Shaheed Rajguru College of Applied Sciences for Women
University of Delhi
Faculty Profile

Name	**Prof.Sneha Kabra**	
Designation	Professor	
Email	sneha.kabra@rajguru.du.ac.in snehakabra@ieee.org snehakabra1@gmail.com www.linkedin.com/in/prof-dr-sneha-kabra-7a901199	

Degree	**Institution**	**Year**
Ph. D (Electronics)	Department of Electronic Science, University of Delhi, South Campus	2008
M.Sc Electronic Science	Department of Electronic Science, University of Delhi, South Campus	2003
B.Sc (H) Electronics	University of Delhi	2001

Areas of Interest / Specialization

Modelling, simulation and characterization of advanced deep submicron & nanoscale semiconductor devices applicable to bio-sensing, gas sensing, RF circuits, digital circuits and VLSI

Awards and Distinctions

1. *Conferred with **Meritorious teacher Award by Govt of NCT of Delhi under scheme "Award for College Lecturers" in March 2022***
2. ***Best paper award**, IEEE 3rd International Conference on VLSI Systems, Architecture, Technology and Applications (VLSI SATA), 16-17 Dec 2022, Bangalore, for paper "Comparative study of Junctionless and Inverted Mode FinFET for detection of breast cancer cell HS578t at microwave frequency*
3. ***Best paper award**, 6th International Conference on Devices, Circuits and Systems , ICDCS 2022, 21-22 April 2022, Coimbatore, for paper "Detection of poisonous gases using JL FinFET with conducting gate polymer*
4. ***Second best paper award**, 11th International Conference on Microelectronics, Circuits & Systems, Micro 2024, 16-17 May 2024, Delhi Technological University, Delhi for paper "Designing, Optimization and Statistical Analysis of Stack Oxide Junctionless FinFET based Ammonia Gas Sensor*
5. ***Best paper Award**,IEEE International Conference on Radio Frequency Communication and Networks (RFCoN-2025), 19-20 June, 2025, SASTRA Deemed University, Thanjavur, Tamilnadu*

Association with Professional Bodies

1. **Senior membe**r, Institute of Electrical and Electronics Engineers (IEEE), USA
2. **Fellow**, Institute of electronics and telecommunications engineers (IETE), India
3. **Associate Member**, Institute of Physics (IOP), 16 April-31 Dec 2025

Research Projects

Major Research Projects:

1. **Presently working on SERB** (Ministry of Science and Technology, Govt of India) funded project entitled "***Design, virtual fabrication and characterization of floating gate field effect transistor based toxic gas sensor for industrial applications"* Dec 2021-June 2025**

2. Completed SERB (Ministry of Science and Technology, Govt of India) funded project entitled "***Modeling, Simulation and development of AlGaN/GaN HEMT based lactic acid and Uric acid biosensor for clinical research"* June 2017- Sep 2020**

Minor Research Projects:

1. Completed Innovation project **titled "Low cost eco friendly Solar Inverter - A standalone solar power system for households"** sanctioned by Delhi University in October 2015, completed in October 2016. **Grant mobilized: 5 Lakhs**
2. Completed Innovation **Project titled "Development of e-resources on standard procedure of operation and applications of important electronic devices used by undergraduate science students"** sanctioned by Delhi University in November 2013, completed in March2015. **Grant mobilized: 5 Lakhs**
3. "Sensitising Community to Climate Resilience through Flash Mobs by under-graduate students" IEEE region Region 10 Educational activities board **(R10 EAB) project April-Sep2023 Sanction amount USD 220 (IEEE R10 EAB) +USD 220 (IEEE Delhi section**)

Ph.D Supervision

- Currently Supervising two Research Scholars enrolled for Ph.D in Electronics from Department of Electronic Science, University of Delhi South Campus.
- Ph.D Completed (degree Awarded): 03

S.No	Name of Student	Thesis Title	Degree Awarded	University
1.	Praveen Pal	Modeling, Simulation and characterization of AlGaN/GaN HEMT based biosensors	July 2022	Delhi University
2.	Neha Garg	Modeling and Simulation of Multigate Junctionless Transistors for Low Power VLSI Design	April 2023	Delhi University

3.	Himani Dua	Modeling and Simulation of Junctionless FinFET for sensing Applications	Jan 2024	Delhi University

Publications Profile

Publications in International Journals

1. Sneha Kabra, Harsupreet Kaur, Ritesh Gupta, Subhasis Haldar, Mridula Gupta and R.S.Gupta "A Semi Empirical Approach for Submicron GaN MESFET Using an Accurate Velocity Field Relationship for High Power Applications", Microelectronics Journal, pp.620-626, no.7, vol.37, 2006. ISSN: 0026-2692, Impact factor 1.992 (5 year-2018) UGCListed https://doi.org/10.1016/j.mejo.2005.09.018

2. Sneha Kabra, Harsupreet Kaur, Subhasis Haldar, Mridula Gupta and R. S. Gupta "An Analytical Model for GaN MESFET's Using New Velocity-Field Dependence" Physica Status Solidi C, pp. 2350-2355, no.6, vol.3, June 2006.ISSN: 1610-1642 https://doi.org/10.1002/pssc.200565318 Impact factor 1.782

3. Sneha Kabra, Harsupreet Kaur, Subhasis Haldar, Mridula Gupta and R. S. Gupta, "Two Dimensional Subthreshold Analysis of Sub-Micron GaN MESFET" Microelectronics Journal, vol. 38, no. 4-5, pp. 547–555, 2007.ISSN: 0026-2692 UGCListed Impact factor 1.992 UGCListed https://doi.org/10.1016/j.mejo.2007.03.006

4. Sneha Kabra, Harsupreet Kaur, Subhasis Haldar, Mridula Gupta and R. S. Gupta, "A Semi-Empirical Model for Admittance and Scattering Parameters of GaN MESFET for microwave circuit applications" Microwave and optical technology Letters, vol.49, no. 10, pp.2446-2450, 27 July 2007. ISSN: 1098-2760 https://doi.org/10.1002/mop.22744 Impact factor 1.311

5. Sneha Kabra, Harsupreet Kaur, Subhasis Haldar, Mridula Gupta and R. S. Gupta, "Temperature Dependent Analytical Model of sub-micron GaN MESFETs for Microwave Frequency Applications", Solid State Electronics, vol.52, no.1, pp.25-30, 2008. ISSN: 0038-1101 UGCListed Impact factor 1.916 (5 year-2018) https://doi.org/10.1016/j.sse.2007.06.010

6. Harsupreet Kaur, Sneha Kabra, Subhasis Haldar, and R. S. Gupta, "Impact of graded channel (GC) design in fully depleted cylindrical/surrounding gate MOSFET (FD CGT/SGT) for improved short channel immunity and hot carrier reliability" Solid State Electronics, vol. 51, Isuue 3, pp. 398-404, 2007. ISSN: 0038-1101 UGCListed, https://doi.org/10.1016/j.sse.2007.01.025 Impact factor 1.916

7. Harsupreet Kaur, Sneha Kabra, Subhasis Haldar, and R. S. Gupta, "An analytical drain current model for graded channel cylindrical/surrounding gate MOSFET" Microelectronics Journal, vol.38, Issue 3, pp. 352-359, 2007. ISSN: 0026-2692 UGCListed, https://doi.org/10.1016/j.mejo.2007.01.003 Impact factor 1.992

8. Harsupreet Kaur, Sneha Kabra, Subhasis Haldar, and R. S. Gupta, "An Analytical Threshold Voltage Model for Graded Channel Asymmetric Gate Stack (GCASYMGAS) Surrounding Gate MOSFET", Solid State Electronics, vol. 52, Issue 2, pp.305-311, 2008. ISSN: 0038-1101 Impact factor 1.437 UGCListed https://doi.org/10.1016/j.sse.2007.09.006 Impact factor 1.916
9. Harsupreet Kaur, Sneha Kabra, S Haldar, RS Gupta, "Impact of laterally asymmetric channel and gate stack architecture on device performance of surrounding gate MOSFETs", Microwave and Optical Technology Letters, vol52, no.3, pp. 746-750, 2010 ISSN: 1098-2760, https://doi.org/10.1002/mop.25022 Impact factor 1.311

10. Sona P Kumar, Anju Agrawal, Sneha Kabra, Mridula Gupta and R.S.Gupta "An analysis for AlGaN/GaN modulation doped field effect transistor using accurate velocity-field dependence for high power microwave frequency applications" Microelectronics Journal, vol.37, Issue 11, pp. 1339-1346, Nov. 2006. ISSN: 0026-2692 UGCListed https://doi.org/10.1016/j.mejo.2006.07.003 Impact factor 1.992

11. Sona P Kumar, A Agrawal, R Chaujar, Sneha Kabra, M Gupta, and R.S.Gupta Threshold voltage model for small geometry AlGaN/GaN HEMTs based on analytical solution of 3-D Poisson's equation, Microelectronics Journal, Vol38 no.10-11, pp 1013-1020, 2007, ISSN: 0026-2692 UGCListed https://doi.org/10.1016/j.mejo.2007.09.001 Impact factor 1.992

12. Yogesh Pratap, M. Kumar, Sneha Kabra, S. Haldar, R. S. Gupta and Mridula Gupta, (2017). Analytical Modeling of Gate-All-Around Junctionless Transistor based Biosensor for Detection of Neutral Biomolecule Species. Journal of Computational Electronics(first published 4 Aug 2017): 288-296.Vol 17, ISSN:1569-8025, E-ISSN: 1572-8137, Impact factor 2.5 UGCListed https://doi.org/10.1007/s10825-017-1041-4

13. UrvashiSharma, ShabanaUrooj, SnehaKabra "Investigation of InGaAs subcell to InGaP subcell in InGaP/InGaAs/Ge multijunction solar cells with Analytical framework" Materials today: Proceedings, Volume 5, Issue 9, Part 3, 2018, Impact Factor-0.99 ,Pages 18574-18579, https://doi.org/10.1016/j.matpr.2018.06.201, ISSN: 2214-7853

14. Praveen Pal, Yogesh Pratap, Mridula Gupta and Sneha Kabra, "Modeling and simulation of AlGaN/GaN MOS-HEMT for biosensor applications" IEEE Sensors Journal, vol. 19, no. 2, pp. 587-593, Jan. 2019, D.O.I : 10.1109/JSEN.2018.2878243 Impact Factor 4.325 (2019) ISSN 1530-437X

15. Neha Garg, Yogesh Pratap, Mridula Gupta and Sneha Kabra, "Impact of different localized trap charge profiles on the short channel double gate junctionless nanowire transistor based inverter and Ring Oscillator circuit" AEU - International Journal of Electronics and Communications, Volume 108, August 2019, Pages 251-261, ISSN: 1434-8411,Impact Factor: 3.169 https://doi.org/10.1016/j.aeue.2019.06.014

16. Neha Garg, Yogesh Pratap, Mridula Gupta and Sneha Kabra , "Reliability Assessment of GaAs/Al2O3 Junctionless FinFET in the presence of Interfacial layer defects and radiations" IEEE Transactions on Device and Materials Reliability. Volume: 20 , Issue: 2, pp.452-458

June 2020 , Impact Factor: 1.407 Print ISSN: 1530-4388, DOI: 10.1109/TDMR.2020.2991662 Impact factor: 1.886

17. N. Garg, Y. Pratap, M. Gupta, and S. Kabra, "Dielectric Separated Independent Gates Junctionless Transistor (DSIG-JLT) For Highly Scaled Digital Logic Implementation," *IEEE Trans. Nanotechnology*, vol. 20, pp. 262–269, 2021, doi: 10.1109/tnano.2021.3066814. Impact Factor: 2.967 DOP: 17 March 2021, Print ISSN: 1536-125X, Electronic ISSN: 1941-0085

18. H. D. Sehgal, Y. Pratap, M. Gupta and S. Kabra, "Performance Analysis and Optimization of Under-Gate Dielectric Modulated Junctionless FinFET Biosensor," in IEEE Sensors Journal, (Impact factor 4.325) vol. 21, no. 17, pp. 18897-18904, 1 Sept.1, 2021, doi: 10.1109/JSEN.2021.3090263 ISSN 1530-437X

19. Praveen Pal, Yogesh Pratap, Mridula Gupta, and Sneha Kabra. "Analytical Modeling and Simulation of AlGaN/GaN MOS-HEMT for High Sensitive pH Sensor." *IEEE Sensors Journal*. (Impact factor 4.325) vol. 21, no. 12, pp. 12998-13005, June. 15, 2021, (d.o.i:10.1109/JSEN.2021.3069243).ISSN 1530-437X

20. H. D. Sehgal, Y. Pratap, M. Gupta and S. Kabra, "Performance Investigation of novel Pt/Pd-SiO2 Junctionless FinFET as a high sensitive hydrogen gas sensor for Industrial applications," in IEEE Sensors Journal, (Impact factor 4.325) Volume: 21, Issue: 12, June15 pp.13356 - 13363 doi: 10.1109/JSEN.2021.3067801. Impact Factor 3.076, Print ISSN: 1530-437X Electronic ISSN: 1558-1748 DOP 22 March 2021

21. Praveen Pal, Yogesh Pratap, Mridula Gupta, and Sneha Kabra, "Open gate AlGaN/GaN HEMT biosensor: Sensitivity analysis and optimization" Superlattices and Microstructures, Vol 156, pp106968, 2021(d.oi: 10.1016/j.spmi.2021.106968). (I.F = 3.118) ISSN: 0749-6036

22. H. D. Sehgal, Y. Pratap and S. Kabra, "Detection of Breast Cancer Cell-MDA-MB-231 by Measuring Conductivity of Schottky Source/Drain GaN FinFET," in IEEE Sensors Journal, (Impact factor 4.325) vol. 22, Issue 6, pp. 6108-6115, March15, 2022, doi: 10.1109/JSEN.2022.3148117. ISSN: 1530-437X Electronic ISSN: 1558-1748

23. Praveen Pal, YogeshPratap and Sneha Kabra, "Small Signal Analysis of Double Channel AlGaN/GaN HEMT and MOSHEMT With Undoped Barrier for Microwave Applications", Journal of Electronic Materials. (I.F = 2.04) Vol 51, Issue 7, pages4095–4103 (2022) DOP 15 May 2022, pp. 4095–4103 https://doi.org/10.1007/s11664-022-09652-1, ISSN: 0361-5235

24. Praveen Pal, Yogesh Pratap and Sneha Kabra, "T-ZnO/AlGaN/GaN HEMT Uric Acid Sensor- Sensitivity Analysis and Effect of Surface Wettability for Improved Performance", IEEE Sensors Journal. (I.F = 4.325) Volume: 22, Issue: 12, June15, 2022, pp.11819-11826, DOP: 4 May 2022 Print ISSN: 1530-437X , Electronic ISSN: 1558-1748 doi 10.1109/JSEN.2022.3172793

25. H. D. Sehgal, Y. Pratap and S. Kabra, "Designing and Reliability Analysis of Radiation Hardened Stacked Gate Junctionless FinFET and CMOS Inverter," in IEEE Transactions on Device and Materials Reliability, vol. 23, no. 2, pp. 249-256, June 2023, doi: 10.1109/TDMR.2023.3255407

26. N. Garg, Y. Pratap, and S. Kabra "Efficient implementation of a DSIG-JLT-based multiplexer and demultiplexer using different logic styles at 20-nm technology", Journal of Computational Electronics, Volume 22, pages 1626–1635, Oct 2023.https://doi.org/10.1007/s10825-023-02099-5

27. Pal, P., Pratap, Y., & Kabra, S. (2024) "TCAD Simulation of Novel Recess Gate Common Drain Dual Channel AlGaN/GaN HEMT for Small Signal Performance" IETE Technical Review,Vol.41, Issuue 5, pp.621-631. https://doi.org/10.1080/02564602.2024.2341086, April 2024

28. Babbar, D., Garg, N. & Kabra, S. Comparative Simulation Study of InGaN and Silicon Channel Stack Oxide Twin Gate Field Effect Transistor Based Ammonia Gas Sensor. *Sens Imaging* 25, 20 (2024). https://doi.org/10.1007/s11220-024-00469-2

29. Babbar, D., Garg, N. & Kabra, S "Capacitance Modeling, Simulation and RF Characterization of Horizontal Floating Gate Field Effect Transistor (H-FGFET) for Gas Sensing Application" Engineering Research. Express Vol.6, no.2, pp 025351, June 2024, https://doi.org/ 10.1088/2631-8695/ad51d2

30. Babbar, D., Garg, N. & Kabra, S. Stability analysis and optimization of stack oxide junctionless finFET based ammonia gas sensor. *Microsyst Technol* (2025). https://doi.org/10.1007/s00542-025-05849-6

31. Garg, N., Pratap, Y. & Kabra, S. Investigation of stability parameters of a gate-stack junctionless double-gate transistor (GS-JLDGT)-based 6T and 3T SRAM in the presence of traps. *J Comput Electron* 24, 52 (2025). https://doi.org/10.1007/s10825-025-02285-7

32. Babbar, D., Garg, N. & Kabra, S. Designing and Reliability Assessment of Stack Oxide Double Gate Junctionless Transistor Based Ammonia Gas Sensor. *Sens Imaging* 26, 24 (2025). https://doi.org/10.1007/s11220-025-00554-0

33. Sehgal, H.D., Pratap, Y. & Kabra, S. Modeling and virtual fabrication of conducting polymer gate Junctionless FinFET based poisonous gas detector. Microsyst Technol (2025). https://doi.org/10.1007/s00542-025-05875-4

34. Arzoo Shakya, Praveen Pal, Sneha Kabra "Performance Enhancement of Asymmetric gate Graded-AlGaN/GaN HEMT on β-Ga2O3 substrate for RF applications", Materials Science & Engineering B, Volume 321, Nov 2025, 118514, Impact factor 3.9, ISSN 1873-4944 https://doi.org/10.1016/j.mseb.2025.118514

Book Chapters

1. Sneha Kabra and Mridula Gupta (2019) Chapter 9, "Current Collapse in AlGaN/GaN HEMTs,": D. Nirmal, J. Ajayan, "Handbook for III-V High Electron Mobility Transistor Technologies". First Edition, Taylor & Francis Group, CRC Press. Published: 14 May 2019 DOI https://doi.org/10.1201/9780429460043 eBook ISBN9780429460043. ebook ISBN 9780429460043

2. Neha Garg, Yogesh Pratap, Mridula Gupta, Sneha Kabra, Impact of Trap Charges and High Temperature on Reliability of GaAs/Al2O3-Based Junctionless FinFET,pp 434-440 , Computers and Devices for Communication, Proceedings of CODEC 2019 Editors Nikhil Ranjan Das Santu Sarkar, Part of the Lecture Notes in Networks and Systems book series (LNNS), volume 147, Springer, ISBN: 978-981-15-8366-7, 4 Feb 2021

3. Sneha Kabra and Mridula Gupta (2022) Chapter 2, Breakdown mechanisms and scaling technologies of AlGaN/GaN HEMTs, pp-25-38, HEMT technology and applications,Published by Springer Tracts in Electrical and Electronics Engineering (STEEE), Springer Singapore, Edited by Trupti Ranjan Lenka and Hieu Pham Trung Nguyen doi https://doi.org/10.1007/978-981-19-2165-0 print ISBN 978-981-19-2164-3 eBook ISBN 978-981-19-2165-0, ISSN 2731-4200 ISSN 2731-4219 (electronic), https://doi.org/10.1007/978-981-19-2165-0 Hardcover ISBN978-981-19-2164-3Published: 24 June 2022 Softcover ISBN978-981-19-2167-4 Published: 25 June 2023

4. Sneha Kabra and Neha Garg, "Modelling of Kink Effects and Current Collapse in GaN HEMTS" J. Ajayan and D. Nirmal (Eds): MODELING OF ALGAN/GAN HIGH ELECTRON MOBILITY TRANSISTORS, eBook ISBN 978-981-97-7506-4 Print ISBN 978-981-97-7505-7, Dec 2024