



# UNIVERSITY OF CALCUTTA

## ACADEMIC DEPARTMENT – RADIO PHYSICS AND ELECTRONICS

### FACULTY ACADEMIC PROFILE/ CV

1. **Full name of the faculty member:** .....NIKHIL RANJAN DAS.....
2. **Designation:** ...PROFESSOR.....
3. **Specialisation :** Semiconductor Nanostructures, Optoelectronic/Photonic Devices & Systems.
4. **Passport size photograph :** .



5. **Contact information :**

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6. **Academic qualifications:**

| College/ university from which the degree was obtained | Abbreviation of the degree |
|--|----------------------------|
| Krishnath College/ University of Calcutta, India       | B.Sc. (Honours in Physics) |
| University of Calcutta, India                          | B.Tech. (post-B.Sc.)       |
| University of Calcutta, India                          | M.Tech.                    |
| University of Calcutta, India                          | Ph.D. (Tech.)              |
| McMaster University, Canada                            | Post-Doc.                  |

7. **Positions held/ holding:**

**Professor**, University of Calcutta (2008--)

**Head of the Department**, Radio Physics and Electronics (Dec. 2014 –Nov.2016),

**DEAN**, Faculty of Engineering & Technology (Aug. 2013 –Aug.2016),

**Director**, Centre for Research in Nanoscience and Nanotechnology (Aug. 2015 –Aug.2017),

**Head** (acting), University Science Instrumentation Centre (Apr. 2014 – Aug. 2022),

**Director** (Hon.), UGC Networking Resource Centre in Physical Sciences (Apr. 2013 --)

**Convenor**, Ph.D. Research Advisory Committee in Radio Physics and Electronics (2017-2021, 2022-...)

**Visiting Scientist** (Aug/Sept, 2018): TU Dresden, Germany

**Visiting Professor**(Winter Semester,2010:Teaching & Research), POSTECH, South Korea

**Visiting Professor**, (Aug., 2008), University of Sheffield, UK

**Visiting Professor**, (May-July,2005), McMaster University, Canada

8. **Research interests:**

( *in brief*)

- Modeling and Design of Electronic and Optoelectronic /Photonic Devices,
- Physical Properties of Semiconductor Nanostructures
- Modeling of Quantum Well, Quantum Wire and Quantum dot based devices
- Crosstalk in optical Wavelength Division Multiplexing systems

9. **Research guidance :**

Number of researchers awarded Ph.D degrees : Ph.D. – 11 (eleven).....

Number of researchers pursuing Ph.D : Ph.D. – 2(submitted), 6 (continuing)

10. **Projects :**

**International**

- In **Erasmus Mundus LEADERS** (Leading mobility between Europe and Asia in Developing Engineering Education and Research) program between 20 European and Asian Universities (Jul.2014 – Jun.2018), as **Key person** for management, from University of Calcutta. (Fund: **Euro 5,000**).
- **UK India Education and Research Initiative** (UKIERI) Thematic partnership with *University of Sheffield, UK* for 2 years (2012) and *University of Calcutta, India* as **P.I.** (Fund to CU: **GBP 30,900**).

**National**

- **DST**(Department of Science and Technology) sponsored project (India) on “*Physics and Modeling of Silicon Nanophotonic Devices*” for 3 years (2007-2010) as Co-P.I.
- **DST**(Department of Science and Technology) sponsored project (India) on “*Studies on Group IV Semiconductors and Their Alloys for Photonic Device Applications*” as P.I.

## 11. Selected list of publications:

### a) *Journals: (selected)*

- M. Mishra and N. R. Das, *Design of a compact silicon photonic directional coupler introducing a hetero-cladding approach*, **Journal of the Optical Society of America (JOSA) B**, 39, pp.2025-2031 (2022).
- D. Ghosh, A. Mukherjee, S. Mandal, N. R. Das, B. N. Biswas, *Controlling birhythmicity in a new Dual Loop Optoelectronic Oscillator with an injection locked van der Pol oscillator*, **Physica D: Nonlinear Phenomena**, 436, Art.133324, (2022).
- S. Dey, N. R. Das, S. Ghosh, *Exploring unconventional features of light dynamics in Aubrey–André–Harper model based quasi-periodic optical lattices*, **Optics Communications**, 506, 1 March 2022, 127593 (2022).
- M. Mishra, N. R. Das, N. Sahoo, T. Sahu, *Performance enhancement of armchair graphene nanoribbon resonant tunneling diode using V-shaped potential well*, **Physica Scripta**, 96 124076 (2021).
- P. P. Mukherjee, S. Sarkar and N. R. Das, *Spectral efficiency and quantum limit of BPSK transmission in a WDM system in presence of multiple interferers*, **Photonic Network Communications**, August (2021), <https://doi.org/10.1007/s11107-021-00945-9>.
- P. Mukherjee and N. R. Das, *Approach to Design of Optical Microring Resonator for Biosensing with Enhanced Efficiency*, **Microsystem Technologies**, 2021, 1-9, <https://doi.org/10.1007/s00542-020-05126-8>.
- K. Majumder, P. Rakshit, and N. R. Das, *Effect of Submicron Structural Parameters on the Performance of a Multi-Diode CMOS Compatible Silicon Avalanche Photodetector*, **Semiconductors** 54, 1032–1038 (2020). <https://doi.org/10.1134/S1063782620090183>.
- A. Banerjee, J. Sarkar, L.A.D. de Britto, G.M. Pacheco, N.R. Das, *On the Transient Behavior of Single-loop Optoelectronic Oscillators under RF Injection-Locking*, **IEEE Journal of Quantum Electronics**, <https://doi.org/10.1109/JQE.2020.3018378>.
- Shampa Guin and Nikhil Ranjan Das, *Modeling power and linewidth of quantum dot superluminescent light emitting diode*, **Journal of Applied Physics**, 128, 083102 (2020); <https://doi.org/10.1063/1.5131550>.
- K. Majumder, P. Rakshit, and N. R. Das, *Effect of Submicron Structural Parameters on the Performance of a Multi-Diode CMOS Compatible Silicon Avalanche Photodetector*, **Semiconductors** 54, 1032–1038 (2020). <https://doi.org/10.1134/S1063782620090183>.
- Paulami Rakshit and Nikhil R. Das, *Effect of device parameters on improving the quantum efficiency of a lateral Si p–i–n photodetector*, **Optical and Quantum Electronics** 52, 371, (2020). <https://doi.org/10.1007/s11082-020-02490-7>. (For view only: <https://rdcu.be/b535i>)

- E. Baek, N.R. Das, C.V. Cannistraci, et al., *Intrinsic plasticity of silicon nanowire neurotransistors for dynamic memory and learning functions*, **Nature Electronics**, 3, pp.398-408, (2020). <https://doi.org/10.1038/s41928-020-0412-1>. (For view only: <https://rdcu.be/b4ovR>)
- M Mishra, N.R. Das, F Morichetti, *Waveguide design optimization for compact silicon photonic ferroelectric phase shifters*, **Applied Optics**, 59, , pp.4385-4391 (2020).
- J. Sarkar, L. A. D. de Britto, A. Banerjee, N. R. Das and G. M. Pacheco, *Frequency pulling in optoelectronic oscillator by RF signal injection*, **Optical and Quantum Electronics**, 52, Article No. 214, pp.1-18, (2020), <https://doi.org/10.1007/s11082-020-02331-7>.
- J. Sarkar, A. Banerjee and N. R. Das, *A Theoretical and Experimental Study of the Frequency Pulling Phenomenon in a Single-loop Optoelectronic Microwave Oscillator due to RF Signal Injection*, **Optik-International Journal for Light and Electron Optics**, 207, April, 164427 (2020), <https://doi.org/10.1016/j.ijleo.2020.164427>.
- A. Ghosh, A. Pal and N. R. Das, *An Approach to Design Photonic Crystal Gas Sensor Using Machine Learning*, **Optik-International Journal for Light and Electron Optics**, online 23 Dec. (2019) (<https://doi.org/10.1016/j.ijleo.2019.163997>).
- M. Mishra, N.R. Das, A. Melloni and F. Morichetti, “*Modelling domain switching of ferroelectric BaTiO<sub>3</sub> integrated in silicon photonic waveguides*”, **Optics Communications**, 448, pp.19–25 (2019).
- S. Guin and N.R.Das, *Enhancement of optical gain in quantum dot ensemble with electric field*, **Superlattices and Microstructures**, 125, pp.151–158, (2019).
- D. Ghosh, A. Mukherjee, N. R. Das, and B. N. Biswas, *Control of coexisting periodic oscillations in an optoelectronic oscillator*, **Optical Engineering**, 57, 126108 (2018).
- D. Ghosh, A. Mukherjee, N. R. Das and B. N. Biswas, *Generation & control of chaos in a single loop optoelectronic oscillator*, **Optik-International Journal for Light and Electron Optics**, 165, pp.275-287 (2018).
- A. Banerjee, J. Sarkar, N. R. Das and B. N. Biswas, *Phase-locking dynamics in optoelectronic oscillator*, **Optics Communications** 414, pp. 119-127 (2018).
- P. Mukherjee, S. Sarkar and N. R. Das, *An approach for realistic estimation of BER due to signal-component crosstalk in a WDM receiver*, **Optik-International Journal for Light and Electron Optics** 146, pp. 1-7 (2017).
- K Majumder and N. R. Das, *Effects of alloy composition on gain and bandwidth of Si/SiGe and Si/GeSn avalanche photodiodes*, **Optik-International Journal for Light and Electron Optics**, 127, pp.3059-3064, (2016).
- A Mukherjee, B. N. Biswas, N.R. Das, *A Study on the Effect of Synchronization by an Angle Modulated Signal in a Single Loop Optoelectronic Oscillator*, **Optik-International Journal for Light and Electron Optics**, 126, pp.1815-1820, (2015).
- Arpan Deyasi, Swapan Bhattacharyya, and Nikhil R Das, *A finite-difference technique for computation of electron states in core-shell quantum wires of different configurations*, **Physica Scripta**, 89, 065804, (2014).
- Kanishka Majumder and N. R. Das, *Gain and Bandwidth Analysis and Comparison for GaAs and Si Avalanche Photodiodes with Very Thin Multiplication Layer*, **Optical Engineering**, 52, 054001, (2013).

- Arpan Deyasi, Swapan Bhattacharyya, and Nikhil R Das, *Computation of Intersubband Transition Energy in Normal and Inverted Core-Shell Quantum Dots using Finite Difference Technique*, **Superlattices and Microstructures**, 1.60, pp.414-425, (2013).
- Santu Sarkar and N. R. Das, *On the Optimum Detection Threshold for Minimum Bit-Error-Rate due to Four Wave Mixing in a WDM System*, (**OSA/IEEE**) **Journal of Optical Communication and Networking**, 5, pp.370-377,(2013).
- N. R. Das, M W Shinwari, M J Deen and Jeong-Soo Lee *Electron states in a silicon nanowire in the presence of surface potential and field*, **Nanotechnology**, 23, 415201 (15pp), (2012).
- S. Bhattacharyya and N. R. Das, *Effect of electric field on the oscillator strength and cross-section for intersubband transition in a semiconductor quantum ring*, **Physica Scripta**, 85, 045708 (8pp), (2012).
- N. R. Das and Paulami Rakshit, *On the Frequency Response and Optimum Designs for Maximum Bandwidth of a Lateral Silicon Photodetector*, **IEEE Journal of Lightwave Technology**, 29, pp. 2913-2919, (2011).
- N. R. Das and Santu Sarkar, *Probability of Power Depletion in SRS Cross-talk and Optimum Detection Threshold for Minimum BER in a WDM Receiver*, **IEEE Journal of Quantum Electronics**, 47, pp.424-430, (2011).
- Kasturi Mukherjee and N. R. Das, *Tunneling Current Calculations for Nonuniform and Asymmetric Multiple Quantum Well Structures*, **Journal of Applied Physics**, 109, 053708, (2011).
- Himadri Sekhar Dutta and N. R. Das, *Calculating the Noise Performance of a Ge-on-Si Schottky Photodetector*, **Microwave and Optical Technology Letters**, 53, pp.5-10, (2011).
- P. K. Basu, N. R. Das, Bratati Mukhopadhyaya, Gopa Sen and Mukul K. Das, (Invited paper) *Ge/Si photodetectors and group IV alloy based photodetector materials*, **Optical and Quantum Electronics**, 41, pp.567–581, (2009).
- Mukul K Das and N. R. Das, *On optimum designs of a RCE Si/SiGe/Si MQW photodetector for long wavelength applications*, **Optical and Quantum Electronics**, 41, pp.539–549, (2009).
- Santu Sarkar and N. R. Das, *Study of Component Cross-talk and Obtaining Optimum Detection Threshold for Minimum Bit-Error-Rate in a WDM Receiver*, **IEEE Journal of Lightwave Technology**, 19, 159-171, (2009).
- Mukul K Das and N. R. Das, *Calculating the Responsivity of a Resonant-Cavity-Enhanced Si<sub>1-x</sub>Ge<sub>x</sub>/Si Multiple Quantum Well Photodetector*, **Journal of Applied Physics**, 105, 093118 (2009).
- S. Bhattacharyya, N. R. Das and Susmita Sen, *Electrical Tuning of Intersubband Transition in a Semiconductor Quantum Ring*, **Journal of Applied Physics**, 105, 053108 (2009).
- N. R. Das and Susmita Sen, *Threshold for Photoelectric Emission from a Quantum Ring of Narrow Gap Semiconductor*, **Physica B: Condensed Matter**, 403, pp.3734-3739, (2008).

- Himadri Sekhar Dutta, N. R. Das and Mukul K. Das, *Investigating the Effect of Heterointerface Trapping on the Performance of a RCE Ge-on-Si Schottky Photodiode at 1.55 $\mu$ m*, **Semiconductor Science and Technology**, 23, 085012 (2008).
- Himadri Sekhar Dutta, N. R. Das and Mukul K. Das, *Frequency Response of a Resonant Cavity Encapsulated Germanium-on-Silicon Schottky Photodiode*, **IET Circuits, Devices and Systems**, 2, pp.128-132, (2008).
- Susmita Sen, N. R. Das and A. N. Chakravarti, *Electron Emission from a Semiconductor Quantum Ring by Normal Incidence of Radiation*, **Journal of Physics: Condensed Matter**, 19, 186205, (8pp) (2007).
- Mukul K Das and N. R. Das, *Effect of Ge-composition on the Frequency Response of a Si/Si<sub>1-y</sub>Ge<sub>y</sub> P-i-N Photodetector*, **Optical Engineering (SPIE)**, 45, p.124001, (2006).
- N. R. Das and Alakananda Mitra, *A New Approach to the Modeling of Si - RFIC Inductor*, **Microwave and Optical Technology Letters**, 8, pp.1095-1101, (2006).
- Mukul. K. Das, N. R. Das and P. K. Basu, *Effect of Ge-Composition on the Performance of a SiGe/Si Heterojunction Bipolar Transistor*, **Microwave and Optical Technology Letters**, 47, pp.247-254, (2005).
- N. R. Das and M. Jamal Deen, *A Model for the Performance Analysis and Design of Waveguide PIN Photodetectors*, **IEEE Transaction on Electron Devices**, 52, pp.465-472, (2005).
- N. R. Das and M. Jamal Deen, *On the Performance Analysis and Design of Integrated Front-End PIN/HBT Photoreceiver*, **IEEE Journal of Quantum Electronics**, 40, pp. 78-91 (2004).
- Yasser M. El-Batawy, M. J. Deen, and N. R. Das, *Analysis, Optimization, and SPICE Modeling of Resonant Cavity Enhanced p-i-n Photodetector*, **IEEE Journal of Lightwave Technology**, Vol. 21, pp. 2031-2043, (2003).
- N.R. Das and M.J. Deen, *On the frequency response of a resonant-cavity-enhanced separate absorption, grading, charge, and multiplication avalanche photodiode*, **Journal of Applied Physics**, 92, pp. 7133-7145(2002).
- N.R. Das and M.J. Deen, *A New Model for Avalanche Build-Up of Carriers in a SAGCM Avalanche Photodiode*, **IEEE Transactions on Electron Devices**, 49, pp.2362-2366,(2002).
- N.R.Das and M.J.Deen, *On the Optimum Design of the Front-End PIN-HBT OEIC Photoreceiver*, **Journal of Vacuum Science and Technology A** , 20, pp. 1067-1071 (2002).
- N.R.Das and M.J. Deen, *Calculating the Photocurrent and Transit-Time Limited Bandwidth of a Heterostructure PIN Photodetector*, **IEEE Journal of Quantum Electronics**, 37, pp. 1574-1587, (2001).
- N.R.Das and M.J.Deen, *Low Bias Performance of Avalanche Photodetector - A Time Domain Approach*, **IEEE Journal of Quantum Electronics**, 37, pp.69-74, (2001).
- N.R.Das, P.K.Basu and M.J.Deen, *A New Approach to the Design Optimization of HEMT and HBT for Maximum Gain-Bandwidth of MSM-Based Integrated Photoreceiver and its Noise Performance at 1.55  $\mu$ m*, **IEEE Transactions on Electron Devices**, 47, pp. 2101-2109, (2000).

b) **Books/ book chapters :**

- N. R. Das and Santu Sarkar, Eds., *Computers and Devices for Communication*, (Proceedings of CODEC 2019), **Lecture Notes in Networks and Systems** book series, Vol. 147, (566 pages), **Springer**, Singapore, 2021, <https://doi.org/10.1007/978-981-15-8366-7>.
- N.R.Das, “Advances in Semiconductor Photodetectors for Infrared Applications”, In: “Advances in Microelectronics and Photonics”, Ed. S. Jit, Chapter No. 9, (33pages), **Nova Science Publishers, Inc.** , 2011.
- N.R.Das, Y.M. El-Batawy and M.J. Deen, *Optoelectronic Integrated Circuit Photoreceivers for Fiber-optic Telecommunication*, in *Integrated Optoelectronics*, Eds. M. J. Deen, D. Misra and J. Ruzyllo, **The Electrochemical Society Inc.**, PV 2002-4, NJ, USA, pp.163-193, 2002.

c) **Monographs/Lecture Notes:**

- Piyali Mukherjee and N. R. Das, “Design of a Microring Resonator Having High Sensitivity for Biosensing Applications”, in **Advances in Smart Communication Technology and Information Processing: OPTRONIX 2020**, (eds.) S. Banerjee and J. K. Mandal, **Lecture Notes in Networks and Systems**, Springer Nature Singapore Pte. Ltd, vol.165, pp.459-470, 2021.
- Madhusudan Mishra and N. R. Das, “Trenched Core Waveguide Structure for Photonic Integrated Circuit” in “Computers and Devices For Communication”, N. R. Das and Santu Sarkar (Eds.), **Lecture Notes in Networks and Systems**, Springer Nature Singapore Pte. Ltd., vol.147, pp.321-325, 2021.
- Shampa Guin and N. R. Das, “Photon Density Distribution in Quantum Dot-Based Light-Emitting Diode” in "Computers and Devices For Communication", N. R. Das and Santu Sarkar (Eds.), **Lecture Notes in Networks and Systems**, Springer Nature Singapore Pte. Ltd., pp.331-335, 2021.
- Sonali Basak, Santu Sarkar, and N. R. Das, “Modes and Coupling in Seven-Core Optical Fiber”, in "Computers and Devices For Communication", N. R. Das and Santu Sarkar (Eds.), **Lecture Notes in Networks and Systems**, Springer Nature Singapore Pte. Ltd., pp.344-349, 2021.
- Santu Sarkar, Pinak Pani Mukherjee and N. R. Das, *A Comparative Study on Determination of Optimum Detection Threshold for Minimum BER in a WDM Receiver with SRS and FWM Crosstalk*, in “Computers and Devices For Communication”, N. R. Das and Santu Sarkar (Eds.), **Lecture Notes in Networks and Systems**, Springer Nature Singapore Pte. Ltd., pp.363-368, 2021.
- M. Mishra and N.R. Das, *Role of Coupling Angle on the Performance of a Ring Resonator–Waveguide Sensor*, In: Janyani V., Singh G., Tiwari M., Ismail T. (eds) *Optical and Wireless Technologies*, **Lecture Notes in Electrical Engineering**, Springer, Singapore, 648, pp. 155-160, (2020).

- A. Ghosh, A. Pal and N.R. Das, *A Simple Structural Design for Tuning of Bandgap and Window in 1D Photonic Crystal*, In: Janyani V., Singh G., Tiwari M., Ismail T. (eds) **Optical and Wireless Technologies, Lecture Notes in Electrical Engineering, Springer, Singapore**, 648, pp. 127-136, (2020).
- S. Mukhopadhyay, S. Das and N.R. Das, *An Approach for Reduction of Cross-Talk in Multi-core Optical Fibers*, In: Janyani V., Singh G., Tiwari M., Ismail T. (eds) **Optical and Wireless Technologies, Lecture Notes in Electrical Engineering, Springer, Singapore**, 648, pp.111-118, (2020).
- Pinak Pani Mukherjee, N. R. Das and S. Sarkar, “Comparison of Power Penalty due to Component, SRS and FWM Crosstalk in a WDM Receiver”, in “Advances in Computer, Communication and Control,” U. Biswas et al. (Eds.), **Lecture Notes in Networks and Systems**, Springer Nature Singapore Pte. Ltd., pp.305-309, 2019.
- M. Mishra, F. Morichetti and N. R. Das, “Ferroelectric-Cladded Tunable Silicon Photonic Couple”, in “Advances in Computer, Communication and Control,” U. Biswas et al. (Eds.), **Lecture Notes in Networks and Systems**, Springer Nature Singapore Pte. Ltd., pp.401-405. 2019.
- Shreerupa Biswas, S. Guin and N.R. Das, “Photonic Crystal for Gas Sensing Application” in “Advances in Computer, Communication and Control,” U. Biswas et al. (Eds.), **Lecture Notes in Networks and Systems**, Springer Nature Singapore Pte. Ltd., pp.449-467. 2019.
- Piyali Mukherjee and N. R. Das, “Tailoring the parameters to increase the efficiency of a microring resonator sensor for biosensing”, in “Advances in Computer, Communication and Control,” U. Biswas et al. (Eds.), **Lecture Notes in Networks and Systems**, Springer Nature Singapore Pte. Ltd., pp.477-485. 2019.
- D. Ghosh, A. Mukherjee, N. R. Das, B. N. Biswas, *A Study on the Effect of an External Periodic Signal in a Chaotic Optoelectronic Oscillator*, In: S. Chattopadhyay, T. Roy, S. Sengupta, C. Berger-Vachon (eds), **Modelling and Simulation in Science, Technology and Engineering Mathematics. MS-17 2017, Advances in Intelligent Systems and Computing** book series, Springer, Cham, 749, pp.27-36 (2018).
- A. Deyasi and N. R. Das, “Effect of gate voltage and structural parameters on the Subthreshold Swing and the DIBL of Si-SiO<sub>2</sub> GAA quantum wire transistor”, in **Frontiers in Computer, Communication and Electrical Engineering – Acharyya** (Ed.), Taylor & Francis Group, London, (ISBN: 978-1-138-02877-7), pp.43-47, 2016.
- Arpan Deyasi, and N. R. Das, *Oscillator Strength and Absorption Cross-section of Core-Shell Triangular Quantum Wire for Intersubband Transition*, In: V. Lakshminarayanan, I. Bhattacharya (eds) **Advances in Optical Science and Engineering**, Chapter 78, **Springer Proceedings in Physics** book series Springer, New Delhi, 166, pp.629-635(2015).
- Arpan Deyasi, and N. R. Das, *Effect on Shell Thickness on Intersubband Transition Energies in GaAs/Al<sub>x</sub>Ga<sub>1-x</sub>As Inverted Core-Shell Nanodot*, In: P. Giri, D. Goswami, A. Perumal (eds) **Advances in Optical Science and Engineering, Springer Proceedings in Physics** (book series), Springer, Berlin, Heidelberg, 143, pp.551-560(2013).



d) *Conference/ seminar volumes:* (selected)

- M. Mishra, N. R. Das, N. Sahoo and T. Sahu, "Effect of Well Width and Barrier Width on I–V Characteristics of Armchair Graphene Nanoribbon based Resonant Tunneling Diode Structure," 2021 Devices for Integrated Circuit (**DevIC**), 2021, pp. 75-78, doi: 10.1109/DevIC50843.2021.9455884.
- S. Basak, S. Sarkar and N. R. Das, "A New Hole-walled Multi-core Fiber for Space Division Multiplexing for Improved Performance," **2020 IEEE 1st International Conference for Convergence in Engineering (ICCE)**, Kolkata, India, 2020, pp. 121-123, doi: 10.1109/ICCE50343.2020.9290645.
- S. Basak, S. Sarkar and N. R. Das, "Modes and Coupling in Six-Core hole-walled Optical Fiber," **2020 IEEE Calcutta Conference (CALCON)**, Kolkata, India, 2020, pp. 478-481, doi: 10.1109/CALCON49167.2020.9106521.
- Santu Sarkar, Pinakpani Mukherjee and N.R. Das "A comparative study on determination of optimum detection threshold for minimum BER in a WDM receiver with SRS and FWM crosstalk", **7th International Conference on Computers and Devices for Communication (CODEC-2019)**, 19-20 Dec. 2019, Hotel Vivanta, Kolkata, India.
- (*Awarded Poster*) Madhusudan Mishra and N.R. Das, "Trenched Core Waveguide Structure for Photonic Integrated Circuit", **7th International Conference on Computers and Devices for Communication (CODEC-2019)**, 19-20 Dec. 2019, Hotel Vivanta, Kolkata, India.
- Shampa Guin and N.R. Das, "Photon Density Distribution in Quantum Dot based Light Emitting Diode", **7th International Conference on Computers and Devices for Communication (CODEC-2019)**, 19-20 Dec. 2019, Hotel Vivanta, Kolkata, India.
- Sonali Basak, Santu Sarkar and N.R. Das, "Modes and Coupling in Seven-Core Optical Fiber", **7th International Conference on Computers and Devices for Communication (CODEC-2019)**, 19-20 Dec. 2019, Hotel Vivanta, Kolkata, India.
- Alekhya Ghosh, Arghadeep Pal and N. R. Das, "A Simple Structural Design for Tuning of Bandgap and Window in 1D Photonic Crystal", **3<sup>rd</sup> International Conference on Optical & Wireless Technologies (OWT 2019)**, March 16-17, 2019, Jaipur, India.
- Shroddha Mukhopadhyay, Samanti Das and N. R. Das, "An Approach for Reduction of Cross-talk in Multi Core Optical Fibers", **3<sup>rd</sup> International Conference on Optical & Wireless Technologies (OWT 2019)**, March 16-17, 2019, Jaipur, India.
- M. Mishra and N.R. Das, "Role of Coupling Angle on the Performance of a Ring Resonator-Waveguide Sensor", **3<sup>rd</sup> International Conference on Optical & Wireless Technologies (OWT 2019)**, March 16-17, 2019, Jaipur, India.
- Piyali Mukherjee and N. R. Das, "Tailoring the parameters to increase the efficiency of a microring resonator sensor for biosensing", **1st International Conference on Emerging Trends in Engineering and Science (ETES-2018)**, 23-24 March, 2018, Asansol Engg. College, India.
- Sonali Basak, S. Guin and **N.R. Das**, "Electrical Tuning of Band Gap in Photonic Crystal", **1st International Conference on Emerging Trends in Engineering and Science (ETES-2018)**, 23-24 March, 2018, Asansol Engg. College, India.

- Shreerupa Biswas, S. Guin and **N.R. Das**, “Photonic Crystal for Gas Sensing Application”, **1st International Conference on Emerging Trends in Engineering and Science (ETES-2018)**, 23-24 March, 2018, Asansol Engg. College, India.
- M. Mishra, F. Morichetti and **N. R. Das**, “Ferroelectric-Cladded Tunable Silicon Photonic Couple”, **1st International Conference on Emerging Trends in Engineering and Science (ETES-2018)**, 23-24 March, 2018, Asansol Engg. College, India.
- Pinak Pani Mukherjee, **N. R. Das** and S. Sarkar, “Comparison of Power Penalty due to Component, SRS and FWM Crosstalk in a WDM Receiver”, **1st International Conference on Emerging Trends in Engineering and Science (ETES-2018)**, 23-24 March, 2018, Asansol Engg. College, India.
- K. Majumder, P. Rakshit and N. R. Das “Dependence of Bandwidth on the Structural Parameters of Si-CMOS Avalanche Photodiode”, **1st International Conference on Emerging Trends in Engineering and Science (ETES-2018)**, 23-24 March, 2018, Asansol Engg. College, India.
- Jayjeet Sarkar, A. Banerjee, **N. R. Das** and B. N. Biswas, “Study the Effect of Delay and Frequency Pulling Phenomenon in an Opto-electronic Oscillator Considering Weak Signal Injection”, **1st International Conference on Emerging Trends in Engineering and Science (ETES-2018)**, 23-24 March, 2018, Asansol Engg. College, India.
- BN Biswas, A Mukherjee, NR Das, D Ghosh, “Optoelectronic oscillator: Electron-photon and photon-electron conversion device”, **3rd International Conference on Microwave and Photonics (ICMAP)**, 9-11 Feb. 2018, IIT ISM Dhanbad, India, IEEE Xplore on 07 May 2018, 1-2, DOI: 10.1109/ICMAP.2018.8354495.
- D Ghosh, NR Das, A Mukherjee, BN Biswas, “Multiple rhythms in an optoelectronic oscillator”, **3rd International Conference on Microwave and Photonics (ICMAP)**, 9-11 Feb. 2018, IIT ISM Dhanbad, India, IEEE Xplore on 07 May 2018, 1-2 DOI: 10.1109/ICMAP.2018.8354522.
- D Ghosh, A Mukherjee, NR Das, BN Biswas, “A Study on the Effect of an External Periodic Signal in a Chaotic Optoelectronic Oscillator”, **International Conference on Modelling and Simulation**, 27-36, 2017, MS-17 2017, 4-5 November , Kolkata, India.
- S Guin, NR Das, “Gain and linewidth enhancement in quantum dots with external electric field”, **International Conference on Numerical Simulation of Optoelectronic Devices (NUSOD)**, 2017, 24-28 July, Copenhagen, Denmark, published in IEEE Explore on 15Aug, 2017, DOI: 10.1109/NUSOD.2017.8010022.
- S Guin, NR Das, “Electric field aided optical gain in semiconductor quantum dots”, **International Conference on Circuits, System and Simulation (ICCSS)**, 2017, pp.24-27, 14-17 July 2017, London, UK, published in IEEE Xplore on 31 Aug., 2017, DOI: 10.1109/CIRSYSSIM. 2017.8023174.
- S Sarkar, PP Mukherjee, NR Das, “Realistic estimation of power penalty through a probabilistic framework in a WDM receiver with component crosstalk”, **International Conference on Circuits, System and Simulation (ICCSS)**, 2017 14-17 July 2017, pp.171-175, London, UK, published in IEEE Xplore on 31 Aug., 2017, DOI: 10.1109/CIRSYSSIM.2017.8023205.

- P.P. Mukherjee, S. Sarkar, N.R. Das, “A probabilistic framework to estimate minimum Bit Error Rate in a WDM receiver with component crosstalk”, **IEEE Region 10 Conference (TENCON)**, 2016, pp. 2004-2007, 22-25 Nov. 2016, Singapore, IEEE Xplore on 09 Feb., 2017, DOI: 10.1109/TENCON.2016.7848376.
- S Guin, NR Das, “Study the effect of inhomogeneous broadening in Quantum Dots for application in medical imaging”, **IEEE Region 10 Conference (TENCON)**, 2016, pp.3246-3248, 22-25 Nov. 2016, Singapore, IEEE Xplore on 09 Feb., 2017, DOI: 10.1109/TENCON.2016.7848650.
- S.Sarkar, P Mukherjee, N.R. Das, “Performance Degradation due to Component, SRS and FWM Crosstalk in a WDM Receiver”, **13<sup>th</sup> International Conference on Fibre Optics and Photonics**, W3A. 61, Kanpur, India, 4-8 Dec. 2016, **OSA Technical Digest** (online), DOI: <https://doi.org/10.1364/PHOTONICS.2016.W3A.61>.
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- Paulami Rakshit, Kanishka Majumder and N. R. Das, “Frequency Response of a CMOS Compatible Silicon Avalanche Photodetector” **6<sup>th</sup> International Conference on Computers and Devices for Communication (CODEC-2015)**, Dec. 2015.
- Pinakpani Mukherjee, Santu Sarkar and N.R.Das, “Analysis of Homodyne In-Band Crosstalk Interference from Multiple Interferers in a WDM Receiver” **6<sup>th</sup> International Conference on Computers and Devices for Communication (CODEC-2015)**, Dec. 2015.
- Kanishka Majumder and N. R. Das, “Effect of Alloy Composition on the Gain Performance of a Si/ Ge<sub>1-y</sub>Sny Avalanche Photodiode”, **2<sup>nd</sup> International Conference of Microwave and Photonics (ICMAP-2015)**, At Indian School of Mines, Dhanbad, India, Dec. 2015.
- Paulami Rakshit, Kanishka Majumder and N. R. Das, “Effect of finger spacing on the gain of a Silicon Avalanche Photodetector Compatible with CMOS Technology”, **2<sup>nd</sup> International Conference of Microwave and Photonics (ICMAP-2015)**, At Indian School of Mines, Dhanbad, India, Dec. 2015.
- Arpan Deyasi and N. R. Das, “Oscillator Strength and Absorption Cross-section of Core-shell Cubic Quantum Dot for Intraband Transition”, **2<sup>nd</sup> International Conference of Microwave and Photonics (ICMAP-2015)**, At Indian School of Mines, Dhanbad, India, Dec.2015 [IEEE Xplore, ISBN: 978-1-4673-6898-8]
- Shampa Guin and N. R. Das, “Modeling of Quantum Dot Superluminescent Light Emitting Diode for Sub-Cellular Imaging”, **One day workshop ‘Photonics for Sensing and Imaging’**, under UKIERI program between University of Calcutta (India) and University of Sheffield (UK), 27<sup>th</sup> March 2015, Institute of Radio Physics and Electronics, University of Calcutta.
- (*Invited*) “Infrared Photodetectors at Medium and Long Wavelengths”, National Conference (NCAE), ADAMAS Institute of Technology, WBUT, Oct., 26, 2013.

- (Invited) “Nanostructures in Semiconductor Photonic Devices”, **Conference** on Engineering Education in the New Century (**E2NC**), Supreme Knowledge Foundation, Mankundu, Feb. 15-16, 2013.
- Arpan Deyasia, S Bhattacharyyab and N. R. Das, “Electron States in a Semiconductor Quantum Disk in Parallel Magnetic Field”, Proceedings of **100th Session of the Indian Science Congress (ISC-2013)** in the Section XIII: Physical Sciences, Jan.3-7, 2013.
- Kanishka Majumder and N. R. Das, Calculating the Gain of  $n^+i-p^+$  Avalanche Photodiode with Nanometric active Layer, Proceedings of **100th Session of the Indian Science Congress (ISC-2013)** in the Section XIII: Physical Sciences, Jan.3-7, 2013.
- Arpan Deyasi, S Bhattacharyya and N. R. Das, “Numerical Computation of Eigenenergy and Intersubband Transition Energy of GaAs Triangular Nanowire Embedded in  $Al_xGa_{1-x}As$  Rectangular Wire”, **International Conference on Computers and Devices for Communication (CODEC-09)**, Hyatt Regency, Kolkata, India, Dec.17-19, 2012.
- (Invited) “Semiconductor Photonic Devices for Optical Communication”, National Conference on Advanced Communication Systems and Design Techniques (**NCACD**) , Haldia Institute of Technology, West Bengal, India, Sept. 29-30, 2012.
- (Invited) N. R. Das, *Advances in Semiconductor Infrared Photodetectors*, Frontiers in Electronics, Communication, and Instrumentation Technology (**FECIT**), ISM Dhanbad, Nov. 3-4, 2011.
- Kanishka Majumder and N.R.Das, *Modeling the Gain and Bandwidth of Submicron Active Layer  $n^+i-p^+$  Avalanche Photodiode* , **XVI International Workshop on the Physics of Semiconductor Devices(IWPSD)**, IIT Kanpur, Dec. 19-22, 2011.
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- Paulami Rakshit and N. R. Das, *Role of Diffusion and Parasitic Effects on the Frequency Response of a Si-CMOS Photodetector*, **XVI International Workshop on the Physics of Semiconductor Devices(IWPSD)**, IIT Kanpur, Dec. 19-22, 2011.
- N.R.Das, Piue Ghosh and Suchismita Mitra, *Effect of Capture and Escape Rates of Carriers and Well Parameters on the Performance of Multi-Quantum Well Solar Cell*, **XVI International Workshop on the Physics of Semiconductor Devices(IWPSD)**, IIT Kanpur, Dec. 19-22, 2011.
- Santu Sarkar and N.R.Das , *Comparison of Bit-Error-Rate Due to Component, SRS and FWM Crosstalks in a WDM Receiver*, Frontiers in Electronics, Communication, and Instrumentation Technology (**FECIT**), ISM Dhanbad, Nov. 3-4, 2011.
- Arpan Deyasi, S Bhattacharyya and N. R. Das, *Effect of Shell thickness & Material Composition on Intersubband Transition Energies in GaAs/ $Al_xGa_{1-x}As$  Core-Shell Quantum Dot*, **Conference** on Engineering Education in the New Century (**E2NC**), SKF Institute of Technology, Hooghly, Feb. 3-4, 2012.
- Arpan Deyasi, S Bhattacharyya and N. R. Das, *Study of Energy Eigenvalues and Density of States of Carriers in a Triangular Quantum Wire*, **XVI International Workshop on the Physics of Semiconductor Devices (IWPSD)**, IIT Kanpur, Dec. 19-22, 2011.

- A. Deyasi, S. Bhattacharyya and N. R. Das, *Effect of Shell Thickness on Intersubband Transition Energies in GaAs/Al<sub>x</sub>Ga<sub>1-x</sub>As Inverted Core-Shell Nanodot*, 2nd **International Conference** on Advanced Nanomaterials and Nanotechnology [ICANN-2011], IIT Guwahati, p. 460, Dec 2011.
- Kasturi Mukherjee and N.R.Das, *Effect of Well Doping Density on the Dark Current in a MQW Photodetector*, *Frontiers in Electronics, Communication, and Instrumentation Technology (FECIT)*, ISM Dhanbad, Nov. 3-4, 2011.
- S. Sarkar and N. R. Das, *Analysis of four wave mixing cross-talk and obtaining Bit-error-rate in a WDM receiver*, **International Conference on Fiber Optics and Photonics (PHOTONICS-2010)** held at IIT Guwahati, India, December 11-15, 2010.
- N. R. Das and Paulami Rakshit, *Effect of Number of Diodes on the Photocurrent in a CMOS Photodetector*, **International Conference on Fiber Optics and Photonics (PHOTONICS-2010)** held at IIT Guwahati, India, December 11-15, 2010.
- N.R. Das and Kanishka Majumder, *A Model to Calculate the Current in an n<sup>+</sup>-i-p<sup>+</sup> Avalanche photodiode*, **International Conference on Fiber Optics and Photonics (PHOTONICS-2010)** held at IIT Guwahati, India, December 11-15, 2010.
- (Invited) N.R. Das, *Advances in Optical Detectors*, Conference on Engineering Education in the New Century (E2NC) during Apr. 3-4, 2010, SKF, Mankundu, Hooghly, India.
- (Invited) N.R. Das, *Si-based Photodetector in Optical Communication*, **International Conference on Emerging trends in Electronic and Photonic Devices and Systems(ELECTRO-2009)**, IT-BHU, Varanasi, India, pp.446-451,Dec. 22-24, 2009.
- Kasturi Mukherjee and N. R. Das, *Effect of Barrier Asymmetry on Tunneling Current in Double Barrier Quantum Well Structure*, **International Conference on Emerging Trends in Electronic and Photonic Devices and Systems (ELECTRO-2009)**, Institute of Technology, BHU, Varanasi, India, pp.468-471,Dec. 22-24, 2009.
- Himadri Sekhar Dutta and N. R. Das, *Calculating the NoiseEquivalent Bandwidth of a Ge-based Schottky photodetector at 1.55 μm wavelength*, **International Conference on Emerging trends in Electronic and Photonic Devices and Systems(ELECTRO-2009)**, IT-BHU, Varanasi, India, pp.490-493,Dec. 22-24, 2009.
- Santu Sarkar and N. R. Das, *Error probability Density and Bit-Error-Rate due to SRS Cross-talk in a WDM Receiver*, **International Conference on Computers and Devices for Communication (CODEC-09)**, Hyatt Regency, Kolkata, India, Dec. 14-16, 2009.
- Mukul K. Das and N. R. Das, *On the Ge-content Dependent noise Current in Si/SiGe MQW Photodetector*, **International Conference on Computers and Devices for Communication (CODEC-09)**, Hyatt Regency, Kolkata, India, Dec. 14-16, 2009.
- Kasturi Mukherjee and N. R. Das, *Calculation of Current in Multiple Quantum Well (MQW) Structures with Variable Barrier Heights*, **International Conference on Computers and Devices for Communication (CODEC-09)**, Hyatt Regency, Kolkata, India, Dec. 14-16, 2009.
- Himadri Sekhar Dutta and N. R. Das, *Calculating the Signal to Noise Ratio of a RCE Ge-based Schottky photodetector*, **International Conference on Computers and Devices for Communication (CODEC-09)**, Hyatt Regency, Kolkata, India, Dec. 14-16, 2009.

- S Bhattacharyya and N. R. Das, *Effect of Electric Field on Intersubband Oscillator Strength in a Semiconductor Quantum Ring*, **International Workshop on The Physics of Semiconductor Devices (IWPSD-2009)**, New Delhi, India, Dec. 15-19, 2009.
- Mukul K. Das and N. R. Das, *On Some Optimum Designs of a Resonant-Cavity-Enhanced SiGe/Si MQW Photodetector for long wavelength applications*, **International Conference on Numerical Simulation of Optoelectronic Devices (NUSOD 2009)**, GIST, Gwangju, Korea, Sept. 14-18, 2009.
- P.K. Basu, N. R. Das, B. Mukhopahyay, G. Sen and Mukul Das, *Ge/Si Group IV Alloy Based Photodetector Materials*, **International Conference on Numerical Simulation of Optoelectronic Devices (NUSOD 2009)**, GIST, Gwangju, Korea, Sept. 14-18, 2009.
- N. R. Das and Kasturi Mukherjee, *Electric-field Assisted Tunneling in Asymmetric Barrier Quantum well for Switch Applications*, **International Conference on Computers, Communication, Control and Information Technology**, Feb.6-7, 2009 at AOT, Hooghly, West Bengal, India.
- (Invited) N. R. Das, *Quantum Dot for Seeing in the Dark*, National Conference on Creativity in Engineering Education, Feb.9-10, 2008 at AOT, Hooghly, West Bengal, India.
- S. Bhattacharya, Susmita Sen and N. R. Das, *Tuning of Intersubband Transition in a Quantum Ring by External; Electric Field*, **International Workshop on The Physics of Semiconductor Devices, IWPSD-2007**, held in December 13-17, 2007 in Mumbai, India.
- (Invited) N. R. Das, *Semiconductor Nanostructures for Photodetector Applications*, **National Workshop on Nano-Science & Technology, Quantum Computing and Its Applications**, March 10, 2007 at Haldia Institute of Technology, India.
- Mukul K. Das and N. R. Das, (Abstract only) *On the Ge-content dependent quantum efficiency of Si<sub>1-x</sub>Ge<sub>x</sub>/Si RCE-p-i-n photodetector*, INCURSI -07, February 21-24, 2007, New Delhi, India
- Himadri Sekhar Dutta and N. R. Das, (Abstract only) *On the Performance of Ge-on-Si RCE Schottky Photodetector*, INCURSI -07, February 21-24, 2007, New Delhi, India
- Mukul K Das and N. R. Das, *On the Ge-content Dependence of the Bandwidth of Si<sub>1-x</sub>Ge<sub>x</sub>/Si p-i-n Photodetector*, Proceedings of the **International Conference on Fiber-Optics and Photonics (PHOTONICS-2006)**, Dec.14-16, 2006 at Hyderabad, India.
- N. R. Das and Sriparna Bhattacharya, *On the Electro-absorption from an Ensemble of Semiconductor Quantum Dots*, Proceedings of the **International Conference on Fiber-Optics and Photonics (PHOTONICS-2006)**, Dec.14-16, 2006 at Hyderabad, India.
- Mukul K Das and N. R. Das, *On the Responsivity of a Si<sub>1-x</sub>Ge<sub>x</sub>/Si RCE p-i-n Photodetector for Different Ge-compositions*, Proceedings of the **International Conference on Computers and Devices for Communication (CODEC-06)**, Dec.18-20, 2006 at Kolkata, India.
- N. R. Das and Alakananda Mitra, *A New Approach for Modeling P-I-N Photodetector using Fuzzy Logic*, Proceedings of the **International Conference on Computers and Devices for Communication (CODEC-06)**, Dec.18-20, 2006 at Kolkata, India.

- Himadri Dutta and N. R. Das, *On the Frequency Response of a Resonant Cavity Encapsulated Germanium Schottky Photodiode*, Proceedings of the **International Conference** on Computers and Devices for Communication (CODEC-06), Dec.18-20, 2006 at Kolkata, India.
- Santu Sarkar and N. R. Das, *A Comparative study of different cross-talk noises in a WDM system*, Proceedings of the **International Conference** on Computers and Devices for Communication (CODEC-06), Dec.18-20, 2006 at Kolkata, India.
- Susmita Sen, S. Bhattacharyya and N. R. Das, *Quantized Electron-States in a Semiconductor Quantum Ring in External Electric and Magnetic Fields*, Proceedings of the **International Conference** on Computers and Devices for Communication (CODEC-06), Dec.18-20, 2006 at Kolkata, India.
- Mukul K Das and N. R. Das, *Performance Analysis of a Vertical SiGe p-i-n Photodetector for Different Ge-composition*, Proc. of the **International conference** on Electronic and Photonic Materials, Devices and Systems (EPMDS), Jan.4-7, 2006 at Kolkata, India.
- Himadri Dutta and N. R. Das, *On the Responsivity of a Si-based Resonant Cavity Enhanced Schottky Photodetector*, Proc. of the **International conference on Electronic and Photonic Materials, Devices and Systems (EPMDS)**, Jan.4-7, 2006 at Kolkata, India.
- (Invited), (Abstract Only), N. R. Das and M. J. Deen, *Quantum Dot Infrared Photodetector and its Applications*, **International Workshop on The Physics of Semiconductor Devices, IWPSD-2005**, held in December 13-17, 2005 at New Delhi, India.
- Mukul K Das, N. R. Das and P. K. Basu, *Performance Analysis of a SiGe/Si Heterojunction Bipolar Transistor for Different Ge-composition*, Proceedings of the **General Assembly of the International Union of Radio Science (URSI)** held during Oct. 23-28, 2005 at New Delhi, India.
- N. R. Das, Alokanda Mitra and Amit Maji, *A New Approach to the Modeling of an IC Inductor*, Proceedings of the **General Assembly of the International Union of Radio Science (URSI)** held during Oct. 23-28, 2005 at New Delhi, India.
- Susmita Sen, A. N. Chakravarti and N. R. Das, *On the Photoemission Studies of Quantum Rings*, Proc. of the **International Conference** on Computers, Devices and Intelligent Systems (CODIS), January 7-9, 2004 at Kolkata, India.
- Mukul K. Das, N. R. Das and P. K. Basu, *Performance Analysis and Design of an Integrated SiGe/Si pin-HBT Photoreceiver for Optical Communication*, Proc. of the **International Conference** on Computers and Devices for Communication (CODEC-04), January 1-3, 2004 at Kolkata, India.
- (Invited) N.R. Das and M.J. Deen, *SiGe and SiGeC-based Devices for Si-based Photonics*, **Twelfth International Workshop on The Physics of Semiconductor Devices, IWPSD-2003**, held in December 16-20, 2003, at Indian Institute of Technology Madras, Chennai, India.
- Susmita Sen and N. R. Das, *Electron-States in a Semiconductor Quantum Ring in the presence of an External Electric Field*, Indian National Conference of the International

Union of Radio Science (INCURSI-03) held in November 27-29, 2003 at National Physical Laboratory, New Delhi, India.

- (Invited) N.R. Das and M.J. Deen, *Integrated Silicon Photoreceivers for Optical Communication*, Sixth **International Conference** on Optoelectronics, Fiber Optics and Photonics, PHOTONICS-2002, held in December 16-18, 2002, at Tata Institute of Fundamental Research (TIFR), Mumbai, India.
- (Invited), N.R.Das, Y.M. El-Batawy and M.J.Deen, *Optoelectronic Integrated Circuit Photoreceivers for Fiber-optic Telecommunication*, First **International Symposium** on Integrated Optoelectronics, Electrochemical Society, held at Phyladelphia, Pennsylvania, USA, May 12-17, 2002.
- N. R. Das, M.J. Deen, *On the Optimum Design of the Front-End PIN-HBT OEIC Photoreceiver*, W3.4, Tenth **Canadian Semiconductor Technology Conference**, held at Ottawa, Canada, August 13-17, 2001.
- N. R. Das, M.J. Deen, Effect of Interface-Trapping on the Frequency Response of a Photodetector, T5P.19, **Tenth Canadian Semiconductor Technology Conference**, held at Ottawa, Canada, August 13-17, 2001.

d) **Other publications :**

- Report published in **IEEE Photonics Society Newsletter** (October 2019, Vol. 33, No. 5, pp.20-22) entitled “*Photonics for Ecological Balance—Outreach Extempore Speech Program*” based on the community event on “*Role of Photonics for Betterment of Lives and Environment of Sunderbans*”.
- Local magazine on *Computer - Analogy with Human beings* (in Bengali)
- “*Nanotechnology and Healthcare*”, an invited publication in a **Souvenir**.

12. **Membership of Learned Societies:**

- **Fellow**, Optical Society of India, (2020/21)
- **Fellow**, Institution of Engineers (India) [FIE(I)]
- **Life Fellow**, Inst. of Electronics & Telecommunication Engineers (FIETE)
- **Senior Member**, Institute of Electrical & Electronics Engineers (SM-IEEE)
- Life Member, Indian Physical Society (IPS)
- Life Member, Indian Association for the Cultivation of Science (IACS)
- Life Member, Indian Science Congress Association (ISCA)
- Member of the **Syndicate**, University of Calcutta (Aug. 2013 –Nov. 2016)
- Member of the **Senate**, University of Calcutta (Aug. 2013 –Aug. 2016)
- Member of the **Governing Council** of **Saha Institute of Nuclear Physics**, DAE, G.O.I. (since 2013)
- Member of the **Governing Body** of **Supreme Knowledge Foundation**, MAKAUT, WB, India.



14. **Invited Presentations (Selected):** (Conference/Seminar/Workshop/Schools/ FDP)

- “*Quantum Dots in Cellular/Sub-cellular Imaging – with design example from SLDs in OCT*”, **National Webinar** (Online Seminar) on **Recent Advances in Emerging Electronics** organized by P.G. Dept. of Electronic Science & Technology, **Berhampur University**, Odisha, (*under World Bank OHEPEE Project*), India, February 22-23, 2022.
- “*Photonics For Sensing Applications*”, **AICTE Training And Learning (ATAL) Faculty Development Programme** (Webinar/Online Seminar) organized by **Mizoram University**, Mizoram, India, February 15-19, 2021.
- “*Quantum Dot SLEDs as Broadband Optical Sources for Sub-Cellular OCT*”, **6th International Conference on Opto-Electronics and Applied Optics (OPTRONIX-2020)**, June 08- 10, 2020, University of Engineering and Management (UEM), Kolkata.
- “*Quantum Dot Superluminescent Light Emitting Diode for Optical Coherence Tomography in Sub-Cellular Imaging*”, **International Seminar cum Research Colloquium on MEMs based Sensors and Smart Nanostructured Devices (MSSND)**, Dec. 27- 28, 2019, Jadavpur University, Kolkata.
- “*Light Emitting Diodes -Advances and Applications*”, **Technical Event** organized by the **IEEE Photonics Society** Kolkata Chapter and **IEEE IEM Student Branch**, Nov. 14, 2019, Institute of Engineering and Management (IEM) Saltlake, Kolkata.
- “*Photonics: Enabler of Next Generation Technology*”, Special Lecture at **Techno International Batanagar**, West Bengal, India, April 23, 2019.
- “*Photonics in Information Age*”, **One-day Seminar “Photonics As Future Of Technology (PhotAFOT)”**, an outreach program by **IEEE Photonics Society** Kolkata Chapter, Feb. 02, 2019, ECE Dept, Supreme Knowledge Foundation Group of Institutions, Mankundu, West Bengal, India.
- “*Semiconductor based Optoelectronic Devices*”, **Faculty Development Programme** organized by **Association of Professional Academic Institution (APAI)**, Kolkata, India, January 15-19, 2019.
- “*Optoelectronic Devices – Basics to Advances*”, **Faculty Development Programme** organized by **Techno India Group (TIG)**, Kolkata, India, January 14-18, 2019.
- “*Some Theoretical Studies – Possible Resource for Data-Driven Material Science*”, **Summer School on DCMS Materials 4.0**, at **Technical University Dresden, Germany**, September 10-14, 2018.
- “*Some Theoretical Investigations on Semiconductor Nanostructures*”, **Seminar**, under **INSA-DFG** Visit, at **Chair of Material Science and Nanotechnology, Technical University Dresden, Germany**, Aug.23, 2018.
- “*Semiconductor Photonic Devices For Optical Communication - Optical Sources*”, Electronics Techno-Cultural Fest ‘VISTAAR 2K18’, at **Indira Gandhi Institute of Technology (IGIT)**, mentored program by **TEQIP**, University of Calcutta, at Sarang, Odisha, India, 2018.
- (**Plenary Lecture**) “*Study Engineering and Contribute to Society*”, in Orientation Programme at **Abacus Institute of Engineering & Management**, Hoogly, India, Aug. 06, 2018.
- (**Keynote Talk**), “*Advances in Semiconductor based Photodetectors*”, **International Conference on Emerging Trends in Engineering and Science (ETES)**, Asansol Engineering College (AEC), Asansol, India, March 24, 2018.
- (**Keynote Talk**), “*Advances in Electronics – A brief Account*”, **UGC-HRDC Special Winter School on Electronics – Science Engineering And Technology (E-SEAT)**, University of Calcutta, Kolkata, India, Feb. 26, 2018.
- “*Semiconductor Optoelectronics*”, **UGC-HRDC Refresher Course** on “Advances in Engineering & Technology”, **Guru Ghasidas Vishwavidyalaya**, Bilaspur, Chhattisgarh, India, June 5-24, 2017.

- “*Nanostructures for Electronics and Photonics*”, **UGC-HRDC Refresher Course**, on “VLSI Design and Nanotechnology: Issues and Challenges”, **Jadavpur University**, Kolkata, India, Nov.28-Dec.17, 2016.
- “*Semiconductor for Light Detection and Light Emission*”, **Short Term Training Program**, on “Semiconductor: Devices & Solar PV Module”, National Institute of Technical Teachers Training and Research (NITTTR), Sept. 29, 2016.
- “*Modeling and Optimum Designs of Semiconductor Photodetectors and Integrated Photoreceivers*”, **School of Engineering, University of Glasgow, Scotland, UK**, Sept. 16, 2016.
- “*Modeling and Design of Semiconductor Photonic Devices*”, **School of Mathematics, Computer Science and Engineering, City, University of London, England, UK**, Sept. 15, 2016.
- *Lecture 1: “Optoelectronic Devices – Basics and Application in Cutting Edge Technology for Developing Human Society”*,  
*Lecture 2: “Modeling of Optoelectronic Devices –How to Approach”*, **Short Term Course on Modeling and Simulation of Optoelectronic Devices and Solar Photovoltaics (MSODSP)** organised by **IIT (ISM) Dhanbad**, Aug.29-Sept.02, 2016.
- (Keynote talk) “Towards Aggressive Integration and Convergence of ICT – A case study with mobile phones”, in **UGC NRCPS School on VLSI, Communication and Microelectronics (VCOMM) (March 28 – April 15, 2016)**, Institute of Radio Physics and Electronics, University of Calcutta.
- “Semiconductor Photonic and Nanophotonic Devices”, **Outreach Program under UGC NRCPS** program, **TRIPURA University**, Feb. 29, 2016
- “Infrared Photon Detectors”, **Seminar to celebrate closing of International Year Light** at Barrackpore Rastraguru Surendranath College, technically sponsored by **IEEE Photonics Society Kolkata Chapter and Calcutta University Student Branch**, Feb.02, 2016.
- “Device for Photonic Systems” Workshop organised by **OSA student Chapter**, School of Electronics Engineering, **KIIT University, Bhubaneswar**, Dec. 13, 2015.
- “Silicon Based Photonic Devices”, **Workshop on Recent Trends in Photonics Technology (RTPT-2015)** to commemorate **International Year of Light** organised by **OSA and SPIE student Chapter, ISM Dhanbad**, August 22, 2015.
- “*Semiconductor Optoelectronic Devices and Applications*”, **Short Term Training Program**, National Institute of Technical Teachers Training and Research (NITTTR), Kolkata, July 15, 2015.
- “Display Devices”, **Outreach Program by IEEE Photonics Society Calcutta Chapter** and IEEE C.U. Student Branch to celebrate **National Science Day**, May 16, 2015, Hareknagar A.M. Institution, Beldanga, Murshidabad.
- “*Devices For Optical Transmission System*”, **Short Term Training Program**, National Institute of Technical Teachers Training and Research (NITTTR), July 15, 2014.
- “*Advances in Solid State Semiconductor Devices For Photonic Applications*”, **Faculty Development Program**, RCCIIT, Feb. 10, 2014.
- “*Devices For Fiber Communication*”, **Faculty Development Program**, University of Calcutta, Jan. 30, 2014.
- “*Semiconductor Photonic Devices And Nanophotonics*”, **Refresher Course**, ETCE Dept., **Jadavpur University**, Dec. 12, 2013.
- “*Infrared Photodetectors at Medium and Long Wavelengths*”, **National Conference (NCAE)**, ADAMAS Institute of Technology, WBUT, Oct., 26, 2013.
- “*Semiconductor Photonic Devices for Optical communications*”, in **2<sup>nd</sup> National Conference on Advanced Communication and Systems and Design Techniques (NCACD)**, **Haldia Institute of Technology**, West Bengal, India, Sep.29-30, 2012.

- “*Photonic Devices for Optical communications*”, in **National Seminar** in Microwave and Optical Communication Systems (**NS MOCS 2012**), **Swami Vivekananda Institute of Science and Technology**, West Bengal, India, Sep.21-22, 2012.
- “*Advances in Semiconductor Photonic Devices for Optical Communication*”, in the **IEEE National Distinguished Lecture Program (NDLP) Lecture**, Mizorum University, Mizorum, India, Mar. 23-26, 2011.
- “*Excess Carriers in Semiconductors and Photodetectors*”, **Winter School** on Semiconductor Fabrication and Characterization Techniques (**FABTech**) organized by the Institute of Radio Physics and Electronics, University of Calcutta, under “**UGC Networking Centre**” programme during Feb. 14-Mar. 4, 2011.
- “*Si CMOS Photodetectors and Photoreceivers*”, organised by the **IEEE Electron Devices Society Chapter** of the IEEE Calcutta Section, April 12, 2010.
- “*Advances in Optical Detectors*”, in the **Conference** on Engineering Education in the New Century (E2NC) during Apr. 3-4, 2010, **Supreme Knowledge Foundation (SKF)**, Mankundu, Hooghly, India.
- “*Optical Transmitter and Optical Receiver*”, **Short Term Training Program**, on “*Fibre Optic Communication*” during Feb. 15-19, 2010, at **National Institute of Technical Teachers’ Training (NITTTR)**, Kolkata, India.
- “*Si-based Photodetector in Optical Communication*”, in the **International Conference** on Emerging trends in Electronic and Photonic Devices and Systems (**ELECTRO-2009**), during Dec. 22-24, 2009 at **Institute of Technology- Banaras Hindu University (IT-BHU)**, Varanasi, India.
- “*Some Aspects of Modeling Semiconductor Photonic Devices*”, in the **Workshop under UK-India Collaborative Program**, organized jointly by the **University of Calcutta**, India and the **University of Sheffield**, UK, Dec. 13, 2009, Kolkata, India.
- “*Semiconductor Photonics –A Brief Review*”, **West Bengal State University**, Barasat, West Bengal, Nov. 14, 2009.
- “*Advances in Semiconductor Photonic Devices – Part I & Part II*”, in the **IEEE ‘National Distinguished Lecture Program’ (NDLP) Lecture**, at **North-Eastern Regional Institute of Science and Technology (NERSIT)**, Arunachal Pradesh, India, Aug. 7-9, 2009.
- “*Semiconductor Nanophotonic Devices*”, **Two-day Workshop on “Photonics to Nanophotonics’** , organised by **IEEE Photonics Society** Calcutta Chapter, June 12-13, 2009, Kolkata, India.
- “*High Electron Mobility Transistor*”, in the **Summer School** on Nanoelectronic Devices (**NanoDev**) organized by the Institute of Radio Physics and Electronics, University of Calcutta, under “**UGC Networking Centre**” programme during June 1-19, 2009.
- “*Advances in Devices for Optical Communication*”, in One-Day Workshop organized by the **Asansol Engineering College**, WB, India in association with the IEEE LEOS Calcutta Chapter, IEEE C.U. Student Branch as a part of **IEEE National Distinguished Lecture Program**, India on April 17, 2009.
- “*Semiconductor Nanophotonic Detectors for Special Area Applications*” organised by the **IEEE Electron Devices Society Chapter** of the IEEE Calcutta Section, March 19, 2009.
- “*Advances in Avalanche Photodiode for Optical Detection*” organised by the **IEEE Lasers and Electro-Optics Society Calcutta Chapter**, Jan.7, 2009.
- “*Component Crosstalk in WDM Optical Network*”, in a **Short course** organized by **National Institute of Technology**, Silchar, India during Dec. 24-28, 2008.
- “*Avalanche Photodiode in a WDM Receiver System*”, in a **Short course** organized by **National Institute of Technology**, Silchar, India during Dec. 24-28, 2008.
- “**PHOTONIC DEVICES**” (**Series of Lectures**) in the **Summer School “SemiNano”** organized by the Institute of Radio Physics and Electronics, University of Calcutta, under “**UGC Networking Centre**” programme during June 2-20, 2008, India.

- “*Quantum Dot for Seeing in the Dark*”, delivered in **National Conference on Creativity in Engineering Education**, Feb.9-10, 2008 at Academy of Technology (A.O.T.), Hooghly, India.
- “*Optical Sources and Detectors*”, in **One-Day Tutorial** on Microwave Multiplexed Lightwave System – A Flavour of Microwave Photonics, Jan. 11, 2008, A.O.T., Hooghly, India.
- “*Advances in Semiconductor Photonic Devices*”, in **Faculty Development Program**, July 2-6, 2007, **Siliguri Institute of Technology**, Siliguri, India.
- “*Semiconductor Nanostructures for Photodetector Application*” at the **National Workshop** on Nano-Science & Technology, Quantum Computing and Its Applications held in March 10, 2007 at **Haldia Institute of Technology**, India.
- “*Optical Detectors and Receivers*” in **One-day Workshop** organised by **IEEE LEOS Chapter, IEEE Calcutta Section** (Sept.30 2005).
- “*Advanced Photodetectors for Optical Communication*”, as a **Senior Guest Scientist** at the **International Centre for Theoretical Physics (ICTP), Trieste, Italy**, Nov. 2004, **Italy**.
- “*High Performance Photoreceiver OEICs: From Advanced Laboratory to Consumer Market*” organised by the **IEEE Electron Devices Society Chapter** of the IEEE Calcutta Section, April 29, 2004.

#### 15. Awards, Honours & Achievements:

- Awarded **INSA-DFG** Bilateral Exchange Visiting Scientist, 2018
- Recipient of **National Scholarship of Merit** (1978 -1986).
- Cracked the **Indian Engineering Services (IES)** examination, **UPSC** (1987) for appointment (1989) in *Telecommunication department*, Govt. of India (though decided not to join but to do research).
- **Fellow**, Optical Society of India, 2020-21
- **Fellow** of **IE(I)** since 2016.
- **Life Fellow** of **IETE** since 2004.
- **Senior Membership** of **IEEE** since 2002.
- **Senior Guest Scientist** in the School of Radio Science for South Asian Scientist, **ICTP, Trieste, Italy**, (Nov. 6-15 2004)
- Invited as **Indian Panelist** (from University of Calcutta) and **Chair** in horizontal “*Photonics Materials and Devices*” of vertical ‘Photonics’ in the **Vaishwik Bharatiya Vaigyanik (VAIBHAV) Summit of Overseas and Resident Indian Scientists** in Oct. 2020, an *initiative of Govt. of India*.
- **National Distinguished Lecturer** of **IEEE India** (2009, 2011).
- Paper with student received the **URSI Young Scientist Award** for the **Student** (General Assembly in Aug. 2008 in Chicago, **USA**).

#### 16. Other notable activities:

- Has been the **Founder/ Chairman** of the IEEE Photonics Society (formerly LEOS) Calcutta Chapter (2004). Since then, has been the key person in organizing various professional activities for **students and the community** at large. **Formed the first-ever IEEE Calcutta University Student Branch** in 2006, and has been the Student Branch Counselor since inception. Mentored and guided for students to hold activities leading to academic advancement as well as professional awareness. Special programs under Photonics Society Chapter and/or Student Branch are as follows:

- **Outreach** Events in *Schools of remote villages to increase awareness in science/technology* among students. The Chapter's activities were recognized with 'Most Improved Chapter' award 4 times since inception.
- Organized **National Science Day** celebration program in the Science College Campus by inviting students of nearby schools and colleges. *Lectures and Demonstrations on Several science-based Models* were arranged for the students.
- **Science and Technology Exhibition** (STEX) cum competition events are being organized periodically to motivate students *to showcase their innovative and creative abilities*.
- Organized **Community programs**, such as (i) **Bystander CPR** demonstrated by Doctors in hands-on workshop, (ii) Seminar by a number of Doctors on "**Role of Light and Light-based Technology in Medical Diagnosis and Treatment**", etc. (iii) **Innovative Community Program** on "*Photonics for Ecological Balance*" on the theme "*Role of Photonics for Betterment of Lives and Environment of Sunderbans*" - report published in IEEE Photonics Society Newsletter (October 2019, Vol. 33, No. 5, pp.20-22).
- Chairman, Convenor/Secretary, Publication Chair, etc. at different times of *International Conference CODEC*; Chair/Co-chair, Member of Advisory, Technical Program committees of Conferences. Also, **Local Sectional Secretary** in 'Materials Science' Section of **100<sup>th</sup> Indian Science Congress** to be held during Jan.3-7, 2013, organized by the University of Calcutta.
- **Arranged opportunity for Students (Post doc: 3, Ph.D.: 2, Masters: 4) and Faculty members (4)** of the University of Calcutta *to carry out higher study/research in advance laboratories abroad* (Germany, Italy, UK, Ireland, Cyprus) as the Key person of the *Erasmus Mundus LEADERS* program in the University of Calcutta. Also, produced an *Employability Toolkit video* in youtube on ERASMUS MUNDUS (LEADERS) - *Employability and International Opportunities*.
- **Mentored young faculty members in the North-East State of India** by organizing outreach Program (as Director of UGCNRC program).
- **Live TV programme on 'Career Plus' (Electronics)** in "Camera Cholchhe", **Doordarshan Kendra Kolkata**. Delivered a *talk* on "*Display Devices*" in the series of talks (in Bengali) arranged by **All India Radio (Akashbani)**, Kolkata (Science Section). Participated in *Phone-in Live Program "Bijnyan Rasiker Darbare"* of **Akashbani Kolkata**.
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(N. R. Das)

*Signature of the faculty member*

*Date: January, 2023*