

## Name of the faculty



### Dr. Monika

Assistant Professor,  
Department of Physics,  
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## Areas of Interest

- Fabrication and electrical characterization of 2D materials and their heterojunctions based semiconductor devices
- Nanoscale synthesis and imaging of nanomaterials
- Power generation via harnessing renewable resources using low dimensional quantum materials

## Educational Qualifications

Degree	College/ University	Year of Passing	Division (%)
B.Sc (Hons.) Physics	Miranda House college (University of Delhi)	2011	First Division (73.4%)
M.Sc Physics	Miranda House college (University of Delhi)	2013	First Division (74.1%)
Ph. D	Indian Institute of Technology Delhi	2020	Successfully completed

## Professional Experience

Designation	Name of Organization	Period		Topic of Research
		From	To	
Assistant Professor	MCM DAV College for Women, Chandigarh	24 <sup>th</sup> June, 2024	Till date	
Research Associate-1	INST Mohali	29 <sup>th</sup> January, 2024	21 <sup>st</sup> June, 2024	Energy storage applications
National Post-doctoral fellowship	IISER Mohali	11 <sup>th</sup> January 2021	10 <sup>th</sup> January 2023	Van der Waals heterostructures of layered quantum materials for thermoelectric applications
Institute post-doctoral fellow	IISER Mohali	8 <sup>th</sup> June 2020	10 <sup>th</sup> January 2021	Atomic force microscopy on quantum materials
Project scientist	Nanoscale research facility, IIT Delhi	2 <sup>nd</sup> September, 2019	1 <sup>st</sup> March, 2020	E-beam lithography for UV photodetector fabrication

## Research Publications

	Authors	Title	Journal	Volume, issue no., pages	Year
1.	Monika Moun, Aditya Singh, and Rajendra Singh	Study of Electrical Behavior of Metal-Semiconductor Contacts on Exfoliated MoS <sub>2</sub> Flakes	Physica Status Solidi (a)	215, 1800188	2018
2.	Monika Moun, Mukesh Kumar, Manjari Garg, Ravi Pathak and Rajendra Singh	Understanding of MoS <sub>2</sub> /GaN Heterojunction Diode and its Photodetection Properties	Scientific Reports	8, 11799	2018
3.	Monika Moun and Rajendra Singh	Barrier Inhomogeneity in Microscale Pt/MoS <sub>2</sub> Schottky Barrier Diode	Semiconductor Science and Technology	33, 125001	2018
4.	Monika Moun, Aditya Singh, Bhera Ram Tak and Rajendra Singh	Study of Photoresponse Behavior of High Barrier Pd/MoS <sub>2</sub> /Pd Photodetector	Journal of physics D	52, 325102	2019
5.	Aditya Singh, Monika Moun and Rajendra Singh	Effect of Different Precursors on CVD Growth of Molybdenum Disulphide	Journal of alloys and compounds	782, 772-779	2019
6.	Sahin Sorifi, Monika Moun, Shuchi Kaushik, Rajendra Singh	High-temperature performance of a GaSe nanosheet-based broadband photodetector	ACS Applied Electronic Materials,	2, 3, 670-676	2020
7.	Monika Moun and Rajendra Singh	Exploring conduction mechanism and photoresponse in P-GaN/n-MoS <sub>2</sub> heterojunction diode	Journal of Applied physics	127, 13, 135702	2020
8.	Aditya Singh, Monika Moun, Madan Sharma, A. Berman, A. K. Kapoor and Rajendra Singh	NaCl- assisted substrate dependent 2D planar nucleated growth of MoS <sub>2</sub>	Applied surface science	538, 148201	2021
9.	Monika Moun and Rajendra Singh	Metal-semiconductor interface engineering in layered 2D materials for device applications	Bulletin of Materials Science	44, 3, 1-10	2021
10.	Monika Moun, Anshu Sirohi and Goutam Sheet	Universality of interfacial superconductivity in heavily doped silicon	ACS Applied Electronic Materials	3, 4, 1594-1600	2021
11.	Monika Moun, Aastha vasdev, Rajashekhar Pujar, K. Priya Madhuri, U. Mogera, Neena S. John, G. U. Kulkarni and Goutam Sheet	Enhanced electrical transport through wrinkles in turbostratic graphene films	Applied Physics Letters	119, 033102	2021
12.	Kalipada Koner, Shayan Karak,	Porous covalent organic nanotubes and their	Nature Chemistry	14, 507-514	2022

	Sharath Kandambeth, Suvendu Karak, Neethu Thomas, Luigi Leanza, Claudio Perego, Luca Pesce, Riccardo Capelli, Monika Moun, Monika Bhakar, Thalasseril G. Ajithkumar, Giovanni M. Pavan and Rahul Banerjee	assembly in loops and toroids			
13.	Monika Moun and Goutam Sheet	Superconductivity in silicon	Superconductor Science and technology	35, 083001	2022
14.	Subhabrata Das, Seema Rani, Naveen Kumar, Shumile Ahmed Siddiqui, Mansi Pahuja, Mohd Afshan, Nikita Chaudhury, Daya Rani, Chandan Bera, Kaushik Ghosh	Self-Powered Cobalt Nanocluster Decorated Flexible Graphene Based Tribo-Sensors for Respiratory Diagnosis of Critical Asthma Patient	Chemical Engineering Journal	492, 152319	2024

### Professional Recognition/ Award

National Eligibility Test (NET) – UGC **JRF** December **2013** – All India rank **37**

Graduate Aptitude Test Engineering (**GATE**) **2014** Qualified with All India Rank **80**

Joint Entrance Screening Test (**JEST**) **2014** Qualified with All India Rank **303**

S. No.	Name of Award	Awarding Agency	Year
1.	<b>Best Poster Award</b>	ISSMD - Jadavpur University, Kolkata	2017
2.	<b>Best Poster Award</b>	ICMAT - Singapore	2017
3.	<b>Best Poster Award</b>	ICASMD - IICT, Hyderabad	2018
4.	<b>National Postdoctoral Fellowship</b>	SERB	2020

### Paper presentation in conferences:

1. *Electrical Characterization of Ni/n-MoS<sub>2</sub> Schottky Diode Fabricated using E-Beam Lithography*, **Monika**, M. Garg and R. Singh, Conference on Emerging Materials (CEMAT), 18-19<sup>th</sup> July, Indian Institute of Science Bangalore, India (2016). (**Poster**)

2. *Study of High Photoresponsivity in MoS<sub>2</sub>/GaN Heterojunction*, **Monika**, M. Kumar, C.S. Pathak, Manjari Garg, S. Nagarajan and R. Singh, Fourth International Symposium on Semiconductor Materials and Devices (ISSMD-4), 8-10<sup>th</sup> march, Jadavpur University Kolkata, India (2017). (**Best Poster award**)

3. *Power Dependent Photoresponse in MoS<sub>2</sub>/GaN Heterojunction*, **Monika**, M. Kumar, Manjari Garg, S. Nagarajan and R. Singh, Nano India 2017 Conference, 15-16<sup>th</sup> march, Indian Institute of Technology Delhi, New Delhi, India (2017). **(Poster)**

4. *Electrical Studies on MoS<sub>2</sub> Schottky Diode with Asymmetric Metal Contacts Fabricated using Electron Beam Lithography*, **Monika**, C.S. Pathak, Manjari Garg and R. Singh, International Conference on Materials for Advanced Technologies (ICMAT 2017), 18-23 june, Singapore (2017). **(Best Poster Award)**

5. *Fabrication of MoS<sub>2</sub>/GaN Heterojunction Diode and its KPFM investigation*, **Monika**, Ravi Pathak and R. Singh, International Workshop on the Physics of Semiconductor Devices (IWPSD), 11-15 December, Indian Institute of Technology Delhi, New Delhi, India (2017). **(Poster)**

6. *Nanoscale Barrier Inhomogeneity in MoS<sub>2</sub> using Conducting Atomic Force Microscopy*, **Monika**, Ravi Pathak and R. Singh, International Conference on Advanced Semiconductor Materials and Devices (ICASMD), 8-10<sup>th</sup> march, IICT Hyderabad, India (2018). **(Best Poster Award)**

7. *Photodetection Study in Bilayer MoS<sub>2</sub> using Pd Schottky Contact*, **Monika Moun**, Aditya Singh, B.R. Tak, and Rajendra Singh, 4th International Conference on two-dimensional materials and technologies (ICON-2DMAT), 10-13<sup>th</sup> December, Melbourne convention and exhibition centre, Melbourne, Australia (2018). (Poster)

8. *Fabrication of MoS<sub>2</sub>/GaN heterojunction and its photoresponse investigation*, **Monika Moun** and Rajendra Singh, EMRS-2019 Spring meeting, 27-31<sup>st</sup> May, Acropolis Congress Centre, Nice, France (2019). (Poster)

9. *Electrical Characterization of 2D/3D Heterojunctions Based on Gallium Nitride and Molybdenum Disulfide*, **Monika Moun** and Rajendra Singh, Symposium on wide bandgap semiconductors, 15-16<sup>th</sup> March, NIT Kurukshetra, Haryana, India (2019). (Oral presentation)

10. *Growth of High-Quality Molybdenum Disulfide and its Layer Dependent Characterization*, Aditya Singh, **Monika**, Ravi Pathak and R. Singh, International Conference on Advanced Semiconductor Materials and Devices (ICASMD), 8-10<sup>th</sup> March, Indian Institute of Chemical Technology, Hyderabad (2018). (Poster)

11. *Chemical Vapour Deposition growth of Molybdenum Disulfide using different precursors*, Aditya Singh, **Monika**, Ravi Pathak and R. Singh, International Symposium on Eco-materials Processing and Design (ISEPD), 19-24<sup>th</sup> February, Hotel Marriott, Jaipur (2018). (Poster)

12. *Effect of gamma irradiation on CVD MoS<sub>2</sub>*, Aditya Singh, **Monika Moun** and Rajendra Singh, **EMRS-2019 Spring meeting**, 27-31<sup>st</sup> May, Acropolis Congress Centre, Nice, France (2019). (Poster)

## Participation in workshops

1. Participation in Workshop on Nanolithography and Nanofabrication organized by IIT Delhi and RAITH GmbH, Germany, October 17, 2015.
2. Participation in India International Science Festival, 4-8<sup>th</sup> December, 2015.
3. Participation in Open house organized by IIT Delhi, 23<sup>rd</sup> April, 2016
4. Served as a student coordinator in Open house organized by IIT Delhi, 20<sup>th</sup> April, 2019