

Faculty Profile

Santipur College

Department of Physics

General Information



Name	Dr. Dipankar Bhattacharyya
Designation	Associate Professor
Date of joining	20.03.2003
Address	Flat no-10, Block-A, Nilimaloy Apartment, 76 Jessore Road, North 24 Parganas, Barasat, 700124
Contact E-mail	bh.dipankar@gmail.com , Dipankar_bh@yahoo.com
Mobile	9433552174
Academic Qualification	M.Sc, Ph.D

Research And Publication

Area of Specialization	X-Rays and Laser Physics
Research interest	Light-matter-interaction, Diode laser spectroscopy, Quantum Optics
<p style="text-align: center;"><u>Postdoctoral Research Experience</u></p> <p>I did my postdoctoral research work in the Department of Physics Complex System, Weizmann Institute of Science, Rehovot, Israel, under the supervision of Prof. Nir Davidson.</p> <p style="text-align: center;"><u>Current Research Activity</u></p> <p>Now I am doing my research work(experimental) in collaboration with Dr. Sankar De, at Saha Institute of Nuclear Physics (SINP), Kolkata.</p> <p style="text-align: center;"><u>ResearchGate link</u></p> <p style="text-align: center;">https://www.researchgate.net/profile/Dipankar-Bhattacharyya-2?ev=hdr_xprf</p>	

Google scholar link

<https://scholar.google.com/citations?user=5Ni0os0AAAAJ&hl=en>

Research projects undertaken

I) Principal Investigator of Minor Research Project (**Sanctioned no. PSW-080/05-06 dated 21/03/06. amount Rs. 1,00,000/-**) funded by UGC, during 2006 to 2008.

II) One Minor Research Project (Rs. 5,00,000/-) has been sanctioned by UGC, (**Sanction no: F PSW-205/13-14 dated 01/08/2014**) during 2014-2016.

III) Submitted one Major Research Project in "Scientific Engineering Research Board" (SERB), India File no: EMR/2017/003022/PHY (PAC Physical Sciences). Not recommended by SERB.

IV) Principal Investigator of TARE Research Project sanctioned by "Scientific Engineering Research Board" (**SERB**), **India File no: TAR/2018/000710**. Project titled "Interaction of ring shaped solitons with coherently prepared atomic media."

Joint Supervisor of Ph.D. students

Name of the Student	Name of Supervisor	Name of Co/Associated Supervisor	Title of the Thesis.	University and year of award
Dr. Khairul Islam	Dr. Amitava Bandyopadhyay, Department of Physics, Visva-Bharati	Dr. Dipankar Bhattacharyya Department of Physics, Santipur College	Study of Atomic Coherence by using lasers as the coherent source of radiation.	Visva-Bharati Awarded in 2017
Mr. Sekher De	Dr. Biswajit Ray, Department of Physics, University of Calcutta.	Dr. Dipankar Bhattacharyya Department of Physics, Santipur College	Measurement and analysis of Coherent resonance line-shape in Rubidium vapour.	University of Calcutta Tentatively thesis will be submitted in Dec, 2025 .
Dr. Kalan Mal	Dr. Amitava Bandyopadhyay Department of Physics, Visva-Bharati	Dr. Dipankar Bhattacharyya Department of Physics, Santipur College	Study of the influence of additional coherent radiation on the probe field propagation through multilevel atomic system.	Visva-Bharati Awarded in 2023 .

Paper Publication			
Sl. No.	Date	Title	Publisher / Other Information
1	2025	Non-adiabatic resonant transient response in electromagnetically induced transparency of hot rubidium atoms with a buffer gas background	AVS Quantum Science American Institute of Physics 7, 033201 https://doi.org/10.1116/5.0266329
2	2025	Correlated vortex generation in a coherent medium	Optics Letters Optica 50,5089 https://doi.org/10.1364/OL.562996
3	2024	Interactive four-level tripod configuration in Zeeman sub-levels of ^{87}Rb leads to power broadening immune electromagnetically induced transparency	Journal of Optical Society of America: B <i>Optica</i> 41,665 https://doi.org/10.1364/JOSAB.505057
4	2023	Simple high-precision diode laser system with digital control	Applied Optics <i>Optica</i> 62,956 https://doi.org/10.1364/ao.479656
5	2022	Electromagnetically induced transparency, narrow absorption and transient response in a three-photon excitation process	Optik <i>Elsevier</i> 265, 169410 https://doi.org/10.1016/j.ijleo.2022.169410
6	2022	A study of sign reversal from transmission peak to an absorption dip in a V-type system using the D ₁ and D ₂ lines of ^{87}Rb in the presence of a buffer gas	Journal of Physics B: Molecular and Optical Physics <i>Institute of Physics (IOP)</i> 55, 215401 https://iopscience.iop.org/article/10.1088/1361-6455/ac8d78#:~:text=10.1088/1361%2D6455/ac8d78
7	2021	Effects of probe ellipticity and longitudinal magnetic field on the polarization rotation in a coherently	OSA Continuum <i>Optica</i> https://doi.org/10.1364/OSAC.409284

		prepared atomic medium	
8	2021	Microwave assisted gain in inverted-Y type atomic system	Optik Elsevier 26,165962 https://doi.org/10.1016/j.ijleo.2020.165962
9	2021	Effects of vector magnetic field on electromagnetically induced transparency with lin \perp lin polarization	Journal of Optical Society of America: B <i>Optica</i> 38, 584 https://doi.org/10.1364/JOSAB.411632
10	2019	Angular dependency of the polarization rotation in a coherent atomic medium	Journal of Physics B: Molecular and Optical Physics. <i>Institute of Physics (IOP)</i> 53,025502 DOI 10.1088/1361-6455/ab590b
11	2019	Interplay between electromagnetically induced transparency (EIT), absorption (EIA), and Autler-Townes (AT) splitting in an N-type atomic system	OSA Continuum <i>Optica</i> 2, 994 http://dx.doi.org/10.1063/1.4971241
12	2019	A detailed study of the quantum coherent and saturating resonances using the hyperfine lines of rubidium	Hyperfine Interactions Springer Nature 240,56 https://doi.org/10.1007/s10751-019-1595-6
13	2018	Pulse delay and group velocity dispersion measurement in V-type electromagnetically induced transparency of hot ^{85}Rb atom	Journal of Physics B: Molecular and Optical Physics. Institute of Physics (IOP) 51, 245501 https://doi.org/10.1088/1361-6455/aaede0
14	2018	Polarization rotation with electromagnetically induced transparency in a V-type configuration of Rb D_1 and D_2 transitions	Journal of Physics B: Molecular and Optical Physics. Institute of Physics (IOP) 51, 175502 https://doi.org/10.1088/1361-6455/aad6d5
15	2018	Observation and theoretical simulation of dispersive properties of an electromagnetically	Laser Physics Institute of Physics (IOP). 28,125205 https://doi.org/10.1088/1555-6611/aae5a7

		induced transparent ⁸⁷ Rb atomic medium	
16	2018	A study on electromagnetically induced transparency and velocity selective optical pumped absorption in an eight level inverted Y-type atomic system	Journal of Physics B: Molecular and Optical Physics. Institute of Physics (IOP). 51,145501 https://doi.org/10.1088/1361-6455/aac6f5
17	2018	Effect of residual Doppler averaging on the probe absorption in cascade type system: a comparative study	Chinese Physics B. <i>Institute of Physics (IOP)</i> 27 , 094204 DOI: 10.1088/1674-1056/27/9/094204
18	2017	Study on the probe field propagation in presence of control and coupling fields through a four-level N-type atomic system	Journal of Physics B: Molecular and Optical Physics. <i>Institute of Physics (IOP).</i> 50 , 215401 https://doi.org/10.1088/1361-6455/aa8b3e
19	2017	Splitting of electromagnetically induced absorption signal in a five-level V-type atomic system	Journal of Optical Society of America: B Optica 34, 2550 https://doi.org/10.1364/JOSAB.34.002550
20	2016	Simultaneous observations of Electromagnetically Induced Transparency (EIT) and Absorption (EIA) in a multi-level V-type system of ⁸⁷ Rb and theoretical simulation of observed spectra using a multi-mode approach	Journal of Chemical Physics American Institute of Physics 145,224312 http://dx.doi.org/10.1063/1.4971241
21	2016	Revisiting the four-level inverted-Y system under both Doppler free and Doppler broadened condition: an analytical approach	Journal of Physics B: Molecular and Optical Physics. Institute of Physics (IOP). 49,195401 doi: 10.1088/0953-4075/49/19/195401
22	2016	Narrowing of Doppler and hyperfine line	Chemical Physics Letters. <i>Elsevier</i>

		shapes of Rb – D ₂ transition using a Vortex beam	644, 212 http://dx.doi.org/10.1016/j.cplett.2015.12.004
23	2015	Comparison of Electromagnetically Induced Transparency (EIT) spectra for six-level lambda (Λ) and five level V-type system	Journal of Atomic, Molecular, Condensate and Nano Physics 2, 93
24	2015	Observation of Electromagnetically Induced transparency in six-level Rb atoms and theoretical simulation of the observed spectra	Journal of Physics B: Molecular and Optical Physics. Institute of Physics (IOP). 48,175503 doi: 10.1088/0953-4075/48/17/175503
25	2014	Anomalous Symmetry Breaking in Two-Dimensional Diffusion of Coherent Atoms	Physical Review A American Physical Society 89,033807 DOI: 10.1103/PhysRevA.89.033807
26	2012	Logarithmically Diverging Two-photon Spectrum: Anomalous Scale Symmetry Breaking in Two Dimensions	OSA Technical Digest Optica DOI: 10.1364/QELS.2012.QF3E.1
27	2009	Study of width and height of EIT resonance in a Doppler broadened five-level system with varying probe power	The European Physical Journal D. Springer Nature 53,141 DOI: 10.1140/epjd/e2009-00108-7
28	2007	Theoretical study of electromagnetically induced transparency in a <i>five-level</i> atom and application to Doppler broadened and Doppler free Rb atoms	Journal of Physics B: Molecular and Optical Physics. <i>Institute of Physics (IOP)</i> 40,4061 doi: 10.1088/0953-4075/40/20/008
29	2007	Velocity dependent pump-probe spectroscopy for a five-level system: An application to Rb D ₂ transition	Chemical Physics Letters. Elsevier 440, 24 doi: 10.1016/j.cplett.2007.04.007

30	2007	Laser frequency stabilization for atom cooling and magnetic field compression of the trap	Laser Physics <i>Springer Nature</i> 17(9), 1 DOI: 10.1134/S1054660X0709@@@@
31	2006	Velocity selective resonances and electromagnetically induced transparency in atomic rubidium	Indian Journal of Physics. Springer Nature 80(5), 467
32	2004	Line shape simulation and saturated absorption spectroscopic measurement of Rb- D ₂ transition	Chemical Physics Letters Elsevier 389, 113 doi:10.1016/j.cplett.2004.03.076
33	2004	Pump induced Autler-Townes effect and A-T mixing in four level atoms	Journal of Optics B: Quantum Semiclassical Optics. <i>Institute of Physics (IOP)</i> 6,563 doi: 10.1088/1464-4266/6/12/012
34	2002	Direct Measurement on Transparent Plates by Using Fizeau Interferometry	Optics and Laser Technology Elsevier 34, 93
35	2003	Temperature and power dependent line shape of Rb-D ₂ transitions studied by Doppler- limited and Doppler-free spectroscopy	Fizika-A Croatian Physical Society 12, 171 4
Books/ Reports/Chapters/General articles etc.			
Sl. No.	Date	Title	Publisher/ Other information
1		Quantum Optics and Quantum Computation	<i>Institute of Physics (IOP)</i> DOI: 10.1088/978-0-7503-2715-2
Reviewer			
<p>Regularly review various journals from the publishing houses like</p> <ul style="list-style-type: none"> ✓ IOP ✓ Optica 			

- ✓ Elsevier
- ✓ Springer Nature,
- ✓ Canadian Journal of Physics etc.

**Talks/ Paper or Poster Presentations/ Chairing Sessions/ Seminar/ Webinar/
Workshop/ RC/ OP/ Short term Course/ Any Other attended**

Sl. No.	Date	Title /Event	Place /Organiser/ Other Information
1	14.11.2017 - 16.11.2017	Observation of slow light in V-type Electromagnetically Induced Transparency	International Conference on condensed matter physics, Indian Statistical Institute Bankim Chandra Das, Dipankar Bhattacharyya , Arpita Das, Satyajit Saha, Shrabana Chakrabarti, Sankar De.,
2	20.12.2017 - 23.12.2017	Observation of slow light in V-type Electromagnetically Induced Transparency	National Laser Symposium (NLS-24), BARC, Mumbai Bankim Chandra Das, Dipankar Bhattacharyya , Arpita Das, Satyajit Saha, Shrabana Chakrabarti, Sankar De.
3	09.12.2017	Observation of slow light in V-type Electromagnetically Induced Transparency	SPIE IIT Guwahati student chapter during SERB school on Frontier in optical science &Technology Bankim Chandra Das, Dipankar Bhattacharyya , Arpita Das, Satyajit Saha, Shrabana Chakrabarti, Sankar De.
4	03.01.2017 - 06.01.2017	Simultaneous observation and theoretical formulation of Electromagnetically Induced Transparency and absorption in V-type system	NCAMP-XXI, PRL, Ahmadabad Bankim Chandra Das, Dipankar Bhattacharyya , Arpita Das, Shrabana Chakrabarti, Sankar De
5	19.02.2016 - 20.02.2016	Logarithmically diverging electromagnetically induced transparency (EIT) spectrum for narrow 2-d beam	Indian Association for Cultivation the Science (IACS). Dipankar Bhattacharyya Workshop Frontiers in atomic, molecular and Optical Sciences
6	11.03.2015 - 14.03.2015	'Comparison of Electromagnetically Induced Transparency (EIT) Spectra for six-level lambda and five level V-type system	4 th International conference on "Current Developments in atomic nano Physics with applications(CDAMOP)" University of Delhi Dipankar Bhattacharyya , A. Bandyopadhyay, S. Saha, S. De
7	02.12.2015 - 05.12.2015	Saturation Absorption Spectroscopy: A Vortex Beam Approach	National Laser Symposium (NLS-24) , RRCAT, Indore Bankim Chandra Das, Dipankar

			Bhattacharyya, Sankar De.
8	14.12.2015 - 16.12.2015	Narrowing of Hyperfine Line-shapes using Vortex beams	International Conference on 'Light Quanta: Modern Perspectives and Applications Bankim Chandra Das, Dipankar Bhattacharyya , Sankar De. University of Allahabad
9	19.12.2014 - 22.12.2014	Experimental observation and theoretical simulation of electromagnetically induced transparency (EIT) in a six-level Rb atoms	International Centre for Theoretical Sciences(ICTS) Discussion meeting on frontiers in light matter interactions held in Indian Association for Cultivation the Science (IACS), Kolkata Dipankar Bhattacharyya , A. Bandyopadhyay, S. Saha, S. De.
10	06.05.2012 - 11.05.2012	Logarithmically Diverging Two-photon Spectrum: Anomalous Scale Symmetry Breaking in Two Dimensions	(Invited talk) by Nir Davidson, Rami Pugatch, Dipankar Bhattacharyya , A. Amir, Y. Sagi. CLEO-2012 held in San Jose, CA, USA
11	21.01.2012 - 26.01.2012	Universality in slow light spectra	(Invited Paper) Paper 8273-39 by Nir Davidson, Rami Pugatch, Dipankar Bhattacharyya , OferFirstenberg, SPIE Photonics West conference The Moscone Center, San Francisco, California, USA
12	05.12.2010	Hearing the diffusion modes by using Electromagnetically Induced Transparency (EIT)	56th Israel Physical Society (IPS) meeting Tel-Aviv University, Israel Dipankar Bhattacharyya , R. Pagutch, A. Amir, Y. Sagi and N. Davidson in
13	20.11.2010 - 25.11.2010	Hearing the diffusion modes by using Electromagnetically Induced Transparency (EIT)	Workshop of " Entanglement in Atomic Systems " Dipankar Bhattacharyya , R. Pagutch, A. Amir, Y. Sagi and N. Davidson Weizmann Institute of Science, Israel.
14	13.12.2009	Observation of imaginary time Anderson localization - the drunkards and the policemen	55th Israel Physical Society (IPS) meeting R. Pagutch, Dipankar Bhattacharyya and N. Davidson Bar Ilan University, Israel.
15	24.02.2008 - 28.02.2008	Theoretical study of Electromagnetically Induced Transparency (EIT) in a five-level Rubidium atomic system in Doppler broadened and Doppler free conditions	2nd International Conference on Perspectives in Vibrational Spectroscopy (ICOPVS-2008) , page 95, Trivandrum, India Dipankar Bhattacharyya , B. Ray and P. N. Ghosh.

16	03.10.2007 - 07.10.2007	Line shape of velocity selective pump-probe spectra of Rb	International Joint Conference SFB/TRR21 and IFRAF P. N. Ghosh, B. Ray, <u>Dipankar Bhattacharyya</u> , S. Chakraborti Page no 70, Schloss Reisensburg, Germany
17	30.11.2006 - 02.12.2006	Velocity-Selective Optical Pumping effect in ^{85}Rb transition with two co and counter propagating laser field	International Conference on Laser and Nano (ICLAN - 06) <u>Dipankar Bhattacharyya</u> , S. Chakraborti, A. Bandhopadhyaya, B. Ray and P. N. Ghosh Page no PL 13, Saha Institute of Nuclear Physics (SINP), Kolkata.
18	16.07.2006 - 21.07.2006	Experimental and theoretical study of pump-probe absorption signal in a <i>four-level</i> atomic system	20 th International Conference on Atomic Physics(ICAP-06) <u>Dipankar Bhattacharyya</u> , A. Bandhopadhyaya, S. Chakraborti, B. Ray and P. N. Ghosh. Page no. 542, University of Innsbruck, Austria, 16 th – 21 st July 2006

Institutional Responsibilities

Portion of syllabus allotted		
Semester	Major/ Minor/ SEC/ MDC/ Other	Topic allotted
Semester 1	Major	Mathematical Physics, Calculus, Vector Calculus
Semester 2	Major	Classical Mechanics, Fundamentals of Dynamics, Work and Energy, Collisions, Rotational Dynamics
Semester 3	Major	Magnetostatics, Magnetic Field, Magnetic Properties of Matter, Electromagnetic Induction, Electrical Circuits, Network theorems, Ballistic Galvanometer
Semester 4	Major	Wave Optics and Electromagnetic theory, Maxwell Equations, EM Wave Propagation in Unbounded Media, EM Wave in Bounded Media
Semester 5	Major	Classical and Statistical Mechanics:

		<p>Dynamics, Classical Mechanics of Point Particles, Bose-Einstein Statistics,.</p> <p>Quantum Mechanics: Eigenvalues and eigenfunctions of the simple harmonic oscillator, Quantum theory of hydrogen-like atoms, Generalized Angular Momenta and Spin, Spectra of Hydrogen atom and its fine structure, Atoms in External Magnetic & Magnetic Fields, Many electron atoms.</p>
Semester 6		
Administrative Responsibilities		
1	Coordinator , IQAC	Since 2023
Institutional Committees		
Sl. No.	Name of Committee	Member / Convener
1	IQAC	Coordinator
2	UGC Committee	Convener
3	Academic Audit Committee	Convener
4	CAS Committee	Member
5	Library Committee	Member
6	NAAC	Member
7	Resource Mobilisation	Member
8	Website Upgradation	member