Details for web updates:

NAME: Dr. DEBORAJ MUCHAHARY

Educational qualifications:

1. **PhD from NIT Arunachal Pradesh (Specialization: Silicon and Perovskite solar cells).**
2. **M. Tech from NIT Arunachal Pradesh.**
3. **B. Tech in Electronics and Communication Engineering from Central Institute of Technology, Kokrajhar, Assam.**

Work experiences:

1. **August 2021 to date, Assistant Professor (Gr -II) at National Institute of Technology, Raipur, Chhattisgarh, India.**
2. **December 2019 to July 2021, Assistant Professor at SR University, Warangal, Telangana India.**

Expert Talk/Chairs:

1. **Expert talk on "Recent trends in emerging solar energy materials and solar cells" at 5 Day faculty development program under the theme "Next Generation materials and devices" organized by the SR University from 3rd to 7th January 2022.**

Book chapter:

Deboraj Muchahary, Sagar Bhattarai, Ajay Kumar Mahato and Santanu Maity 'A brief on emerging materials and its photovoltaic application' in Emerging Materials: Design, Characterization and Applications, Springer, ISBN: 978-981-19-1311-2, 2022.

PUBLICATIONS:

1. **D. Muchahary**, L. S. Ram, R. Narzary, P. P. Sahu, S. Bhattarai and S. Tayal, “Heterojunction between crystalline silicon and nanocomposite coupled $ZnO{\cdot}SnO_2$ and optimization of its photovoltaic performance”, ***Current Applied Physics***, Vol. 38, pp. 15-21. 2022. https://doi.org/10.1016/j.cap.2022.02.009 **(SCI)**
2. S. Tayal, S. Bhattacharya, J. Ajayan, L. R. Thoutam, **D. Muchahary**, S. Jadav, B. Krishan and M. Nizamuddin, “Gate-stack optimization of a vertically stacked nanosheet FET for digital/analog/RF applications”, ***Journal of Computational Electronics***, 2022. https://doi.org/10.1007/s10825-022-01864-2 **(SCI)**
3. **D. Muchahary**, and S. Maity, “A qualitative analysis of the impact of P composition in $GaAs_{1-x}P_x$ capped InAs/GaAs quantum dot hetero-structure”, ***Superlattices and Microstructures***, 2022. https://doi.org/10.1016/j.spmi.2022.107154 **(SCI)**
4. **D. Muchahary**, K. Priyanka, L. S. Ram, A. Prahitha and S. Kollem, “Performance enhancement through optimization of metal oxide electron transport layer in hybrid solar cell”, ***Optik***, Vol. 248, p.168102, 2021. https://doi.org/10.1016/j.ijleo.2021.168102 **(SCI)**
5. S. Kollem, K. R. Reddy, D. S. Rao, C. R. Prasad, V. Malathy, J. Ajayan, and **D. Muchahary**, “Image denoising for magnetic resonance imaging medical images using improved generalized cross validation based on the diffusivity function”, ***International Journal of Imaging Systems and Technology***, 2021. https://doi.org/10.1002/ima.22681 **(SCI)**
6. S. Bhattarai, A. Sharma, **D. Muchahary**, M. Gogoi and T. D. Das, “Carrier transport layer free perovskite solar cell for enhancing the efficiency: A simulation study” ***Optik***, Vol. 243, p.167492, 2021. https://doi.org/10.1016/j.ijleo.2021.167492 **(SCI)**
7. S. Tayal, S. Bhattacharya, B. Jena, J. Ajayan, **D. Muchahary** and P. Singla, “Linearity Performance and Harmonic Distortion Analysis of IGE Junctionless Silicon Nanotube-FET for Wireless Applications”, ***Silicon,*** pp. 1-6, 2021. https://doi.org/10.1007/s12633-021-01313-y. **(SCI)**
8. S. Bhattarai, A. Sharma, **D. Muchahary**, D. Gogoi, and T. D. Das, “Numerical simulation study for efficiency enhancement of doubly graded perovskite solar cell”, ***Optical Materials***, Vol. 118, p. 111285, 2021. https://doi.org/10.1016/j.optmat.2021.111285. **(SCI)**
9. **D. Muchahary,** S. Maity and S. K. Metya and B. Basumatary, "A simulation approach to improve photocurrent through a double-layer of the emitter in $a\text{-}Si_{1-x}C_x/c\text{-}Si$ heterojunction solar cell." ***Superlattices and Microstructures***, Vol. 146, pp. 106651, 2020. https://doi.org/10.1016/j.spmi.2020.106651. **(SCI)**
10. **D. Muchahary,** S. Maity and S. K. Metya, “Modeling and analysis of temperature dependent carrier lifetime and surface recombination velocity of Si-ZnO heterojunction thin film solar cell” ***IET Micro and Nano Lett.*** Vol. 14, Issue 4, pp. 399-403, 2019. https://doi.org/10.1049/mnl.2018.5147 (**SCI**)
11. **D. Muchahary**, and S. Maity, "High-Efficiency thin film ZnMgO/ZnO solar cell simulation approach: temperature dependency, BSF and efficient small signal analysis," ***Superlattices and Microstructures,*** Vol. 109, pp. 209-216, September *2017*, doi: 10.1016/j.spmi.2017.05.012. https://doi.org/10.1016/j.spmi.2017.05.012 **(SCI)**

12. **D. Muchahary**, S. Maity, and C. T. Bhunia, “Back surface field approach: Surface and interface defect states optimization of high efficient Si-ZnO based heterojunction solar cell” ***Journal of Renewable and Sustainable Energy*** 9, 033504 (*2017*). https://doi.org/10.1063/1.4990819 **(SCI)**
13. S. Maity, **D. Muchahary**, and P. P. Sahu, “Enhancing Responsivity and Detectivity of Si-ZnO Photodetector with growth of densely packed and aligned hexagonal nanorods” ***IEEE Transactions on Nanotechnology*** Vol. 16, Issue. 6, pp. 939-945, *2017*. https://doi.org/10.1109/TNANO.2017.2726101 **(SCI)**
14. R. R. Das, S. Maity, **D. Muchahary**, C. T. Bhunia, “Temperature dependent study of Fin-FET drain current through optimization of controlling gate parameters and dielectric material” ***Superlattices and Microstructures,*** Vol. 103, pp. 262- 269, March *2017*. https://doi.org/10.1016/j.spmi.2017.01.041 **(SCI)**
15. B. Basumatary, **D. Muchahary**, S. Maity, “Improvement of drain current of AlGaN/GaN-HEMT through the modification of negative differential conductance (NDC), current collapse, self-heating, and optimization of double hetero structure” ***Superlattices and Microstructures,*** Vol. 97, pp. 606-616, September *2016*. https://doi.org/10.1016/j.spmi.2016.07.013 **(SCI)**

List of Conference Publications:

1. P. Chandini, **D. Muchahary**, A. S. Raghuvanshi, “Analysis of image compression techniques for IoT applications,” IEEE 2nd CONIT 2022 to be held in Hubballi, Karnataka ,India from 24th to 26th June, 2022. (Accepted)

2. **D. Muchahary**, A. J. Mondal, A. Majumder, “A CORDIC based Design Technique for Efficient Computation of DCT,” in IEEE International Conference ICCSP, pp. 0484- 0489, 2015.

3. **D. Muchahary**, A. J. Mondal, R. S. Parmar, A. D. Borah, A. Majumder, “A Simplified Design Approach for Efficient Computation of DCT,” in IEEE International Conference CSNT, pp. 483-487, 2015.

4. A. D. Borah, A. J. Mondal, **D. Muchahary**, A. Majumder, “FIR Low Pass filter design using Craziness Base Particle Swarm Optimization Technique” in IEEE International Conference ICCSP, pp. 0870-0874, 2015.