

➤ **List of Publications & Research Projects**

S.No.	
Year 2018	
1.	Umang Sharma and Suresh C. Sharma, "A parametric study to unravel the alignment mechanism of carbon nanotubes during its plasma-assisted growth", Phys. of Plasmas, 25 (2018) 103509.
2.	Ruchi Sharma and Suresh C. Sharma, "Theoretical model for the effect of dust grains on self-filamentation of Gaussian electromagnetic beam in ionized plasma", Contributions to Plasma Physics, Vol 59 (2), (2018), 1-15.
3.	Pratibha Malik, Suresh C. Sharma and Rinku Sharma, "Coherent terahertz radiation from beam driven upper hybrid wave in magnetostatic plasma", J. of Electromagnetic Waves and Applications, Vol 32 (17), (2018), 2195-2209.
4.	Neha Gupta and Suresh C. Sharma, "Investigations on the plasma enabled growth of vertical graphene sheets on CNT surface", Phys. of Plasmas, Vol 25 (7), (2018), 073509.
5.	Monika Yadav, Suresh C. Sharma, and D N Gupta, "Electron acceleration by a relativistic electron plasma wave in inverse-free-electron laser mechanism", IEEE Trans on Plasma Sci., Vol 46 (7), (2018), 2521.
6.	Jyotsna Panwar and Suresh C. Sharma, "Terahertz radiation emission using plasma filled dielectric liner with the effects of pre-modulated relativistic electron beam", Contributions to Plasma Physics, Vol 58 (9), (2018), 1-8.
7.	Ravi Gupta, Neha Gupta and Suresh C. Sharma, "Modeling to study the role of catalyst in the formation of graphitic shells during carbon nanofiber growth subjected to reactive plasma", Phys. of Plasmas, Vol 25 (4), (2018), 043504.
8.	Ravi Gupta and Suresh C. Sharma, "Modeling the effects of nitrogen doping on the carbon nanofiber growth via catalytic PECVD process", Contributions to Plasma Physics, Vol 59 (1), (2018), 1-14.
9.	Ajay Gahlot and Suresh C. Sharma, "Resonant decay of a Langmuir wave in presence of dust grains in cylindrical plasma", Contributions to Plasma Physics, Vol 58 (4), (2018), 1-9.
10.	Kavita Rani Segwal and Suresh C. Sharma, "Current Driven Low Frequency Electrostatic Waves in a Collisional Strongly Coupled Magnetized Dusty Plasma", IEEE Trans on Plasma Sci., Vol 46 (4), (2018), 797-805.

11.	Kavita Rani Segwal and Suresh C. Sharma, "Theoretical Modelling of an Ion Beam Driven Kelvin Helmholtz Instability in a Plasma Cylinder Having Negatively Charged Dust Grains", IEEE Trans on Plasma Sci., Vol. 46 (4), (2018), 775-781.
12.	Nisha Deopa, A.S.Rao, Mohini Gupta and G. Vijaya Prakash, "Spectroscopic investigations of Nd ³⁺ doped lithium lead alumino borate glasses for 1.06µm laser applications", Optical Materials, Vol 75, (2018), 127-134.
13.	Nisha Deopa and A.S.Rao, "Spectroscopic studies of single near ultra violet pumped Tb ³⁺ doped lithium lead alumino borate glasses for green laser and tricolor w-LED applications", Journal of Luminescence, Vol 194, (2018), 56-63.
14.	Nisha Deopa, A.S.Rao, Ankur Choudhary, Shubham Saini, Abhishek Navhal, M.Jayasimhadri, D.Haranath and G.Vijaya Prakash, "Photoluminescence Investigations on Sm ³⁺ ions doped borate glasses for tricolor w-LEDs and Lasers", Materials Research Bulletin, Vol 100, (2018), 206-212.
15.	Ch.B. Annapurna Devi, Sk. Mahamuda, K. Swapna, M. Venkateswarlu, A.S.Rao and G. Vijaya Prakash, "Pr ³⁺ ions doped single alkali and mixed alkali fluoro tungsten tellurite glasses for visible red luminescent devices", Journal of Non-Crystalline Solids, Vol 498, (2018), 345-351.
16.	Ritu Sharma, A.S.Rao, Nisha Deopa, M.Venkateswarlu, M.Jayasimhadri, D.Haranath and G.Vijaya Prakash, "Spectroscopic study of Pr ³⁺ ions doped Zinc Lead Tungsten Tellurite Glasses for Visible Photonic device Applications", Optical Materials, Vol 78, (2018), 457-464.
17.	Rupesh A. Talewar, Sk.Mahamuda, K.Swapna, M.Venkateswarlu and A.S.Rao, "Spectroscopic Studies of Sm ³⁺ ions doped Alkaline-Earth Chloro Borate Glasses for Visible Photonic Applications", Materials Research Bulletin, Vol 105, (2018), 45-54.
18.	Mukesh K. Sahu, M. Jayasimhadri, Kaushal Jha, B. Sivaiah, A.S. Rao, D. Haranath, "Synthesis and enhancement of photoluminescent properties in spherical shaped Sm ³⁺ /Eu ³⁺ co-doped NaCaPO ₄ phosphor particles for w-LEDs", Journal of Luminescence, Vol 202, (2018), 475-483.
19.	K. Siva Rama Krishna Reddy, K.Swapna, Sk.Mahamuda, M.Venkateswarlu, M.V.V.K.S.Prasad, A. S. Rao and G. Vijaya Prakash, "Structural, Optical Absorption and Photoluminescence Spectral Studies of Sm ³⁺ ions in Alkaline-Earth Boro Tellurite Glasses", Optical Materials, Vol 73, (2018), 21-32.
20.	Sumandeep Kaur, Amit K. Vishwakarma, Nisha Deopa, Aman Prasad, M. Jayasimhadri, A.S. Rao, "Spectroscopic studies of Dy ³⁺ doped borate glasses for cool white light generation", Materials Research Bulletin, Vol 104, (2018), 77-82.
21.	Sumandeep Kaur, A.S. Rao, M. Jayasimhadri, "Enhanced red down-conversion luminescence and high color purity from flux assisted Eu ³⁺ doped calcium aluminozincate phosphor", Journal of Luminescence, Vol 202, (2018), 461-468.

22.	N. Singh, S. Kaur, M. Jayasimhadri, M.S. Pathak, S. Watanabe, T.K. Gundu Rao, Jung-Kul Lee, Vijay Singh, "UV emitting Pb ²⁺ doped SrZrO ₃ phosphors prepared by sol-gel procedure", <i>Ceramics International</i> , Vol 44, (2018), 17074-17078.
23.	Kaushal Jha, M. Jayasimhadri, "Effective sensitization of Eu ³⁺ and energy transfer in Sm ³⁺ /Eu ³⁺ co-doped ZPBT glasses for CuPC based solar cell and w-LED applications", <i>Journal of Luminescence</i> , Vol 194, (2018), 102-107.
24.	Nisha Deopa, Sumandeep Kaur, Aman Prasad, B.Joshi and A.S.Rao, "Spectral studies of Eu ³⁺ doped Lithium Lead Alumino Borate Glasses for visible photonic applications", <i>Optics & Laser Technology</i> 108 (2018) 434-440
25.	K.S.R.K.Reddy, K.Swapna, Sk.Mahamuda, M.Venkateswarlu and A.S.Rao, "Investigation on structural and luminescence features of Dy ³⁺ ions doped alkaline-earth boro tellurite glasses for optoelectronic devices", <i>Optical Materials</i> 85(2018)200-210.
26.	Aman Prasad, A.S.Rao, M.Gupta and G.V.Prakash, "Morphological and Luminescence studies on KGdF ₄ :Yb ³⁺ Tb ³⁺ Up-Coverision Nanophosphors", <i>Materials Chemistry and Physics</i> 219 (2018) 13-21.
27.	Sarvottam K. Jha, Reetu Kumari, Shubham Choudhary, Pushpendu Guha, P V Satyam, Brajesh S. Yadav, Zainab Naqvi, S. S. Kushvaha, R. K. Ratnesh, M. S. Mehta, Aditya Jain, Amrish K. Panwar, Fouran Singh, Pawan K. Tyagi, "Facile synthesis of semiconducting ultrathin layer of molybdenum disulfide", <i>J. Nanosci. Nanotechnol.</i> , Vol 18, (2018), 614–622.
28.	M.S. Mehata, "Spectral and time-resolved properties of photoinduced hydroxyquinolines doped thin polymer films", <i>Optical Materials</i> , Vol 75, (2018), 751-756.
29.	Kaushal Jha, M. Jayasimhadri, "Effective sensitization of Eu ³⁺ and energy transfer in Sm ³⁺ /Eu ³⁺ co-doped ZPBT glasses for CuPC based solar cell and w-LED applications", <i>Journal of Luminescence</i> , Vol 194, (2018), 102-107.
30.	Reena Reena, Yogita Kalra, Ajeet Kumar, "Ellipsoidal all-dielectric Fano resonant core-shell metamaterials," <i>Superlattices and Microstructures</i> , Vol 118, (2018), 205-212.
31.	N Shankhwar, Y Kalra, RK Sinha , "All dielectric zero-index metamaterial for TE/TM polarization", <i>Journal of Optics</i> , Vol 20 (11), (2018), 1-6.
32.	Utkarsh Nigam, Ajeet Kumar and Than Singh Saini, "Numerical Modeling of a Single Mode Optical Fiber in Bismuth Oxide for Slow-Light Generation Based on Stimulated Brillouin Scattering", <i>Optikv</i> , Vol 157, (2018), 1207-1213.
33.	Priti Siwach, Ajeet Kumar and Than Singh Saini, "Broadband supercontinuum generation spanning 1.5–13 μm in Ge _{11.5} As ₂₄ Se _{64.5} based chalcogenide glass step index optical fiber", <i>Optik</i> , Vol 156, (2018), 564-570.

34.	Mukhtiyar Singh, H.S. Saini, and M.K. Kashyap, "Corroborating the Spin Gapless of Ti ₂ MnAl Inverse Heusler alloy: A Study of Strain Effect", <i>Material Today: Proceeding</i> , Vol 5 (7), (2018), 15421-15425.
35.	Gagandeep, Mukhtiyar Singh, Ramesh Kumar and Fakir Chand "A Theoretical Study of Perovskite Material for Solar Cell Application" <i>AIP Conf. Proc.</i> , Vol 2006 (1), (2014), 030018.
36.	Aditya Jain, Amrishi K. Panwar, A.K. Jha, "Significant enhancement in structural, dielectric, piezoelectric and ferromagnetic properties of Ba _{0.9} Sr _{0.1} Zr _{0.1} Ti _{0.9} O ₃ -CoFe ₂ O ₄ multiferroic composites", <i>Materials Research Bulletin</i> , Vol 100, (2018), 367-376.
37.	M Sharma, S Sundriyal, A Panwar, A Gaur, "Enhanced, Supercapacitive performance of Ni _{0.5} Mg _{0.5} Co ₂ O ₄ flowers and rods as an electrode material for high energy density supercapacitors: Rod morphology holds the key", <i>Journal of Alloys and Compounds</i> , Vol 766, (2018), 859-867.
38.	Rakesh Saroha, A K Panwar, Anurag Gaur, P. K. Tyagi, "Electrochemical studies of novel olivine-layered (LiFePO ₄ -Li ₂ MnO ₃) dual composite as an alternative cathode material for lithium-ion batteries", <i>Journal of solid state electrochemistry.</i> , Vol 22 (8), (2018), 2507-2513.
39.	Jain Aditya, Panwar A. K., Jha AK, "Significant improvement in morphological, dielectric, ferroelectric and piezoelectric characteristics of Ba _{0.9} Sr _{0.1} Ti _{0.9} Zr _{0.1} O ₃ -BaNb ₂ O ₆ nanocomposites", <i>Journal of Materials Science-Materials in Electronics</i> , Vol 29(22), (2018), 19086-19098.
40.	M Chandra, R Shukla, R Saroha, AK Panwar, A Gupta, S Basu, RS Dhaka, "Physical properties and electrochemical performance of Zn-substituted Na _{0.44} Mn _{1-x} Zn _x O ₂ nanostructures as cathode in Na-ion batteries", <i>Ceramics International</i> , Vol 44 (17), (2018), 21127-21131.
41.	N. Pandey, M.S. Mehata, N. Fatma, S. Pant, "Efficient fluorescence quenching of 5-aminoquinoline: Silver ion recognition study", <i>Journal of Luminescence</i> , Vol 205, (2018) 475-481.
42.	R.K. Ratnesh, M.S. Mehata, "Tunable single and double emission semiconductor nanocrystal quantum dots: A multianalyte sensor", <i>Methods and Applications in Fluorescence</i> , Vol 6 (3), (2018), 035006.
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46.	B Bajaj, KB Yi, HI Joh, SM Jo, S Lee, "Enhanced reactive H ₂ S adsorption using carbon nanofiber supported with Cu/Cu _x O nanoparticles", Applied Surface Science, Vol 429, (2018), 253-257.
47.	Rishabh Sharma, Nisha Kodan, Vinod Singh, Shailesh Narayan Sharma, Om Prakash Sinha, "Enhanced photoelectrochemical performance of TiO ₂ photoanode decorated with Pd-carbon core shell nanoparticles", Renewable Energy, Vol 134, (2018), 1232-1239.
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55.	Rahul Pandey and Rishu Chaujar, "Rear Contact Silicon Solar Cells with a-SiCX:H Based Front Surface Passivation for Near-Ultraviolet Radiation Stability", Superlattices and Microstructures, Vol 122, (2018), 111-123.

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60.	Skanda Shekhar, Jaya Madan and Rishu Chaujar, "Source/Gate Material Engineered Double Gate TFET for Improved RF and Linearity Performance: A Numerical Simulation", Applied Physics-A, Springer, (2018), 1-10.
61.	V.M.Krishna, Sk.Mahamuda, R.A.Talewar, K.Swapna, M.Venkateswarlu and A.S.Rao "Dy ³⁺ ions doped oxy-fluoro boro tellurite glasses for the prospective optoelectronic device applications", Journal of Alloys and compounds 762(2018)814-826.
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64.	R.Sharma and A.S.Rao, "Photoluminescence studies of Sm ³⁺ doped zinc lead tungsten tellurite glasses for reddish-orange photonic device applications", Optical Materials 84(2018)375-382
65.	S.Kaur, Nisha Deopa, A.Prasad, R.Bajaj and A.S. Rao, "Intense green emission from Tb ³⁺ ions doped zinc lead alumina borate glasses for laser and w-LED applications", Optical Materials 84 (2018)318-323
66.	Ritu Sharma and A.S.Rao, "Photoluminescence Investigations on Dy ³⁺ ions doped zinc lead tungsten tellurite glasses for optoelectronic devices", Journal of Non-Crystalline Solids 495(2018)85-94
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	semiconductor quantum dot under a magnetic field”, Journal of Atomic, Molecular, Condensate and Nanophysics 5(2018).
68.	Pratibha Malik, Suresh C. Sharma and Rinku Sharma, Coherent terahertz radiation from beam-driven upper hybrid wave in magnetostatic plasma, accepted in Journal of electromagnetic waves and applications.
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69.	Jyotsna Panwar and Suresh C. Sharma, “Modeling the emission of high power terahertz radiation using Langmuir wave as a wiggler”, Phys. of Plasmas, Vol 24, (2017), 083101.
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72.	Pratibha Malik, Suresh C. Sharma and Rinku Sharma, “Generating Tunable THz radiation using rippled density plasma driven by density modulated relativistic electron beam (REB)”, Phys. of Plasmas, Vol 24, (2017), 073101.
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74.	Deepika Sandil, Saurabh Kumar, Kamal Arora, Saurabh Srivastava, B. D. Malhotra, S. C. Sharma, Nitin K. Puri, “Biofunctionalized Nanostructured Tungsten Trioxide Based Sensor for Cardiac Biomarker Detection”, Material Letters, Vol 186, (2017), 202–205.
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Project Details:**➤ Total Research Projects carried out during the period (2013-2018):**

Principal Investigator (PI)	Co-PI	Sponsorig Agency	Title of the Project	Total Amount	Period	Status
Prof. Suresh C. Sharma	NA	DST, Govt of India	Role of plasma in the growth and field emission properties of graphene	18,17,520	3years	Completed
Prof. Suresh C. Sharma	Prof. Rinku Sharma	SERB-DST, Govt of India	Analytical and Numerical Simulation of Growth and Field Emission Properties of CNT-Graphene Composites	23, 93,794	3years (2018 to 2021)	Ongoing
Dr. Rishu Chaujar	NA	DST, Govt. of India	Characterization , Simulation and Equivalent Circuit Analysis of Silicon Nanowire Transistors For High Performance Applications in Wireless and RF Technology	18.6 Lacs	3years (2013 to 2016)	Completed
Dr. Mohan Singh Mehata	Prof. R.K. Sinha	Board of research in Nuclear Science (BRNS), Department of	External Electric field effect on the photoinduced charge transfer dynamics	#####	2012-2016	Completed

		Atomic Energy (DAE)				
Dr. Mohan Singh Mehata	NA	Science and Engineering Research Board (SERB), Department of Science and Technology (DST)	Photoinduced Charge Transfer Dynamics of Quantum Dots/Molecules under the Influence of External perturbation.	#####	2017-2020	Ongoing
Dr. M. Jayasimhadri	NA	DAE-BRNS, Govt. of India, BARC, Mumbai	Development of Efficient and Environmental Friendly Phosphors and Nanophosphors for White Light Emitting Diodes	12,04,000	3years (12/05/2011 to 11/05/2014)	Completed
Dr. M. Jayasimhadri	NA	SERB-DST, Govt. of India, New Delhi	Development of Versatile Alkaline Earth Phosphate Micro and Nanophosphors for Energy Saving near UV-based White LEDs	26,36,800	3years (28/08/2015 to 27/08/2018)	Ongoing under scheme for Young Scientist in Physical Sciences

Dr. Amrish K. Panwar	NA	SERB, DST Delhi	Development of Alternative Cathode Materials for High Energy Density Lithium Ion Batteries	25,00,000	3years (24.12.2012 to 23.12.2015)* + June, 2016	Completed
Dr. Ajeet Kumar	NA	DST	Large-Mode-Area Rectangular Waveguides and Fibers for High Power Applications	25.3Lakhs	3years (2013 to 2016)	Completed
Dr. Bharti Singh	NA	DST-INSPIRE	Electrical Energy Harvesting using Monolayer MoS ₂ and MoS ₂ -Graphene Heterostructures for Self Powering Electronic and Bioelectronics Devices	35 Lakhs	2017-2022	Ongoing
Dr. Bharti Singh	NA	UGC Startup Grant	Tapping solar, wind and human energy; a hybrid photovoltaic/piezoelectric device based on 2D materials and their van der	10 Lakhs	2018-2020	Ongoing

			Waals heterostructures			
Dr Mukhtiyar Singh	NA	UGC	Investigation of Heusler Alloys for Thermoelectric Applications	10,00,000	2years (2018 to 2020)	Ongoing
Dr. Pawan Kumar Tyagi	NA	SERB, DST	Synthesis of Structural Defects Free Single Layer Graphene for Applications in Nanoelectronic Devices	27.1Lakhs	2013-2016	Completed
Dr. Pawan Kumar Tyagi	NA	UGC-IUAC, Delhi	Ion irradiation on filled-multiwalled carbon nanotubes to create N-V center	7.5 Lakhs	2017-2020	Ongoing
Dr. Pawan Kumar Tyagi	NA	IUAC-DAE, Indore	Study of the chemical structure and bonding in CuO nanowire by using EXAFS Synchrotron radiation	7.5 Lakhs	2017-2020	Ongoing
Dr. Nitin K. Puri		DAE-BRNS, Govt. of India	Investigation of the origin of circular Rydberg states (CRS) in beam foil excitation	24,51,750	3years (2014 to 2017)	Completed

Dr. Nitin K. Puri		Inter University Accelerator Centre (IUAC), UGC	Photovoltaic and Multiferroic properties of multilayered BFO/BTO thin films using Swift Heavy Ion irradiation	6,03,000	3years (2014 to till date)	Ongoing
Dr. Nitin K. Puri		Inter University Accelerator Centre (IUAC), UGC	Elastic Recoil Detection Analysis of Pt/Ti capped Na/Al and Li/Al thin films using ¹⁰⁷ Ag and ⁵⁸ Ni swift heavy ion beam.	Non-Sponsored	3years (2017 to till date)	Ongoing
Dr. Nitin K. Puri	Dr. Saurabh Srivastava, Prof. B. D. Malhotra	SERB-DST, Govt. of India	Ultrathin 2D-Nanomaterials for Cancer Diagnostic Application	49,68,480	3years (2017 to till date)	Ongoing
Dr. Yogita Kalra	-	DRDO	Modelling and Simulation of Single Mode High Power Fiber Lasers	10 lacs	2015-2017	Completed

➤ **Inter-Institutional Collaborative projects:**

• **International Collaboration:**

Principal Investigator (PI)	Co-PI	Name of the Sponsoring Agency	Title of the Project	Total Amount	Period	Status

Dr. Ajeet Kumar	Prof. R. K. Sinha	Bilateral Project DST, India & Ministry of Higher Education and Scientific Research of the Republic of Tunisia	Design, modeling and characterization of highly nonlinear fibers for all-optical high bit-rate networks	13.5 Lakhs	3 years (2013 to 2016)	Completed
Dr. Mohan Singh Mehata	-	Bilateral Project DST-RFBR (Indo-Russian Joint Research Project)	Ultrafast dynamics of excitons and charge carriers in the white-light-emitting quantum dots produced at low temperature.	###	2017-2019	Ongoing
Dr. Pawan Kumar Tyagi	Prof. R.K. Sinha	Bilateral Project Indo-Portuguese project	Graphene-Based Flexible, Transparent Electrodes For Organic Light Emitting diodes and Photovoltaics	5.30 Lakhs	2013-2016	Completed
Prof. R.K.Sinha	Dr. Yogita Kalra	Bilateral Project DST-RMES (Indo-Russian Joint Research Project)	All dielectric plasmonic hybrid nanostructures	65.04 lacs	2015-2018	Ongoing

Prof. R.K.Sinha	Dr. Yogita Kalra	Bilateral Project DST-RFBR (Indo-Russian Joint Research Project DST)	From Plasmonic to dielectric and hybrid nanoantennas	22.56 lacs	2015 to 2018	Ongoing
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• **National Collaboration:**

Principal Investigator	Co-Principal Investigator details	Name of the Sponsoring Agency	Title of the Project	Total Amount	Period	Status
Prof. A.S. Rao	Prof. G.Vijaya Prakash (IIT-Delhi)	DST-SERB	Studies on Novel Visible Up-Conversion Luminescent Rare Earth doped Nanophosphors for Bio-Photonic Applications	38 Lakhs	3 years (2017 to 2020)	Ongoing
Dr. Sk. Mahamuda (K L University, Vijayawada, A.P)	Prof. A.S. Rao	DST-ECRA	Preparation and Characterization of Rare Earth ions doped Oxide, Fluoride and Oxy-Fluoride Glasses/Glassy Ceramics for Fiber Lasers and Optical Fiber Amplifiers	52 Lakhs	3 years (2016 to 2019)	Ongoing

➤ **Departmental Projects Funded by DST-FIST, UGC-SAP etc.,:**

Project Details	Total Amount	Period	Status
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Name of the Sponsoring Agency				
DST-FIST	To strengthen research facilities and post-graduate teaching in the Department	1,53,00,000.00	2012-2017	Completed
TIFAC	TIFAC-Center of Relevance and Excellence in Fiber Optics and Optical Communication, Mission REACH Program, Technology Vision-2020, Govt. of India	255 Lakhs	2004	Ongoing

➤ **Details of Patents**

Name of the Patenter	Patent Number	Title of the patent	Year of Award of patent
Dr. Vinod Singh	301873	A process for synthesis of metal core-carbon shell nanoparticles	2015
Dr. Bharat Bajaj	1468380	The preparing method of conductive long fiber coated with silver nanoparticles thereby	2014
Dr. Bharat Bajaj	1420084	The preparing method of conducting long fiber and conductive long fiber thereby	2014
Dr. Bharat Bajaj	1328525	Apparatus for increasing strength of nano carbon fiber by mechano-electrospinning and method there of	2013
Dr. Bharat Bajaj	1295372	Nano and semi-nano sized fiber, and preparation method for thereof	2013

Dr. Bharat Bajaj	1335521	Preparation method of Cu coated conductive long fiber, and conductive long fiber thereby	2013
Dr. Bharat Bajaj	1326295	The fiber comprising plural strands having squeezed coiled structure and the manufacturing method thereof	2013

➤ **Areas of Consultancy and income generated**

Name of the consultant	Name of consultancy project	Consulting/sponsoring agency with contact details	Year	Revenue generated (INR in Lakhs)
Dr. Bharat Bajaj	Development of PU automotive finish paints	HAM Paint Industries	2016	2,50,000/-

➤ **Books/Book Chapters Published**

- Contributed a Chapter titled “*Effect of Nanoscale Structure on Reliability of Nano Devices and Sensors*” in a Book titled “*Outlook and Challenges of Nano Devices, Sensors and MEMS*” by Jaya Madan and **Rishu Chaujar**, Editors: Ting Li and Ziv Liu published by Springer, (2017).
- **Dr. Vinod Singh** (single Author)- A book titled as “Applied Physics Practical-II” is published by Mewar University Press ISBN-978-81-930772-0-7.
- **Dr. Ajeet Kumar** was the Co-editor of Proceedings of 10th National Conference on Solid State Chemistry and Allied Areas (ISBN: 938575830-6)
- Contributed a Chapter titled “*Emerging Solar PV Technologies: A Paradigm shift*” by **Sarita Baghel** and Nandini Sharma, published by Nova Science Publishers, USA, 2016.

➤ **Details of Students Awarded Ph.D. Degree**

Guidance by Prof Rinku Sharma

1. **Pratibha Malik**, Role of beam pre-bunching on terahertz (THz) radiation emissions, jointly with Prof. Suresh C. Sharma (25.09.2018).
2. **Jyotsna Panwar**, Theoretical modeling of terahertz (THz) radiation emissions from Free electrons lasers (FELs), jointly with Prof. Suresh C. Sharma (26.02.2019).

Guidance by Prof Suresh C. Sharma

1. **Jyotsna Sharma**, Studies of weak turbulence in dusty plasma Environment, Jointly with Prof. V. K. Jain (24.12.2014).
2. **Ved Prakash**, Effect of dust charge fluctuations on excitation of electrostatic and electromagnetic waves in plasma, Jointly with Prof. Vijayshri (10.12.2015).

3. **Aarti Tewari**, Study on the effect of plasma parameters and catalyst on the growth and field emission properties of Carbon Nanotubes (CNTs) (23.01.2017).
4. **Neha Gupta**, Role of Plasma in the Growth and Field emission properties of 2D graphene Nanomaterial (04.09.2018).
5. **Pratibha Malik**, Role of beam pre-bunching on terahertz (THz) radiation emissions, jointly with Prof. Rinku Sharma (25.09.2018).
6. **Ravi Gupta**, Theoretical investigations of role of plasma on the growth and field emission properties of Carbon Nanofibers (CNF) (04.12.2018).
7. **Kavita Sharma**, Theoretical Investigations of waves and instabilities in dusty and strongly coupled dusty plasma (13.02.2019).
8. **Jyotsna Panwar**, Theoretical modeling of terahertz (THz) radiation emissions from Free electrons lasers (FELs), jointly with Prof. Rinku Sharma (26.02.2019).

Guidance by Prof. A. S. Rao

1. **Sk. Mahamuda**, Spectroscopic Studies and Lasing Potentialities of Nd³⁺, Pr³⁺, Ho³⁺ Ions doped Zinc Alumino Bismuth Borate and Dy³⁺, Sm³⁺ ions doped Oxy-fluoroborate Glasses (2015).
2. **K. Swapna**, Absorption and Emission Characteristics of Dy³⁺, Sm³⁺, Eu³⁺, Tb³⁺ Er³⁺ ions doped Zinc Alumino Bismuth Borate Glasses (2015).
3. **M. Venkateswarlu**, Luminescent Characterization of certain Rare Earth ions (Pr³⁺, Nd³⁺, Ho³⁺ and Tm³⁺) doped Lead Tungsten Tellurite Glasses (2016).
4. **Ch. B Annapurna Devi**, Photoluminescence Properties of Dy³⁺, Eu³⁺, Pr³⁺ and Sm³⁺ ions doped Single and Mixed Alkali Fluoro Tungsten Tellurite Glasses (2018).
5. **Nisha Deopa**, Spectroscopic Studies of certain Rare Earth ions doped Lithium Lead Alumino Borate Glasses for Photonic Applications (2018).

Guidance by Dr. Rishu Chaujar

1. **Neha Gupta**, TCAD Analysis and Simulation of Gate Electrode Workfunction Engineered (GEWE) Silicon Nanowire MOSFET for high performance Analog and RF Applications (02.06.2017).
2. **Jaya Madan**, Simulation and Analysis of Gate All Around Tunnel FET for High Performance Analog and RF Applications (09.03.2018).
3. **Rahul Pandey**, Design and Simulation of SiC based Rear Contact Si and SiGe Solar Cell for Standalone and Tandem Applications (28.03.2018).
4. **Saood Ahmad**, Microwave Based Ferromagnetic Resonance in Magnetic Thin Films induced by Spin Hall Effect, jointly with Dr.Nitin K. Puri and Dr. R.K.Kotnala (13.08.2018).
5. **Manju Singh**, Study of Superconducting Nanowire towards its application as a Single Photon Detector, jointly with Dr. Rajib Rakshit (05.12.2018).

Guidance by Dr. Nitin K. Puri

1. **Savita Sharma**, Multicomponent based composite materials for multifunctional applications, Jointly with Prof. Vinay Gupta (18.10.2016).

2. **Vikash Sharma**, Biomolecular interfacial studies on carbon nanocomposite materials for biosensing applications, Jointly with Dr. Rajesh (15.07.2017).
3. **Saood Ahmad**, Microwave based ferromagnetic resonance in magnetic thin films induced by spin Hall effect, Jointly with Dr Rishu Chaujar and Dr. R.K. Kotnala (13.08.2018).
4. **Gaurav Sharma**, Investigating the origin of circular Rydberg states using beam foil Spectroscopy, Jointly with Dr. Tapan Nandi (23.08.2018).
5. **Reetu Kumari**, Synthesis of filled carbon nanotubes and analysis of irradiation effects on their structural and magnetic properties, Jointly with Dr. Pawan Tyagi (05.12.2018).

Guidance by Dr. Mohan Singh Mehata

1. **Ratneshwar Kumar Ratnesh**, Synthesis and Characterization of (II-VI) CdSe Core/Shell Quantum dots (15.11.2017).

Guidance by Dr. Pawan K. Tyagi

1. **Kamlesh Patel**, Characterization and Applications of CVD -Grown Graphene for Passive Microwave Devices (08.02.2018).
2. **Reetu Kumari**, Synthesis of filled carbon nanotubes and analysis of irradiation effects on their structural and magnetic properties, Jointly with Dr. Nitin K. Puri (05.12.2018).
3. **Vinay Kumar**, “Synthesis of Carbon Nanomaterials and Application in Sensing Devices” (01.12.2018).
4. **Lucky Krishnai**, “Synthesis of Carbon Nanomaterials and Nanostructures from Sugarcane Bagasse” (04.12.2018).

Guidance by Dr. M. Jayasimhadri

1. **B. Sivaiah**, Development of Thermoelectric Materials with Enhanced Figure-of Merit for Waste-Heat Energy Utilization, Jointly with Dr. Ajay Dhar (04.10.2016).
2. **Amit Kumar Vishwakarma**, Synthesis and Photoluminescence Properties of Rare-Earth doped Alkaline Earth Niobate Phosphors for Solid State Lighting Applications (25.01.2017).
3. **Kaushal Jha**, Synthesis and Characterization of Rare Earth doped Zinc Phosphate based Glasses for Optoelectronic Applications (26.09.2018).

Guidance by Dr. Amrish Panwar

1. **Aditya Jain**, Microstructural and Electrical Investigations of BaTiO₃ Based Electroceramics jointly with Prof. A. K. Jha (6.12.2017).
2. **Rakesh Saroha**, Structural, Morphological and electrochemical studies on olivine/layered composite cathode materials for Li-ion batteries (21.12.2017).

Guidance by Dr. Ajeet Kumar

1. **Than Singh**, Application specific specialty optical fiber and waveguides, Jointly with Prof. R. K Sinha (06.06.2016).

Guidance by Dr. Yogita Kalra

1. **Preeti Rani**, Modeling of photonic crystal based logic gates and optical devices, Jointly with Prof. R. K Sinha (2017).

7. Students Extra-Curricular Activities:

➤ **Soceties: DEPTH**

- **Cosmology Club**

DEPTH (DelTech Engineering Physics Technical Hub) is a one of its kind society in DTU which has incredible excellence in Physics.

Research studies these days are gaining an unprecedented focus and attention. A researchable area in any academic discipline is an area that has ample scope to be explored. The very path one traverses in search of authentic solutions to a specific academic problem constitutes of what we call 'research'. This research question posed by the researcher and the methodology that he adopts to get solutions is the most crucial part of the research work.

Advances in technology are often based on discoveries in physics and inventions based on a new interpretation of existing scientific knowledge. Astrophysics, quantum mechanics and investigations into atomic structure and energy have been able to explain much of the way the world works, even down to the original birth of the universe. Also, Physics is not a standalone field. Its tenets actually apply to a wide variety of fields. Specific aspects of physics that many people find daunting include the need to understand different mathematical equations and graphs and then be able to translate those concepts into real life. While there may be easier subjects out there, one of the values of studying physics is that it is intrinsically challenging and therefore also extremely rewarding when a student finally understands it.

Electrical and Electronics engineering is at the forefront of developing new technologies for a number of industries including transport, healthcare, construction, and robotic. The programs in electronics are rigorous with an emphasis in math and science. Students study topics such as wireless, digital, data and fibre optic communications, which prove to be extremely engaging topics for research.

Along with the need to acquire a first-hand knowledge of the subject time, money and patience could also prove to be some constraints for a researcher. The research work itself demands attention to finer details and accuracy. When these things are put to stake in a bid to hurry up there could be massive flaws in the work. A research enthusiast hence must overcome these barriers and get heads on involved in the work.

Pursuing a research project is a challenging and rewarding experience, and this opportunity enables one to pursue an in-depth original study about a topic of interest.

Vision

The Department of Applied Physics aims to act as a centre of excellence for creating an environment of technological innovation and solving problems using scientific approach. To

provide facilities to delve into educational research in various fields of physics such as nanotechnology, nuclear technology, microwave and optical communications, etc.

OBJECTIVES:

1. To teach students basic indispensable concepts of physics which form the foundation of the subject. These concepts include Classical Mechanics, Quantum Mechanics, Special Relativity and Electromagnetics.
2. To help develop an inclination for research among the students.

A research begins with a potential idea or a question. One of the most important of the research problems is the 'validity' of the research question itself. This however can be overcome by attaining a deep insight into the subject which allows one to raise questions, which will be promoted among the students by the society.

3. Formation and presentation of research papers.

Once a project is completed, Student should be able to present it to the professors in the form of research paper and society provides a platform for such works to be accomplished by the involved students.

4. Guiding the students for further higher studies. The society considers it a goal to guide those aspiring to pursue a career in R&D, or secure admissions in higher institutions, by providing them with the pre-requisites, academically or otherwise, in terms of guidance.

WHAT MAKES US DIFFERENT?

The fact that our college has not seen many such societies as ours, which focuses considerably on regular lecture classes given by the society member themselves, with the help of recognized unequalled resources, renders the reason that DEPTH should be associated with DTU. Good knowledge should be always be put to good use. This is the purpose of the society; the society members attempt to combine learning with ideas to help grasp the practical know-how for future study and more importantly, carry out research under concerned professors, not only for their own benefit but also for the fellow students.

If not for research purposes, students who find physics anything but problematical would be greatly benefited.

OUR ACHIEVEMENTS

1. Former Member, Vaibhav Sharma, EP BTech'15

- 1) GSoC 2017 - Proposal selected by Australian Open Source Software Innovations and Education for the Carbon footprint project.
- 2) IIIT Hyderabad Hackathon Winner - Digital Masala Hackathon 2017 sponsored by Facebook. Received a funding of 5000\$ to further develop his project.
- 3) GSoC 2018 Mentor - Served as a mentor at AOSSIE for a carbon footprint project on Crowdalert web.

- 4) Placement - Is successfully placed in Zomato with a CTC of 24 lacs.
- 2. Former Member, Alankrit Tomar EP BTech'15**
- 1) Research Paper Published:
 - “*Design and Analysis of a graded Rectangular-Core Photonic Crystal Fibre for Low-Loss Terahertz Communication*”, Photonic Fiber and Crystal Devices: Advances in Materials and Innovations in Device Applications XII, SPIE Optical Engineering + Applications, San Diego, California, US (Link: <https://doi.org/10.1117/12.2320912>).
 - “*Rectangular-Core Photonic Crystal Fibre for Low-Loss Terahertz Communication*”, International Conference on Advances in Optics and Photonics, Optical Society of India (OSI), Hisar, India.
 - “*Triangular-Core Photonic Crystal Fiber for Terahertz Communication*”, Photonics 2018, Indian Institute of Technology, New Delhi.
 - 2) Was selected to undertake a 12-week fully-funded project at Universite Laval, Quebec, Canada under the MITACS Globalink Research Internship Program.
- 3. Our former member Debadri Das EP DTU'14** got selected for M.S. in Quantum Computing at Stanford University.
- 4. Chirag Arora EP DTU'15**
- 1) Only person to crack GSoC 2016 in first year from DTU
 - 2) GSoC Student Mentor for two years.
 - 3) Represented my GSoC org (AOSSIE) at Mentor summit that took place in Sunnyvale, California
 - 4) Got selected in CERN OpenLab summer student programme in 2018 and henceforth, interned at CERN in Geneva during the summer.
- 5. Rishi Aneja EP DTU'15**
- 1) Selected for Mitacs Globalink research internship at University of Ontario Institute of Technology.
 - 2) Selected for the Harvard project for Asian and international relations 2016 in Hong Kong.
 - 3) Prize Winner: Jaipuria Quiz League 2018 National Finals 2nd position and Jaipuria Quiz League 2019 regional finals 1st position.
- 6. Current team member Aryan Jogia and Pranav Kairon** interned at SSPL (SOLID STATE PHYSICS LAB) a laboratory of the Defence Research & Development Organization (DRDO). Located in Delhi, it is the main DRDO lab involved in the development of Semiconductors and related technologies in India.
- 7. Our current team members namely Ishan Goel, Aditya Prasad, Tariq Naseem and Pranav Kairon** interned at LASTEC (Laser Science and Technology Centre) a laboratory of the Defence Research & Development Organization (DRDO). It is the main DRDO lab involved in the development of Lasers and related technologies. LASTEC functions under the DRDO Directorate of Electronics & Computer Science.