

# Shonal Chouksey

Assistant Professor (Grade-II) in the School of Electronics at IIIT, Una  
(August 2023 - Present)

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## AREAS OF INTEREST

- Nano-electronics and VLSI.
- Opto-electronics.
- Physics of semiconductor devices.
- Fabrication and characterization of nano-scale devices.

## EDUCATIONAL BACKGROUND

- **Ph.D. (2014–2021) Indian Institute of Technology Bombay, Mumbai**
  - Specialization: Microelectronics and VLSI (CPI - 9.36/10).
  - Thesis title: Investigation of Size-Dependent Ultra-fast Processes in GaN based Structures.
- **M. Tech. (2010–2012) Shri Govindram Seksaria Institute of Technology and Science, Indore**
  - Specialization: (Optoelectronics) Optical Communication (CPI - 8.05/10 Hons.).
- **B. E. (2004–2008) Jai Narain College of Technology, Bhopal**
  - Specialization: Electronics and Communication Engineering (Aggregate: 73.66%).

## AWARDS/FELLOWSHIPS

- Recipient of the National Post-Doctoral Fellowship (NPDF) by Science and Engineering Research Board (SERB), Government of India (File Number: PDF/2022/001077 dated November 01, 2022). (Not availed)
- Awarded with the International Travel Support (ITS) grant by Science and Engineering Research Board (SERB), Government of India (File Number: ITS/2019/001987 dated May 31, 2019). (Not availed)

## RESEARCH EXPERIENCE (INDUSTRIAL)

- Research Scientist at R & D division, Applied Materials, Mumbai (September 2021 - April 2022)
- Research Intern at R & D division, Applied Materials, Mumbai (May 2021 - July 2021)

## US PATENT APPLICATIONS

1. Geetika Bajaj, Shonal Chouksey, Amit Kumar Roy, Darshan Thakare, Seshadri Ganguly, Gopi Chandran Ramachandran, Srinivas Gandikota, Jayeeta Sen “ATOMIC LAYER DEPOSITION OF HIGH DIELECTRIC CONSTANT MATERIALS” US Patent Application No. US20230420486A1 filed on June 12, 2023.
2. Geetika Bajaj, Amit Kumar Roy, Shonal Chouksey, Seshadri Ganguly, Gopi Chandran Ramachandran, Srinivas Gandikota “ATOMIC LAYER DEPOSITION USING NOVEL OXYGEN-CONTAINING PRECURSORS” US Patent Application No. US20230416915A1 filed on June 12, 2023.

## EXPERT TALKS

Delivered an expert talk titled “From Sand to Circuits” on March 18, 2024 at the Hands-on Workshop on VLSI Circuits and Systems using Xilinx and Cadence Tools during March 16-22, 2024 organised by IIIT Una, Himachal Pradesh.

## TECHNICAL SKILLS (With hands-on experience)

- **Semiconductor Device Fabrication Tools:** Atomic Layer Deposition, Electron Beam Lithography, Photolithography, Inductive Coupled Plasma Reactive Ion Etching, Rapid Thermal Processing, Thermal Evaporator, Wet Chemistry, Spin Coating, Glove-box.
- **Physical Characterization Tools:** Scanning Electron Microscopy, Atomic Force Microscopy, X-ray Photoemission Spectroscopy, X-ray Diffraction, Spectroscopic Ellipsometry.
- **Optical Characterization Tools:** Photo-luminescence Spectroscopy, Transient Absorption Spectroscopy, UV-Vis Absorption Spectroscopy.
- **Electrical Characterization Tools:** B 1500A Semiconductor Device Parameter Analyzer, 6221 AC and DC Current Source, Coherent Probe Station, Agilent Digital Storage Oscilloscope.
- **Simulation Tools:** TCAD, COMSOL, APSYS, ANSYS.

## PUBLICATIONS

Journals (Total Nos. 14)

1. **S. Chouksey**, S. Sankaranarayanan, V. Pendem, P. K. Saha, S. Ganguly, and D. Saha “Strong Size Dependency on the Carrier and Photon Dynamics in InGaN/GaN Single Nanowalls Determined Using Photoluminescence and Ultrafast Transient Absorption Spectroscopy” *Nano Lett.* 17 (8), 2017.

2. **S. Chouksey**, P. Saha, V. Pendem, T. Aggarwal, A. Udai, S. Ganguly, and D. Saha “Femto-second transient absorption spectroscopy for probing near-surface carrier-photon dynamics in GaN” *Appl. Surf. Sci.* 518 (146225), 2020.
3. **S. Chouksey**, S. Sreenadh, S. Ganguly, and D. Saha “Determination of Size Dependent Carrier Capture in InGaN/GaN Quantum Nanowires by Femto-second Transient Absorption Spectroscopy: Effect of Optical Phonon, Electron-Electron Scattering and Diffusion” *Nanotechnology* 30 (19), 2019.
4. **S. Chouksey** and D. Saha “Implementation of the Taguchi method to optimize p-ohmic contact for InGaN/GaN LEDs” *Microelectron. Eng.* 218 (111135), 2019.
5. S. Sankaranarayanan, **S. Chouksey**, P. Saha, V. Pendem, A. Udai, T. Aggarwal, S. Ganguly, and D. Saha “Determination of strain relaxation in InGaN/GaN nanowalls from quantum confinement and exciton binding energy dependent photoluminescence peak” *Sci. Rep.* 8 (1), 2018.
6. P. Saha, **S. Chouksey**, S. Ganguly, and D. Saha “Temperature independent optical transition with sub-nanometer linewidth in thermally diffused Gd in GaN” *Opt. Lett.* 42 (11), 2017.
7. P. Chaturvedi, **S. Chouksey**, D. Banerjee, S. Ganguly, and D. Saha “Carrier and photon dynamics in a topological insulator Bi<sub>2</sub>Te<sub>3</sub>/GaN type II staggered heterostructure” *Appl. Phys. Lett.* 107 (19), 2015.
8. Om P. Choudhary, **S. Chouksey**, P. K. Sen, P. Sen, J. Solanki, J. T. Andrews “MOEMS optical delay line for optical coherence tomography” *J. Phys.: Conf. Ser.* 534 (1), 2014.
9. P. Saha, V. Pendem, **S. Chouksey**, A. Udai, T. Aggarwal, S. Ganguly, and D. Saha “Enhanced luminescence from InGaN/GaN nano-disk in a wire array caused by surface potential modulation during wet treatment” *Nanotechnology* 30 (10), 2019.
10. V. Pendem, P. Saha, **S. Chouksey**, S. Ganguly, and D. Saha “Nanosecond pulsed-bias-actuated and exciton-dynamics-induced chirp in InGaN/GaN LEDs towards realizing electrically-tunable broadband light emitters” *J. Lumin.* 229 (117703), 2021.
11. J. T. Andrews, J. Solanki, Om P. Choudhary, **S. Chouksey**, N. Malvia, P. Chaturvedi, P. Sen “Towards a wearable non-invasive blood glucose monitoring device” *J. Phys.: Conf. Ser.* 365 (1), 2012.
12. T. Aggarwal, A. Udai, D. Banerjee, V. Pendem, **S. Chouksey**, P. Saha, S. Sankaranarayanan, S. Ganguly, P. Bhattacharya, and D. Saha “Investigation of Ultrafast Carrier Dynamics in InGaN/GaN-Based Nanostructures Using Femtosecond Pump-Probe Absorption Spectroscopy” *Phys. Status Solidi B* 258 (2100223), 2021.
13. T. Aggarwal, V. Pendem, A. Udai, P. Saha, **S. Chouksey**, S. Ganguly, and D. Saha “Impact of DBR on Carrier and Photon Dynamics in GaN-based Surface Emitting Diodes Manifested by Ultrafast Transient Absorption Spectroscopy” *Jpn. J. Appl. Phys.* 58, (SCCC15) 2019.
14. D. Banerjee, K. Takhar, S. Sankaranarayanan, P. Upadhyay, R. Ruia, **S. Chouksey**, D. Khachariya, S. Ganguly, and D. Saha “Electrically injected ultra-low threshold room temperature InGaN/GaN-based lateral triangular nanowire laser” *Appl. Phys. Lett.* 107 (10), 2015.

### Conferences (Total Nos. 2)

1. **S. Chouksey**, P. Saha, S. Ganguly and D. Saha, “Carrier and Photon Dynamics in InGaN/GaN Lateral Nanowires” 12<sup>th</sup> International Conference on Nitride Semiconductors, Strasbourg, France, July 24 - 28, 2017. (Poster presentation)
2. V. Pendem, P. Saha, T. Aggarwal, **S. Chouksey**, A. Udai, S. Ganguly and D. Saha “Angle-Dependent Pump-Probe Differential Transient Absorption Spectroscopy as a Novel Technique to Examine Surface Properties of Semiconductor Nanostructures”, Optical Devices and Materials for Solar Energy and Solid-state Lighting 2019, Burlingame, California United States, July 29 - August 02, 2019. (Oral presentation)

### RESEARCH EXPERIENCE (ACADEMIC)

- Research Associate in the Department of Electrical Engineering, IIT Bombay (July 2020 - January 2021)
- Project Research Assistant in the Department of Electrical Engineering, IIT Bombay (September 2014 - December 2014)
- Senior Research Fellow in the Department of Applied Physics, SGSITS, Indore (February 2013 - June 2014)

### TEACHING EXPERIENCE

- Assistant Professor (on contract) in the Department of Electronics and Communication Engineering, Punjab Engineering College (Deemed to be University), Chandigarh (August 2022 - May 2023)
- Assistant Professor in the Department of Electronics and Communication Engineering, Radharaman Engineering College, Bhopal (July 2012 - January 2013)
- Lecturer in the Department of Electronics and Communication Engineering, Radharaman Engineering College, Bhopal (January 2009 - July 2010)