Dr. Mitra Barun Sarkar,
Assistant Professor (Gr-I), Department of ECE

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Profiles:

https://www.researchgate.net/profile/Mitra_Barun_Sarkar
https://scholar.google.com/citations?hl=en&user=aXTseVYAAAAJ&view_op=list_works&sortby=pubdate

Education:

- Ph.D. in Electronics and Communication Engineering, National Institute of Technology Agartala, 2018.
- M.Tech. in Electronics and Communication Engineering (Microwaves), University of Burdwan, 2006.
- B.Tech. in Electronics and Telecommunication Engineering, University of Kalyani, 2004.

Current Research:

- Optoelectronics devices, Photodetectors, Memory devices, Thin Films, Nanostructures, Metal Oxide Nanoparticles, Schottky detector, Nano Devices design and fabrication.
- Solar Photo Voltaic Based Sensing, fabrication of Solar Cells (I, II, III or IV generation) solar cells, study the conversion efficiency, theoretical study on the sensing linked to Heat flux, fabrication of proto version of solar cell/Photovoltaic based heat fluxsensor,
- Weather monitoring system design, smart systems for sensing in IoT.

Awards & Grants:

National Scholar. (2004-2006), GATE Scholarship MHRD

Skills & Activities:

Skills:

Electronics and Communication Engineering, Optoelectronics devices, Memory devices, Thin Films, Nanostructures, Schottky detector, Nano Devices, Photodetectors, Design and fabrication and characterization, X-ray Diffraction, FESEM, AFM, TEM, HFSS, Microstrip Antenna.

Languages: English, Bengali and Hindi

Scientific Memberships:

1. Institute of Electrical and Electronics Engineers (IEEE), membership number is: 96667421.
2. The Institution of Engineers India (IEI), membership number is: 200101063910
3. International Association of Engineers (IAENG), IAENG membership number is: 123877.

Research Projects / Sponsored project/ Consultancy activities:

Ongoing Project:

CRG-SERB PROJECT

Title: Fabrication and Characterization of Ag doped Al_2O_3:TiO_2 Nanowire Array Device for UV-Vis Detection and Breath Sensing Application
Funding Agency: Science and Engineering Research Board **(**SERB)
Role: Principal Investigator
Grant: INR 57,66,332
Duration: 03 Year
Tenure: Ongoing

ISRO PROJECT

Title: Development of an Integrated Miniature and Portable Air Pollution Monitoring System (APMS)
Funding Agency: Indian Space Research Organisation **(**ISRO)
Role: Principal Investigator
Grant: INR 24,43,520
Duration: 2 Year 3 Month
Tenure: Completed

NIT AGARTALA SEED GRANT

Title: Synthesis of Indium (In) doped TiO_2 nanowires for UV-Vis detector and fabrication of TFSC
Funding Agency: TEQIP-III, NIT Agartala, India
Role: Principal Investigator
Grant: INR 3,00,000
Duration: 01 Year
Tenure: Completed

Ph.D. Scholars:

Dr. AMITABHA NATH (Presently in IIT Bombay)

Former Full-Time Ph.D. Scholar, Department of ECE
Area of Research: Growth of 0D and 1D nanostructures for optoelectronics, gas sensors, memory device and wettability application
Ph.D. Tenure: January 2019 – November 2022
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Mr. RAHUL RAMAN

Part-Time Ph.D. Scholar, Department of ECE
Area of Research: Semiconductor and optoelectronics device application
Ph.D. Tenure: January 2019 - Till Date
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Mr. ABHIJIT DAS

Full-Time Ph.D. Scholar, Department of ECE
Area of Research: Memory and optoelectronics device application
Ph.D. Tenure: January 2020 - Till Date
Email: abhijitece.sch@nita.ac.in
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Contact No.: +91-9774824175

Mr. RAJIB KUMAR NANDA

Full-Time Ph.D. Scholar, Department of ECE
Area of Research: Optoelectronics, memory and nanoelectronics device application
Ph.D. Tenure: January 2020 - Till Date
Email: rajibnandaece.sch@nita.ac.in
rajib.nanda@gmail.com
Contact No.: +91-9438004858

Mr. SHUBHAJIT VISHWAS

Full-Time Ph.D. Scholar, Department of ECE
Area of Research: Semiconductor and optoelectronics device application
Work Tenure: January 2022 - Till Date
Email: shubhajitece.stu@nita.ac.in
vshubhajit@gmail.com
Contact No.: +91-9587048192

Publications:

Journal Publications (SCI/International):

1. Rajib Kumar Nanda, Amitabha Nath, Laishram Robindro Singh, and **Mitra Barun Sarkar**, "*Morphological, Optical and Surface Wettability Analysis of Electron-Beam Synthesized annealed TiO_2 NW/Au TF*", Brazilian Journal of Physics, 04/05/2023, 53(4), Art No. 85, DOI:10.1007/s13538-023-01299-5, SCI.
2. Abhijit Das, Amitabha Nath, Shuvam Pawar, Naorem Khelchand Singh, and **Mitra Barun Sarkar**, *Superior Photosensing Performance by Ag Nanoparticles Textured Al_2O_3 Thin Film based Device*, Journal of Nanoparticle Research, 24/04/2023, 25(5), Art No. 88, DOI:10.1007/s11051-023-05740-3, SCI.
3. Amitabha Nath, and **Mitra Barun Sarkar**, *An In-Depth Analysis on the Switching Response and Impedance Curves of n-Si/In_2O_3 NW/Ag NPs/In based Devices by a Double-Step Glancing Angle Deposition Technique*, Physica B: Condensed Matter, 11/04/2023, 660(17), Art No. 414886, DOI:10.1016/j.physb.2023.414886, SCI.
4. Amitabha Nath, Amanisha Chakraborty, Abhijit Das, Laishram Robindro Singh, and **Mitra Barun Sarkar**, *Post Annealing Effect on Surface Wettability by Electron Beam Evaporated Ag/In_2O_3 Thin Films*, Brazilian Journal of Physics, 19/10/2022, 52(6), Art No. 204, DOI:10.1007/s13538-022-01207-3, SCI.
5. Julaiba Tahsina Mazumder, Rishikanta Mayengbam, Amitabha Nath, and **Mitra Barun Sarkar**, *Investigations of Structural, Optical and Electrical Properties of TiO_2 Thin Film-Nanowire-based Device for Photodetector Application*. Optical Materials, 05/09/2022, 133, Art No. 112936, DOI:10.1016/j.optmat.2022.112936, SCI.
6. Rahul Raman, Amitabha Nath, and **Mitra Barun Sarkar,** *Influence of Annealing Temperature on ZrO_2 Nanoparticles for Improved Photodetection*. IEEE Electron Device Letters, 18/04/2022, 43(6), 918-921, DOI:10.1109/LED.2022.3168562, SCI.
7. Amitabha Nath, Laishram Robindro Singh, **Mitra Barun Sarkar**, *Enhanced surface wettability of Ag:TiO_2 heterostructured assembly using double step glancing angle deposition technique*. Ceramics International, 15/04/2022, 48(8), 11392-11400, DOI:10.1016/j.ceramint.2021.12.362, SCI.
8. Vinit Kumar Yadav, Amitabha Nath, and **Mitra Barun Sarkar,** *Indium Nanoparticles Coated high dielectric TiO_2 Nanowire for Capacitive Memory Application*. IEEE Transactions on Nanotechnology, 19/11/2021, 20, 860-865, DOI:10.1109/TNANO.2021.3129305, SCI.
9. Amitabha Nath, Bikram Kishore Mahajan, Aniruddha Mondal, Laishram Robindro Singh, and **Mitra Barun Sarkar**, *Synthesis and Detailed Characterizations of Ag Nanoparticles Coated In_2O_3 Nanostructured Devices: An Analytical and Experimental Approach*. Journal of Vacuum Science and Technology B, 14/9/2021, 39(5), 052209-1–052209-11, DOI:10.1116/6.0001208, SCI.
10. Amitabha Nath, Naveen Bhati, Bikram Kishore Mahajan, Jayanta Kumar Rakshit, and **Mitra Barun Sarkar,** *Silver Nanoparticles Textured Oxide Thin Films for Surface Plasmon Enhanced Photovoltaic Properties*. Plasmonics, 03/08/2021, 17(1), 193-201, DOI:10.1007/s11468-021-01509-3, SCI.
11. Rahul Raman, Amitabha Nath, Rajib Kumar Nanda, Abhijit Das, Shubhajit Vishwas, **Mitra Barun Sarkar,** *Fast Response UV Detector by Vertically Allied ZrO_2 Nanowire Array through Glancing Angle Deposition*. IEEE Photonics Technology Letters, 24/05/2021, 33(12), 631-634, DOI:10.1109/LPT.2021.3083090, SCI.
12. Amitabha Nath, Bikram Kishore Mahajan, Laishram Robindro Singh, Shubhajit Vishwas, Rajib Kumar Nanda, **Mitra Barun Sarkar**, *Enhancing Detectivity of Indium Oxide-based Photodetectors via Vertical Nanostructuring through Glancing Angle Deposition*. Journal of Electronic Materials, 15/04/2021, 50(6), 3722–3730, DOI:10.1007/s11664-021-08889-6, SCI.
13. Amitabha Nath, Rahul Raman, Laishram Robindro Singh, **Mitra Barun Sarkar,** *Enhanced Photodetection in Glancing Angle Deposited One-Dimensional In_2O_3 Nanorod Array*. Journal of Nanoscience and Nanotechnology, 01/5/2021, 21(5), 3115–3122, DOI:10.1166/jnn.2021.19280, SCI.
14. Vinit Kumar Yadav, Amitabha Nath, Abhijit Das, Julaiba Mazumder, **Mitra Barun Sarkar**, *Indium Nanoparticles Capped TiO_2 Nanowire Array for Boosted Photosensing Adoption*. IEEE Electron Device Letters, 24/12/2020, 42(2), 192-195, DOI:10.1109/LED.2020.3047272, SCI.
15. Amitabha Nath, Bikram Kishore Mahajan, **Mitra Barun Sarkar**, *Ag Nanoparticles Sheltered In_2O_3 Nanowire as a Capacitive MOS Memory Device*. IEEE Transactions on Nanotechnology, 02/11/2020, 19, 856–863, DOI:10.1109/TNANO.2020.3035179, SCI.
16. Amitabha Nath, **Mitra Barun Sarkar**, *Surface-Plasmon-Induced Ag Nanoparticles Decorated In_2O_3 Nanowires for Low Noise Photodetectors*. Plasmonics, 14/8/2020; 16(1), 37-48, DOI:10.1007/s11468-020-01262-z, SCI.
17. Amitabha Nath, Rahul Raman, Vinit Kumar Yadav, Pudi Sannibabu, **Mitra Barun Sarkar**, *Bandgap Modulation of Glancing Angle Deposition Aided Ag Nanoparticles Covered TiO_2 Thin Film by High*

Temperature Annealing. Journal of Nanoscience and Nanotechnology, 1/12/2020, 20(12), 7668–7675, DOI:10.1166/jnn.2020.18575, SCI.

18. Bikram Kishore Mahajan, Bijit Choudhuri, Debkalpa Goswami, Ajitabh Kumar Tiwari, **Mitra Barun Sarkar**, Aniruddha Mondal, *Enhanced Photodetection with Crystalline Si Nanoclusters*. Journal of Nanoscience and Nanotechnology, 23/2019; 20, 1-7, DOI:10.1166/jnn.2020.17176, SCI.
19. **Mitra Barun Sarkar**, Bijit Choudhuri, P. Bhattacharya, R. N. Barman, A. Ghosh, S. M. M. D. Dwivedi, S. Chakrabartty, Aniruddha Mondal, *Improved UV Photodetection by Indium Doped TiO_2 Thin Film Based Photodetector*. Journal of Nanoscience and Nanotechnology, 07/2017, 18(7), 4898-4903, DOI:10.1166/jnn.2018.15295, SCI.
20. **Mitra Barun Sarkar**, Aniruddha Mondal, Bijit Choudhuri, *Presence of capacitive memory in Indium doped TiO_2 alloy thin film*. Journal of Alloys and Compounds, 09/2016, 654, DOI:10.1016/j.jallcom.2015.09.129, SCI.
21. S. Saha, A. Mondal, B. Choudhuri, T. Goswami, **M. B. Sarkar**, K. K. Chattopadhyay, *TiO_2 Nanowires/Poly (Methyl Methacrylate) Based Hybrid Photodetector: Improved Light Detection*. Journal of Nanoscience and Nanotechnology 03/2016, 16(3): 2737-2741, DOI:10.1166/jnn.2016.10788, SCI.
22. Ajitabh K. Tiwari, Aniruddha Mondal, Bikram Kishore Mahajan, Bijit Choudhuri, Tamal Goswami, **Mitra Barun Sarkar**, S. Chakrabartty, C. Ngangbam, Saptadip Saha, *Improved Photo-Detection Using Zigzag TiO_2 Nanostructures as an Active Medium*. Journal of Nanoscience and Nanotechnology 05/2015, 14(7): 1-6, DOI:10.1166/jnn.2014.9821, SCI.
23. **Mitra Barun Sarkar**, Joydeep Datta, Diptojyoti Mondal, Sabyasachi Mukhopadhyay: *Synthesis and Morphology of Silicon Nanoparticles by Deposition Time Varying LPCVD Method to Demonstrate the Variation of Height, Density and Size*. International Journal of Research in Engineering and Technology 08/2014; 400-404.
24. Shubhro Chakrabartty, Aniruddha Mondal, **Mitra Barun Sarkar**, Bijit Choudhuri, Apu Kumar Saha, Anirban Bhattacharyya: *TiO_2 Nanoparticles Arrays Ultraviolet-A Detector With Au Schottky Contact*. IEEE Photonics Technology Letters 03/2014; DOI:10.1109/LPT.2014.2313181, SCI.
25. **Mitra Barun Sarkar**, Aniruddha Mondal, Bijit Choudhuri, Bikram Kishore Mahajan, ShubhroChakrabartty, Chitralekha Ngangbam: *Enlarged broad band photodetection using Indium doped TiO_2 alloy thin film*. Journal of Alloys and Compounds 07/2014; 615:440-445, DOI:10.1016/j.jallcom.2014.06.184, SCI.
26. Hirak Kumar Maity, **Mitra Barun Sarkar**, A. Chakrobarty: *Wave Pipelining: An Analysis for High Performance Digital Circuits*. International Journal of Electronics Engineering 03/2009; 269-278.

Conferences (National/International):

1. Abhijit Das, Vaishali Bora, **Mitra Barun Sarkar**, Shuvam Pawar: *Effect on photo-absorbance and optical energy-gap of Al_2O_3 after deposition of Ag thin film on it*. XXI International Workshop on Physics of Semiconductor Devices (IWPSD 2021), December 14-17, 2021.
2. Shubhajit Vishwas, Sayantan Saha, Monali Nath Bhowmik, Amitabha Nath, Shyam S Kundu, Sambhu Nath Pradhan, **Mitra Barun Sarkar**: *Design and Development of Arduino Based Portable Air Quality Monitoring System*. ODICON-2021, Siksha 'O' Anusandhan (Deemed to be University).
3. Pudi Sannibabu, Amitabha Nath, Rahul Raman, Salini Singh, **Mitra Barun Sarkar**: *An evaluation report on Resistive Random-Access Memory. International Conference on Applied Mathematics & Computational Intelligence*, NIT Agartala; 2020.
4. Salini Singh, Amitabha Nath, Rahul Raman, Rinku Rani Das, Pudi Sannibabu, **Mitra Barun Sarkar**: *A Comparative Study of Temperature Dependency on Electrical Parameters of FinFET for Al_2O_3 and HfO_2 Dielectric Materials*. International Conference on Applied Mathematics & Computational Intelligence, NIT Agartala; 2020.
5. Rahul Raman, Amitabha Nath, **Mitra Barun Sarkar**: *Comparison of Photodetection Capability of Spin Coated TiO_2 Thin Film and In_2O_3 Thin Film Devices*. International Conference on Soft Computing Theories and Applications, NIT Patna; 2019.

6. Naveen Bhati, Amitabha Nath, Rahul Raman, Jayanta Kumar Rakshit, **Mitra Barun Sarkar**: *A Review Paper on Recent Trends of Solar Cell Technology, Materials and Efficiencies*. Institute of Engineers (INDIA), Tripura State Centre; 2019.
7. Amitabha Nath, Rahul Raman, **Mitra Barun Sarkar**: *Visible Range Photodetection using Annealed Ag Nanoparticles Coated Titania Heterostructure*. Institute of Engineers (INDIA), Tripura State Centre; 2019.
8. Vinod Kumar Yadav, Vinit Kumar Yadav, Nath, Amitabha Nath, Rahul Raman, Priyanka Choudhury; **Mitra Barun Sarkar**: *GLAD Assisted In_2O_3 NW-TiO_2 NW Heterostructure for Enhanced UV-Vis Absorption*. Microelectronics, Computing & Communication Systems (MCCS-2019), Ranchi, Jharkhand; 2019.
9. Vinit Yadav, Vinod Yadav, Rahul Raman, **Mitra Barun Sarkar**: *Investigation of Band Gap Tailoring Phenomenon in In NP and TiO_2 NW Heterostructure*. International Conference on Emergent Research in Mathematics and Engineering, NIT Agartala; 2019.
10. **Mitra Barun Sarkar**, Aniruddha Mondal: *Enhanced Charge Trapping Response of the In Doped TiO_2 TF Device*., Pune, India; 08/2017.
11. Nitesh Soni, Kasturi Gogoi, Rahul Raman, **Mitra Barun Sarkar**: *Defect States Analyses of E-Bean Evaporated TiO_2 and SiO_x Thin Films Structures for Application in Photo detectors*. Agartala, India; 06/2016.
12. Kasturi Gogoi, **Mitra Barun Sarkar**, Nitesh Soni: *Analysis of different defect states incorporated in e- beam evaporated TiO_2 thin film of variable thickness*., IETE Burdwan Sub Centre,The University of Burdwan , India; 02/2016.
13. Shubhro Chakrabartty, Aniruddha Mondal, Apu Kumar Saha, Bijit Choudhuri, **Mitra Barun Sarkar**, Pankaj Singh: *Retention of charge in TiO_2 NPS/SiO_x system*. 12/2014.
14. **Mitra Barun Sarkar**, Aniruddha Mondal, Shubhro Chakrabartty, Bijit Choudhuri, Manas Jena, Amal Das: *Reduction of Surface States of TiO_2 Thin Film by Indium Doping*. 12/2014.
15. Mukhopadhyay, Sabyasachi; Panigrahi, Prasanta K; Mitra, Asish; Bhattacharya, Paritosh; **Sarkar, M.B.**; Das, P; :*Optimized DHT-RBF model as replacement of ARMA-RBF model for wind power forecastingr 2013.*
16. S Mukhopadhayay, A Mitra, P. Bhattacharya, **Mitra Barun Sarkar**: *Wind Power Forecasting Based on Discrete Hilbert Transform and Neural Network Model*. International Conference on Advances in Mechanical Engineering and its Interdisciplinary Areas (ICAMEI-2012); 12/2012.
17. Soumyo Chatterjee, DibyenduBhowmick**, Mitra Barun Sarkar**, Hirak kumar Maity: *Parametric Study of Rectangular Microstrip Antenna Using Particle Swarm Optimization Algorithm*. National Conference on Materials, Devices and Circuits in Communication Technology (MDCCT 2010); 03/2010, DOI:10.13140/2.1.4048.2081.
18. **Mitra Barun Sarkar**, S Maiti, Hirak Kumar Maity: *Quantum Structures: Applications, Implementations and Challenges in Futuristic Nano-Electronic Devices*. "Computing and Communication Systems (CoCoSys-09)", Burdwan; 01/2009.
19. **Sarkar, Mitra Barun**; Maiti, Sukes; *Synthesis and Characterization of Silicon Nanoparticles in the Range of 2-10 nm 2008.*

Patents:

1. **Mitra Barun Sarkar**, Sabyasachi Mukhopadhyay, Paritosh Bhattacharya: Waste Monitoring System. Ref. No. 201931040157, Year: 2019.
2. **Mitra Barun Sarkar**, Ankita Rupam, Abriti Roy: *System for agronomy monitoring and enhancing an irrigation efficiency*. Ref. No. 201931029993, Year: 2019.
3. Sabyasachi Mukhopadhyay, Sawon Pratiher, **Mitra Barun Sarkar**, Prasanta K. Panigrahi, Manik Bhowmik: *A Touch-Pad Based Device With Integrated Electronic Tool Providing Authentication For User*. Ref. No: 4254/RQ-KOL/2015, Year: 2015.

Books:

- **Mitra Barun Sarkar**, S Mukhopadhyay: *Synthesis & Characterization of Nanodot Embedded MOS-C for the NVM*. 01/2015; LAP LAMBERT Academic Publishing.

Major Conferences/Workshops Organized:

1. **Challenge and Opportunities of Emerging Nanotechnology for VLSI Nano electronics,** January 21st, 2016, NIT Agartala **(Coordinator)**.
2. **Introduction to Speech Coding with Internet of Things (IoT) Applications under GIAN,** November 21-25, 2016, NIT Agartala **(Coordinator)**.

Invited/ Plenary/Keynote Lectures in International/National Conferences/ Workshops:

1. **Refresher Course in Material Science and Nanotechnology** (Invited talk-Online), UGC-Human Resource Development Centre NEHU, Shillong, 24th September – 8th October, 2021.
2. **Internet of Things (IoT)** (Invited talk), *5 days AICTE Training and Learning (ATAL) Academy Workshop*; CSE Department, National Institute of Technology Agartala, August 26-30, 2019.