## Indian Institute of Technology Delhi Department of Physics

16-05-2023

## Sub: Available Ph.D. positions in Semester-I of academic year 2023-2024

Dear candidates,

Please note that we can only fill a limited number of Ph.D. positions with Institute fellowship offered by Ministry of Education (for GATE, etc.). The break-up of the no. of available institute fellowships for the PhD admission for Semester-I, academic year 2023-24 is as follows:

GEN	EWS	OBC	SC	ST	Total
9	3	7	4	1	24

## List of available projects for Ph.D. program at the Department of Physics, IIT Delhi

SI. no. of projects	Faculty supervisor	E-mail	Title of project
1	Vikrant Saxena	vsaxena@physics.iitd.ac.in	1. Simulating Laser-Plasma Interactions
2	P K Muduli	muduli@physics.iitd.ac.in	2. Tuning magnetization dynamics by ion beam (expt)
3			3. spin-orbit torque in magnetic multilayers (expt)3.
4			4. Spin-orbit torque switching using quantum materials (expt)
5		amartya@physics.iitd.ac.in	5. Raman Spectroscopy studies of Quantum Materials
6	Amartya Sengupta		6. THz Emission and Spectroscopy of Materials
7			7. Ultrafast Optics/Pump-Probe studies in SC Heterostructures
8	Prof. G. Vijaya Prakash	prakash@physics.iitd.ac.in	8. Photonics of metal-organic frameworks
9	Rahul Marathe	maratherahul@physics.iitd.ac.in	<ul> <li>9. Non-equilibrium statistical mechanics/classical and quantum transport in small scale system/active particles/heat engines</li> <li>10. Statistical Physics of Biological systems with applications to bacterial physical and years</li> </ul>
11			11 Study of SERS based biosensors
12	Prof JP Singh	jpsingh@physics.iitd.ac.in	Study of nanomechanical properties of metal nanosprings
13			Gas sensing properties of 2D materials
14	Dalin Singh Mehta	mehtads@physics.jitd.ac.in	Line-field Optical Coherence Tomography and Confocal Microscopy
15			Surface Enhanced Raman Spectroscopy of Contaminants in Water and Cancer Detection
16	Amita Das	amita@physics.iitd.ac.in	Particle - In Cell simulations for high intensity laser plasma studies
17			plasma system

19         Calificative prime         Saturation (section of the section of the secti	18	Sarthak Barikh	aarthak@abuaiaa iitd aa in	Discrete gauge/gravity duality	
20         Pradipta Ghosh         physpg@physics.iitd.ac.in         BSM phenomenology           21         Raushik Sen         kaushik.sen@physics.iitd.ac.in         Setting up a polarized Rama spectrometer           23         Kaushik Sen         kaushik.sen@physics.iitd.ac.in         Pulsed laser deposition and device fabrication           24         Quasipartice dynamics in multiferoics         Developing Methods for Optical and Electroical Discharge (OPED)           26         Marshal         marshal@physics.iitd.ac.in         Capillary Plasma Electroide Discharge (OPED)           27         Pintu Das         pintu@physics.iitd.ac.in         Capillary Plasma Electroide Discharge (OPED)           28         Pintu Das         pintu@physics.iitd.ac.in         Studies of quantum divertials           30         Rejendra S. Dhaka         rsdhaka@physics.iitd.ac.in         Single crystal growth and investigation of quantum materials           33         Sujeet Chaudhary         sujeet@physics.iitd.ac.in         Fred pace quantum comunication (joint supervision with Vivek Venkataraman)           36         Joyee Ghosh         joyee@physics.iitd.ac.in         Growth and Studies of High Spin Orbit Coupling Magnetoramsport Investigations on Topological Insulator Spin Pumping Applications puttering Magnetoramsport Investigations on Topological Insulator Spin Pumping Applications (joint supervision with Vivek Venkataraman)           36         Joyee Ghosh         joyee	19		sartnak@pnysics.iitu.ac.iii	Higher loop holography and renormalization	
21         Practical Grown         physipggingsics.iitd.ac.in         BSM phenomenology           22         Kaushik Son         kaushik.sen@physics.iitd.ac.in         BSM phenomenology           23         Kaushik Son         kaushik.sen@physics.iitd.ac.in         Setting up a polarized Raman spectrometer           24         Pulsed laser deposition and device fabrication         Quasiparticle dynamics in multiferroics           25         Developing Methods for Optical and Electrical         Characterization of Microplasma Discharges           26         Marshal         marshal@physics.iitd.ac.in         Capillary Plasma Electrode Discharge (OPED)           27         Distribute of the treatment of substrates for Discensor applications         Admic scale inaging and spectroscopy of guantum materials           29         Pintu Das         pintu@physics.iitd.ac.in         Sudies of quantum devices based on 2- dimensional magnetic field growth and investigation of quantum materials           30         Rajendra S. Dhaka         rsdhaka@physics.iitd.ac.in         Free space quantum devices based on 2- dimensional magnetic maging and spectroscopy of guantum materials           33         Sujeet Chaudhary         sujeetc@physics.iitd.ac.in         Growth and Studes of High Spin Orbit Coupling thin films for Spin Pumping Applications by magnetor sputching           34         Joyee Ghosh         joyee@physics.iitd.ac.in         Free space quantum communication (joint super	20	Dradinta Chash	tahuana@ahuaiaa iital aa in	BSM phenomenology	
22         Kaushik Sen         kaushik.sen@physics.iitd.ac.in         Setting up a polarized Raman spectrometer           23         Kaushik Sen         kaushik.sen@physics.iitd.ac.in         Pulsed laser deposition and device fabrication           24         Quasiparticle dynamics in multiferroics         Developing Methods for Optical and Electrical           26         Marshal         marshal@physics.iitd.ac.in         Gapilary Plasma Electroace Discharge (CPED) and Understanding Their Characteristics           27         Developing Methods for Optical and Substrate for Discharge (CPED) and Understanding Their Characteristics           28         Pintu Das         pintu@physics.iitd.ac.in         Capilary Plasma Electroaceopy of quantum materials           30         Rajendra S. Dhaka         rsdhaka@physics.iitd.ac.in         Stuties of quantum devices based on 2-dimensional magnetic materials           31         Rajendra S. Dhaka         rsdhaka@physics.iitd.ac.in         Studies of High Spin Orbit Coupling thin films for Spin Pumping Applications by magnetorin sputtering           33         Sujeet Chaudhary         sujeetc@physics.iitd.ac.in         Free space quantum communication (qioit supervision with Vivek Venkataraman)           36         Joyee Ghosh         Joyee@physics.iitd.ac.in         Free space quantum communication (qioit supervision with Vivek Venkataraman)           38         Bhaskar Kanseri         bkanseri@physics.iitd.ac.in         Studies	21	Pradipta Gnosh	tpnyspg@pnysics.iitd.ac.in	BSM phenomenology	
23     Kaushik Sen     kaushik.sen@physics.iltd.ac.in     Pulsed laser deposition and device fabrication       24     Quasiparticle dynamics in multiferroics     Developing Methods for Optical and Electrical Characterization of Micro-plesma Discharges Methods       26     Marshal     marshal@physics.iltd.ac.in     Capillary Plasma Electrode Discharge (CPED) and Understanding Their Characteristics       27     Quasiparticle dynamics in multiferroics     Developing Methods for Optical and Beckrages Methods       28     Pintu Das     pintu@physics.iltd.ac.in     Capillary Plasma Electrode Discharge (CPED) and Understanding Their Characteristics       29     Pintu Das     pintu@physics.iltd.ac.in     Atomic scale imaging and spectroscopy of quantum materials       30     Rajendra S. Dhaka     rsdhaka@physics.iltd.ac.in     Studies of quantum devices based on 2-dimensional magnetic meterials       31     Rajendra S. Dhaka     rsdhaka@physics.iltd.ac.in     Studies of Spin Quantum materials       33     Sujeet Chaudhary     sujeetc@physics.iltd.ac.in     Studies of Spin Quantum anterials       34     Sujeet Chaudhary     sujeetc@physics.iltd.ac.in     Free space quantum communication (joint spin Orbit Coupling thin films for Spin Pumping Applications by magnetron sputtering       35     Joyses Ghosh     Joyse@physics.iltd.ac.in     Quantum materials       36     Quantum material     Quantum communication (joint spupervision with Vivek Verkataraman)	22			Setting up a polarized Raman spectrometer	
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29       dimensional magnetic materials         30       31       Rajendra S. Dhaka       redhaka@physics.iitd.ac.in       Single crystal growth and investigation of quantum materials         31       Rajendra S. Dhaka       redhaka@physics.iitd.ac.in       Heusler alloys or Sodium-ion battery         32       Sodium-ion battery       Sodium-ion battery         33       Sujeet Chaudhary       sujeetc@physics.iitd.ac.in       Growth and Studies of High Spin Orbit Coupling thin films for Spin Pumping Applications by magnetron sputtering         34       Sujeet Chaudhary       sujeetc@physics.iitd.ac.in       Free space quantum communication (joint supervision with Vivek Venkataraman)         35       joyee@physics.iitd.ac.in       Free space quantum communication (joint supervision with Vivek Venkataraman)         36       Supervision with Vivek Venkataraman)       Coherent Hight-matter interaction (joint supervision with Vivek Venkataraman)         38       bkanseri@physics.iitd.ac.in       Quantum Optics with photons         41       Sunil Kumar       kumarsunil@physics.iitd.ac.in       Experimental condensed matter physics         42       Tobias Toli       tobiastoli@physics.iitd.ac.in       Anyonic statistics and Chern Simons theory         43       Tobias Toli       tobiastoli@physics.iitd.ac.in       Anyonic statistics and Chern Simons theory         44       Tarun Sharma		Pintu Das	pintu@physics.iitd.ac.in	Studies of quantum devices based on 2-	
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32       Sodium-ion battery         33       Sujeet Chaudhary       sujeetc@physics.iitd.ac.in       Growth and Studies of High Spin Orbit Coupling thin films for Spin Pumping Applications by magnetron sputtering         34       Sujeet Chaudhary       sujeetc@physics.iitd.ac.in       Heusler alloy based Spin gap-less Semiconducting thin films by Ion-beam sputtering         35       Magnetotransport Investigations on Topological Insulator Sputtered Thin Films       Pree space quantum communication (joint supervision with Vivek Venkataraman)         36       joyee Ghosh       joyee@physics.iitd.ac.in       Fiber based quantum communication (joint supervision with Vivek Venkataraman)         38       Bhaskar Kanseri       bkanseri@physics.iitd.ac.in       Quantum Optics with photons         40       Sunii Kumar       kumarsunil@physics.iitd.ac.in       Quantum Optics with photons         41       Sunii Kumar       kumarsunil@physics.iitd.ac.in       Experimental condensed matter physics         43       Tobias Toll       tobiastoll@physics.iitd.ac.in       Phenomenological investigations of hadron structure at small x         44       Tarun Sharma       tks@physics.iitd.ac.in       Anyonic statistics and Chern Simons theory         45       H K Malik       hkmalik@physics.iitd.ac.in       Anyonic statistics and Chern Simons theory         47       Sujit Manna       smanna@physics.iitd.ac.in       Experimental s	31	Rajendra S. Dhaka	rsdhaka@physics.iitd.ac.in	Heusler alloys or Sodium-ion battery	
33Sujeet Chaudharysujeetc@physics.iitd.ac.inGrowth and Studies of High Spin Orbit Coupling thin films for Spin Pumping Applications by magnetron sputtering Heusler alloy based Spin gap-less Semiconducting thin films by Ion-beam sputtering Magnetoransport Investigations on Topological Insulator Sputtered Thin Films36Joyee Ghoshjoyee@physics.iitd.ac.inFree space quantum communication (joint supervision with Vivek Venkataraman) Coherent light-matter interaction (joint supervision with Vivek Venkataraman)37Joyee Ghoshbkanseri@physics.iitd.ac.inQuantum Optics with photons38Bhaskar Kanseribkanseri@physics.iitd.ac.inQuantum Optics with photons40Sunil Kumarkumarsunil@physics.iitd.ac.inQuantum entanglement of photons41Sunil Kumartobiastoll@physics.iitd.ac.inExperimental condensed matter physics43Tobias Tolltobiastoll@physics.iitd.ac.inPhenomenological investigations of hadron structure at small x44Tarun Sharmatks@physics.iitd.ac.inAnyonic statistics and Chern Simons theory45H K Malikhkmalik@physics.iitd.ac.inTerahertz radiation generation and its application structure at small x47Sujit Mannasmana@physics.iitd.ac.inExperimental study of plasma-material interaction Experimental study of superconducting nanowires and Josephson device48Deepak Kumarkrdeepak@physics.iitd.ac.inStatistics and mechanics of soft matter systems	32			Sodium-ion battery	
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36Joyee Ghoshjoyee@physics.iitd.ac.inSupervision with Vivek Verikataraman)3738Fiber based quantum communication (joint supervision with Vivek Venkataraman)3839Bhaskar Kanseribkanseri@physics.iitd.ac.inQuantum Optics with photons40405Kumarsunil@physics.iitd.ac.inQuantum optics with photons41Sunil Kumarkumarsunil@physics.iitd.ac.inExperimental condensed matter physics42Tobias Tolltobiastoll@physics.iitd.ac.inUltrafast time-resolved spectroscopy43Tobias Tolltobiastoll@physics.iitd.ac.inPhenomenological investigations of hadron structure at small x44Tarun Sharmatks@physics.iitd.ac.inAnyonic statistics and Chern Simons theory45H K Malikhkmalik@physics.iitd.ac.inTerahertz radiation generation and its application Experimental study of plasma-material interaction47Sujit Mannasmanna@physics.iitd.ac.inExperimental study of Superconducting nanowires and Josephson device48Deepak Kumarkrdeepak@physics.iitd.ac.inStatistics and mechanics of soft matter systems	26			Free space quantum communication (joint	
37       Supervision with Vivek Venkataraman)         38       Coherent light-matter interaction (joint supervision with Vivek Venkataraman)         39       Bhaskar Kanseri       bkanseri@physics.iitd.ac.in         40       Quantum Optics with photons         41       Sunil Kumar       kumarsunil@physics.iitd.ac.in         42       Tobias Toll       tobiastoll@physics.iitd.ac.in         43       Tobias Toll       tobiastoll@physics.iitd.ac.in         44       Tarun Sharma       tks@physics.iitd.ac.in         45       H K Malik       hkmalik@physics.iitd.ac.in         46       Nujit Manna       smanna@physics.iitd.ac.in         47       Sujit Manna       smanna@physics.iitd.ac.in         48       Deepak Kumar       krdeepak@physics.iitd.ac.in		Joyee Ghosh	joyee@physics.iitd.ac.in	Fiber based quantum communication (joint	
38       supervision with Vivek Venkataraman)         39       Bhaskar Kanseri       bkanseri@physics.iitd.ac.in       Quantum Optics with photons         40       Studies on quantum entanglement of photons         41       Sunil Kumar       kumarsunil@physics.iitd.ac.in       Experimental condensed matter physics         42       Tobias Toll       tobiastoll@physics.iitd.ac.in       Ultrafast time-resolved spectroscopy         43       Torun Sharma       tks@physics.iitd.ac.in       Phenomenological investigations of hadron structure at small x         44       Tarun Sharma       tks@physics.iitd.ac.in       Anyonic statistics and Chern Simons theory         45       H K Malik       hkmalik@physics.iitd.ac.in       Terahertz radiation generation and its application         47       Sujit Manna       smanna@physics.iitd.ac.in       Experimental study of plasma-material interaction         48       Deepak Kumar       krdeepak@physics.iitd.ac.in       Statistics and mechanics of soft matter systems	37			Coherent light-matter interaction (joint	
39 40Bhaskar Kanseri 40bkanseri@physics.iitd.ac.inQuantum Optics with photons Studies on quantum entanglement of photons41 42Sunil Kumar 42kumarsunil@physics.iitd.ac.inExperimental condensed matter physics Ultrafast time-resolved spectroscopy43Tobias Tolltobiastoll@physics.iitd.ac.inPhenomenological investigations of hadron structure at small x44Tarun Sharmatks@physics.iitd.ac.inAnyonic statistics and Chern Simons theory45H K Malikhkmalik@physics.iitd.ac.inTerahertz radiation generation and its application Experimental study of plasma-material interaction47Sujit Mannasmanna@physics.iitd.ac.inExperimental study of Superconducting nanowires and Josephson device48Deepak Kumarkrdeepak@physics.iitd.ac.inStatistics and mechanics of soft matter systems	38			supervision with Vivek Venkataraman)	
40Studies on quantum entanglement of photons41Sunil Kumarkumarsunil@physics.iitd.ac.inExperimental condensed matter physics42Tobias Tolltobiastoll@physics.iitd.ac.inUltrafast time-resolved spectroscopy43Tarun Sharmatks@physics.iitd.ac.inPhenomenological investigations of hadron structure at small x44Tarun Sharmatks@physics.iitd.ac.inAnyonic statistics and Chern Simons theory45H K Malikhkmalik@physics.iitd.ac.inTerahertz radiation generation and its application Experimental study of plasma-material interaction46Sujit Mannasmanna@physics.iitd.ac.inExperimental study of Superconducting nanowires and Josephson device48Deepak Kumarkrdeepak@physics.iitd.ac.inStatistics and mechanics of soft matter systems	39	Bhaskar Kanseri	bkanseri@physics.iitd.ac.in	Quantum Optics with photons	
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44       Tarun Sharma       tks@physics.iitd.ac.in       Anyonic statistics and Chern Simons theory         45       H K Malik       hkmalik@physics.iitd.ac.in       Terahertz radiation generation and its application         46       Sujit Manna       smanna@physics.iitd.ac.in       Experimental study of plasma-material interaction         47       Sujit Manna       smanna@physics.iitd.ac.in       Experimental study of Superconducting nanowires and Josephson device         48       Deepak Kumar       krdeepak@physics.iitd.ac.in       Statistics and mechanics of soft matter systems	43	Tobias Toll	tobiastoll@physics.iitd.ac.in	Phenomenological investigations of hadron structure at small x	
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46     Experimental study of plasma-material interaction       47     Sujit Manna     smanna@physics.iitd.ac.in     Experimental study of Superconducting nanowires and Josephson device       48     Deepak Kumar     krdeepak@physics.iitd.ac.in     Statistics and mechanics of soft matter systems	45	H K Malik	hkmalik@nhvsics iitd ac in	Terahertz radiation generation and its application	
47     Sujit Manna     smanna@physics.iitd.ac.in     Experimental study of Superconducting nanowires and Josephson device       48     Deepak Kumar     krdeepak@physics.iitd.ac.in     Statistics and mechanics of soft matter systems	46			Experimental study of plasma-material interaction	
48 Deepak Kumar krdeepak@physics.iitd.ac.in Statistics and mechanics of soft matter systems	47	Sujit Manna	smanna@physics.iitd.ac.in	Experimental study of Superconducting nanowires and Josephson device	
Deepak Kumar krdeepak@physics.iitd.ac.in contactors and mechanics of soft matter systems	/8			Statistics and mechanics of soft matter systems	
49 Non-equillibrium physics of granular matter	40	Deepak Kumar	krdeepak@physics.iitd.ac.in	Non-equilibrium physics of granular matter	

			Experimental realization of high fidelity quantum
50		bodhaditya.santra@physics.iitd.ac.in	gates for neutral atom quantum computers
			cold atom quantum gravimeter for field
51	Bodhaditya Santra		applications
51			Construction and characterization of narrow
			linewidth laser systems for high precision
52			quantum measurements
53			Modeling microorganism in Stokes regime
	Sujin B Babu	sujin@physics.litd.ac.in	
54			Statistical Mechanics of anisotropic particles
			Exploring valley physics in 2D materials from first
55	55 56 Saswata Bhattacharya		Discovering new quantum materials from
56		saswata@physics.iitd.ac.in	machine learning approaches
			Probing excited states from many body
57			perturbation theory
		sankalpa@physics.iitd.ac.in	Twistronics -Twisted Layers of Graphene and
58			their properties
	SANKALPA GHOSH		Transport in Dirac materials (graphene and other
59			topological materials) and their hetero-structures
60			Quantum Simulation with ultra cold atoms
			Theoretical Studies of Raman Scattering in
61	Rohit Narula rnarula@physics.iitd.ac.in		Twisted Bilayer Graphene
	62 Kaustuv Manna		Effect of symmetry tuned Barry curvature on the
62		kaustuvmanna@physics.iitd.ac.in	physical properties of the quantum magnets
			Single crystal growth and magneto-transport
63			measurements of quantum magnets
64			Transport studies in topological superconductors
65	Manisha Thakurathi	manisha@physics.iitd.ac.in	Higher order semimetal systems
66			Interaction effects in topological matter

Note:

We can only fill a limited number of Ph.D. positions with Institute fellowship (GATE, etc.) as per the following Institute level restrictions for this PhD admission for Semester-I, academic year 2023-24

Best wishes, **Prof. Pankaj Srivastva** Head, Department of Physics