


Faculty Profile: For University Website

Department of Physics

Name:	Prof. Sarang Medhekar	
Designation:	Professor	
Educational Qualification:	M. Sc., Ph. D.	
Awards:	Young Scientist Award 1995 by M. P. Council of Science & Technology.	
Area of Interest:	Nanophotonics (Photonic crystals and devices), Optical solitons (propagation and devices), Optical Waveguide devices, Optical computing, Fibre optics, Integrated optics.	
Courses Taught: (in CUJ only)	<p>5 years Integrated M. Sc. (Applied Physics);</p> <p>Sem I:</p> <ul style="list-style-type: none">• Basic Physics-I (for EVS and Life Sciences) <p>Sem II:</p> <ul style="list-style-type: none">• Basic Physics-II (for EVS and Life Sciences)• Modern Physics <p>Sem V:</p> <ul style="list-style-type: none">• Fiber and Integrated Optics <p>Sem VI:</p> <ul style="list-style-type: none">• Electricity and Magnetism-II <p>Sem VII:</p> <ul style="list-style-type: none">• Classical Mechanics-II <p>Sem VIII</p> <ul style="list-style-type: none">• Atomic and Molecular Physics-II <p>Sem IX</p> <ul style="list-style-type: none">• Nano-Photonics <p>2 years M. Sc. (Physics);</p> <p>Sem I:</p> <ul style="list-style-type: none">• Classical Mechanics and relativity <p>Sem II:</p> <ul style="list-style-type: none">• Atomic and Molecular Physics• Statistical Mechanics <p>Sem III:</p> <ul style="list-style-type: none">• Quantum Electronics• Fiber and Integrated Optics <p>Sem IV:</p> <ul style="list-style-type: none">• Optoelectronics and Optical Computing• Fourier Optics and Holography• Nanophotonics	

	B.Sc./M.Sc. (NEP) Sem III: <ul style="list-style-type: none"> • OPTICS Ph. D. Coursework <ul style="list-style-type: none"> • Nanophotonics and applications • Laser Physics and Nonlinear Optics • Research Methodology • Research Publications and Ethics 				
Contact:	9431382715, 7903655136				
Email:	sarang.medhekar@cuja.ac.in , smedhekarbit@gmail.com				
Administrative responsibilities: (in CUJ)	S. No.	Post	From	To	
	1	Department of Physics	Head	20-10-2012	19-10-2018
			Head (i/c)	20-10-2018	30-06-2020
			Head	01-02-2024	09-02-2026
	2	International Students and Research Cell	Coordinator	01-11-2012	29-10-2013
			Chairman	30-10-2013	03-06-2020
	3	Chairman Admissions 2014	11-03-2014	---	
	4	Registrar (i/c)	30-07-2014	23-06-2015	
	5	Controller of Examinations (i/c)	16-01-2016	13-05-2018	
	6	Professor-in-charge, Library	07-01-2016	25-10-2017	
	7	Chief Vigilance Officer (CVO)	29-07-2016	12-02-2026	
	8	Chairman Admissions 2017	06-06-2017	----	
	9	Dean, School of Natural Sciences	14-11-2017	13-11-2020	
	10	President, Institute Innovation Council (IIC)	12-10-2018	23-11-2020	
11	Dean R&D Cell	07-09-2021	13-09-2022		
12	Member IQAC	10-06-2016	14-01-2026		
13	Vice Chancellor (Acting)	06-02-2026	Continuing		
Collaboration:	Space Physics Laboratory (SPL), Vikram Sarabhai Space Centre (VSSC), ISRO, Dept. of Space, Govt. of India Thiruvananthapuram -695022				

Project (Completed/ Ongoing)	<ol style="list-style-type: none"> 1. Sarang Medhekar (PI) and P. K. Barhai (Co-PI) received a research Grant of Rs. 3.10 Lakhs from UGC on 1 July 2003 for the project titled "Theoretical Investigation of Induced Nonlinear Optical Fiber Waveguides and Devices" (Project Reference No.: 10-25 /2003 (SR); Duration 3.5 years; Status: Completed. 2. Sarang Medhekar (PI) and P. K. Barhai (Co-PI) received a research Grant of Rs. 8.87 Lakhs from BRNS-DAE on 16 Feb. 2004 for the project titled "Investigation of the effects of higher order nonlinearities on optical pulse propagation in semiconductor doped glass fibers and waveguides" (Project Reference No.: 2003/34/19/BRNS/1951; Duration 4 years; Status: Completed. 3. Sarang Medhekar (PI) received a research Grant of Rs. 24.68 Lakhs from DST on 10.2.2009 for the project titled "Modeling and Analysis of Mach-Zhender Interferometer based Nonlinear Waveguide Devices for All-Optical Switching and Logic Gates" (Project Reference No.: SR/S2/LOP-27/2007; Duration 3 years; Status: Completed. 4. Sarang Medhekar (PI) received a research Grant of Rs. 8.278 Lakhs from UGC on 30.12.2008 for the project titled "Investigation of Optical Beam Propagation in Nonlinear Media: Spatial Soliton Formation and Their Interaction for All-Optical Devices" (Project Reference No.: 34-24/2008 (SR); Duration 3 years; Status: Completed. 5. Sarang Medhekar (PI) received a research Grant of Rs. 24.15 Lakhs from DST on 20.5.2013 for the project titled "Modeling and Analysis of all-optical switching devices based on waveguide and photonic crystal geometry" (Project Reference No.: SR/S2/LOP-0025/2012; Duration 3 years 4 Months; Status: Completed <p>In addition to above;</p> <ul style="list-style-type: none"> • Supervised two (02) CSIR (SRF) projects. (completed) • Mentor of DST project under DST WOMEN SCIENTISTS SCHEME (WOS-A). (completed) 																			
Patents	<table border="1"> <thead> <tr> <th>Sl No</th> <th>Description</th> <th>Patent no.</th> <th>inventors</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Mechanical load stabilizer with load dependent stepless gear ratio variation system</td> <td>223097</td> <td>Sarang Medhekar</td> </tr> <tr> <td>2</td> <td>Extraction of one beam from a mixture of two coaxially co-propagating mutually incoherent beams of same frequency, Extraction of Data Bits loaded on one coherent beam mixed with the Data Bits loaded on another coherent beam of same frequency and Coherence Division Multiplexing</td> <td>261064</td> <td>Sarang Medhekar and Puny Prasanna Plaltani</td> </tr> <tr> <td>3</td> <td>ALL-OPTICAL NOT/XOR, AND NAND GATES, ALL-OPTICAL BISTABLE, ASTABLE MULTIVIBRATORS AND ALL-OPTICAL HALF ADDER USING NOVEL ALL-OPTICAL SWITCHING IN A MACH-ZENDER INTERFEROMETER</td> <td>296862</td> <td>Sarang Medhekar and Puny Prasanna Plaltani</td> </tr> </tbody> </table>	Sl No	Description	Patent no.	inventors	1	Mechanical load stabilizer with load dependent stepless gear ratio variation system	223097	Sarang Medhekar	2	Extraction of one beam from a mixture of two coaxially co-propagating mutually incoherent beams of same frequency, Extraction of Data Bits loaded on one coherent beam mixed with the Data Bits loaded on another coherent beam of same frequency and Coherence Division Multiplexing	261064	Sarang Medhekar and Puny Prasanna Plaltani	3	ALL-OPTICAL NOT/XOR, AND NAND GATES, ALL-OPTICAL BISTABLE, ASTABLE MULTIVIBRATORS AND ALL-OPTICAL HALF ADDER USING NOVEL ALL-OPTICAL SWITCHING IN A MACH-ZENDER INTERFEROMETER	296862	Sarang Medhekar and Puny Prasanna Plaltani			
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	4	ALL-OPTICAL PASSIVE TRANSISTOR ADAPTING A MACH-ZEHNDER INTERFEROMETER	304332	Sarang Medhekar and Puny Prasanna Plaltani
	5	A SYSTEM AND A METHOD TO SYNTHESIZE OPTICAL DEVICES OF DESIRED FUNCTIONALITY	531675	Sarang Medhekar

Articles Published

	Title/Journal/Vol./Year/Pages			
1	"Maximum possible transverse velocity in special relativity" S. Medhekar , <i>Physics Education</i> Vol.7, No.4, p-320-322(1991).			
2	"Propagation of Gaussian laser beams in a nonlinear radially inhomogeneous absorbing medium with arbitrary nonlinearity" S. Medhekar , Rajkamal and A.Saxena, <i>Ind. J. Pure & Appl. Phys.</i> Vol.31, p-605-609(Sept.1993).			
3	"Absorption/Amplification induced self tapering and uptapering of a laser beam in a saturable nonlinear medium: large nonlinearity" M.S.Sodha, S. Medhekar , S.Konar, A.Saxena and Rajkamal, <i>Optics Letters</i> , Vol.19, No.15, p-1110(Aug.1 st 1994). https://doi.org/10.1364/OL.19.001110			
4	"Self tapering and uptapering of a self guided laser beam in an absorption/gain medium with arbitrary nonlinearity", S. Medhekar , S.Konar and Rajkamal, <i>Pramana-Journal of physics</i> , vol.44, No.3, p-249(March1995). https://www.ias.ac.in/article/fulltext/pram/044/03/0249-0256			
5	"Profile of radial inhomogeneity for stationary self trapped propagation of laser beams in a nonlinear absorbing/amplifying medium with arbitrary nonlinearity" S Medhekar , S.Konar and Rajkamal, <i>IL NUOVO CIMENTO D</i> , Vol.17, p-351,(1995). https://link.springer.com/article/10.1007/BF02457337			
6	"Successive uptapering and stationary self trapped propagation of a laser beam in a saturating nonlinear medium" S Medhekar , S.Konar and Rajkamal, <i>Lasers & Particle Beams</i> , Vol.13, No.4, p-559(1995) doi:10.1017/S026303460000968X			
7	"Self tapering of elliptic beams in elliptic core nonlinear fibers", S Medhekar , S. Konar and M.S.Sodha, <i>Optics Letters</i> , Vol.20, No.21, p-2192 (1995). https://doi.org/10.1364/OL.20.002192			
8	"Optical Power filter: A new kind of passive nonlinear optical device" S Medhekar , M.S.Sodha and S.Konar, <i>Optics Letters</i> , Vol.20, No.4, p-305(1996). https://doi.org/10.1364/OL.21.000305			
9	"Displacement and Deflection of Optical Beams by Nonlinear Planer Waveguide" S.Konar, P.K.Barhai and S Medhekar , <i>J. of Nonlinear Optical Physics & Materials</i> , Vol. 12, No. 1, p.101-112 (2003) USA. https://doi.org/10.1142/S0218863503001286			
10	"All-optical Passive Transistor" S Medhekar and Ramkrishna Sarkar, <i>Optics Letters</i> , vol. 30, No. 8, April 2005, pp-887-889. https://doi.org/10.1364/OL.30.000887			
11	"Propagation of Doughnut mode in Nonlinear Media" Ram Krishna Sarkar and S Medhekar <i>Nonlinear Optics, Quantum Optics</i> Vol. 35, Sept. (2006) pp-275-286.			
12	"Coupled Spatial-Soliton Pairs in Saturating nonlinear Medium., S Medhekar , R. K. Sarkar and P. P. Paltani, <i>Optics Letters</i> vol. 31, No. 1 Jan. 2006, pp-77-79. https://doi.org/10.1364/OL.31.000077			

13	All-optical bistable and astable multivibrators” S Medhekar and Ram Krishna Sarkar <i>Nonlinear Optics, Quantum Optics</i> , vol. 35, Sept. 2006, pp-287-296..
14	“Passive, ‘Self-Trapped Family’ All-Optical Half Adder using All-Optical X-OR, and AND Gate” S Medhekar and Ram Krishna Sarkar <i>Czechoslovak J. Physics</i> , Vol. 56, No. 4 (2006) pp-359-366. https://doi.org/10.1007/s10582-006-0097-3
15	“Proposal for an All-Optical Switch using nonlinear refraction” S. Medhekar and Punya Prasanna Paltani <i>IEEE Photonics Technology Letters</i> Vol. 18 , No. 15 Aug. (2006) pp-1579-1581. 21 August 2006. https://doi.org/10.1109/LPT.2006.878147 .
16	“All-Optical Switching and Tunable Wavelength Filtering in Grating Assisted Directional Coupler” S Medhekar and Punya Prasanna Paltani <i>Nonlinear Optics, Quantum Optics</i> Vol. 36 , (2007) pp-81-90.
17	“Synchronous Couplers Made of Symmetric and Asymmetric Slabs”, Punya P. Paltani and S. Medhekar , <i>Nonlinear Optics, Quantum Optics</i> Vol. 36 , (2007) pp-129-145.
18	“Spatial Solitons of desired intensity and width and their Self-Tapering/Uptapering in Cubic Quintic Nonlinear Medium”, Ram Krishna Sarkar and S. Medhekar , <i>Physica Scripta</i> , Vol. 76, (2007) pp-683-688. 8 November 2007. https://doi.org/10.1088/0031-8949/76/6/017
19	“Soliton Pairing of Two Coaxially Co-Propagating Mutually Incoherent 1-D Beams in Kerr Type Media”, S. Medhekar, Ram Krishna Sarkar and Punya P. Paltani, <i>Optica Applicata</i> , XXXVII , 243-259 (2007)
20	“Novel All-Optical Switch using Nonlinear Mach-Zehnder Interferometer” S. Medhekar and Punya prasanna Paltani, <i>Fiber and Integrated Optics</i> Vol.28 Number 3 (2009) p. 229-236. 15 May 2009. https://doi.org/10.1080/01468030802536599
21	“All-Optical transistor using counter propagating beams in a Nonlinear Mach-Zehnder Interferometer” S. Medhekar and Punya prasanna Paltani, <i>Fiber and Integrated Optics</i> Vol.28 Number 4 (2009) p. 268-274. 16 Jun 2009. https://doi.org/10.1080/01468030902759307 .
22	Spatial soliton pairing of two cylindrical beams in saturable nonlinear media, R. K. Sarkar and S Medhekar, <i>Progress In Electromagnetics Research M</i> , Vol. 9, 53-64, 2009
23	“Mutual-focusing of two co-propagating beams and formation of trapped spatial breather pair in saturable nonlinear media” Ram Krishna Sarkar and S. Medhekar , <i>OPTIK</i> 121 (2010) p-339–346. February 2010. https://doi.org/10.1016/j.ijleo.2008.07.022
24	Switching Behaviour of a Nonlinear Mach-Zehnder Interferometer, Arpita Srivastava, Punya Prasanna Paltani and S. Medhekar , <i>Pramana</i> , Vol.74 Number 4 (2010) p. 575-590. April 2010. https://www.ias.ac.in/article/fulltext/pram/074/04/0575-0590
25	“Optimally Stabilized Beam Pairs”, Punya Prasanna Paltani and S. Medhekar, <i>OPTIK</i> , vol. 122, issue 1, pp. 70-75(2011). January 2011. https://doi.org/10.1016/j.ijleo.2010.02.007
26	All-optical Circulator Based on Cross Phase Modulation in a Nonlinear Mach-Zehnder Interferometer, Punya Prasanna Paltani and S. Medhekar , <i>OPTIK</i> , Volume 122, Issue 5, March 2011, Pages 464-466. March 2011. https://doi.org/10.1016/j.ijleo.2010.04.011

27	Switching of One Beam by Another in a Kerr Type Nonlinear Mach-Zehnder Interferometer, Arpita Srivastava and S. Medhekar , Optics & Laser Technology, vol. 43, issue 1, pp. 29-35(2011). February 2011. https://doi.org/10.1016/j.optlastec.2010.04.021
28	Coupled tapered / uptapered optical beams” Arpita Srivastava, Ram Krishna Sarkar, Shraddha Prasad and S. Medhekar , OPTIK, 122 (2011) 2039– 2043, November 2011. https://doi.org/10.1016/j.jileo.2010.12.034
29	Switching Behaviour of a Nonlinear Mach-Zehnder Interferometer; Saturating Nonlinearity” authored by Arpita Srivastava and S. Medhekar Optics & Laser Technology 43 (2011) 1208–1211, October 2011. https://doi.org/10.1016/j.optlastec.2011.03.010
30	Coupled Propagation in Electromagnetically Induced Transparent Medium; Thirring Type Soliton Pairs and Breather Pairs” Authored by Shraddha Prasad, Ram Krishna Sarkar, Arpita Srivastava and S. Medhekar , J. of Electromagn. Waves and Appl., Vol. 25, 923–933, 2011. 03 Apr 2012. https://doi.org/10.1163/156939311795253957
31	Investigations on the combustion parameters of a dual fuel diesel engine with hydrogen and LPG as secondary fuels by D. B. Lata, A. Mishra and S. Medhekar , International Journal of Hydrogen Energy Vol. 36, 13808–13819, 2011, October 2011. https://doi.org/10.1016/j.ijhydene.2011.07.142
32	Signal amplification based on the local nonlinear Mach–Zehnder interferometer by Arpita Srivastava, Man Mohan Gupta, S. Medhekar , Optics & Laser Technology, Vol. 44, 492–496, 2011, March 2012. https://doi.org/10.1016/j.optlastec.2011.08.020
33	Effect of hydrogen and LPG addition on the efficiency and emissions of a dual fuel diesel engine, D. B. Lata, A. Mishra and S. Medhekar , International Journal of Hydrogen Energy Vol. 37, Pages 6084–6096, 2012, April 2012, https://doi.org/10.1016/j.ijhydene.2012.01.014
34	Switching Behavior of a Nonlinear Mach-Zehnder Interferometer with Exponentially Saturable Nonlinearity, Arpita Srivastava and S. Medhekar , Optical Engineering , Vol. 51, Pages 074604-1 to 074604-4, 2012. https://doi.org/10.1117/1.OE.51.7.074604
35	Effect of change in core width and core refractive index on the switching behavior of a nonlinear Mach–Zehnder interferometer, Arpita Srivastava Sarang Medhekar, Optical Engineering 51(9), 094601 (September 2012). https://doi.org/10.1117/1.OE.51.9.094601
36	Coupled tapering/uptapering of soliton pairs in nonlinear media, Shraddha Prasad, Ram Krishna Sarkar and Sarang Medhekar, Optik - Int. J. Light, Electron Opt., 124 (2013) 6661– 6665, 2013.05.108, December 2013. https://doi.org/10.1016/j.jileo.2013.05.108
37	Study of nonlinear optical properties of organic dye by Z-scan technique using He–Ne laser, R. K. Choubey S. Medhekar, R. Kumar S. Mukherjee Sunil Kumar, Journal of Materials Science: Materials in Electronics, 25 January 2014. https://doi.org/10.1007/s10854-014-1743-3
38	Switching Behavior of Nonlinear Mach-Zehnder Interferometer Based on Photonic Crystal Geometry, Man Mohan Gupta and S Medhekar, Pramana Vol. 82, No. 6, 2014, pp. 1061–1074, June 2014. https://www.ias.ac.in/public/Volumes/pram/082/06/1061-1074.pdf
39	A versatile optical junction using photonic band-gap guidance and self- collimation, Man Mohan Gupta and Sarang Medhekar, Applied Physics Letters 105, 131104 (2014);, 29 September 2014. https://doi.org/10.1063/1.4896622
40	Coupled tapering/uptapering of dark soliton pair in nonlinear media, Shraddha Prasad, Ram Krishna Sarkar, Sarang Medhekar, Optik-International Journal for Light and Electron Optics 126 (2015) 677–680, April 2015. https://doi.org/10.1016/j.jileo.2015.02.042
41	Solitons in optical metamaterials with trial solution approach and Backlund transform of Riccati equation A. H. Arnous, Mohammad Mirzazadeh, Seithuti Moshokoa, Sarang Medhekar , Qin Zhou, M. F. Mahmood, Anjan Biswas and Milivoj Belic, Journal of Computational and Theoretical Nanoscience , Vol. 12, 5940–5948, 2015. https://doi.org/10.1166/jctn.2015.4739
42	All-optical NOT and AND gates using counter propagating beams in nonlinear Mach Zehnder interferometer made of photonic crystal waveguides, Man Mohan Gupta, Sarang Medhekar , Optik-International Journal for Light and Electron Optics 127 (2016) 1221–1228, February 2016.

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44	Asymmetric light reflection at the reflecting layer incorporated in a linear, time-independent and non-magnetic two-dimensional photonic crystal Man Mohan Gupta and Sarang Medhekar , Euro Physics Letters , 114 (2016) 54002, 8 July 2016. https://doi.org/10.1209/0295-5075/114/54002
45	All-optical NOT and AND Gates based on 2D Nonlinear Photonic Crystal Ring Resonant Cavity, Alok Kumar, Man Mohan Gupta and Sarang Medhekar , Optik-International Journal for Light and Electron Optics 167 (2018) 164–169, August 2018. https://doi.org/10.1016/j.ijleo.2018.04.042 .
46	All optical NOT and NOR gates using interference in the structures based on 2D linear photonic crystal ring resonator, Alok Kumar and Sarang Medhekar , Optik - International Journal for Light and Electron Optics 179 (2019) 237–243, February 2019. https://doi.org/10.1016/j.ijleo.2018.10.188
47	Wavelength Filter Based on Photonic Crystal Resonant Cavity, Alok Kumar and Sarang Medhekar Nonlinear Optics, Quantum Optics , (2019) p. 1-13.
48	All optical NOR and NAND gates using four circular cavities created in 2D nonlinear photonic crystal, Alok Kumar and Sarang Medhekar, Optics & Laser Technology ,(2020) vol 123, p-105910. March 2020. https://doi.org/10.1016/j.optlastec.2019.105910
49	Slow light in rod type 2D photonic crystal waveguide comprising of cavity :optimization and analysis, Satchi Kumari, Alok Kumar and Sarang Medhekar , Optik - International Journal for Light and Electron Optics 231 (2021) 166438 April 2021. https://doi.org/10.1016/j.ijleo.2021.166438
50	Investigation of Coupled Self-Tapering / Self-Uptapering of Soliton Beams in Nonlinear Media, Ram Krishna Sarkar, Anjan Biswas and Sarang Medhekar , Optik - International Journal for Light and Electron Optics 232 (2021) 166511, April 2021. https://doi.org/10.1016/j.ijleo.2021.166511
51	Investigation of plasma cladded optical fiber for dynamic manipulations of its propagation properties, A. K. Mishra, Sarang Medhekar , J. Parashar, Mukesh Kumar, Optik - International Journal for Light and Electron Optics 232 (2021) 166537 April 2021. https://doi.org/10.1016/j.ijleo.2021.166537
52	Dynamic control over group speed of light in plasma cladded optical fiber: An analytical approach, A.K. Mishra, Sarang Medhekar , J. Parashar, Mukesh Kumar, Results in Optics 4 (2021) 100087 August 2021. https://doi.org/10.1016/j.rio.2021.100087 ISSN 2666-9501
53	2D photonic crystal based all-optical add-drop filter consisting of square ring resonator, Puja Sharma, Man Mohan Gupta, Nilaksha Ghosh, Sarang Medhekar , Materials Today: Proceedings 66 (2022) 3344–3348. https://doi.org/10.1016/j.matpr.2022.07.062 .
54	Ultra-compact photonic crystal nanocavity-based sensor for simultaneous detection of refractive index and temperature, Puja Sharma and Sarang Medhekar, https://doi.org/10.1007/s12596-022-01037-1 , Journal of Optics (Springer Link) , Vol. 52 23 December 2022 Electronic ISSN: 0974-6900 . Print ISSN: 0972-8821
55	Ring resonator-based highly sensitive chemical/biochemical sensor created on holes in silicon slab 2D photonic crystal, Puja Sharma and Sarang Medhekar, Journal of Optics (Springer Link) , 20 March 2023, https://doi.org/10.1007/s12596-023-01149-2 , Electronic ISSN: 0974-6900 . Print ISSN: 0972-8821
56	Frequency comb generation in rod type 2D photonic crystal coupled cavity waveguide, Puja Sharma and Sarang Medhekar, Journal of Optics (Springer Link) , 13 May 2023, https://doi.org/10.1007/s12596-023-01218-6 Electronic ISSN: 0974-6900 . Print ISSN: 0972-8821
57	“Add-Drop Filter” and “Refractive Index and Temperature Sensor” using 2D Photonic Crystal Ring Resonator, Puja Sharma, Nilaksha Ghosh, Man Mohan Gupta and Sarang Medhekar, International Journal of Optics and Photonics (IJOP) Vol. 16, No. 2, Summer-Fall, 2022. Print ISSN: 1735-8590 ; Online ISSN: 2538-4007

58	Photonic crystal power limiter based on fano-like resonance, Nilaksha Ghosh, Arnab Das, Puja Sharma, Sarang Medhekar, Journal of Optics (Springer Link), 13 Nov. 2023. https://doi.org/10.1007/s12596-023-01460-y . Electronic ISSN: 0974-6900. Print ISSN: 0972-8821
59	“Fluid nonlinear coefficient sensor” designed on 2D photonic Crystal, Puja Sharma, Sarang Medhekar Journal of Optics (Springer Link), https://doi.org/10.1007/s12596-023-01617-9 , Electronic ISSN: 0974-6900. Print ISSN: 0972-8821
60	A gateway to synthesis of all-optical devices of desired functionalities, Sarang Medhekar, Results in Optics 15 (2024) 100644, https://doi.org/10.1016/j.rio.2024.100644 , ISSN 2666-9501
61	Dual resonance self-referenced refractive index sensor using 2D Silicon photonic crystal cavity waveguide system, Nilaksha Ghosh, Puja Sharma and Sarang Medhekar, <i>Optica Applicata</i> , Vol. LIV, No. 4, 2024 https://doi.org/10.37190/oa/195222 ISSN 0078-5466 (print). ISSN 1899-7015 (online)
62	Dual Fano-type resonance based refractive index sensor using 2D silicon photonic crystal waveguide-cavity System, Nilaksha Ghosh, Sarang Medhekar, IJPAP, Vol. 63, September 2025, pp. 796-802, https://doi.org/10.56042/ijpap.v63i9.14347 ISSN: 0975-1041 (Online) CODEN: IJOPAU ISSN: 0019-5596 (Print)
63	Design of a highly sensitive blood sensor based on a 2D photonic crystal L3 cavity, Puja Sharma and Sarang Medhekar, <i>Optica Applicata</i> , Vol. LV, No. 2, 2025, https://doi.org/10.37190/oa/201341 ISSN 0078-5466 (print). ISSN 1899-7015 (online)

Seminar/Workshop/Conference Participation:**Plenary talk/ Invited talks**

16	Delivered an Invited Talk “Synthesis of all optical devices of desired functionalities” at the Symposium on Advanced Photonics (SAP 2025), held from November 16–18, 2025, organized by the Optoelectronic Nanodevice Research Laboratory (ONRL), Centre for Advanced Electronics (CAE), Indian Institute of Technology IIT Indore, India.
15	Served as a Keynote Speaker at the One-Day Workshop on “The Role of Thermal Storage Materials in the Future of Concentrated Solar Power”, organized by the Department of Mechanical Engineering, Birla Institute of Technology, Mesra, Ranchi, on September 25, 2024.
14	Delivered an Invited Talk on National Science Day 2023, jointly organized by the School of Liberal Arts and Sciences, Mody University of Science and Technology, Lakshmangarh, Rajasthan, and Vigyan Bharati, Rajasthan, on February 28, 2023.
13	Delivered an Invited Talk at the National Conference on Innovation and Prototype Patent – Special Reference to Pollutant Detection/Prevention, Energy Generation, and Medical Diagnostics (NCIPP-2022), organized by the Institution’s Innovation Council (IIC), Birla Institute of Technology, Mesra – Patna Campus, in association with the Materials Research Society of India and the Bihar State Pollution Control Board, on December 14, 2022.
12	Delivered an Invited Lecture in the AICTE Training and Learning (ATAL) Academy Online Elementary FDP on “Photonics: Fundamentals & Applications”, held from June 28 to July 2, 2021, at Samrat Ashok Technological Institute.
11	Delivered an Invited Lecture on National Science Day 2021, organized by the Department of Applied Science, Samrat Ashok Technological Institute, Vidisha, and sponsored by the M.P. Council of Science & Technology, Bhopal, on February 28, 2021, via a virtual platform.
10	Delivered an Invited Talk at the National Conference on Recent Trends in Nanotechnology (NANO-2019), held on October 4–5, 2019, organized by the Department of Applied Science, Samrat Ashok Technological Institute (SATI), Vidisha, Madhya Pradesh.
9	Delivered an Invited Talk on “Optical Computing: Challenges and Possibilities” at the UGC-sponsored National Seminar on Recent Advances in Physical Sciences, organized by P. K. Roy Memorial College, Dhanbad, in collaboration with BIT Sindri, held on January 19–20, 2018.
8	Delivered an Invited Talk at the National Seminar on Recent Trends in Condensed Matter Physics Including Laser Applications (NSCMPLA-2017), organized by the Department of Physics, University of Burdwan, India, on March 8–9, 2017.
7	Delivered an Expert Lecture on “Basics of Optics and Its Advanced Applications” on February 22, 2016, organized by the Department of Applied Physics, Cambridge Institute of Technology, Tatisilwai, Ranchi, under TEQIP Phase-II.
6	Delivered a Popular Talk at the National Workshop on “Energy Efficient Lighting Technology: Recent Developments and Future Ahead”, organized by Mody University, Rajasthan, on November

	28, 2015.
5	Delivered an Invited Talk “Photonics: the basis of future generation communication and computing” in Short term course on “Next Generation Electronics” Sponsored by TEQIP II, MHRD, Govt. of India, Jointly Organized by Department of Applied Physics & Department of Electrical and Electronic Engineering, Cambridge Institute of Technology, Ranchi. During September 14-18, 2015.
4	Delivered an Invited Talk "Experimental Physics" at the Faculty Refresher Course held on 12 July 2014 at the UGC-Academic Staff College, Ranchi University, India.
3	Delivered a Plenary Talk at the International Conference on Recent Trends in Science & Technology (ICRTST 2013), held from December 27–29, 2013, organized by the Departments of Basic Science & Humanities, Computer Science & Engineering, and Information Technology, College of Engineering & Management, Kolaghat, West Bengal, India.
2	Delivered an Invited Talk “Basic Science” at the Faculty Refresher Course held on 9 March 2013 at the UGC-Academic Staff College, Ranchi University, India.
1	Delivered an Invited Talk “All optical Switching in a Mach-Zehnder Interferometer” at the National Seminar on Photonics and Materials (NASPAM-2010) held on March 25-27, 2010 Department of Applied Physics Indian school of Mines, Dhanbad, Jharkhand.

Plenary talk/ Invited talks at University level/ School Level

7	Delivered an invited talk entitled “Curriculum Excellence through CO–PO–PSO Mapping and Attainment” at the Sarala Birla University on 29th November, 2025
6	Delivered Chief Guest speech the “Science Exhibition” on 26 Oct. 2024 at Saraswati Shishu Vidya Mandir, Dhurwa, Ranchi.
5	Delivered an invited talk in the Online Lecture & Training Programme on “Faculty Development Programme–QIP,” organized by the Internal Quality Assurance Cell (IQAC), Central University of Jharkhand, Ranchi, India, held from 30 January to 13 February 2022.
4	Delivered an invited motivational speech during the “Personality Development Programme” for Class XI students on 6 July 2019 at Saraswati Shishu Vidya Mandir, Dhurwa, Ranchi.
3	Delivered an invited lecture in in-service training course for PGT teachers at Kendriya Vidyalaya, Dipa Toli, Ranchi on 27 May 2016
2	Delivered invited talk on “Switching and all optical logic in nonlinear Mach-Zehnder interferometers” at the Department of Education, Lucknow University on 29th November 2011.
1	Delivered invited talk on “Self trapped family all optical logic gates” at the Department of Education, Lucknow University on 29th November 2011.

International Conferences (Latest First)

S. No.	Authors	Paper/Poster Title and Conference/Symposium Name	Venue	Date
23	Puja Sharma, Man Mohan Gupta, Nilaksha Ghosh, SARANG MEDHEKAR	Proposal of mid-infrared range sensor using defect waveguide created in holes in slab type 2D photonic crystal (International Conference on Advancement in Core and Frontier of Physics (ACFP-2022))	GLA University, Mathura, UP, India	February 5-7, 2022
22	Puja Sharma, Man Mohan Gupta, Nilaksha Ghosh, Sarang Medhekar	Proposal for Ultra-Compact Add Drop Filter based on Holes in Slab 2D Hexagonal Photonic Crystals (DAE-BRNS National Laser Symposium (NLS-30))	Bhabha Atomic Research Centre Department of Atomic Energy Mumbai – 400085, Maharashtra, India	January, 2022
21	P. Sharma, M. M. Gupta, N. Ghosh, and SARANG MEDHEKAR	Optical add-drop filter based on square ring resonator consisting of octagon shape core (2021 IEEE International Conference on Technology, Research, and Innovation for Betterment of Society (TRIBES))	International Institute of Information Technology, Naya Raipur	December 17-19, 2021
20	N. Ghosh, P. Sharma, SARANG MEDHEKAR, and M. M. Gupta	Design and analysis of pressure sensor based on 2D photonic crystal consisting of micro-cavity (2021 IEEE International Conference on Technology, Research, and Innovation for Betterment of Society (TRIBES))	International Institute of Information Technology, Naya Raipur	December 17-19, 2021
19	Puja Sharma, Man Mohan Gupta, Nilaksha Ghosh, and SARANG MEDHEKAR	Design and Simulation of 2D Photonic Crystal based ring resonator (27th International Conference of International Academy of Physical Science)	Vikram University, Ujjain, M.P. India	26th-28th October 2021
18	Puja Sharma, Alok Kumar, Nilakash Ghosh, Dr. Sharddha Prasad and Sarang Medhekar	All optical NOT gate using interference in the structure based on 2D photonic crystal circular cavity (international e-conference on “Multidisciplinary approach for sustainable development”)	“ICMASD-2020” Jharkhand Rai University, Ranchi	19th - 20th September, 2020
17	Alok Kumar and	All-optical AND gate based on 2D	Indian Institute of	12-15

	SARANG MEDHEKAR	nonlinear photonic crystal ring resonator (PHOTONICS 2018: International Conference on Fiber Optics & Photonics)	Technology IIT, New Delhi	December 2018
16	SARANG MEDHEKAR, R. Kumar, S. Mukherjee, and R. K. Choubey	Study of nonlinear refraction of organic dye by Z-scan technique using He-Ne laser (AIP Conf. Proc. 1512, 470 (2013); doi: 10.1063/1.4791115)	American Institute of Physics.	2013
15	Man Mohan Gupta, Arpita Sivastava and SARANG MEDHEKAR	Effect of Perfectly Matched Layer Width on Switching Behaviour of Photonic Crystal based Nonlinear Mach-Zehnder Interferometer (1st International Science Congress (ISC-2011))	Maharaja Ranjit Singh College of Professional Sciences, Indore, MP, India	24-25th December- 2011
14	Arpita Srivastava, SARANG MEDHEKAR	Switching Behaviour of Nonlinear Mach-Zehnder Interferometer with different Core widths (International Science Congress (ISC)-2011)	Maharaja Ranjit Singh College of Professional Sciences, Indore, MP, India	24th and 25th December 2011
13	Ram Krishna Sarkar, Shraddha Prasad, SARANG MEDHEKAR	Propagation of Gaussian beam in Cubic Quintic Nonlinear medium (International Science Congress (ISC)-2011)	Maharaja Ranjit Singh College of Professional Sciences, Indore, MP, India	24th and 25th December 2011
12	Arpita Srivastava, Man Mohan Gupta and SARANG MEDHEKAR	Switching Behaviour of a Nonlinear Mach-Zehnder Interferometer With Different Saturable Nonlinearities (Second International Conference on Trends in Optics and Photonics (IConTOP))	Department of Applied Optics and Photonics, University of Kolkata, India	December 7-9, 2011
11	Man Mohan Gupta, Arpita Shrivastava and SARANG MEDHEKAR	Switching Behaviour of Photonic Crystal based Nonlinear Mach-Zehnder Interferometer (Second International Conference on Trends in Optics and Photonics (IConTOP))	Department of Applied Optics and Photonics, University of Kolkata, India	December 7-9, 2011
10	Ram Krishna Sarkar, Shraddha Prasad and	Spatial Soliton Pairing in Radially Inhomogeneous Nonlinear Media (Second International Conference on	Department of Applied Optics and Photonics,	December 7-9, 2011

	SARANG MEDHEKAR	Trends in Optics and Photonics (IConTOP)	University of Kolkata, India	
9	Shraddha Prasad, Ram Krishna Sarkar, Arpita Srivastava and SARANG MEDHEKAR	THIRRING TYPE BREATHING PAIRS AND SOLITONS (PHOTONICS 2010: 10th International Conference on Fiber Optics & Photonics)	IIT Guwahati, India	December 11-15, 2010
8	SARANG MEDHEKAR, Arpita Srivastava and Punya Prasann Paltani	PULSE SWITCHING IN A NONLINEAR MACH-ZEHNDER INTERFEROMETER (PHOTONICS 2010: 10th International Conference on Fiber Optics & Photonics)	IIT Guwahati, India	December 11-15, 2010
7	Arpita Srivastava, Man Mohan Gupta and SARANG MEDHEKAR	SIGNAL AMPLIFICATION BY USING A NONLINEAR MACH-ZEHNDER INTERFEROMETER (PHOTONICS 2010: 10th International Conference on Fiber Optics & Photonics)	IIT Guwahati, India	December 11-15, 2010
6	Ram Krishna Sarkar and SARANG MEDHEKAR	Soliton pairing in nonlinear media (in Photonics-2006)	University of Hyderabad, INDIA	13-16 Dec 2006
5	Punya P. Paltani and SARANG MEDHEKAR	Switching Behaviour of Nonlinear Refraction Based optical Switch (in Photonics 2006)	University of Hyderabad, INDIA	13-16 Dec 2006
4	SARANG MEDHEKAR and Ram Krishna Sarkar	All-optical passive Isolator (in Photonics 2004, International conference on photonics and related areas)	Cochin, INDIA	Dec.2004
3	SARANG MEDHEKAR and Ram Krishna Sarkar	Propagation of doughnut mode in various nonlinear media (in Asia Pacific Microwave Conference, International conference)	New Delhi, INDIA	Dec.2004
2	SARANG MEDHEKAR, S Konar, P.K.Barhai	All-optical pulse width manipulation of stationary temporal soliton (in Photonics-2002, International conference on photonics and related areas)	Tata Institute of Fundamental Research, Mumbai, INDIA	Dec.2002

1	SARANG MEDHEKAR et. al.	Highly sensitive optical power filters (in Photonics-96, international conference on photonics and related areas)	Indian Institute of Technology IIT, Chennai, INDIA	9-13 Dec.1996
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National Conferences (Latest First)

S. No.	Authors	Paper/Poster Title and Conference/Symposium Name	Venue	Date
22	Puja Sharma, Man Mohan Gupta, Nilaksha Ghosh, SARANG MEDHEKAR	2D Photonic Crystal L3 cavity based highly sensitive Ferroelectric BTO electro-Optic sensor (XXIII National seminar on Ferroelectrics and Dielectrics (NSFD-2024))	Central University of Jharkhand, Ranchi-835222, Jharkhand	December 17-19, 2024
21	Puja Sharma, Man Mohan Gupta, Nilaksha Ghosh, SARANG MEDHEKAR	Propagation of Slow Light in Photonic Crystal Circular Ring Resonator (XLV Symposium of the Optical Society of India COPaQ 2022 Conference on Optics, Photonics & Quantum Optics)	Indian Institute of Technology (IIT) Roorkee	10-13 November, 2022
20	Nilaksha Ghosh, Puja Sharma, SARANG MEDHEKAR	Fano resonance based refractive index sensing in Photonic crystal waveguide-cavity system (XLV Symposium of the Optical Society of India COPaQ 2022 Conference on Optics, Photonics & Quantum Optics)	Indian Institute of Technology (IIT) Roorkee	10-13 November, 2022
19	P. Sharma, M. M. Gupta, N. Ghosh, and SARANG MEDHEKAR	Proposal for Ultra-Compact Add Drop Filter based on Holes in Slab 2D Hexagonal Photonic Crystals (DAE-BRNS National Laser Symposium (NLS-30) e- Proceedings)	Bhabha Atomic Research Centre (BARC), Mumbai	January, 2022
18	Puja Sharma, Man Mohan Gupta, Nilaksha Ghosh, SARANG MEDHEKAR,	2D photonic crystal based all-optical add-drop filter consisting of square ring resonator,	Materials Today: Proceedings 66, 3348-	2022
17	Puja Sharma, Man Mohan Gupta, Nilaksha Ghosh, and SARANG	2D photonic crystal based all-optical tunable add drop filter using square ring resonator (29th National (Virtual) Conference on Condensed Matter Physics - Condensed Matter Days	Central University of Jharkhand, Ranchi, Jharkhand,	10th-12th December 2021

	MEDHEKAR	(CMDAYS 21)	India	
16	Saurabh Suman, Man Mohan Gupta and SARANG MEDHEKAR	Finite Difference Time Domain Technique: Effect of Perfectly Matched Layer Polynomial in radiation absorption (Condensed Matter Days 2012)	Birla Institute of Technology, Mesra, Ranchi, Jharkhand, India	29-31st August-2012
15	Man Mohan Gupta and SARANG MEDHEKAR	Transmission Characteristics of a Photonic Crystal (PC) based Cross Waveguide Consisting of Resonant Cavities: Effect of Central Rod Size (Condensed Matter Days 2012) POSTER	Birla Institute of Technology, Mesra, Ranchi, Jharkhand, India	29-31st August-2012
14	Arpita Srivastava, SARANG MEDHEKAR	Signal Amplification Using a Structure Based on Nonlinear Mach-Zehnder Interferometer: Effect of Change in Length and Nonlinearity Coefficient of the Nonlinear Arm (Condensed Matter Days 2012)	Birla Institute of Technology, Mesra, Ranchi, Jharkhand, India	29-31st August-2012
13	Arpita Srivastava, Punya Prasanna Paltani and SARANG MEDHEKAR	Analysis of a Nonlinear Mach-Zehnder Interferometer (Proc. 2nd National Seminar on Advanced Optoelectronic Materials and Devices (AOMD-2008))	Indian Institute of Technology (BHU) Varanasi	22-24 Dec. 2008
12	Punya P. Paltani and SARANG MEDHEKAR	Switching Behavior in Nonlinear Mach- Zehnder Interferometer (in National Laser Symposium "NLS-7")	M.S. University, Vadodara, INDIA	17-20 Dec. 2007
11	Punya P. Paltani and SARANG MEDHEKAR	Theoretical Investigation of Directional Couplers and Their Synchronization (in CODEC-06)	University of Kolkata, INDIA	18-20 Dec 2006
10	SARANG MEDHEKAR and Ram Krishna Sarkar	Trapped Spatial Breather Pair in Saturable Nonlinear Media (in National Laser Symposium (in National Laser Symposium (NLS-6))	Raja Ramanna Center for Advanced Technology, Indore, INDIA	5-8 Dec. 2006
9	Punya P. Paltani and SARANG MEDHEKAR	Solitonic and Nearly Solitonic Beam Pairs (in National Laser Symposium (NLS-6))	Raja Ramanna Center for Advanced Technology,	5-8 Dec. 2006

			Indore, INDIA	
8	SARANG MEDHEKAR and Ram Krishna Sarkar	Co-propagating beams in saturating nonlinear media [in NASDEC (2)-06]	Birla Institute of Technology, Mesra, INDIA	2-4 Nov. 2006
7	Punya P. Paltani and SARANG MEDHEKAR	Analysis of Nonlinear Refraction Using Split Step Method [in NASDEC (2)-06]	Birla Institute of Technology, Mesra, INDIA	2-4 Nov. 2006
6	Punya P. Paltani and SARANG MEDHEKAR	Study of Grating Assisted Directional Couplers (in National Laser Symposium (NLS-5))	Vallore Institute of Technology, Vallore, INDIA	7-10 Dec. 2005
5	Punya P. Paltani and SARANG MEDHEKAR	Synchronous Couplers: Symmetric and Asymmetric Directional Coupler (in Seminar on Optics of Photonic Band gap Materials)	Indian Institute of Technology, Kharagpur, INDIA	28-30 Oct 2005
4	Ram Krishna Sarkar, SARANG MEDHEKAR, and Punya Prasanna Paltani	Analysis of Cross focusing of Gaussian beams in Saturating Nonlinear medium (in National Laser Symposium (NLS-4))	Bhabha Atomic Research Centre, Mumbai, INDIA	Dec.2004 Jan 2005
3	J. N. Singh, Swapan Konar and SARANG MEDHEKAR	Absorption induced higher order mode excitation in nonlinear media (in National laser symposium)	Bhabha Atomic Research Centre, Mumbai, INDIA	Jan. 17-19, 1996
2	SARANG MEDHEKAR	Presented Ph. D. Thesis "Guided Laser Beams in Nonlinear Media" (in National laser symposium)	Bhabha Atomic Research Centre, Mumbai, INDIA	Jan. 17-19, 1996
1	M. S. Sodha, SARANG MEDHEKAR, S. Konar, A. Saxena and Rajkamal	Self tapering/uptapering of self guided beams (in National laser symposium)	Center for Advanced Technology, C.A.T., Indore, INDIA	Jan.29-Feb.1, 1994

State Level Conferences

S. No.	Authors	Paper/Poster Title and Conference/Symposium Name	Venue	Date
1	SARANG MEDHEKAR	Paper on optical device (presented in 11th M. P. Young scientists congress)	Rani Durgavati University Jabalpur, INDIA	Feb.28- March 1st 1996

Workshops/Training Programs

	Details
19	Attended the two-day National Meet on the theme "ISRO's Venus Orbiter Mission – Science and Enhancing Academia Engagements," held at ISRO Headquarters, Bangalore, from October 29 to 30, 2025.
18	Attended the "Rashtriya Karmayogi Large Scale Jan Seva Program" (RK-LSJSP), provided by the Capacity Building Commission, with Illumine Knowledge Resources as Knowledge Partner, on September 9, 2025.
17	Participated in the three-day Workshop on Academic and Administrative Audit, organized by the Internal Quality Assurance Cell (IQAC), Central University of Jharkhand, Ranchi, India, from December 11 to 13, 2023.
16	Participated in the IP Awareness/Training Programme under the National Intellectual Property Awareness Mission, organized by the Intellectual Property Office and the Ministry of Education's Innovation Cell, India, on August 10, 2022.
15	Attended the Online Induction Training Programme for Part-Time CVOs under the Ministry of Human Resource Development, sponsored by the Central Vigilance Commission, on February 22–23 and March 25, 2021.
14	Attended the Virtual Symposium on Emerging Areas of Photonics to celebrate the International Day of Light, organized by NASI – Delhi Chapter and the Optical Society of India, on May 16, 2020.
13	Participated in the Vice-Chancellors' Meeting as the representative of the Vice-Chancellor, held at the Auditorium, AICTE Headquarters, New Delhi, on August 13, 2019.
12	As President of the Institution's Innovation Council (CUJ), attended the Inaugural Function of the Institution Innovation Council (IIC) at the AICTE Headquarters, New Delhi, on November 21, 2018.
11	Attended Condensed Matter Days 2012, a National Conference on Condensed Matter Physics, organized by the Dept. of Applied Physics, BIT Mesra, Ranchi, from August 29 to 31, 2012.
10	Attended a Workshop on Intellectual Property Rights (IPR 2016) held at the Birla Institute of Technology (BIT), Mesra, Ranchi, on December 2, 2011.

9	Attended a National Seminar on Devices, Circuits and Communication organized by the Dept. of Electronics and Communication Engineering, BIT Mesra, Ranchi (Occurred before 2011).
8	Attended a Short-Term Course on Training on Pro-E conducted at Birla Institute of Technology (BIT), Mesra, Ranchi, on November 23 and 24, 2009.
7	Attended a Short-Term Course on Training on AutoCAD conducted at the Birla Institute of Technology (BIT), Mesra, Ranchi, from November 3 to 13, 2009.
6	Attended a Workshop on Self Focusing held at the University of Lucknow, Lucknow, from November 19 to 25, 2007.
5	Attended a Two-Day Training Workshop on Low-Cost Experiments held at BIT Extension Centre, Lalpur, Ranchi, on May 6 and 7, 2006.
4	Attended the Course on Laser Material Processing Technology and the Workshop on Applications of Laser in Traditional and Non-Traditional Areas, Jadavpur University, Kolkata, from February 27 to 29, 2004.
3	Attended the First One-Day International Workshop on Wireless Communication Technology (IWWCT 2003) at BIT Mesra, Ranchi, on November 12, 2003.
2	Attended the 4th Workshop on Application of Laser in Mechanical Industry (Valmiki 2002), organized by Jadavpur University, Kolkata, from February 22 to 24, 2002.
1	Attended a Workshop on Fibre Optics and Applications held at the Department of Physics, IIT Delhi, from December 12 to 16, 1994.

Conferences/ scientific events Organized

Sl. No.	Conference Details
23	Organized as Head of the Department the National Science Day (NSD-2025) on 28 Feb. 2025. Dr. Raj Kumar Choudhary, Scientist-G of Space Physics Laboratory, Vikram Sarabhai Space Center, Thiruvananthapuram delivered a talk entitled "Indian network for Space weather monitoring (InSWIM): An introduction on its utility for navigation" in the Department of Physics, Central University of Jharkhand, Ranchi.
22	Chairperson, National Seminar on Ferroelectrics and Dielectrics (XXIII NSFD-2024), organized by the Department of Physics, Central University of Jharkhand, Ranchi.
21	Organized "National Space Day" celebrated at the Central University of Jharkhand on 23 rd Aug. 2024 to commemorate the success of Chandrayaan-3 mission marked by safe and soft landing of Vikram Lander at "Shiv Shakti" point
20	Advisory committee member of "One Week Orientation Program in Natural Sciences for Teachers of Senior Secondary Schools (OPNST- 2022)", organized by the Department of Physics, Central

	University of Jharkhand, Ranchi-835222, during 25th-30th April 2022.
19	Chairman, National Science Day (NSD-2022) on "Sustainable Energy and Society," organized by the Department of Physics, Central University of Jharkhand, 28 February 2022.
18	Patron, National Conference on "Condensed Matter Days 2021" (CMDAYS-21), organized by the Department of Physics, Central University of Jharkhand, 10–12 December 2021.
17	Chairman, Consultative Workshop with Stakeholders for Feedback and Suggestions on R&D in Higher Education Institutions (HEIs), 12 November 2021.
16	Organizing Committee Member, National Webinar on "Research Opportunities Over the Horizon in Physical Sciences," organized by the Department of Physics, CUJ in collaboration with IAPT (RC-20), 2 October 2021.
15	Chairman, Online Lecture Series on "Advances in Physical Sciences," organized by the Department of Physics, Central University of Jharkhand, 9–13 August 2021.
14	Advisory Committee Member, AICTE Training and Learning (ATAL) Academy Online Elementary FDP on "Photonics: Fundamentals & Applications," Samrat Ashok Technological Institute, 28 June – 2 July 2021.
13	Chairman, Online National Science Day (NSD-2021) on "The Science We Live By: An Inclusive Principle," organized by the Department of Physics, Central University of Jharkhand, 28 February 2021.
12	Coordinator, Five-day Online Faculty Development Programme, sponsored by AICTE Training and Learning (ATAL) Academy and organized by the Department of Physics, CUJ, 18–22 January 2021.
11	Chairman, Online Faculty Development Programme on "Quest Abound with Radiation Around: Cross-Disciplinary Endeavours in Radiation Science," organized by the Department of Physics, CUJ, 7–11 December 2020.
10	Chairman, Online FDP on "RECENT DEVELOPMENTS IN MATHEMATICAL SCIENCES (RDMS)" 6th– 10th November 2020 Organized by Department of Mathematics (DoM), Central University of Jharkhand (CUJ), Cheri-Manatu, Kamre, Kanke, Ranchi, Jharkhand-835222
9	Convener, One-Week Workshop on "Internet of Things (IoT)," sponsored by AICTE (ATAL) Academy and organized by the Department of Computer Science & Technology, CUJ, 14–18 September 2020.
8	Co-Patron, International Webinar on "IT Industry and Online Education," organized by the Department of Computer Science & Technology, Central University of Jharkhand, 16 August 2020.
7	Patron, Webinar on "COVID-19: A Challenge and Opportunities for Life Sciences Community," organized by the Department of Life Sciences, Central University of Jharkhand, 5 June 2020.
6	Chairman, Two-day Webinar on "Emerging Technologies for Higher Education Post COVID-19,"

	organized by the Department of Computer Science & Technology, CUJ, 16–17 May 2020.
5	Member, Core Organizing Committee, “East Zone Vice-Chancellors’ Meet 2019–20,” held at the Brambe Campus, Central University of Jharkhand, 19–20 December 2019.
4	Chairman, Five-day Workshop on “Cyber Security,” sponsored by AICTE Training and Learning (ATAL) Academy, Central University of Jharkhand, 16–20 September 2019.
3	Patron and Chairman, International Conference on Nuclear, Particle and Accelerator Physics (ICNPAP-2018), Centre for Applied Physics, Central University of Jharkhand, 23–26 October 2018.
2	Chairman, National Conference on Nuclear and Radiation Physics (NCNAP-2016), University Campus, 4–6 October 2016.
1	Organizing Committee Member, National Conference “Condensed Matter Days-2012,” Department of Applied Physics, Birla Institute of Technology, Mesra, Ranchi, 29–31 August 2012.

Program Organized for School students

1	<i>Coordinator of Physics Learning Camp for School students organized during 24-29, November 2006 at the Birla Institute of Technology, Mesra, Ranchi supported by RVSP, DST, Govt. of India, New Delhi</i>
2	<i>Coordinator of the laboratory visit organized on 26 June 2006 by the Department of Physics, Birla Institute of Technology, Mesra for Plus II School and Polytechnic students. The visit was organized to develop the scientific temper amongst the students and make them aware of the latest scientific/engineering equipment. The students visited various state-of-art laboratories of Birla Institute of Technology, Mesra.</i>

Serial No.	Session Chair
11	Session Chairman , National Seminar on "Clean Environment Envisioned towards Viksit Bharat" (CEEVB-2025), organized by the Department of Environmental Sciences, Central University of Jharkhand, Ranchi, 11–12 March 2025.
10	Session Chairman , Online Lecture & Training Programme on "Faculty Development Programme–QIP," organized by the Internal Quality Assurance Cell (IQAC), Central University of Jharkhand, Ranchi, 30 January – 13 February 2022.
9	Chairman (Two Sessions) , 29th National (Virtual) Conference on Condensed Matter Physics (CMDAYS-21), 2021.
8	Session Chairman , National Webinar on "Research Opportunities Over the Horizon in Physical Sciences," organized by the Department of Physics, Central University of Jharkhand in collaboration with the Indian Association of Physics Teachers (IAPT), RC-20, 2 October 2021.

7	Chairman , Online Lecture Series on "Advances in Physical Sciences," organized by the Department of Physics, Central University of Jharkhand, 9–13 August 2021 (Session chaired on 12 August 2021).
6	Session Chairperson , International Conference on "Vision 2022 – The Way Forward Towards Sustainable Development," Kamre Campus, Rai University, Ranchi, 1–2 June 2019.
5	Session Chairperson , International Conference on "Emerging Technologies, Systems and Applications" (ICETSA-2018), Kamre Campus, Rai University, Ranchi, 21–22 April 2018.
4	Resource Person , Seminar on "Make in India – A Way Forward," organized by Jharkhand Rai University in association with the Department of Industry, Government of Jharkhand, Kamre Campus, Rai University, Ranchi, 18 March 2017.
3	Session Chairman , National Seminar on "Recent Trends in Condensed Matter Physics including Laser Applications" (NSCMPLA-2017), organized by the Department of Physics, The University of Burdwan, West Bengal, 8–9 March 2017.
2	Technical Session Chair , National Seminar on "Recent Science and Technological Advancements" (NSCST-2016), organized by the Department of Applied Physics, Cambridge Institute of Technology, Tatisilwai, Ranchi, 19 February 2016.
1	Session Chairman (Sessions II & III) , International Conference on "Recent Trends in Science & Technology" (ICRTST-2013), organized by the Departments of Basic Science & Humanities, CSE, and IT, College of Engineering & Management, Kolaghat, West Bengal, 27–29 December 2013.

Ph.D. thesis supervision

	Topic	Name of the student/ Registration number	Name of guide/co-guide	Status
1	Study of Induced Nonlinear Optical Fiber Waveguides and Devices (Ph.D. Thesis)	Mr. Ram Krishna Sarkar (PHD/13/2004)	Sarang Medhekar	Awarded 14 Oct.2009
2	Investigation of Light Beam Propagation in Nonlinear Media for All-optical devices (Ph.D. Thesis)	Mr. Punya Prasanna Paltani (PHD/39/2005)	Sarang Medhekar	Awarded 15 Feb. 2011
3	Modeling and Analysis of Nonlinear Waveguide Devices for All-Optical Logic Gates(Ph.D. Thesis)	Mrs. Arpita Srivastava (PHD/13/2008)	Sarang Medhekar	Awarded 26 Nov. 2014
4	Investigation of Optical Beam Propagation in Nonlinear Media: Spatial Soliton Formation and Their Interaction for All-Optical Devices(Ph.D. Thesis)	Mrs. Shraddha Prasad (PHD/52/2009)	Ram Krishna Sarkar/ Sarang Medhekar	Awarded 12 Jan. 2017

5	Investigation of Light Propagation through Photonic Crystals (PCs) for All Optical Devices.	Mr. Man Mohan Gupta CUJ/P/2013/PHDA P/001	Sarang Medhekar	Awarded 07 June 2017
6	Investigation of photonic crystal based optical devices and components for all optical switching	Mr. Alok Kumar CUJ/P/2015/PHDA P/001	Sarang Medhekar	Awarded July 2020
7	Design and Simulation of All-Dielectric Two Dimensional (2D) Photonic Crystal Devices and Sensors	Ms Puja Sharma (19160201005)	Sarang Medhekar	Awarded 6 Feb.2025
8	Design and Analysis of Photonic Crystal-based Logic and Sensing Device	Mr. Nilaksha Ghosh (19160201003)	Sarang Medhekar	Submitted on 3 Sept. 2025

Other information:

International Exposure

	Post/ Assignment	Organisation / University	Area of Assignment	From	to
1	Visiting Research Professor for research work to demonstrate the proof of concept feasibility of All Optical Passive Transistor proposed by me and my Ph D student Mr Ramkrishna Sarkar.	University of Hartford CT USA	Research in Photonics	25-12-2007	16-01-2008
2	Visiting Research Professor for research work to demonstrate the proof of concept feasibility of All Optical Passive Transistor proposed by me and my Ph D student Mr Ramkrishna Sarkar.	University of Hartford CT USA	Research in Photonics	07-07-2008	12-08-2008
3	Visited China on invitation from the consulate general of the people republic of China Kolkata I was a member of the high level delegation from Central University of Jharkhand	Universities in China	to explore possibility of MOUs	12-06-2016	20-06-2016
4	Participated in 3 week Leadership for Academicians Program of Ministry of Human resource and Development Govt of India organized by Indian Institute of Technology Banaras Hindu University in collaboration with Penn State University USA. The program was conducted from 25 February 2019 to 9 March 2019 at IIT BHU India and from 11 March 2019 to 15 March 2019 at Penn State University USA	Penn State University USA	Leadership Training	11-03-2019	15-03-2019

Visiting Faculty

Served as a Visiting Faculty member at the Indian Institute of Management (IIM) Ranchi. Responsibilities included teaching the course titled "Introduction to Physical and Biological Sciences" to the students of the 2024-29 batch during their Term II.

Memberships and Honors

- **Vice-President, Indian Association of Physics Teachers (IAPT):** Served as Vice-President for the Regional Council (RC-20) of the IAPT for a full term, from January 1, 2016, to December 31, 2018.
- **Lifetime Member, Indian Association of Physics Teachers (IAPT):** Retained Lifetime Membership (Membership No. L 6465 / 10196) since 2013.

Professional and Academic Highlights

A. Research and Innovation

- 1 **Pioneering All-Optical Transistor Concept:** Proposed a novel all-optically driven transistor concept during a UGC-funded project. This proposal was published in the highly regarded journal, **Optics Letters** (published by the Optical Society of America). The novelty of this work was recognized and featured in a report titled "Theorists propose an all-optical Transistor" in **PHOTONICS SPECTRA** (Laurin Publication, USA, May 2005, pp. 106).
- 2 **International Collaborative Research:** Received two separate invitations for collaborative research from the **University of Hartford, CT, USA**, to demonstrate the proof-of-concept (POC) feasibility of the All-Optical Passive Transistor I proposed.
 - **Visit 1:** December 25, 2007, to January 16, 2008
 - **Visit 2:** July 7, 2008, to August 12, 2008

B. Awards and Leadership Development

- 1 **Young Scientist Award:** Honoured with the **Young Scientist Award** by the M. P. Council of Science and Technology, M. P State Government.
- 2 **MHRD Leadership Program (LEAP):** Selected and successfully attended the prestigious **Leadership for Academicians Program (LEAP)**, sponsored by the Ministry of Human Resource Development (MHRD), Govt. of India.
 - **Mission:** LEAP's mission is to develop India's Higher Education leaders to advance the sector's goals in access, equity, and quality.
 - **Phase 1 (Domestic):** 25th February 2019 – 9th March 2019 at **IIT (BHU), India**.
 - **Phase 2 (International):** 11th March 2019 – 15th March 2019 at **Penn State, USA**.

Updated as on

24 May 2026