

Prof. (Dr.) Divya Haridas

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Educational Qualifications

- Ph.D. (Physics) from University of Delhi (2011), Thesis on “*Studies on SnO₂ thin film gas sensors for LPG and Methane*” under supervision of Prof. Vinay Gupta.
- B.Sc. (Hons) Physics (Topped in South Campus, University of Delhi) and M.Sc. in Physics with specialization in Electronics from University of Delhi in 2005 and 2003 respectively.
- Qualified joint CSIR-UGC National Eligibility Test (NET) Examination 2005

Undergraduate Teaching Experience: More than 17 years

Publications: **36 (21– International/ National Journals, 15-Conference Proceedings)**
(All papers published in journals are listed in UGC Care list and Scopus indexed)

Total citations as per Google Scholar:

Citations	: 655
h-index	: 10
i10-index	: 10

Awards and scholarships

- Got **Meritorious Teacher Award** from the Directorate of Higher Education, Government of the NCT of Delhi. Based on the feedback from students and the Principal, and the records of the efforts put in by the teacher in improving results, in research, extra-curricular activities and in corporate life of college, the Directorate of Higher Education, Government of the NCT of Delhi selected for the award and awarded with Rs.1 lakh .

- Awarded the **Best Poster Presentation** Award in International conference on Sensing Technology, ICST 2008, Tainan, Taiwan, Nov.30-Dec 3, 2008
- **Awarded 1st position** with a cash prize of Rs. 5000/- in Poster presentation titled “To design a chemical filter capable of reducing emissions of SO₂ and NO_x from vehicular pollution” at Acharya Narendra Dev college, Innovation Conclave 25-26th October 2016.
- Secured **2nd Position in oral presentation** in International Conference on Indo-UK Conference on recent advances on chemical sensors held at Gargi College, University of Delhi from 10-11 February 2014.
- Awarded with **paper presentation award** for Poster presentation in 3-day National Conference on "Redefining Science Teaching: Future of Education" during 7-9 March, 2013 at South Campus, University of Delhi.
- Awarded “**All India Post Graduate Scholarship**” for the academic year 2003-2005.
- Awarded “**Science Meritorious Students Award**” *thrice* for the academic year 2002-03; 2003-04; 2004-05.

Hands-on experience

RF/DC sputtering techniques for preparation of thin films and nanostructures, fabrication of Micro-electronic devices, Development of efficient LPG and Methane sensors. Designing Electronic Nose (E-Nose) and further started analysis of the data with artificial neural network. Photolithography setup and patterning of inter-digital electrodes, Synthesis of nanoparticles, Thermal evaporation, Atomic Force Microscopy (AFM), X-ray diffraction, precision capacitance bridges, Keithley electrometers, Thickness profilometer, UV-VIS spectroscopy. Worked in a DST sponsored project entitled “Development of nano sized semiconducting oxide powders films and catalysts by gas phase condensation for gas sensor application”

Part of the Organizing Committee of the following events

- National Seminar on Multifunctional Nanomaterials & Nanostructures Applications–MNNA 2006 (23 -24 Dec. 2006) at Dept. of Physics and Astrophysics, Univ. of Delhi, India
- Indo-Australia Symposium on Multifunctional Nanomaterials and Nanostructures Applications (MNNA 2007), Dept. of Physics & Astrophysics, Univ. of Delhi from 19-21 December 2007.
- Workshop on Experiments in Physics and Electronics from 23rd July 2008 to 26th July 2008 co-organised with Institute of Life Long Learning (ILLL) University of Delhi, India.

Publications

International / National Journals (Impact Factor in parentheses)

1. Modeling Radioactive Decay Series Phenomenon Involving First-Order Differential Equation and Visualizing Solutions Using Open-Source Software XCOS R Menon, M Verma, **Divya Haridas**, A Tanwar, The Physics Educator (2024) 2450005
2. Low temperature relaxor behaviour of SrBi_{1.5}La_{0.5}Nb₂O₉ ceramics R Jain, M Verma, A Tanwar, R Menon, **Divya Haridas**, S Mahajan, Ferroelectrics 618 (3) (2024) 696-703 (**Impact factor: 0.6**)
3. Solving exact solution of time independent Schrodinger wave equation and visualizing eigenfunctions using XCOS NB Bali, R Sachdeva, P Ashdhir, M Verma, **Divya Haridas**, R Menon, Amit Tanwar, Physica Scripta 99 (1) (2023) 016101 (**Impact factor: 2.6**)
4. Effect of annealing temperature and thickness on the structural and optical properties of strontium bismuth niobate films M Verma, **Divya Haridas**, A Tanwar, R Menon, R Jain, K Sreenivas, Thin Solid Films 776 (2023) 139885 (**Impact factor: 2.0**)
5. Algorithm based determination of the Planck's constant S Korpai, A Aggarwal, AK Arora, J Anand, M Verma, **Divya Haridas**, Physics Education 58 (4) (2023) 045003
6. Study of structural and morphological properties of RF-sputtered SnO thin films and their effect on gas-sensing phenomenon, AK Arora, S Mahajan, M Verma, **Divya Haridas**, International Journal on Smart Sensing and Intelligent Systems 16 (1) (2023) (**Impact factor: 0.5**)
7. Study of optical properties of SnO₂ thin films and its influence on gas sensing response, **Divya Haridas**, Maya Verma, Smita Korpai, Sandeep Mahajan, Amit Tanwar, Rashmi Menon, Emerging Materials Research 11 (2022) 1-9 (Impact factor: 1.795) (**Impact factor: 1.3**)
8. Effect of calcination temperature on structural, dielectric and piezoelectric properties of strontium bismuth niobate ceramics, Maya Verma, Amit Tanwar, **Divya Haridas**, Sandeep Mahajan, Rashmi Menon, Sudhanshu Kumar, K. Sreenivas, Applied Physics A 128 (2022) 793 (**Impact factor: 2.983**)
9. Conduction mechanism in excess Bismuth doped Strontium Bismuth Niobate ceramics, Maya Verma, Amit Tanwar, **Divya Haridas**, Rashmi Menon, K. Sreenivas, Journal of Solid State Chemistry 307 (2021) 122825 (**Impact factor: 3.2**)
10. "Investigation of conduction and relaxation phenomena in BaZr_xTi_{1-x}O₃ (x=0.05) by impedance spectroscopy", Sandeep Mahajan, **Divya Haridas**, S. T. Ali, O.P.Thakur, C.Prakash, Physica B: Condensed Matter 451(2014) 114–119 (**Impact factor: 2.8**)

11. Study of collective efforts of catalytic activity and photoactivation to enhance room temperature response of SnO₂ thin film sensor for methane, **Divya Haridas**, Vinay Gupta, Sensors and Actuators B 182 (2013) 741-746 **(Impact factor: 8)**
12. Dilatometric behaviour of doped barium titanate ceramic, Sandeep Mahajan, **Divya Haridas**, O.P. Thakur, Chandra Prakash, Materials Letters 92 (2013) 421–423 **(Impact factor: 2.7)**
13. Enhancement in electro-strain behavior by La₃₊ substitution in lead free BaZr_{0.05}Ti_{0.95}O₃ ceramics, Sandeep Mahajan, **Divya Haridas**, K. Sreenivas, O.P. Thakur, Chandra Prakash, Materials Letters 97 (2013) 40–43. **(Impact factor: 2.7)**
14. Enhanced response characteristics of SnO₂ thin film based sensors loaded with Pd clusters for methane detection, **Divya Haridas**, Vinay Gupta, Sensors and Actuators B 166–167 (2012) 156–164. **(Impact factor: 8)**
15. Enhanced room temperature response of SnO₂ thin film sensor loaded with Pt catalyst clusters under UV radiation for LPG, **Divya Haridas**, Arijit Chowdhuri, K. Sreenivas and Vinay Gupta, Sensors and Actuators B 153 (2011) 152–157. **(Impact factor: 8)**
16. Effect of thickness of Platinum catalyst clusters on response of SnO₂ thin film sensor for LPG, **Divya Haridas**, Arijit Chowdhuri, K. Sreenivas and Vinay Gupta, Sensors and Actuators B 153 (2011) 89–95 **(Impact factor: 8)**
17. Enhanced LPG response characteristics of SnO₂ thin film based sensors loaded with Pt clusters”, **Divya Haridas**, Arijit Chowdhuri, K. Sreenivas and Vinay Gupta, International Journal on Smart Sensing And Intelligent Systems 2 (2009) 503-514. **(Impact factor: 0.5)**
18. Mechanism of trace level H₂S gas sensing using RF sputtered SnO₂ thin films with CuO catalytic overlayer, Arijit Chowdhuri, **Divya Haridas**, K. Sreenivas and Vinay Gupta International Journal of Smart Sensing and Intelligent systems 2 (2009) 540-548. **(Impact factor: 0.5)**
19. Improved response characteristics of SnO₂ thin film loaded with nanoscale catalysts for LPG detection, **Divya Haridas**, K.Sreenivas, Vinay Gupta, Sensors and Actuators B, 133 (2008) 270-275. **(Impact factor: 8)**
20. Enhanced catalytic activity of nanoscale platinum islands loaded on SnO₂ thin film for sensitive LPG gas sensor, **Divya Haridas**, Vinay Gupta, K. Sreenivas, Bulletin of Materials Science, 31 (2008) 397-400. **(Impact factor: 1.9)**
21. Influence of temperature stability on sensing properties of SAW NO_x sensor, Namrata Dewan, **Divya Haridas**, Swati Shandilya, K. Sreenivas and Vinay Gupta, Ind. J. Engg. & Mater. Sc., 15 (2008) 352-354. **(Impact factor: 0.794)**

RESEARCH PAPERS PUBLISHED IN REFERRED/PEER REVIEWED CONFERENCES

1. “Enhanced response of SnO₂ based thin film sensors towards methane gas due to the collective efforts of catalytic activity and photo-activation phenomenon”, **Divya Haridas** and V Gupta 2015 IOP Conf. Ser.: Mater. Sci. Eng. 73 (012025)
doi:10.1088/1757-899X/73/1/012025
2. *Enhanced response characteristics of SnO₂-ZnO heterostructures loaded with nanoscale catalyst clusters for methane gas detection*, **Divya Haridas** and Vinay Gupta, MRS Proceedings 1454, 227-232 (2012) DOI: <http://dx.doi.org/10.1557/opl.2012.1444>
3. *Analysis of industrial and domestic gases by means of electronic nose*, **Divya Haridas** and Vinay Gupta, IMCS proceedings, Sensors Arrays (2012) 122-125, DOI 10.5162/IMCS2012/1.4.4
4. *Enhanced Room Temperature Response of SnO₂ Thin Film Sensor Loaded with Pd Catalyst Clusters Under UV Radiation for Methane*, **Divya Haridas** and Vinay Gupta, IMCS proceedings, Sensors Arrays (2012) 758-760, DOI 10.5162/IMCS2012/P1.0.4.
5. *Effect of thickness of thin film SnO₂ based LPG sensors*, **Divya Haridas**, Sreenivas, K., Gupta, V. Proceeding MRS Fall 2010, 30th Nov-3rd Dec 2010, Boston, USA
6. *Enhanced Response Characteristics of SnO₂ Thin Film Loaded with Nanoscale Catalytic Clusters for Methane Gas*, **Divya Haridas**, Chowdhuri, A, Sreenivas, K., Gupta, V. Proceeding Materials Research Society Symposium 1303 (2011) 169-176.
7. *Fabrication of SnO₂ thin film based electronic nose for industrial environment*, **Divya Haridas**, K.Sreenivas & Vinay Gupta, Sensors Applications Symposium (SAS), 2010 IEEE PP 212 – 215, Limerick, Ireland
8. *Enhanced LPG response characteristics of SnO₂ thin film based sensors loaded with Pt clusters*, **Divya Haridas**, Arijit Chowdhuri, K. Sreenivas and Vinay Gupta, Proceeding of International Conference on Sensing Technology (ICST) 2008, Nov 30 - Dec 03, 2008, pp 119, Tainan, Taiwan
9. *Enhanced oxygen adsorption activity by CuO catalyst clusters on SnO₂ thin film based sensors*, A.Chowdhuri, **Divya Haridas**, K.Sreenivas & Vinay Gupta, Proceeding of International Conference on Sensing Technology (ICST) 2008, Nov 30-Dec 03, 2008, pp 147 Tainan, Taiwan
10. *Influence of thickness of ultrathin islands of Platinum catalyst on SnO₂ for LPG sensing*, **Divya Haridas**, Amit Tanwar, K.Sreenivas, Vinay Gupta, Proceeding of International Conference on Advanced Materials and Applications (ICAMA) 15-17th Nov 2007, Shivaji University, India.

11. *Nanoscale catalyst islands loaded on SnO₂ semiconductor sensor for detection of home fuel (LPG)*” **Divya Haridas**, Manish Kr Verma, K.Sreenivas, Vinay Gupta, Proc. 2nd ISSS National conference on MEMS, 16-17th Nov 2007, CEERI, Pilani.
12. *Influence of thickness of nanoscale dotted islands of Platinum catalyst on SnO₂ film for LPG sensing*, **Divya Haridas**, K. Sreenivas, Vinay Gupta, Proc. Multifunctional Nanomaterials Nanostructures and applications (MNNA), 19-21st Dec 2007, University of Delhi.
13. *Catalytic activity of nanoscale platinum islands on SnO₂ for LPG sensors*, **Divya Haridas**, Vinay Gupta, K. Sreenivas, Proc. National Review and Coordination meeting (NSNT-2007) 21-23rd Feb, 2007, Hyderabad.
14. *LPG sensors based on SnO₂ thin film loaded with nanoscale catalyst*, **Divya Haridas**, Vinay Gupta, K.Sreenivas, Proc. Multifunctional Nanomaterials Nanostructures and Applications 22-23rd Dec 2006, University of Delhi, Delhi.
15. *Influence of temperature stability on sensing properties of SAW NO_x sensor*, Namrata Dewan, **Divya Haridas**, Vinay Gupta, K. Sreenivas, Proc. National Seminar on Ferroelectrics & Dielectrics (NSFD XIV) 18-21st Dec 2006, IIT Kharagpur.

Conference Participation / Presentations

1. Poster presentation titled “*Detection and classification of gases using Electronic Nose by Principal component analysis*” in International Conference on advanced semiconductor materials and devices organized by CMET Hyderabad during 8-10, March 2018.
2. Participated in a workshop on “Introduction To Scilab” organised by Hans Raj College, Delhi University on 22-23 September 2017.
3. Poster presentation in National Seminar on “Emerging Economics and challenges to Sustainability towards Developing nations” held at Sri Aurobindo college on March 29-30th 2016.
4. Poster presentation in National Conference organized by Gargi college on “Combating Industrial Pollution for Sustainable Environment-A Fusion of Industrial and Scientific Efforts”(CIPSE - 2016) on 22-23rd September 2016.
5. Poster presentation titled “To design a chemical filter capable of reducing emissions of SO₂ and NO_x from vehicular pollution” at Acharya Narendra Dev college, Innovation Conclave 25-26th October 2016 and were awarded 1st position with a cash prize of Rs. 5000/-
6. Innovation Project was selected for display during the Convocation Ceremony of the University of Delhi held on 19th November 2016. Participated in the poster presentation. A certificate of Appreciation was awarded to the project.

7. Participated in a National Seminar on '*New Roles of Teachers in technology-driven Higher Education*' organised by S.G.T.B Khalsa College, University of Delhi during 1st March 2017.
8. Participated in Faculty Development Program in '*Research Project Management proposal to publication and beyond*' on 19th July 2016 in CIC-Centre for Science Education and Communication University of Delhi.
9. Participated in Capacity-Building Workshop on '*e-content creation in Physics*' held on 21st June 2016 in ILL, University of Delhi.
10. Participated in a workshop on '*Quantum Mechanics: Theory and Application*' organised by Deen Dayal Upadhyaya College, University of Delhi during 13 March- 14 March 2016.
11. Participated in a workshop on '*Awareness and Advocacy*' organised by University of Delhi for Digital India on 25th February 2016.
12. Participated in a Seminar on '*Technical Terminology and Science Teaching*' organised by Deen Dayal Upadhyaya College, University of Delhi during 18 September- 19 September 2015.
13. Participated in a workshop on '3D printing' for college teachers organised by Centre for Science Education & Communication and Cluster Innovation Centre, University of Delhi during 28 February 2015 – 1 March 2015.
14. Oral presentation on "Room temperature response of SnO₂ based thin film methane gas sensors" in International Conference on Indo-UK Conference on recent advances on chemical sensors held at Gargi College, University of Delhi from 10-11 February 2014
15. Participated in "National conference on synthesis characterization and application of advanced Nano Materials-2014" during 17-19 January 2014 in Hindustan college of Science & Technology, Mathura.
16. Participated in a collaborative workshop for undergraduate Physics teachers, "Active learning Integrating Hands-on Experiments and Multimedia Resources", organised by Miranda House from 7-8 October 2013
17. Presented an oral presentation and a poster presentation in IMCS 2012 14th International Meeting on Chemical Sensors (IMCS) held in **Nuremberg, Germany** during May 20 - 23, 2012.
18. Presented an oral presentation on "Enhanced response of SnO₂ based thin film sensors towards methane gas due to the collective efforts of catalytic activity and photo-activation phenomenon" in International Conference on Materials Science and Technology ICMST 2012 held in Kerala during 10-14 June 2012.

19. Oral presentation on “*Low cost computerized laser Raman spectrometer designed for Undergraduate student laboratories*” in IAPT National Student Symposium on Physics during 25-27 February, 2013 in Chandigarh.
20. Poster presentation by students of Innovation Project in 3-day National Conference on "Redefining Science Teaching: Future of Education" during 7-9 March, 2013 at South Campus, University of Delhi and awarded by a paper presentation award.
21. Oral presentation in Sensors Applications Symposium (SAS) held in **Limerick, Ireland** during 21-23 February, 2010.
22. Presented two poster presentations in **MRS Fall 2010 held in Boston, USA** during 30th Nov-3rd Dec 2010.
23. Awarded by best paper presentation in International Conference on Sensing Technology (ICST) 2008 in **Tainan, Taiwan** during Nov 30-Dec 03, 2008, where one oral presentation and one poster presentation was given.
24. Presented a poster presentation in International Conference on Advanced Materials and Applications (ICAMA) in Shivaji University, India during 15-17th Nov 2007.
25. Presented an oral presentation in 2nd ISSS National conference on MEMS in CEERI, Pilani during 16-17th Nov 2007.
26. Presented a poster presentation in National Review and Coordination meeting (NSNT-2007) in Hyderabad during 21-23rd Feb, 2007.
27. Presented an oral presentation in National Seminar on Ferroelectrics & Dielectrics (NSFD XIV) in IIT Kharagpur during 18-21st Dec 2006.

Other Academic Activities/Achievements.

- Convener of two papers, namely Solid state physics and Nanomaterials and applications for revision of syllabus of B.Sc. (Hons) Physics and B.Sc. Physical science (program) under LOCF-CBCS, University of Delhi (2019)
- Worked as a member of Steering Committee for the Undergraduate Course revision in the Department of Physics & Astrophysics University of Delhi.
- Worked as a member of Sub-Committee of Committee of Courses and Studies for Hons, Post-graduate and Research Studies in Physics & Astrophysics for two years.

- Worked as a Resource person in the “Workshop for development of e-Resources in Science for secondary stage” organised by Department of Education in Science and Mathematics, NCERT, NIE, New Delhi held during 30 October to 3 November 2017 and 2 January to 5 January 2018.
- Actively involved in the development of e-content for MOOCs under NIOS and gave four video lectures.
 - <https://www.youtube.com/embed/mGbD4Jpdcuc>
 - https://www.youtube.com/watch?v=RpGw7tYBw_4&t=11s
 - <https://www.youtube.com/watch?v=DNDCO6xWqDA&t=302s>
 - <https://www.youtube.com/watch?v=cr61YXxF96s>
- Worked as content contributor and written Four chapters in Digital Electronics (Paper-8, PHHT-206) as e-lessons for Institute of Life Long Learning (ILLL) virtual learning material, University of Delhi as per B.Sc. Physics (H)-II sem syllabus. ISBN 978-93-85611-19-3
- Worked as content contributor and written a chapter on superconductivity in Solid State Physics (available online) for Institute of Life Long Learning (ILLL) virtual learning material, University of Delhi.
- Worked as Reviewer in International journals including: ACS Applied Materials & Interfaces, Sensors and Actuators B, Materials Science and Engineering B, Proceeding Materials Research Society Symposium.

Research Projects:

Name of Project:	Innovation Project titled “Design and development of a low cost computerized laser Raman spectrometer indigenously for DU student laboratories
Position in Project:	Project Investigator along with Dr. Ajay Arora and Dr. Priti Sehgal.
Period:	One Year
Funding Agency:	Awarded/Funded by University of Delhi
Grant:	Rs. 10,00,000/-

Name of Project:	To design and develop an instrument/device to control emissions of Sox and Nox from motor vehicles
Position in Project:	Project Investigator along with Dr. Neha Sharma, Mr. Anil Sethi and Mr. Himanshu
Period:	One Year
Funding Agency:	Awarded/Funded by University of Delhi
Grant:	Rs. 5,00,000/-