

Faculty Profile



1. Name: Dr. Pijush K Ghosh
2. Designation: Professor
3. Email(s): pijushkanti.ghosh@visva-bharati.ac.in
4. Address: Department of Physics, Visva-Bharati, Santiniketan, PIN 731 235, West Bengal.
5. Research ID (Google Scholar, ORCID ID, Scopus ID, WOS ID, Vidwan ID):
Google Scholar: [LybEmzMAAAAJ](#); **ORCID:** [0000-0003-0513-3323](#);

SCOPUS: [35567963100](#);

IRINS Vidwan- <https://visvabharati.irins.org/profile/163661>

6. Publication Summary:
 - (a) No. of Research papers - 54 (published: 50, Preprint-01, Non-refereed-03)
 - (b) No. of Book Chapters - Nil
 - (c) No. of Conference papers - 01
 - (d) h-index - 18
 - (e) i-10 index – 35

7. Date of Joining Visva-Bharati Service: 2005

8. Education:

Degree	Year	University/Institution
Ph. D.	1997	Institute of Physics, Utkal University, Bhubaneswar
M. Sc. / M. Tech.	1990	Siksha-Bhavana, Visva-Bharati, Santiniketan
B. Sc.	1988	Siksha-Bhavana, Visva-Bharati, Santiniketan

9. Academic Positions held (in reverse chronological order)

Sl. No.	Positions held	University/ Institution	Period
1	Professor	Visva-Bharati, Santiniketan, India	2011-Continuing
2	Associate Professor	Visva-Bharati, Santiniketan, India	2008-2011
3	Reader	Visva-Bharati, Santiniketan, India	2005-2008
4	Visiting Scientist**	Saha Institute of Nuclear Physics, Kolkata, India	2002-2005
7	JSPS Post-Doctoral Fellow	Ochanomizu University, Tokyo, Japan	1999-2001
8	Visiting Fellow	Institute of Mathematical Sciences, Chennai, India	1997-1999
9	Visiting Fellow	Harish-Chandra Research Institute, Allahabad, India	1995-1997
10	Research Fellow*	Institute of Physics, Bhubaneswar, India	1991-1995

** Under Fast-Track Scheme for Young Scientists, SERC, DST, Govt. of India and host Institute's own Academic Programme

* Period spent for Ph. D. Thesis

10. Areas of Research: Theoretical Physics

11. Subject Specialization/Research Interests: High Energy Physics, Mathematical Physics, Quantum Physics, Nonlinear Dynamics, Interdisciplinary areas between High Energy Physics and Condensed Matter Physics

12. Courses Teaching / Taught:

Undergraduate Courses	Computational Methods using Scilab
	Particle Physics
	Mathematical Methods In Physics
	Laboratory Course (Electricity, Optics, Modern Physics)
	Physical Optics
	Laboratory Course (Electricity, Optics, Properties of Matter) for allied course
Postgraduate Courses	Nonlinear Dynamics-I
	Nonlinear Dynamics-II (Advanced Topics)
	Bio-Physics
	Computational Nonlinear Dynamics
	Computer Applications In Physics
	Field Theory
	Topics In Modern Quantum Mechanics
	Particle Physics
	Atomic & Molecular Physics
	Laboratory Course (Electronics)
Ph.D. Course-work	Field Theory & Integrable Models,
	Nonlinear Dynamics

13. Research Guidance:

(a) No. of Postdoctoral students (Completed / Ongoing): Nil

(b) No. of Doctoral students (Completed / Ongoing): 03

(c) No. of M.Sc. Dissertations:: 17

14. Research Collaboration (National / International):

15. Research Grants/Projects

Sl. No.	Project Title	PI/ Co-PI	Funding Agency	Amount	Completed/Ongoing
1	Investigations on Hamiltonian systems with balanced loss and gain	PI	SERB, DST, Govt. of India	Rs. 6, 60, 000	Completed
2	Physics & Mathematics of PT-symmetric systems	PI	SERC, DST, Govt. of India	Rs. 13,44,000	Completed
3	Aspects of noncommutative Field Theory	PI	SERC, DST, Govt. of India	Rs. 9, 12,000	Completed
4	Calogero-Sutherland model and its connection to supersymmetric quantum field theories	Co-PI	JSPS, Japan	2 million Yen	Completed

16. Professional Recognition/ Award/ Prize/Fellowship

Sl. No.	Name of Award/Prize/Fellowship	Awarding Agency	Year
1	Fellowship for visiting abroad under the scientific bi-lateral exchange Programme	Indian National Science Academy, New Delhi.	2013
2	Invitation Fellowship for research in Japan,	Japan Society for the Promotion of Science	2008
3	Fellowship under Fast Track Scheme for Young Scientist: 2001 - 2002	Science & Engineering Research Council, Government of India.	2001
4	Post-doctoral Fellowship	Japan Society for the Promotion of Science	1999
5	Post-doctoral Fellowship	Institute of Mathematical Sciences, Chennai	1997
6	Post-doctoral Fellowship	Harish-Chandra Research Institute, Allahabad	1995

17. Talks Delivered at International / National Conferences/Seminars/Symposium:

- RUSA sponsored lecture Series (Lecture No. 32), April 08, 2022, Department of Nonlinear Dynamics, Bharathidasan University, Tiruchirappally. Video LINK: <https://www.youtube.com/watch?v=S6-IByFA09c>
- International conference on Non-Hermitian Physics(Online), March 22-26, 2021, ICTS-TIFR, Bangalore. Video LINK: <https://www.youtube.com/watch?v=3KpJa1uXhaY>
- International Conference on “Current Developments in Quantum Field Theory and Gravity”, December 03-07, 2018, S. N. Bose National Centre for Basic Sciences, Kolkata, India.
- International conference on Non-Hermitian Physics- “Pseudo-Hermitian Hamiltonians in Quantum Physics (PHHQP) XVIII” June 4-18, 2018, ICTS-TIFR, Bangalore.
Video LINK: <https://www.youtube.com/watch?v=VMLp7K8Fnss>
- International conference on Quantum Integrable System, December 02-06, 2013, S. N. Bose National Centre for Basic Sciences, Kolkata, India.

- vi. Jubilee meeting of the international conference series Pseudo-hermitian Hamiltonian and Quantum Physics(PHHQP X) entitled ``Quantum Physics with non-hermitian operators'', June 16-25, 2011, Max Planck Institute for Physics of Complex Systems, Dresden, Germany.
- vii. International Workshop on Supersymmetric Quantum Mechanics & Spectral Design, July 18-July 30, 2010, Centro De Ciencias Pedro Pasual, Benasque, Spain.
- viii. National Level Applied Mathematics Symposium on Trends & Challenges in Quantum Theory, February 27-28, 2008, Department of Applied Mathematics, University of Calcutta, Kolkata, India.
- ix. Applied Mathematics Symposium on Quantum Mechanics in the Perspective of Modern Trends, February 2005 Department of Applied Mathematics, University of Calcutta, Kolkata.
- x. India And Abroad -III: A Conference In Condensed Matter Physics(A special session on the Bose-Einstein condensation), January 2003, S. N. Bose National Centre for Basic Sciences, Kolkata.
- xi. Symposium on Current Trends in Physics, September 1999, Institute of Physics, Bhubaneswar, INDIA.
- xii. XI Department of Atomic Energy(DAE) Symposium on High Energy Physics, January 1995, Visva-Bharati, Santiniketan.

18. List of Scientific Publications:

A) Preprints:

1. **Pijush K Ghosh**, Construction of Pseudo-hermitian matrices describing systems with balanced loss-gain, arXiv preprint arXiv:2401.01126.

B) Publications in international refereed journals:

1. S Ghosh, **Pijush K Ghosh** and S Sil, Edge states and persistent current in a PT-symmetric extended Su-Schrieffer-Heeger model with generic boundary conditions, Phys. Rev. B **111** (2025) 245428(arXiv preprint arXiv:2501.08991).
2. S Ghosh and **Pijush K Ghosh**, Quantum integrability and chaos in a periodic Toda lattice with balanced loss-gain, Chaos: An Interdisciplinary Journal of Nonlinear Science **34** (2024)023121 [**Editor's Pick**] (arXiv preprint arXiv:2310.20217).
3. P Roy and **Pijush K Ghosh**, Balanced loss-gain induced chaos in a periodic Toda lattice, Physics Letters A **489** (2023) 129156 (arXiv preprint arXiv:2303.17639).
4. S Ghosh and **Pijush K Ghosh**, Solvable limits of a class of generalized vector nonlocal nonlinear Schrödinger equation with balanced loss-gain, Physica Scripta **98** (2023) 115214 (arXiv preprint arXiv:2212.02786).
5. S Ghosh and **Pijush K Ghosh**, Non-linear Schrödinger equation with time-dependent balanced loss-gain and space-time modulated non-linear interaction, Annals of Physics **454** (2023)169330 (arXiv preprint arXiv:2112.04802).
6. P Roy and **Pijush K Ghosh**, Complex dynamical properties of coupled Van der Pol–Duffing oscillators with balanced loss and gain, Journal of Physics A: Mathematical and Theoretical **55** (2022) 315701 (arXiv preprint arXiv:2112.10555).
7. **Pijush K Ghosh**, Classical Hamiltonian Systems with balanced loss and gain, Journal of Physics:

- Conference Series **2038**(2021) 012012 (arXiv preprint arXiv:2104.03745).
8. **Pijush K. Ghosh**, Constructing solvable models of vector non-linear Schrödinger equation with balanced loss and gain via non-unitary transformation, *Physics Letters A* **402** (2021) 127361 (arXiv preprint arXiv:2008.12252).
 9. **Pijush K Ghosh** and P Roy, On regular and chaotic dynamics of a non-PT-symmetric Hamiltonian system of a coupled Duffing oscillator with balanced loss and gain, *Journal of Physics A: Mathematical and Theoretical* **53** (2020) 475202 (arXiv preprint arXiv:2007.07286).
 10. **Pijush K. Ghosh**, Taming Hamiltonian systems with balanced loss and gain via Lorentz interaction : General results and a case study with Landau Hamiltonian, *Journal of Physics A: Mathematical and Theoretical* **52** (2019) 415202 (arXiv preprint [arXiv:1810.04137](https://arxiv.org/abs/1810.04137)).
 11. D. Sinha and **Pijush K. Ghosh**, On Symmetries and Exact Solutions of a Class of Non-local Non-linear Schrodinger Equations with Self-induced PT- symmetric Potential, *Phys. Rev. E* **91** (2015) 042908[arXiv preprint [arXiv:1408.0954](https://arxiv.org/abs/1408.0954)]
 12. D. Sinha and **Pijush K. Ghosh**, On the bound states and correlation functions of a class of Calogero-type quantum many-body problems with balanced loss and gain, *Journal of Physics A: Mathematical and Theoretical* **52** (2019) 505203 (arXiv preprint [arXiv:1709.09648](https://arxiv.org/abs/1709.09648))
 13. D. Sinha and **Pijush K. Ghosh**, Integrable coupled Lienard-type systems with balanced loss and gain, *Annals of Physics* **400** (2019) 109–127 (arXiv preprint [arXiv:1804.02366](https://arxiv.org/abs/1804.02366))
 14. **Pijush K. Ghosh** and D. Sinha, Hamiltonian formulation of systems with balanced loss-gain and exactly solvable models, *Annals of Physics* **388** (2018) 276-304 [arXiv preprint [arXiv:1707.01122](https://arxiv.org/abs/1707.01122)].
 15. D. Sinha and **Pijush K. Ghosh**, PT -symmetric rational Calogero model with balanced loss and gain, *Eur. Phys. J. Plus* **132** (2017) 460 (9pp) [arXiv preprint [arXiv:1705.03426](https://arxiv.org/abs/1705.03426)].
 16. D. Sinha and **Pijush K. Ghosh**, Integrable nonlocal vector nonlinear Schrödinger equation with self-induced parity-time-symmetric Potential, *Phys. Lett. A* **381** (2017) 124-128 [arXiv preprint [arXiv:1506.03036](https://arxiv.org/abs/1506.03036)].
 17. **Pijush K. Ghosh**, Supersymmetric many-particle quantum systems with inverse-square interactions, *J. Phys. A: Math. Theor.* **45** (2012) 183001 [arXiv preprint arXiv:1111.6255] (**Commissioned topical review article for Journal of Physics A: Math. Theor.**).
 18. **Pijush K. Ghosh**, A note on topological insulator phase in non-hermitian quantum system, *J. Phys.: Condens. Matter* **24** (2012) 145302 [arXiv preprint arXiv:1109.1697].
 19. **Pijush K. Ghosh**, Deconstructing non-dissipative non-Dirac-hermitian relativistic quantum systems, *Phys. Lett. A* **375** (2011) 3250 [arXiv preprint arXiv:1105.2495].
 20. **Pijush K. Ghosh**, Deconstructing non-Dirac-hermitian supersymmetric quantum systems, *J. Phys. A:Math. Theor.* **44** (2011) 215307[arXiv preprint arXiv:1101.2120].
 21. **Pijush K. Ghosh**, Constructing Exactly Solvable Pseudo-hermitian Many-particle Quantum Systems by Isospectral Deformation, *Int. J. Theo. Phys.* **50** (2011) 1143 [arXiv preprint arXiv:1012.0907] (**Invited contribution to the Special Issue of the international conference series Pseudo-Hermitian Hamiltonian and Quantum Physics, 2010, China**).
 22. **Pijush K. Ghosh**, On the construction of pseudo-hermitian quantum system with a pre-determined metric in the Hilbert space, *J. Phys. A:Math. Theor.* **43** (2010) 125203 [arXiv preprint arXiv:0908.1321].

23. T. Deguchi and **Pijush K. Ghosh**, Exactly Solvable Quasi-hermitian Transverse Ising Model, J. Phys. A: Math. Theor. **42** (2009) 475208[arXiv preprint arXiv:0904.2852].
24. Tetsuo Deguchi, **Pijush K. Ghosh** and Kazue Kudo, Level statistics of a pseudo-Hermitian Dicke model, Phys. Rev. **E80** (2009) 026213 [arXiv preprint arXiv:0903.4568].
25. T. Deguchi and **Pijush K. Ghosh**, Quantum Phase Transition in a Pseudo-hermitian Dicke model, Phys. Rev. **E80** (2009) 021107[arXiv preprint arXiv:0901.1730].
26. **Pijush K. Ghosh**, Exactly solvable non-hermitian Jaynes-Cummings-type Hamiltonian admitting entirely real spectra from supersymmetry, Journal of Physics A: Mathematical & General **38** (2005) 7313-7323 [arXiv preprint quant-ph/0501087].
27. **Pijush K. Ghosh**, Supersymmetric quantum mechanics on noncommutative space, European Physical Journal **C42** (2005) 355[arXiv preprint hep-th/0403083].
28. **Pijush K. Ghosh**, Comment on "Dynamical role of anyonic excitation statistics in rapidly rotating Bose gases", Physical Review Letters **94** (2005) 208903 [arXiv preprint cond-mat/0410398].
29. **Pijush K. Ghosh** and Kumar S. Gupta, On the real spectra of Calogero model with complex coupling, Physics Letters **A323** (2004) 29-33 [arXiv preprint hep-th/0310276].
30. **Pijush K. Ghosh**, Super-Calogero model with $Osp(2|2)$ supersymmetry : is the construction unique?, Nuclear Physics **B681** (2004) 359-373[arXiv preprint hep-th/0309183].
31. B. Basu-Mallick, **Pijush K. Ghosh** and Kumar S. Gupta, Inequivalent quantization of the rational Calogero models, Physics Letters **A311** (2003) 87-92 [arXiv preprint hep-th/0208132].
32. B. Basu-Mallick, **Pijush K. Ghosh** and Kumar S. Gupta, Novel quantum states of the rational Calogero Models without the confining interaction, Nucl. Phys. **B659** (2003) 437-457 [arXiv preprint hep-th/0207040].
33. **Pijush K. Ghosh**, Explosion-implosion duality in the Bose-Einstein condensation, Physics Letters **A308** (2003)411-416 [arXiv preprint cond-mat/0109073].
34. **Pijush K. Ghosh**, Exact results on the dynamics of multi-component Bose-Einstein condensate, Physical Review **A65** (2002) 053601 [arXiv preprint cond-mat/0111523].
35. **Pijush K. Ghosh**, Conformal symmetry and the nonlinear Schroedinger equation, Physical Review **A65** (2002) 012103 [arXiv preprint cond-mat/0102488].
36. Tetsuo Deguchi and **Pijush K. Ghosh**, Spin chains from super-models, Journal of the Physical Society of Japan **70** (2001) 3225-3237 [arXiv preprint hep-th/0012058].
37. **Pijush K. Ghosh**, Extended superconformal symmetry and Calogero-Marchioro model, Journal of Physics A: Mathematical and General **34** (2001) 5583-5592 [arXiv preprint hep-th/0009055].
38. **Pijush K. Ghosh**, Super-Calogero-Moser-Sutherland systems and free super-oscillators : a mapping, Nuclear Physics **B595** (2001) 519-535 [arXiv preprint hep-th/000720].
39. **Pijush K. Ghosh** and Avinash Khare, Relationship between the energy eigenstates of Calogero-Sutherland models with oscillator and Coulomb-like potentials, Journal of Physics A: Mathematical and General **32** (1999) 2129-2140 [arXiv preprint solv-int/9808005].

40. G. Date, **Pijush K. Ghosh** and M. V. N. Murthy, Novel classical ground state of a many-body system in arbitrary dimensions, Physical Review Letters **81** (199) 3051-3054 [arXiv preprint cond-mat/9802302].
41. **Pijush K. Ghosh**, Avinash Khare and M. Sivakumar, Supersymmetry, shape invariance, and solvability of A_{N-1} and BC_N Calogero-Sutherland model, Physical Review **A 58** (1998) 821-825 [arXiv preprint cond-mat/9710206].
42. **Pijush K. Ghosh**, Solitons in 1+1 dimensional gauged sigma models, Physical Review **D 56** (1997) 5153-5159 [arXiv preprint hep-th/9701132].
43. **Pijush K. Ghosh**, Calogero-Sutherland type models in higher dimensions, Physics Letters **A 229** (1997) 203-207 [arXiv preprint cond-mat/9610024].
44. **Pijush K. Ghosh**, Self-dual gauged CP^N models, Physics Letters **B 384** (1996) 185-189 [arXiv preprint hep-th/9603122].
45. **Pijush K. Ghosh**, Exact self-dual soliton solutions in a gauged $O(3)$ sigma model with anomalous magnetic moment interaction, Physics Letters **B 381** (1996) 237-242 [arXiv preprint hep-th/9601009].
46. **Pijush K. Ghosh** and Sanjay K. Ghosh, Topological and nontopological solitons in a gauged $O(3)$ sigma model with a Chern-Simons term, Physics Letters **B 366** (1996) 199-204 [arXiv preprint hep-th/9507015].
47. **Pijush K. Ghosh**, Semilocal self-dual Chern-Simons solitons, Physical Review **D 53** (1996) 2248-2251 [arXiv preprint hep-th/9503199].
48. **Pijush K. Ghosh**, Avinash Khare and Prasanta K. Panigrahi, The $B \wedge F$ Term by spontaneous symmetry breaking in a generalized abelian Higgs Model, Journal of Physics G: Nuclear and Particle Physics **21** (1995) 1303-1305 [arXiv preprint hep-th/9407150].
49. **Pijush K. Ghosh**, Bogomol'nyi equations of Maxwell-Chern-Simons vortices from a generalized abelian Higgs model, Physical Review **D 49** (1994) 5458 -5468 [arXiv preprint hep-th/9310096].
50. **Pijush K. Ghosh**, Degenerate topological vortex solutions from a generalized abelian Higgs model with a Chern-Simons term, Physics Letters **B 326** (1994) 264-269 [arXiv preprint hep-th/9309104].

C) Publications in refereed international conference proceedings:

1. B. Basu-Mallick, **Pijush K. Ghosh** and Kumar S. Gupta, Near-horizon States of Black Holes and Calogero Models, Pramana-J. Phys. **62** (2004) 691-694, [arXiv preprint hep-th/0304071] (Proceedings of PASCOS03, TIFR, Mumbai).

D) Publications (Non-refereed):

1. **Pijush K. Ghosh**, Novel correlations in arbitrary dimensions. Harish-Chandra Research Institute preprint, MRI-PHY/96-20, arXiv preprint cond-mat/9607009.
2. **Pijush K. Ghosh** and Avinash Khare, Self-dual charged vortices of finite energy per unit length in 3+1 dimensions. Institute of Physics preprint IP/BBSR/94-14, arXiv preprint hep-th/9404015.
3. **Pijush K. Ghosh** and Avinash Khare, Comment on ``Partition function of anyon gas". Institute of Physics (Bhubaneswar) preprint, IP-BBSR/92-20. (NOTE: Comments similar to ours were submitted to Physical Review Letters by two other groups. One of the Comments was published in Phys. Rev. Lett. **69** (1992) 2875 with a special Editorial note giving specific reference to our Article.)

E) **Publication on Education, Science and related subjects:**

1. **পীযুষ কান্তি ঘোষ, গলদটা তো গোড়াতেই, শেষরক্ষা হবে কি করে? এই সময়, ২০ শে জানুয়ারী, ২০২০** [This is a post-editorial published on 20th January, 2020 in the Times Group Bengali Newspaper **Ei Samay**. The article discusses on fallacy of new reservation policy addressed to the economically weaker section and exorbitant application fee in higher educational institutions.]

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