sensitization Programme" organized by UGC-MMTTC (GAD-MMTTC), Sri Guru Tegh Bahadur Khalsa College, University of Delhi from 14 to 24 May 2024.

- 2-weeks interdisciplinary refresher course in "Advanced Research Methodology" from 26 April-9 May 2024, organized by teaching learning center, Ramanujam college.

- 4-weeks Faculty Induction/Orientation Programme for "Faculty in Universities/ Colleges/Institutes of Higher Education" from 27 March – 23 April, 2024 organized by teaching learning center, Ramanujam college.

- One-Week National Faculty Development Program organized by University of Delhi (Skill Enhancement Course Committee) in collaboration with Daulat Ram College, DU (Department of Physics) and Guru Angad Dev Teaching Learning Centre, a Centre under PMMMNMTT, Ministry of Education, Government of India and obtained "A+" grade (17th -23rd July 2023).

- IP Awareness/Training program under National Intellectual Property Awareness mission (NIPAM) on January 19, 2022.

- One-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).

- 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).

- 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.

Awards & Distinctions

- Best poster presentation award in an international conference entitled "International Conference on Materials for Advanced Technology (ICMAT-2011)" held at Suntec, Singapore from 26th June to 1st July 2011.
- Best paper award at the annual function of Solid-State Physics Laboratory (DRDO) on 5th April 2011.
- Best oral presentation award in 16th national seminar on physics and technology of sensors (NSPTS-16) at Lucknow from 11th to 13th February 2011.
- All India rank of 55 in "Graduate Aptitude Test in Engineering (GATE)" in 2007.
- All India rank of 220 in "Joint Entrance Screening Test (JEST)" in 2007.
- All India rank of 223 in "Joint Admission Test (JAM)" in 2005.
- National scholarship under "Centre of Advanced Studies" during MSc. (2005-2007).
- First rank in M.Sc. (Previous) and fourth in final year in Hans Raj College (2006-2007).
- 4th rank in MSc entrance exam of University of Delhi 2007.
- Ist rank in SSLT Gujarat Sr. Sec. School (12th) and got various meritorious awards.
- "National Eligibility Test (NET)/JRF" held on December 2006.

Public Service/ University Service/ Consulting Activity

NA

Professional Societies Memberships

NA

Projects (Major Grants/ Collaborations)

NA

Computer Expertise

- Programming Language: **C/C++, Matlab, Scilab**

- Circuit Simulation softwares: **MultiSim, PSpice, LT Spice**
- Assembly language: **8085 μP and 8051 μC**
- Audio/video editing software: **Video Pad Editor, Audacity**
- **MS office, Libre Office, Origin software**

E-content developed

(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 (including **Molecular Dynamics simulations**)
   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.)

Research Experience:

- Worked at **Solid State Physics Laboratory** (DRDO) in Surface Acoustic Wave group in their mission mode project **E-Nasika**.
- Worked at **SPEC lab.**, University of Puerto Rico, Puerto Rico, **USA** for 1 month.