

RESUME OF DR. JITENDRA NATH ROY

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Permanent Address: Gopalpore, Dehiramnagar, Paschim Medinipur, West Bengal, India, 721212

Academic Qualification: M. Sc (Physics) and Ph D (Physics) Vidyasagar University.

Specialization: Applied Optics and Photonics, Laser and Optoelectronics, Multi-valued Logic.

Present Position: Professor, Department of Physics, Kazi Nazrul University, Asansol.

Teaching Experience: 20 yrs [UG and P.G level]

Research Publications: 132

Published /accepted	International	National
❖ Journal	76	11
❖ Conference	31	14

■ Research Guidance :

Ph D level:

- Awarded: Nine (9). Continued: Three (3).

■ Reviewer of International journal

(i) Nature Photonics (ii) J. of Optical Society of America A, (OSA publication) (iii) Optical Engineering (iv) Journal of Electronic Imaging (S.P.I.E. publication) (v) Applied Optics (vi) J. of Optics and Laser Technology and many more.

■ Special Awards/Honours received

Year	Name of Award/Honour	Name of Organization
2012	International Sardar Patel Award	Sardar Vallabhbhai Patel Foundation http://www.sardarpatelaward.org/awardgallery.php
2012	Editorial Board member	The Scientific World Journal (Optics Division, Hindawi publication)
2012		<i>Progress in Theoretical and Applied Physics</i> .(Journal)
2009		Recent Patents on Signal Processing (Bentham Open)
2007	Session Chairman	International Conference on <i>Information Technology</i> held at HIT, W.B.
1994	Senior Research Fellowship	C.S.I.R (Govt. of India)
1991	University Silver Medal	Vidyasagar University, W.B, India

- **Research Collaboration:** with Prof. K.E. Zoiros, Department of Electrical and Computer Engineering, Light wave Communications Research Group, Xanthi-Greece.

- **Book Chapter (invited):** J.N.Roy and T.Chattopadhyay, Design and architectures for digital signal processing, Chapter-4, “*All-optical quaternary logic based information processing: Challenges and opportunities*”, © INTECH Publishers, Edited by Dr. Gustavo Ruiz (University of Cantabria, Spain), ISBN: 980-953-307-610-7. [16.01. 2013] ([Book Chapter](#))
- **Book :** Optics in computing: All-Optical Logic and Information Processing with Terahertz Optical Asymmetric Demultiplexer (TOAD) 2012 [D.K.Gayen,J.N.Roy and R.K.Pal] by LAP Lambert Academic Publishing - ISBN: 978-3-659-25260-0. <http://www.amazon.com/dp/3659252603>
- **Research Project:** “Designing of an all-optical conversion scheme from binary to its Modified Trinary Number” funded by A.I.C.T.E (Govt. of India).
- **Citations:** <http://scholar.google.co.in/citations?user=LHYZC0MAAAAJ&hl=en&oi=ao>
- **Invited Speaker:**

Year	Nature:	Event
2018	International	International Conference on Emerging Trends in Engineering and Science ETES-2018
2018	National	National Seminar on Emerging Technologies and Future of Electronics ETFE2018
2017	International	International Conference on Emerging Trends in Computing Communication and Control (ICETC3-2017)
2013	International	Winter Symposium on Photonics and Optoelectronics (W-SOPO 2013) Sanya, China http://www.sopoconf.org/SOPO2013DECEMBER/ShowkeynotespeakerDetails.aspx?personID=2944
2013	National	AICTE sponsored Faculty Development Programme organized by B P Poddar Institute of Management and Technology
2012	National	UGC sponsored national seminar on "Science and Technology and its Historical Application" held at Pingla Thana Mahavidyalaya 9-10 February 2012.
2011	National	UGC sponsored national seminar on Photonics and Nano Sciences held at Garhbeta College 20-21 December 2011,

The list of published and/or accepted papers of Dr. J. N. Roy

Google scholar citation report

	All	Since 2015
<u>Citations</u>	1833	883
<u>h-index</u>	26	16
<u>i10-index</u>	51	30

International Referred Journal (SCI) : 71

2020

1. D Nath, P Dey, AM Joseph, JK Rakshit, **JN Roy** Photocurrent generation under forward bias with interfacial tunneling of carrier at pentacene/F16CuPc heterojunction photodetector” *Journal of Alloys and Compounds*, **815**, 152401 (2020).
2. A Raja, K Mukherjee, **JN Roy**, K Maji “Analysis of new all-optical polarization-encoded quaternary Galois field adder processing soliton pulses” *J Opt* (2020). [Springer Publication]<https://doi.org/10.1007/s12596-020-00594-7>.
3. K Maji, K Mukherjee, A Raja, **JN Roy** “Numerical simulations of an all-optical parity generator and checker utilizing a reflective semiconductor optical amplifier at 200 Gbps” *J Comput Electron* (2020). . <https://doi.org/10.1007/s10825-020-01451-3>.

2019

5. A Raja, K Mukherjee, **JN Roy**, K Maji “Analysis of polarization encoded optical switch implementing cross-polarization modulation effect in semiconductor optical amplifier” *Int. J. Photon. Opt. Technol.* 5(1) 2019

2018

6. Debarati Nath, S. K. Mandal, Debajit Deb, J. K. Rakshit, P. Dey, and **J. N. Roy**, Light tuning DC and AC electrical properties of ZnO-rGO based hybrid nanocomposite film, *Journal of Applied Physics* **123**, 095115 (2018).
7. Debarati Nath, S. K. Mandal, Debajit Deb, J. K. Rakshit, P. Dey and **J. N. Roy**, “Optical, electrical properties and structural characterization of ZnO:rGO based photodetector,” *AIP Conference Proceedings* **1942**, 080006 (2018).
8. P. Dey, D. Deb, Rajesh Debnath, S.K. Mandal, Archana Lakhani, T.K. Nath, **J.N. Roy**, A. Nath “Sign reversal of spin-polarized tunnelling magnetoresistance in 99.95% La_{0.7}Sr_{0.3}MnO₃-0.05% Paraffin wax nanocomposite: An effect of spin-flip scattering at

- intergranular Paraffin wax interface”, *Journal of Magnetism and Magnetic Materials* **468**, (2018) 85–90.
9. S. K. Mandal, Swati Singh, Rajesh Debnath, P. Dey, **J.N. Roy**, T.K. Nath, Magnetoelectric coupling and AC electrical properties of $x\text{La}_{0.7}\text{Sr}_{0.3}\text{MnO}_3 - (1-x)\text{HoMnO}_3$ ($x = 0.1, 0.3$ and 0.5) lead free multiferroic nanocomposites, *Materials Chemistry and Physics* 205 217-227
 10. S Chakraborty, MK Paul, **JN Roy**, A Nath Diagnostic study of multiple double layer formation in expanding RF plasma. *Physics of Plasmas*, 25.033518 (2018)

2017

11. J.K.Rakshit and **J.N.Roy**, “Silicon micro-ring resonator-based all-optical digital-to-analog converter” *Photonic Network Communications* 34(1) 82 (2017) [Publisher: Springer US].
12. S. K. Mandal, Swati Singh, P. Dey, **J. N. Roy**, P. R. Mandal and T. K. Nath Temperature and Frequency Dependence of AC Electrical Properties of Zn and Ni doped CoFe_2O_4 Nanocrystals, , *Philosophical Magazine*, **97**, 1628–1645 (2017).
13. P. Dey, Rajesh Debnath, Swati Singh, S. K.Mandal and **Jitendra Nath Roy** Irreversibility in Room Temperature Current-Voltage Characteristics of NiFe_2O_4 Nanoparticles: A Signature of Electrical Memory Effect", , *Journal of Magnetism and Magnetic Materials*, **421**, 132 (2017).
14. D Nath, P Dey, D Deb, JK Rakshit, **JN Roy** - Fabrication and characterization of organic semiconductor based photodetector for optical communication CSI transactions on ICT, 2017

2016

15. JK Rakshit, JN Roy “Design of all-optical universal shift register using nonlinear microring resonators” - *Journal of Computational Electronics*, 15 (4) 1450-1461(2016).
16. S. K. Mandal, Swati Singh, P. Dey, **J. N. Roy**, P. R. Mandal, T. K. Nath, Frequency and Temperature Dependence of Dielectric and Electrical Properties of TFe_2O_4 ($\text{T}=\text{Ni}, \text{Zn}, \text{Zn}_{0.5}\text{Ni}_{0.5}$) Ferrite Nanocrystals, *Journal of Alloys and Compounds*, **656**, 887-896 (2016).
17. JK Rakshit, JN Roy “All-optical ultrafast switching in a silicon microring resonator and its application to design multiplexer/demultiplexer, adder/subtractor and comparator circuit” *Optica Applicata* 46(4) 517-539.

2015

18. **J.N.Roy**, *P.Bhowmik*, and *T.Chattopadhyay* Design of all optical ternary logic based half adder circuit and it’s applications, *Journal of Optics* 44(4) (2015).

19. R Debnath, P Dey, S Singh, **J N Roy**, SK Mandal "Magnetically tunable alternating current electrical properties of $x \text{La}_{0.7}\text{Sr}_{0.3}\text{MnO}_3-(1-x) \text{ErMnO}_3$ ($x= 0.1, 0.3$, and 0.5) multiferroic nanocomposite" *Journal of Applied Physics* 118 (4), 2015, 044104.
20. SK Mandal, Swati Singh, P Dey, **J N Roy**, PR Mandal, TK Nath "Frequency and temperature dependence of dielectric and electrical properties of TFe_2O_4 ($T= \text{Ni, Zn, Zn } 0.5 \text{ Ni } 0.5$) ferrite nanocrystals" *Journal of Alloys and Compounds*, 656 (2015) 887.
21. Swati Singh, P Dey, **J N Roy**, SK Mandal "Tunable dielectric constant with transition metals doping in $\text{Zn } 1-x (\text{MnTM}) x\text{O}$ ($\text{TM}= \text{Co, Fe}$) nanocrystals. *Journal of Alloys and Compounds* 642, 2015,15-21.

2014

22. **J.N.Roy** and P. Bhowmik, "Polarization encoded all-optical multi-valued shift operators" *Optics Communication*. 325 (2014) 144-151 <http://dx.doi.org/10.1016/j.optcom.2014.03.087> [13/04/2014].
23. J.K.Rakshit and **J.N.Roy**, "micro-ring resonator-based all-optical reconfigurable logic operations" *Optics Communication* 321 (2014) 38-46 .
24. **J.N.Roy** and J.K.Rakshit, "Design of micro-ring resonator-based all-optical logic shifter" *Optics Communication*. 312 (2014) 73–79 DOI: 10.1016/j.optcom.2013.08.073. [2013/9/19]
25. P.Bhowmik, **J.N.Roy** and T.Chattopadhyay "Designing of all-optical generalized circuit for two input binary and multi-valued logic operations. " *Optics Communication*. 331 (2014) 14-27.
26. J.K.Rakshit and **J.N.Roy**, "Design of all-optical time division multiplexing scheme with the help of Micro-ring resonator" *Optica Applicata XLIV (1) 2014*. DOI:10.5277/oa140104.
27. J.K.Rakshit, T.Chattopadhyay and **J.N.Roy**, "A theoretical study of all optical clocked D flip flop using single micro-ring resonator" *Journal of Computational Electronics*, 13(1) 2014, 278-286 DOI:10.1007/s10825-013-0519-y .
28. S Singh, P Dey, JN Roy, SK Mandal "Enhancement of dielectric constant in transition metal doped ZnO nanocrystals" *Applied Physics Letters* 105(9) 2014,92903

2013

29. J.K.Rakshit, T.Chattopadhyay and **J.N.Roy**, "Design of ring resonator based all optical switch for logic and arithmetic operations - a theoretical study", *Optik International Journal for Light and Electron Optics*, <http://dx.doi.org/10.1016/j.ijleo.2013.04.075> 124 (23), 6048-6057 (2013). [2013/7/21]
30. P.Bhowmik, **J.N.Roy** and T.Chattopadhyay, "Ternary Galois Field Arithmetic Operations With Optical Nonlinear Material (OPNLM) Switch", *International Journal for Light and Electron Optics*, *Optik* 124 (22), 5561-5566 (2013) (Elsevier), <http://dx.doi.org/10.1016/j.ijleo.2013.03.167>. [2013/7/18]

31. E Dimitriadou, KE Zoiros, T Chattopadhyay and **JN Roy** "Design of ultrafast all-optical 4-bit parity generator and checker using quantum-dot semiconductor optical amplifier-based Mach-Zehnderinterferometer" *Journal of Computational Electronics*, 12(3) 2013, 481-489. DOI 10.1007/s10825-013-0463-x (Springer), [Link](#)
32. T.Chattopadhyay and **J.N.Roy** "Design of polarization encoded all-optical 4-valued MAX logic gate and its applications" *Optics Communication*. 300 (2013)119–128. <http://dx.doi.org/10.1016/j.optcom.2013.02.025>. [15.03.2013]
33. J K Rakshit , **J.N.Roy** and T Chattopadhyay "Design of micro ring resonator based all optical parity generator and checker circuit" *Optics Communication*. 303 (2013) 30-37 <http://dx.doi.org/10.1016/j.optcom.2013.03.025> . 2013/4/16
34. T.Chattopadhyay and **J.N.Roy** "All-optical Quaternary Computing and Information Processing: a promising path" *J.of Optics* (Springer publication) 42(3) (2013) 228-238 DOI: 10.1007/s12596-013-0126-0. [17th March 2013]

2012

35. D.K.Gayen, A. Bhattacharyya, T.Chattopadhyay and **J.N. Roy** "Ultrafast All-Optical Half Adder using Quantum-Dot Semiconductor Optical Amplifier-based Mach-Zehnder Interferometer" *Journal of Light wave Technology*. (IEEE), 30(21), (2012), 3387-3393. [Link](#) [publisher: IEEE-OSA] DOI: [10.1109/JLT.2012.2215579](http://dx.doi.org/10.1109/JLT.2012.2215579) [01.11.2012]
36. T.Chattopadhyay, P.Bhowmik and **J.N.Roy**, "Polarization encoded optical N-valued inverter", *Journal of Optical Society of America B, (OSA)*, 29(10), (2012), 2852-2860. [Link](#) [01.10.2012]
37. J.K.Rakshit, T.Chattopadhyay and **J.N.Roy** "Design of Micro Ring Resonator Basedall Optical Adder/Subtractor" *Progress in Theoretical and Applied Physics*. 1(1) 2012, 32-43. www.researchmathsci.org [31st January 2013]
38. M.K.Das .T. Chattopadhyay, **J.N.Roy**, Passive all-optical tree architecture (PATA) based scheme for conversion of 2ⁿ radix based number to its binary form" *IET Optoelectronics* . In press (2012) doi: 10.1049/iet-opt.2011.0088 [Link](#) [October 2012]
39. T. Chattopadhyay and **J.N.Roy** "Designing of an all-optical quaternary NOT gate using binary NOT gate" *Optik. Int.J. Light Electron. Opt* in press (2012) [Publisher: Elsevier] <http://dx.doi.org/10.1016/j.ijleo.2012.01.035>. [April 2013]
40. D. K. Gayen, **J. N. Roy**, and R. K. Pal "All-optical Carry Look ahead Adder with the help of Terahertz Optical Asymmetric Demultiplexer" 123 (40-45) (2012), *Optik - Int. J. Light Electron Opt*. <http://dx.doi.org/10.1016/j.ijleo.2010.11.029> [jnauary 2012]

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41. K E Zoiros, M K Das, T.Chattopadhyay, H K Maity, D K Gayen, , **J N Roy**, All-Optical Pseudorandom Binary Sequence Generator with TOAD-based D Flip-Flops *Optics Communication* 284 (19) 4297-4306 (2011) [Publisher: Elsevier] [in press: [doi:10.1016/j.optcom.2011.05.007](https://doi.org/10.1016/j.optcom.2011.05.007)]
42. Tanay Chattopadhyay and **Jitendra Nath Roy** “Polarization encoded all-optical quaternary Successor with the help of SOA assisted Sagnac switch” *Optics Communication*. 284(12) 2755-2762 (2011)[Publisher: Elsevier] <http://dx.doi.org/10.1016/j.optcom.2011.02.005>
43. C.Taraphdar ,T. Chattopadhyay and **J.N.Roy** “Designing of Polarization encoded all-optical ternary multiplexer and Demultiplexer” *Recent patent in signal processing (Bentham Science Publishers)*, 1(2), 143-155 (2011), [Link](#).
44. Tanay Chattopadhyay and **Jitendra Nath Roy**, “ Easy conversion technique of binary to quaternary signed digit and vice versa” *Physics express*. (simplex-academic-publishers), 1(3), 2011, 165-174. [Link](#)
45. C.Taraphdar, T. Chattopadhyay and **J.N.Roy** “Designing of an all-optical scheme for single input Ternary logical operations” *Optik. Int.J. Light Electron. Opt* 122(1)33-36 (2011) [Publisher: Elsevier]. <http://dx.doi.org/10.1016/j.ijleo.2009.09.016>
46. D.K.Gayen, A. Bhattacharyya, C.Taraphdar, R.K. Pal and **J.N. Roy** “All-Optical Binary Coded Decimal (BCD) Adder with the help of Terahertz Optical Asymmetric Demultiplexer” Accepted in *Computing in Science and Engineering*.13 (1) 50-57(2011) [IEEE]. DOI: [10.1109/MCSE.2009.209](https://doi.org/10.1109/MCSE.2009.209)
47. D. K. Gayen, T. Chattopadhyay, **J. N. Roy** and R. K. Pal “All-optical Prefix Tree Adder with the help of SOA-assisted Sagnac Switch”, *Chinese Optics Letters* 9 (6) (2011) 062001. doi: 10.3788/COL201109.06200
48. D.K.Gayen, M.K.Das, **J.N.Roy** and R.K.Pal , “All-optical binary to Gray code and Gray to binary code conversion scheme with the help of Semiconductor Optical Amplifier -assisted Sagnac switch” *IET Circuits Devices and System*, 5(2). 123–131 (2011) **Doi** [10.1049/iet-cds.2010.0069](https://doi.org/10.1049/iet-cds.2010.0069).
49. T. Chattopadhyay, M.K.Das , **J.N.Roy**, A.K.Chakraborty and D.K.Gayen, “ Conversion of Binary number to its Quaternary Signed Digit form and its all-optical implementation”

- IET Circuits Devices and System** 5(2). 132–142 (2011) . doi: 10.1049/iet-cds.2010.00565 [Link](#)
50. D.K.Gayen, C. Taraphdar, **J.N.Roy** and R.K.Pal , “All-optical Reconfigurable Logic Operations with the help of Terahertz Optical Asymmetric Demultiplexer” **Optik - Int. J. Light Electron Opt.**122 (8) 711-718 (2011), <http://dx.doi.org/10.1016/j.ijleo.2010.04.024>
51. T. Chattopadhyay and **J.N.Roy** , “Semiconductor Optical Amplifier (SOA)-Assisted Sagnac Switch for designing of all-optical tri-state logic gates” **Optik - Int. J. Light Electron Opt.** 122 (12) 1073-1078 (2011), <http://dx.doi.org/10.1016/j.ijleo.2010.06.045>
52. T. Chattopadhyay and **J.N.Roy** , All-optical quaternary Galois field sum of product (GFSOP) circuits **122(9)** 758-763 (2011), Pages **Optik - Int. J. Light Electron Opt.** (2010), <http://dx.doi.org/10.1016/j.ijleo.2010.06.002>,

2010

53. T. Chattopadhyay and **J.N.Roy** “Design of SOA-MZI based all-optical programmable logic device (PLD)” **Optics Communication**. 283 (12) 2506-2517 (2010) [Publisher: Elsevier]. <http://dx.doi.org/10.1016/j.optcom.2010.02.031>
54. Dilip Kumar Gayen, Tanay Chattopadhyay, Rajat Kumar Pal and **Jitendra Nath Roy**, “All-optical Multiplication with the help of Semiconductor Optical Amplifier—assisted Sagnac Switch” **Journal of Computational Electronics**, Volume 9(2) 57-67 (2010) Pages DOI: 10.1007/s10825-010-0305-z [Springer]
55. D.K.Gayen, **J.N.Roy**, R.K.Pal and S. P. Ghosh “All-Optical Incrementer/Decrementer with the Help of Semiconductor Optical Amplifier-Assisted Sagnac Switch” **International Journal of Optomechatronics**, 4(2) 177 – 194 (2010) **DOI:** 10.1080/15599612.2010.484519 [Taylor & Francis]
56. T. Chattopadhyay and **J.N.Roy** “Polarization Encoded All-optical Quaternary Universal Inverter and Designing of Multi-valued Flip-flop” **Optical Engineering** 49 (3) 035201 (2010) doi:10.1117/1.3362897 [Publisher: S.P.I.E .USA]. [Link](#)

57. D.K.Gayen, C.Taraphdar and **J.N.Roy**, “Terahertz Optical Asymmetric Demultiplexer based All Optical Data Comparator” *Journal of Circuit Systems and Computers* 19 (3) 2010 **Publisher: World Scientific Publishing Company Pvt Ltd.] DOI: 10.1142/S0218126610006359**
58. C.Taraphdar ,T. Chattopadhyay and **J.N.Roy**, “Mach-Zehnder Interferometer based all-optical Reversible Logic Gate” *Optics and Laser Technology* 42(2) 249–259(2010) **[Publisher: Elsevier]** <http://dx.doi.org/10.1016/j.optlastec.2009.06.017>
59. G.K.Maity,T. Chattopadhyay ,D.K.Gayen, C.Taraphdar, A.K.Maiti, S.P.Maity and **J.N.Roy** “All-optical Binary Flip-Flop with the help of Terahertz Optical Asymmetric Demultiplexer” *Natural Computing* 9 (4) 903-916 (2010) **[Publisher: Springer]** DOI: 10.1007/s11047-009-9162-8.
60. T. Chattopadhyay and **J.N.Roy** “Polarization encoded TOAD based all-optical quaternary Literals”.121(7) 617–622 (2010) *Optik* **[Publisher: Elsevier]** <http://dx.doi.org/10.1016/j.ijleo.2008.09.014>

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62. **T.Chattopadhyay**, C.Taraphdar and J.N.Roy, “Quaternary Galois field adder based all-optical multivalued logic circuits”, *Applied Optics*, (feature issue on ‘optical high-performance computing’) (OSA), 48(22), (2009), E35-E44. [Link](http://dx.doi.org/10.1364/AO.48.000E35) **[Publisher: Optical Society of America]** <http://dx.doi.org/10.1364/AO.48.000E35>
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64. T. Chattopadhyay, **J.N.Roy** and A.K.Chakraborty “Polarization encoded all-optical Quaternary R-S Flip-flop using binary latch” *Optics Communication*.282 (7) 1287-1292 (2009) <http://dx.doi.org/10.1016/j.optcom.2008.12.022> **[Publisher: Elsevier]**.
65. T. Chattopadhyay and **J.N.Roy** “All-optical conversion scheme: binary to quaternary and quaternary to binary number” *Optics and Laser Technology* 41(3) 289– 294(2009), **[Publisher: Elsevier]** <http://dx.doi.org/10.1016/j.optlastec.2008.06.003>

66. **J.N.Roy** “Mach-Zehnder Interferometer based tree architecture for all-optical logic and arithmetic operations”. *Optik. Int.J. Light Electron. Opt* 120(7) 318-324 (2009) <http://dx.doi.org/10.1016/j.ijleo.2007.09.004> [Publisher: Elsevier]
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72. **J.N.Roy** and D.K.Gayen “Integrated all-optical logic and arithmetic operations with the help of TOAD based interferometer device –An alternative approach” *Applied Optics* 46(22), 5304-5310 (2007). [Publisher: Optical Society of America] Doi: <http://dx.doi.org/10.1364/AO.46.005304>
73. A.K.Maiti **J.N.Roy** and S.Mukhopadhyay “All-optical conversion scheme from binary to its MTN form with the help of nonlinear material based tree-net architecture” *Chinese*

Optics Letters 5 (8) 480-483 (2007) Doi: 1671-7694/2007/080480-04 [Publisher: Optical Society of China] .

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National Referred Journal: 11

2007

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