

Rudra Sankar Dhar

Assistant Professor

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SUMMARY OF QUALIFICATIONS

- Fourteen plus (14+) years in total of teaching, research and industrial experience in Semiconductor Device, Nanotechnology, Process Reliability, Nanoscopic Surface Profiling, VLSI and Material Characterization
- Eleven (~11) years of pre-PhD experience in semiconductor and nanotechnology for teaching, research and industrial career at highly reputed and top-ranked Universities and Industries recognized internationally.
- Author/co-author of 13 peer-reviewed international journal articles and 15 peer-reviewed international conferences with cumulative impact factor of 30.38.
- Professional expertise in Scanning Probe Microscopy (SPM); Atomic Force Microscopy (AFM); Failure and Reliability analysis; TCAD based design, modeling, simulation; and design of experimental measurement setup for electrical and optical characterization of semiconductor devices.

EDUCATION

- **Ph.D. in Nanotechnology Engineering** *August 2014*
Department of Electrical and Computer Engineering
University of Waterloo, Waterloo, ON, Canada.
- **M.Phil. in Microelectronics Engineering** *January 2006*
Faculty of Science Agriculture and Engineering
University of Newcastle upon Tyne, Newcastle, UK.
- **B.E. in Electronics & Telecommunication Engineering** *June 2002*
Utkal University, Bhubaneswar, India.

RESEARCH INTERESTS

- Nano-material synthesis, processing and fabrication of electrochromic/SPD technology
- Reverse engineering, Failure analysis and Reliability Engineering
- Process Technology, TCAD modeling and simulation of nanoelectronic devices with SILVACO/MEDICI
- Voltage and charge profiling and mapping of dynamic carriers and their transport
- Nanoscopic probing with AFM, SPM, SVM, SSRM, SCM
- Semiconductor Process Reliability and Integration Engineering of novel electronic and photonic devices
- Growth of quantum dot/well based devices using MOCVD/MBE

EXPERIENCE AND EMPLOYMENT HISTORY

➤ **Total Employment Experience : 14 years 3 months**

Assistant Professor, Full-time (pursuing 2 years 4 months) *Dec. 2015 – till date*
Electronics & Communication Engineering Department, NIT, Mizoram, India

- Coordinator: Activity in Nanotechnology at NIT Mizoram.
- Course Instructor & Lab Demonstrator: Nanoelectronics, VLSI Lab II.

Post-Doctoral Fellow, Full-time, Smart Materials Lab (1 year) *Nov. 2014 – Oct. 2015*
Center of Natural Resources Engineering Facility, University of Alberta, Edmonton, AB, Canada

- Investigate nanocellulose fibrils and electrochromic material to develop nanomaterial membrane/coating.
- Develop nanomaterial based organic solar cells to be implemented in smart windows.

➤ **Pre-PhD Employment Experience : 10 years 11 months**

Research Assistant, Full-time (4 years 4 months)

May 2010 – Aug. 2014

Waterloo Institute of Nanotechnology, Waterloo, ON, Canada

- Execute nano-surface profile analysis to investigate high field domain formation using SPM based AFM in Terahertz (THz) Quantum Cascade Lasers (QCLs) under operation.
- Quantitatively determine charge density in each cascade stages in the active region of Interband Cascade lasers (ICL) using cryogenic and room temperature SVM.
- Establish cryogenic temperature SVM on AFM to measure, image and observe nonlinearity and electric field domains while scanning operating mid-IR QCLs, THz QCLs and novel electronic devices.
- Engaged in cryogenic temperature set up and measurements of light-current-voltage (LIV) and spectrum for ICLs, mid-IR QCLs and THz QCLs.

Teaching Assistant

Sept. 2010 – Aug. 2014

University of Waterloo, Waterloo, ON, Canada

- Course Instructor & Lab Demonstrator for BS/MS: Electronic Device, Electronic Circuits, Microelectronic.

Process Development Engineer, Full-time (8 months)

Feb. 2012 – Sep. 2012

Microelectronics Technology Group, Chipworks, Ottawa, ON, Canada

- Deployed Reverse Engineering technique for sample preparation of Non Volatile Memory (NVM) devices.
- Performed Failure Analysis using SCM and imaged NVM devices to detect static charges on floating gates.

Assistant Professor, Full-time (1 year)

Jun. 2009 – May 2010

Electronics & Communication Engineering Department, Thapar University, Punjab, India

- Course Instructor & Lab Demonstrator for B.Tech and M.E: Semiconductor Devices, Advanced Semiconductor Devices Semiconductor Device Lab, VLSI Lab.
- Master Degree (M.E) Thesis Examiner.
- Committee member and head of Final year Grand Viva Voice for B.E/B.Tech students.
- Training and Placement Officer.

Assistant Professor, Full-time (3 months)

Jan. 2009 – Mar. 2009

Electronics & Communication Engineering Department, MIET, Meerut, India

- Course Instructor & Lab Demonstrator: Semiconductor Materials and Devices, Electronics Lab II.

Graduate Researcher, Full-time, Division of Microelectronics (1 year)

Jan. 2008 – Dec. 2008

School of Electrical & Electronic Engineering, Nanyang Technological University (NTU), Singapore

- Processed and grown III-V material quantum dot Laser diodes and LEDs using MOCVD/MBE.
- Utilized AFM and XRD to characterize the grown quantum dot devices for defect density analysis.
- Employed SEM, EDX, and TEM for imaging the grown devices.

Lecturer, Full-time (1 year 6 months)

Feb. 2006 – Jul. 2007

Electronics & Communication Engineering Department, NSEC, Kolkata, India

- Course Instructor & Lab Demonstrator for B.Tech/M.Tech: Microelectronic & Optoelectronic Devices, Microelectronic Technology, Digital Electronics, Solid State Devices, Basic Electronics, Discrete Electronics, Electronic Circuit Design Lab, Basic Electronic Lab.
- Departmental Chair and member of Final year Grand Viva Voice and Projects for B.Tech students.
- External Examiner and marker of B.Tech students.

Project Officer, Full-time (11 months)

Oct. 2003 – Aug. 2004

The Science Association of Bengal (SAB), Kolkata, India

- Involved in the development of Science and Technology entrepreneurship, computer literacy.

- Edited and associated in published popular science Magazine “Bijnan Mela” (Science Fair).

Project Trainee Engineer, Part-time*Aug. 2002 – Aug. 2004*

RSS (P) Ltd div. of InfoUniv Technologies, Kolkata, India

- Established VLSI designing and simulation of DLX CPU using VHDL tool in Altera EDA platform.
- Developed VLSI designing and simulation of sequential rational number system using VHDL.

Project Engineer, Full-time (1 year 3 months)*Jul. 2002 – Sep. 2003*

S. R. Infoware Pvt. Ltd., Kolkata, India

- Designed web page for different companies using html, dhtml, asp, xml.
- Technically supported computer servicing and maintenance.

COMPUTER AND EXPERIMENTAL SKILLS

- **Nano-Surface Profiling, Probing and Mapping Techniques:** SPM, AFM, Scanning voltage microscopy (SVM), Scanning capacitance microscopy (SCM), Scanning spreading resistance microscopy (SSRM), nanopotentiometry, Contact AFM (C-AFM), Scanning tunneling microscopy (STM) with analysis tools.
- **TCAD modeling and simulation Tools:** SILVACO, MEDICI, ATHENA, Cadence, Supreme.
- **Semiconductor Process, Development and Fabrication:** Thin film deposition (MOCVD, MBE, X-Ray, Ion-Beam Sputter), Reverse Engineering, Diffusion, Failure & Reliability analysis, Packaging, Testing.
- **Electrical Set-up and Characterization:** Probe station (Signatone) for semiconductor devices (MOS/MOSFETs), LCR Meter, Function generator and Parameter Analyzer for AC/DC IV-CV measurements.
- **Optical Set-up and Characterization:** Liquid Helium cooled cryostat, pulser, oscilloscope, lock-in, bolometer and FTIR for LIV and Spectrum measurements of LEDs, ICLs and QCLs.
- **HD Nanoscopic Imaging Tools:** SEM, EDX, XRD, TEM, SIMS.
- **VLSI and Circuit Design, Control system and Programming:** VHDL, Verilog, Altera, Xilinx, PSpice, TSPICE, Multisim, Modelsim, LABVIEW, MATLAB, C, C++, Web Page Designing.
- **Basic computer skills:** Microsoft Office including Word, Excel, Power Point, Microsoft Visio, Adobe Photoshop, Adobe acrobat Professional.

SPONSORED RESEARCH PROJECTS

DST-NanoMission

August 2017

- **Sponsoring Agency:** DST-NanoMission, Govt. of India
- **Title:** Development of novel smart technology based on nanomaterial membranes
- **Grant Value:** Rs. 114,00,000 for 2 years from date of implementation
- **Contribution:** Project approved in August 2017.

Engage Grant, NSERC

March 2015

- **Sponsoring Agency:** Natural Sciences and Engineering Research Council (NSERC), Govt. of Canada
- **Title:** Development of a Novel Smart Window Technology Based on Nanocellulose Crystals
- **Grant Value:** \$25,000 ≈ Rs. 12,50,000
- **Contribution:** Developed a proto-type model technique to perform electric dimming using nanocellulose and electrochromic materials.

Engage Grant, NSERC

February 2012

- **Sponsoring Agency:** Natural Sciences and Engineering Research Council (NSERC), Govt. of Canada
- **Title:** Atomic force microscopy surface potential
- **Grant Value:** \$25,000 ≈ Rs. 12,50,000

- **Contribution:** Developed a technique to read-back stored data from memory devices using Failure analysis.

Ph.D./P.G. SUPERVISIONS ONGOING

- Ms. Lalthanpui Khiangte: Modelling and Simulation of Sub-14nm NanoFET (Ph.D.)
- Ms. Shingmila Hungyo: Modelling and Simulation of Nanomaterial based Multi-junction Solar Cell (Ph.D.)
- Mr. Pragati Singh: Modelling of minimization of ambipolar leakage in nano-Tunnel FET (Ph.D.)

NEW COURSES DEVELOPED

- Physics of Semiconductor Devices (UG- B.Tech), NIT Mizoram, India *August 2017*
- Microelectronics & Optoelectronics (UG- B.Tech), NSEC under WBUT, India *December 2005*

NEW LABS ESTABLISHED WITH NEW EXPERIMENTS DEVELOPED

- TCAD Lab (PG- M.Tech course) (**5 experiments**) *January 2017*
Electronics & Communication Engineering Department, NIT, Mizoram, India
- Digital VLSI Lab (PG- M.Tech course) *January 2017*
Electronics & Communication Engineering Department, NIT, Mizoram, India
- Analog VLSI Lab (PG- M.Tech course) (**5 experiments**) *August 2016*
Electronics & Communication Engineering Department, NIT, Mizoram, India

ADDITIONAL NEW LAB EXPERIMENTS DEVELOPED

- Current mirror & cascade amplifier Design *January 2011*
Course Electronic Circuits, ECE332, University of Waterloo, ON, Canada
- Magnetic Coils for inner and outer magnetic field measurement *September 2010*
Course Electromagnetism, NE241, University of Waterloo, ON, Canada

COURSES TAUGHT

- Introduction to Nanoelectronics (PG- M.Tech), NIT Mizoram, India (2 Sems.) 2017-2018
- Physics of Semiconductor Devices (Ph.D. & PG-M.Tech) NIT Mizoram, India (2 Sems.) 2016-2017
- Introduction to MEMS (Ph.D.), NIT Mizoram, India (1 Sem.) 2017
- Digital Logic Circuit and Design (UG- B.Tech), NIT Mizoram, India (1 Sem.) 2017
- Nanoelectronics (Ph.D. & UG- B.Tech), NIT Mizoram, India (2 Sem.) 2016-2017
- Electronic Devices (UG- B.S.), University of Waterloo, Canada (5 Sems.) 2012-2014
- Microelectronic Processing Technology (Ph.D. & PG- M.S.),
University of Waterloo, Canada (1 Sem.) 2012-2012
- Advanced Semiconductor Devices (PG- M.Tech), Thapar University, India (1 Sem.) 2010-2010
- Semiconductor Devices (UG- B.Tech), Thapar University, India (2 Sems.) 2009-2010
- Microelectronics & Optoelectronics (UG- B.Tech), NSEC, Kolkata, India (1 Sem.) 2007-2007
- Microelectronics Technology (UG-B.Tech), NSEC, Kolkata, India (2 Sems.) 2006-2007
- Solid State Devices (UG- B.Tech), NSEC, Kolkata, India (1 Sem.) 2006-2006
- Basic Electronics (UG- B.Tech), NSEC, Kolkata, India (2 Sems.) 2006-2007
- Digital Electronics (UG- B.Tech), NSEC, Kolkata, India (1 Sem.) 2006-2006

LABORATORIES DEMONSTRATED AND TAUGHT

- TCAD Lab (PG- M.Tech), NIT Mizoram, India (2 Sems.) 2017-2018
- Digital VLSI Lab (PG- M.Tech), NIT Mizoram, India (2 Sems.) 2017-2018

- Analog VLSI Lab (PG- M.Tech), NIT Mizoram, India (2 Sems.) 2016-2017
- VLSI Lab II (UG- B.Tech), NIT Mizoram, India (1 Sem.) 2016-2016
- Electronic Devices Lab (UG- B.S.), University of Waterloo, Canada (5 Sems.) 2012-2014
- Electronic Circuits Lab (UG- B.S.), University of Waterloo, Canada (1 Sem.) 2011-2011
- Electromagnetics Lab (UG- B.S.), University of Waterloo, Canada (1 Sem.) 2010-2010
- Semiconductor Devices Lab (UG- B.Tech), Thapar University, India (2 Sems.) 2009-2010
- Semiconductor Materials & Devices Lab (UG- B.Tech), MIET, Meerut, India (1 Sem.) 2009-2009
- Basic Electronics Lab (UG- B.Tech), NSEC, Kolkata, India (3 Sems.) 2006-2007
- Digital Electronics Lab (UG- B.Tech), NSEC, Kolkata, India (2 Sems.) 2006-2006
- Circuit Theory Lab (UG- B.Tech), NSEC, Kolkata, India (1 Sem.) 2006-2006

PROFESSIONAL AFFILIATIONS

- Life Member, International Journal of Advanced Engineering and Management (IJOAEM),
ID: IJOAEM/17/E/10 Jan. 2017
- Member, Institute of Engineering and Technology (MIET), ID: 83241423 Oct. 2003

PRESENT INSTITUTE ACTIVITIES & SPECIAL COMMITTEE

- Chairman of Monitoring Committee of the Institute (**1 sem.**) *Nov. 2017– till date*
National Institute of Technology (NIT) Mizoram, India (validating conference review standards)
- Member for Foreign Scholarship Committee of the Institute (**1 sem.**) *Sep. 2017– till date*
National Institute of Technology (NIT) Mizoram, India (performing software verification)
- Member for Software Committee of the Institute (**1 sem.**) *Aug. 2017– till date*
National Institute of Technology (NIT) Mizoram, India (performing software verification)
- Convener for Purchase Committee of Microprocessor Lab (**2 sems.**) *Mar. 2017– Dec. 2017*
National Institute of Technology (NIT) Mizoram, India (coordinating purchase of kits & peripherals)
- Convener for Celebration Committee for Unity for Run (**3 sems.**) *Oct. 2016– Dec. 2017*
NIT, Mizoram, India (organizing program for celebration)
- Co-Coordinator for Working Group of Nanoscience and Nanotechnology (**4 sems.**) *Apr. 2016– till date*
National Institute of Technology (NIT) Mizoram, India (coordinating and developing the center)

PRESENT DEPARTMENTAL ACTIVITIES

- Laboratory In-Charge: Microprocessors and Microcontrollers Lab B.Tech (**4 sems.**) *Aug. 2016– till date*
NIT, Mizoram, India (Maintaining and developing the Lab for B.Tech students)
- Coordinator for M.Tech Courses, Dept. of ECE (**3 sem.**) *Sep. 2016– Dec. 2017*
National Institute of Technology (NIT) Mizoram, India

RECENT INSTITUTE OUTREACH ACTIVITIES

- Invited Speaker for ICN:3I 2017 Conference, IIT Roorkee, India *December 2017*
- International Program Committee Member for MAMI 2017, India *December 2017*
- Invited Resource Person for National Workshop, Mizoram, India *August 2017*
- Invited Speaker for EMN Terahertz Meeting Conference 2017, Honolulu, USA *April 2017*
- International Program Committee Member for MAMI 2015, India *December 2015*

PREVIOUS ADMINISTRATIVE EXPERIENCE

- Departmental Training & Placement Officer *Jun. 2009– May 2010*

Thapar University, Patiala, India (Arranging summer training for B.Tech students)

- Departmental Examination Controller *Jun. 2006– Jul. 2007*
NSEC, Kolkata, India (Organizing, arranging, and scheduling exams for B.Tech/M.Tech students)
- Laboratory In-Charge: Basic Electronics Lab B.Tech *Feb. 2006– Jul. 2007*
NSEC, Kolkata, India (Organizing, arranging, and maintaining Lab for B.Tech students)
- Departmental Chair of Final Grand Viva Voice and Projects for B.Tech *Feb. 2006– Jul. 2007*
- NSEC, Kolkata, India (Arranging and coordinating final Grand Viva and Projects for B.Tech students)

CONFERENCE/SEMINAR/WORKSHOP ORGANIZED

- Course on RF Microwave Circuits in Wireless Communications (8 days) *August 2016*
Organizing Member, NIT Mizoram, Mizoram, India
- Workshop on Recent Trends in Nano Science and Nanotechnology (RTNN) (2 days) *March 2016*
Co-Coordinator, NIT Mizoram, Mizoram, India
- MOC Summit & 1st International Conference, Edmonton, Alberta, Canada (3 days) *May 2015*
Organizing Member, University of Alberta, Canada

CONFERENCE/SEMINAR/WORKSHOP ATTENDED

- International Conference on MAMI 2017, CVRCE, Bhubaneswar, India (3 days) *December 2017*
- International Conference on Nanotechnology (ICN:3I), IIT Roorkee, India (3 days) *December 2017*
- Energy Materials Nanotechnology (EMN) Meeting, Honolulu, USA (5 days) *April 2017*
- Workshop on Nanotechnology (RTNN), Mizoram, India (2 days) *March 2016*
- MOC Summit & 1st International Conference, Edmonton, Alberta, Canada (3 days) *May 2015*
- CLEO 2015 Conference, San Jose, California, USA (6 days) *May 2015*
- TechConnect World 2014 Conference, Washington D.C., USA (4 days) *June 2014*
- CLEO 2014 Conference, San Jose, California, USA (6 days) *June 2014*
- MRS Fall 2012 Conference, Boston, USA (6 days) *November 2012*
- Photonics North 2012 Conference, Montreal, Quebec, Canada (3 days) *June 2012*
- International Winter School (IWSGS), IIT Bombay, India (1 weeks) *December 2009*
- Faculty Induction Workshop, NSEC, Kolkata, India, AICTE sponsored (2 weeks) *March 2007*
- MRS Fall 2005 Conference, Boston, USA (6 days) *December 2005*
- Post Graduate Conference, Newcastle upon Tyne, U.K (3 days) *January 2005*

AWARDS AND HONORS

- Graduate Research Studentship, Department of Electrical and Computer Engineering, University of Waterloo from May 2010 to August 2014.
- University of Waterloo Graduate Scholarship, Winter 2013, Spring 2013 and Fall 2013.
- International Doctoral Student Award Year 4, University of Waterloo from May 2013 to August 2013.
- Electrical and Computer Engineering Graduate Award, University of Waterloo, Fall 2012.
- International Doctoral Student Award by University of Waterloo from May 2010 to August 2012.
- Research Scholarship, Nanyang Technological University, Singapore, January 2008 – December 2008.

PUBLICATIONS

International Referred Journals

- J1. L. Khiangte, and **R. S. Dhar**, “*Development of tri-layered s-Si/s-SiGe/s-Si Channel Heterostructure on Insulator MOSFET for enhanced drive current*”, Physica Status Solidi B, Wiley-VCH, submitted January 2018. **Impact Factor – 1.71**
- J2. **R. S. Dhar**, “*Nanomaterial based thin film membrane for Smart Window Technologies*”, ChemPhysChem, Wiley-VCH, submitted October 2017. **Impact Factor – 3.36**
- J3. A. Mahmud, A. Ali, **R. S. Dhar**, S. G. Razavipour, Z. Wasilewski, M. Rezeq, and D. Ban, “*Scanning Voltage Microscopy for Emerging Electronic and Photonic Devices: Integrating nanotips with a single atom end for SVM*”, IEEE Nanotechnology Magazine, vol. 11, no. 1, pp. 4-11, March 2017. **Impact Factor – 1.52**
- J4. **R. S. Dhar**, and D. Ban, “*Nanosopic Voltage Distribution of Operating Cascade Laser Devices in Cryogenic Temperature*”, Journal of Microscopy, Wiley-RMS Publications, Vol. 262, no.3, pp.226-231, June 2016. **Impact Factor – 2.14**
- J5. **R. S. Dhar**, A. Elezzabi, and M. Al-Hussein, “*Smart Window Technologies: Electrochromics and Nanocellulose thin film Membranes and Devices*”, SRDP Journal of Nanotechnology and Material Science, Vol. 1, pp. 1-14, April 2016.
- J6. D. Ban, B. Wen, **R. S. Dhar**, S. G. Razavipour, C. Xu, X. Wang, Z. Wasilewski, E. Dupont, S. Laframboise, R. Q. Yang, and St. J. Dixon-Warren, “*Electrical scanning probe microscopy of electronic and photonic devices: connecting internal mechanisms with external measures*”, Nanotechnology Reviews, De Gruyter Publishing, Vol. 5, issue 3, pp. 279-300, June 2016. **Impact Factor – 2.04**
- J7. **R. S. Dhar**, L. Li, H. Ye, X. Wang, R. Q. Yang, and D. Ban, “*Nanosopic Resolving of Dynamic Charge Carrier Distribution in operating Interband Cascade Laser*”, Laser and Photonics Review, Wiley-VCH, Vol. 9, no., pp.224-230, March 2015. **Impact Factor - 9.31**
- J8. **R. S. Dhar**, S. G. Razavipour, E. Dupont, C. Xu, S. Laframboise, Z. Wasilewski, Q. Hu, and D. Ban, “*Direct Nanoscale Imaging of Evolving Electric Field Domains in Quantum Structures*”, Nature Scientific Reports, Nature Publishing Group, Vol. 4, no.7183, pp.1-9, November 2014. **Impact Factor – 5.23**
- J9. **R. S. Dhar**, Z. Wasilewski, and D. Ban, “*Cryogenic Temperature Voltage Profiling of Operating Laser Devices*”, NSTI Nanotech, NSTI Publications, Vol. 1, pp.428-431, June 2014.
- J10. **R. S. Dhar**, St. J. Dixon-Warren, M. A. Kawaliye, J. Campbell, M. Green, and D. Ban, “*Direct Charge Measurements to Read Back Stored Data in Non Volatile Memory Devices using Scanning Capacitance Microscopy*”, Journal of Vacuum Science & Technology B, AVS Publications, Vol. 31, pp.061801-1-7, December 2013. **Impact Factor – 1.4**
- J11. **R. S. Dhar**, and D. Ban, “*Two-dimensional profiling of carriers in terahertz quantum cascade lasers using calibrated scanning spreading resistance microscopy and scanning capacitance microscopy*”, Journal of Microscopy, Wiley-RMS Publications, Vol. 251, pp.35-44, July 2013. **Impact Factor – 2.14**
- J12. D. Qin, P. Gu, **R. S. Dhar**, S. G. Razavipour, and D. Ban, “*Measuring the exciton diffusion length of C₆₀ in organic planar heterojunction solar cells*”, Physica Status Solidi A, Wiley-VCH, Vol. 208, pp.1967-1971, March 2011. **Impact Factor – 1.65**

- J13. **R. S. Dhar**, “*Estimating Device Parameters in Strained Si/SiGe nMOSFET due to Self-Heating*”, The Institute of Engineering and Technology Branch Newsletter, IET, Vol. 29, pp.3-6, December 2006.

International Referred Conferences

- C1. L. Khiangte, and **R. S. Dhar**, “*Tri-layered Strained Si/SiGe/Si Channel HOI MOSFET*”, International Conference ICITE 2018, Osmania University, Hyderabad, India, April 11-13, 2018. **Submitted.**
- C2. L. Khiangte, and **R. S. Dhar**, “*Double Strained Si Channel Heterostructure on Insulator MOSFET in sub-100nm regime*”, 2nd International Conference MAMI 2017, CVRCE, Bhubaneswar, India, December 21-23, 2017.
- C3. L. Khiangte, and **R. S. Dhar**, “*Development of Double Strained Si Channel for Heterostructure on Insulator MOSFET*”, 2nd International Conference MAMI 2017, CVRCE, Bhubaneswar, India, December 21-23, 2017.
- C4. **R. S. Dhar**, and L. Khiangte, “*Doubly Infused Strain in sub-50 nm three layered channel Heterostructure on Insulator MOSFET*”, ICN:3I-2017 Conference, IIT Roorkee, India, Proc. Energy & Nano. Elect. 257-ICN3I, pp. 252, December 6-8, 2017.
- C5. **R. S. Dhar**, “*Scanning voltage microscopy for Terahertz quantum devices*”, Energy Materials Nanotechnology (EMN) Meeting on Terahertz 2017, pp.9, Honolulu, Hawaii, USA April 1-5, 2017.
- C6. D. Ban, **R. S. Dhar**, S. G. Razavipour, E. Dupont, Z. R. Wasilewski, “*Competition of current-carrying channels in operating terahertz quantum cascade lasers*”, International Conference on Optical, Optoelectronic and Photonic Materials and Applications, Montreal, Canada, pp.12, June 13-17, 2016.
- C7. **R. S. Dhar**, A. Elezzabi, and M. Al-Hussein, “*Innovative and Energy Efficient Smart Window Based on Nanomaterial Technologies*”, MOC Summit & 1st International Conference, Edmonton, AB, Canada, May 19-21, MOC Summit & 1st ICIC Proc., pp.494-501, May 2015.
- C8. **R. S. Dhar**, S.G. Razavipour, E. Dupont, Z. Wasilewski, and D. Ban, “*Scanning Voltage Microscopy Study of Lasing and Non-lasing Terahertz Quantum Cascade Lasers*”, CLEO 2015 Conference, San Jose, CA, USA, May 10-15, CLEO Proc., Vol. Stu1G.4, May 2015.
- C9. **R. S. Dhar**, S.G. Razavipour, E. Dupont, C. Xu, S. Laframboise, Z. Wasilewski, Q. Hu, and D. Ban, “*Direct Observation of Electric Field Domain in the Active Regions of Terahertz Quantum Cascade Laser*”, IQCLSW2014 Conference, Policoro, Italy, September 7-12, 2014.
- C10. **R. S. Dhar**, and D. Ban, “*Cryogenic Temperature Voltage Profiling of Operating Laser Devices*”, TechConnect World 2014 Conference, Washington DC., MD, USA, June 15-19, 2014.
- C11. **R. S. Dhar**, C. Xu, D. Ban, L. Li, H. Ye, R.Q. Yang, M.B. Johnson, T.D. Mishima, and M.B. Santos, “*Direct Observation of Non-uniform Electric Field in the Active Regions of an Interband Cascade Laser*”, CLEO 2014 Conference, San Jose, CA, USA, June 8-13, CLEO Proc., Vol. STh3G.3, 2014.
- C12. **R. S. Dhar**, St. J. Dixon-Warren, M. A. Kawaliye, J. Campbell, M. Green, and D. Ban, “*Read Back of Stored Data in Non Volatile Memory Devices by Scanning Capacitance Microscopy*”, Materials Research Society, MRS Fall 2012 Conference, Boston, USA, November 25-30, MRS Proc., Vol. 1527, pp.UU03-22 - 1-7, December 2012.
- C13. **R. S. Dhar**, and D. Ban, “*SSRM and SCM study for doping concentration of THZ QCL devices*”, Photonics North 2012 Conference, Montreal, QC, Canada, June 6-8, Proc. of SPIE, Vol. 8412, pp.84121Z-1-6, September 2012. **Impact Factor – 0.20**

C14. **R. S. Dhar**, G. K. Dalapati, S. Chattopadhyay, K. S. K. Kwa, S. H. Olsen, and A. G. O'Neill, "*Modelling of Self-Heating in Strained Si n-Channel MOSFETs on SiGe Virtual Substrates*", Materials Research Society, MRS Fall 2005 Conference, Boston, MA, USA, December 1-5, 2005.

C15. **R. S. Dhar**, A. G. O'Neill, G. K. Dalapati, K. S. K. Kwa, L. S. Driscoll, S. Chattopadhyay, and S. H. Olsen, "*AC Conductance Technique to Eliminate the Effect of Self Heating in Strained Si/SiGe MOSFET*", Post Graduate Conference 2005, Newcastle, U.K, January 10-13, 2005.

Book

- **R. S. Dhar**, "*Solid State Devices*", Book Syndicate Pvt. Ltd., Kolkata, India, September 2007.

Monographs

M1. **R. S. Dhar**, "*Nanometer Probing of Operating Nano-Photonic Devices*", PhD thesis, University of Waterloo, Waterloo, ON, Canada, August 2014.

M2. **R. S. Dhar**, "*Modelling of Self-Heating in Deep Sub-Micron Heterostructure Strained Si/SiGe MOSFET Devices*", MPhil thesis, University of Newcastle upon Tyne, Newcastle, UK, January 2006.