



ZAKIR HUSAIN DELHI COLLEGE
(University of Delhi)

Faculty Details

(Please Fill the form and Email it to website@zh.du.ac.in)

Dr.	Lokesh	Rana	Photograph
Designation	Assistant Professor		
Address	267 Siraspur Delhi-42		
Phone Number	Office		
	Residence		
	Mobile	9968218246	
Email Id	lokeshrana123@gmail.com		
Web Page			
Educational Qualification			
Degree	Institution	Year	
B.Sc.(H)Physics	University of Delhi	2010	
M.Sc.(H)Physics	University of Delhi	2012	
Ph.D., Physics	University of Delhi	2019	
Career Profile			
22 January 2018 to 30 November 2018 as Assistant professor at Deshbandhu college, University of Delhi.			
From 4 September 2019 till present as Assistant Professor at Zakir Husain College, University of Delhi			
Administrative Assignments			
Areas of Interest / Specialization			
Simulation			

Virtuosity in simulating various micro electro mechanical systems (MEMS) based devices using COMSOL and Intellisuite.

Thin Film Deposition

Specialization in thin film deposition using physical vapor deposition techniques like magnetron sputtering, RF diode sputtering, DC sputtering, thermal evaporation, pulsed laser deposition and thermal evaporation, Plasma Enhanced Chemical Vapor Deposition and chemical solution deposition for various applications.

Material Characterization

Handling and analysis of characterization techniques like Vector Network Analyzer, UV-Visible Spectrophotometer, Fourier Transform Infra-red Spectroscopy, Semiconductor Characterization Unit (Keithley 4200) and Dielectric Measurements.

Device Fabrication

Expertize in Photolithography for device fabrication, Wet as well as Dry Etching of Silicon wafers for micro electro mechanical systems, Dicing and wire bonding for packaging of the devices.

Microfluidics

Preparation of Poly Di Methyl Siloxane (PDMS) microchannels for biosensing applications.

Subjects Taught

Digital Analog and Instrumentation, Quantum Mechanics, Basic Instrumentation Skills, Applied Optics

Research Guidance

Publications Profile

Papers published in international Journal

1. Fabrication of Surface Acoustic wave resonator as Acousto-optic Modulator, M Bharati, **L Rana**, R Gupta, A Sharma, PK Jha, M Tomar, Optical Materials 142, 114088 (2023)
2. Simulation and Fabrication of Higher-Mode Lamb Wave Acoustic Devices for Sensing Applications, M Bharati, **L Rana**, R Gupta, A Sharma, PK Jha, M Tomar, physica status solidi (a) 220 (14), 2200760 (2023)
3. Lamb Wave Resonator for UV Photodetection and Impact of Induced Piezopotential on Schottky Barrier Height towards Enhanced Sensitivity, M Bharati, **L Rana**, K Jindal, R Gupta, A Sharma, M Tomar, IEEE Sensors Journal (2023)

4. Realization of a DNA biosensor using inverted Lamb wave MEMS resonator based on ZnO/SiO₂/Si/ZnO membrane, M Bharati, **L Rana***, R Gupta, A Sharma, PK Jha, M Tomar, *Analytica Chimica Acta* 1249, 340929 (2023), * Corresponding Author
5. Solar tree—a sustainable energy approach for farmers, M Kumar, **L Rana**, A Pattnaik, *J. Univ. Shanghai Sci. Technol* 23 (07), 410-419 (2021)
6. Artificial Intelligence: A tool for COVID-19 surface detection, M Kumar, L Rana, *Artificial Intelligence* 6 (7), 60-63 (2020)
7. Flexible solar power tree—A Concept, M Kumar, JP Kesari, **L Rana**, *J Eng Appl Sci* 5, 217-21 (2020)
8. Fabrication of micro-cantilever and its theoretical validation for energy harvesting applications, R Gupta, **L Rana**, A Sharma, V Gupta, M Tomar, *Microsystem Technologies* 25, 4249-4256 (2019)
9. Process Optimization and Thin Film Characterization of ZnO Layer for Sensor Applications, K Singh, AV Nirmal, **L Rana**, M Tomar, V Gupta, *International Journal on Electrical Engineering & Informatics* 11 (2) (2019)
10. Fabrication of ZnO/Si lamb wave acoustic devices, **L Rana**, R Gupta, A Sharma, M Tomar, V Gupta, *Ferroelectrics* 535 (1), 41-46 (2018)
11. Fabrication of surface acoustic wave based wireless NO₂ gas sensor, **L Rana**, R Gupta, R Kshetrimayum, M Tomar, V Gupta, *Surface and Coatings Technology* 343, 89-92 (2018)
12. Highly sensitive Love wave acoustic biosensor for uric acid, **L Rana**, R Gupta, M Tomar, V Gupta, *Sensors and Actuators B: Chemical* 261, 169-177 (2018)
13. Characterization of lead zirconium titanate thin films based multifunctional energy harvesters, R Gupta, **L Rana**, M Tomar, V Gupta, *Thin Solid Films* 652, 39-42 (2018)
14. Development of MEMS-based lamb wave acoustic devices, **L Rana**, R Gupta, A Sharma, M Tomar, V Gupta, *IEEE Transactions on Electron Devices* 65 (4), 1523-1528 (2018)
15. ZnO/ST-Quartz SAW resonator: An efficient NO₂ gas sensor, **L Rana**, R Gupta, M Tomar, V Gupta, *Sensors and Actuators B: Chemical* 252, 840-845 (2017)
16. Coplanar waveguide resonator using PLZT thin film, R Gupta, **L Rana**, A Sharma, AP Freundorfer, M Sayer, M Tomar, V Gupta, *Ferroelectrics* 515 (1), 8-12 (2017)

Patents

S.N.	Title	Inventors	Patent Country	Application No.	Status
1	Lamb Wave Resonator Device For Pressure Sensing	Monika Tomar, Lokesh Rana , Reema Gupta, Anjali Sharma, Pradip K. Jha, Archibald Theodore Nimal, Upendra Mittal, Manisha Bharati	India	202311002112	Pending
2	Fabrication Of Lamb Wave Acoustic Device Using Potassium Sodium Niobate (KNN) Thin Film	Monika Tomar, Lokesh Rana , Reema Gupta, Anjali Sharma, Shweta Sharma, Archibald Theodore Nimal, Upendra Mittal, Manisha Bharati	India	202211070947	Pending
3	KNN based Pressure Sensor	Monika Tomar, Lokesh Rana , Reema Gupta, Anjali Sharma, Shweta Sharma	India	202311023209	Pending
4	Fabrication of Niobium Doped Lead Zirconium Titanate Thin Film In Lamb Wave Acoustic Device	Monika Tomar, Lokesh Rana , Vandana , Anjali Sharma, Reema Gupta, Manisha Bharati , Upendra Mittal, Archibald Theodore Nimal, Ajit Raymond JAMES	India	202311036612	Pending

Papers in Proceedings

1. Theoretical simulations of SAW based sensor on PVDF, M Bharati, **L Rana**, M Tomar, V Gupta, Materials Today: Proceedings 47, 1538-1541 (2021)
2. High frequency coplanar microwave resonator using ferroelectric thin film for wireless communication applications, R Gupta, **L Rana**, A Sharma, AP Freundorfer, M Sayer, M Tomar, V Gupta, Materials Today: Proceedings 5 (7), 15395-15398
3. Novel designs of SAW devices for highly sensitive chemical sensors, **L Rana**, R Gupta, A Sharma, V Gupta, M Tomar, Materials Today: Proceedings 5 (7), 15371-15375
4. SAW field and acousto-optical interaction in ZnO/AlN/sapphire structure, **L Rana**, V Gupta, ND Soni, M Tomar, 2016 Joint IEEE International Symposium on the Applications of Ferroelectrics, European Conference on Application of Polar Dielectrics, and Piezoelectric Force Microscopy Workshop (ISAF/ECAPD/PFM)

Book Chapters

1. Innovative Design for Efficient Solar Cell, M Kumar, **L Rana**, A Pattnaik, Advanced Functional Materials and Devices: Select Proceedings of AFMD 2021 14, 271-281 (2022), book chapter
2. Optimization of Mask-Less Laser Lithography, M Bharati, **L Rana**, R Gupta, M Tomar, V Gupta, Advanced Functional Materials and Devices: Select Proceedings of AFMD 2021, 14, 263-269 (2021), book chapter

Conference Organization/ Presentations (in the last five years)

1. “Wireless detection of ammonia using Surface Acoustic Wave resonator” **Lokesh Rana**, Reema Gupta, Monika Tomar, Vinay Gupta, delivered oral presentation at 13th Western Pacific Acoustics Conference (WESPAC 2018), held during 11-15 November, 2018 at CSIR-National Physical Laboratory, New Delhi, India
2. “*Development of Rayleigh wave, Love wave and Lamb wave based acoustic devices for gas/bio sensors*” presented poster at 64th DAE Solid State Physics Symposium held during 18-22, December 2019 held at IIT Jodhpur
3. “Studies on SAW resonators based on ST-Quartz crystal in International” Conference on “Advanced Functional Materials and Devices” (AFMD-2021) organised by Department of Physics & IQAC, ARSD College, University of Delhi during 3-5th March 2021 via online mode (**best oral presentation**).
4. FABRICATION OF SAW OSCILLATOR FOR WIRELESS GAS SENSING at International Conference on Nanotechnology: Opportunities & Challenges (ICNOC-2022) organized by Department of Applied Sciences & Humanities, Faculty of Engineering & Technology, Jamia Millia November 28-30, 2022.

Research Projects (Major Grants/Research Collaboration)

Awards and Distinctions

- UGC-LS(NET) DECEMBER-2011 qualified.
- UGC-JRF(NET) DECEMBER-2012 qualified with **AIR-25**
- **Gold Prize** in photo competition organized by IEEE-UFFC society, 2016 Joint IEEE International Symposium on the Applications of Ferroelectrics, European Conference on Application of Polar Dielectrics, and Piezoelectric Force Microscopy Workshop (ISAF/ECAPD/PFM), Darmstadt, Germany.
 - Link: <https://ieee-uffc.org/news/ferroelectrics-news/student-activities-at-isafecapdpm-2016/>
- Best Poster award for paper “Fabrication of Lithium niobate SAW resonators for enhanced sensitivity”, at 10th National Conference on Solid State Chemistry and Allied Areas from 1st to 3rd July 2017, held at Department of Applied Physics Delhi Technological University.

Association With Professional Bodies
Other Activities