

2nd National Workshop

on

**Advanced Optoelectronic
Materials and Devices**

(AOMD-2008)

December 22–24, 2008

Centre for Research in Microelectronics (CRME)
Department of Electronics Engineering
Institute of Technology
Banaras Hindu University
Varanasi-221005



Contents

	Page
1. Wavelength Tailorable Detectors: Ultraviolet to Far-Infrared	1
– A.G.U. Perera	
2. Organic Opto-Electronics: Present Status and Future Prospects	19
– Achintya Dhar	
3. Formation of SiC Nanostructures on Si Surface using C ₆₀ by Spinning Technique	28
– Aniruddha Mondal, Nilesh Jadav and Utpal Das	
4. PVA/STA Composite Polymer Electrolyte Membranes for Fuel Cell Application: Synthesis and Characterization	36
– Arfat Anis, A.K. Banthia and Sri Bandyopadhyay	
5. Analysis of a Nonlinear Mach-Zhender Interferometer	47
– Arpita Srivastava, Punya Prasanna Paltani and S. Medhekar	
6. A Comparative Study of Polyanthranilic Acid (PANA)/Metal and Polycarbazole (Pcz)/Metal Contacts for Electronic and Optoelectronic Applications	56
– A.D.D. Dwivedi, Arun Kumar Singh, Rajiv Prakash and P. Chakrabarti	
7. Conduction Mechanism in Electronic Polymers: Effect of Morphology	65
– Arun Kumar Singh and Rajiv Prakash	
8. Effect of Post Annealing on Structural Properties of ZnO Thin Films Deposited by Thermal Evaporation Technique	75
– C. Periasamy, P. Chakrabarti and Rajiv Prakash	
9. Novel Strained Layer Superlattices for Long Wavelength IR Detectors	84
– Devki N. Talwar	
10. Performance Optimization of Ge/SiGe MQW-Electroabsorption Modulator for Optical Short Pulse Generation	94
– Gopa Sen, Bratati Mukhopadhyay and P.K. Basu	

11. General Model for the Computation of Energy Eigen Values in Aperiodic Multiple Quantum Well Structures – <i>Jatindranath Gain, Madhumita Das Sarkar and Sudakshina Kundu</i>	102
12. Laser Beam Shaping – <i>L.N. Hazra</i>	108
13. Effect of Doping on the Electrical and Optical Properties of Organic Semiconductors – <i>M.N. Kamalasanan, Ritu Srivastava and Virendra Kumar Rai</i>	110
14. Design Aspects of Optical Router Using MEMS – <i>M. Shanmuga Priya, M. Meenakshi and G. Geetha</i>	117
15. III-Nitride Compound Semiconductors for Solar Cell – <i>Md. Onirban Islam, Md. Raisul Islam, Dil Afroz Jahan, A.A. Md. Monzur-Ul-Akhir and Zahid Hasan Mahmood</i>	124
16. Study of Optical Properties of CuInSe ₂ Thin Film – <i>Mohammad Arif Sobhan Bhuiyan and Zahid Hasan Mahmood</i>	129
17. Reflection Properties of Photonic Bandgap Material Containing Different Gradding Profiles – <i>P.C. Pandey and Khem B. Thapa</i>	134
18. Ge/SiGeSn Multiple Quantum Well Photonic Devices – <i>P.K. Basu, Sumitra Ghosh, Bratati Mukhopadhyay and Gopa Sen</i>	141
19. InAsSb Based Heterojunction Photodetector for Application in Longwavelength Infrared (LWIR) Region – <i>P.K. Maurya and P. Chakrabarti</i>	156
20. Noise Analysis of LWIR Photodetector Based on HgCdTe for Free Space Optical Receiver – <i>P.K. Saxena and P. Chakrabarti</i>	164
21. Some Passive All-fiber Components for Optical Fiber Communication Systems: Physics and Technology – <i>Partha Roy Chaudhuri</i>	170
22. Experimental Investigation of Emergency Siren Simulator for Real-Time Small-Signal Power Applications – <i>Prince, Rajat, Anju Agrawal, Rishu Chaujar and Ravneet Kaur</i>	192
23. Performance Analysis of an Asymmetric Metal Semiconductor Metal Photodetector – <i>Rahul Tripathi, Paritosh Singh Baghel and R.K. Chauhan</i>	197
24. Solution to CMOS Technology for High Performance Analog Applications: GEWE-RC MOSFET – <i>Rishu Chaujar, Ravneet Kaur, Manoj Saxena, Mridula Gupta and R.S. Gupta</i>	201
25. Optical Properties of Self-assembled Ge(Si) Quantum Dots Grown on Si(001) by Molecular Beam Epitaxy – <i>S. Das, R.K. Singha, S. Manna, A. Dhar and S.K. Ray</i>	206

26. An n-Doped GaAs/AlGaAs Multi-Layered HEIWIP Based Terahertz Photodetector – <i>S. Jit, A.B. Weerasekara, R.C. Jayasinghe, S.G. Matsik and A.G.U. Perera</i>	213
27. Sensors for the High Resolution Astronomical Imaging – <i>S.K. Saha</i>	217
28. A Novel Design of Nano Layered Optical Filter using Photonic Band Gap Materials – <i>S.K. Srivastava and S.P. Ojha</i>	225
29. Treatment of Liquid Effluents and Gaseous Emissions from Solid-State Electronic Materials Processing Units – <i>S.N. Upadhyay</i>	231
30. Effect of Unintentional Charges on the Performance of Nanoscale DGMOSFETs – <i>Saji Joseph, George James T. and Vincent Mathew</i>	243
31. Microphotonics to Nanophotonics: A Quick Scan – <i>Samir K. Lahiri</i>	249
32. Modeling and ATLAS Simulation Studies on Mid-infrared Homojunction LED – <i>Sanjeev and P. Chakrabarti</i>	253
33. Further Support to the Large Band Gap 1.95 eV of InN – <i>Sanjib Kabi, Subindu Kumar, Dipankar Biswas and Tapas Das</i>	260
34. Supercontinuum Generation at Mid-Infrared Region in Photonic Crystal Fiber made of Chalcogenide Glass – <i>Sourabh Roy and Partha Roy Chaudhuri</i>	269
35. Bandgap Reduction in Dilute InPN Grown by Liquid Phase Epitaxy – <i>T.D. Das, S.C. Das and S. Dhar</i>	275
36. A First Report on the Utility of the Full Width at Half Maximum of the Photoluminescence Spectrum from $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{GaN}$ Quantum Wells – <i>Tapas Das, Dipankar Biswas and Sanjib Kabi</i>	283
37. Electronic and Optical Properties of InN in Wurtzite and Cubic Phases – <i>Tarun K. Maurya, S. Kumar and S. Auluck</i>	286
38. Behavior of Ag and ZnO Thin Films, Deposited by Thermal Evaporation Technique, as an Optical Filter – <i>V.K. Dwivedi, K.P. Misra, Atul Srivastava, R.K. Shukla and Anchal Srivastava</i>	295
39. Minority Carrier Lifetime Measurement of Solar Cell – <i>Vikash Ranjan, Chetan S. Solanki and R.K. Lal</i>	299
40. Advances in Materials and Fibers for High Power Mid-Infrared Fiber Lasers – <i>Ravi K. Jain and Xiushan Zhu</i>	307