

# Curriculum Vitae

## PERSONAL DETAILS

**Name** : BIPLAB PAL

**Date of Birth** : 25.04.1988

**Age** : 31 yrs.

**Gender** : Male

**Marital Status** : Married

**Nationality** : Indian

**Language** : English, Bengali, Hindi

**Permanent Address** : Vill. – Gourpara  
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**Present Designation** : Assistant Professor of Physics (recruited through WBCSC)

**Official Address** : Department of Physics  
Kaliachak College, Kaliachak  
Sultanganj, Malda  
West Bengal – 732201, India



## PROFESSIONAL DETAILS

### (A) Educational Qualification:

Qualification	Year of passing	Subjects / Specialization	Board / University	Percentage of marks	Division / Class / Rank
M. P. (10 <sup>th</sup> )	2003	Beng., Eng., Math, L.Sc., P.Sc., Hist., Geo.	W.B.B.S.E.	83.13%	1 <sup>st</sup> Div.
H. S. (12 <sup>th</sup> )	2005	Beng., Eng., Math, Phys., Chem., Bio.	W.B.C.H.S.E.	72.60%	1 <sup>st</sup> Div.
B. Sc.	2008	Physics(Hons.), Chem., Math	University of Kalyani	62.38%	1 <sup>st</sup> Class
M. Sc.	2010	Physics (Specialization in Solid State Physics)	University of Kalyani	78.58%	1 <sup>st</sup> Class (1 <sup>st</sup> Rank)
Ph. D.	2016	Physics	University of Kalyani	83% (Pre-PhD Course Work)	Grade 'A'

### (B) Research Experience:

- ◆ M. Sc. Project Fellow, Department of Physics, University of Kalyani, India (December 2009 – May 2010) [Completed a project work entitled “*Magneto-transport in a simple model quantum device*” under the supervision of Prof. Arunava Chakrabarti.]
- ◆ DST-INSPIRE Fellow (JRF), Department of Physics, University of Kalyani, India (April 2011 – April 2013).
- ◆ Visiting Research Student in Physics (Newton-Bhabha Fellow), University of Warwick, UK (June 2015 – August 2015).
- ◆ DST-INSPIRE Fellow (SRF), Department of Physics, University of Kalyani, India (April 2013 – April 2016).
- ◆ Postdoctoral Research Fellow, Condensed Matter Physics Division, Max Planck Institute for the Physics of Complex Systems (MPIPKS), Germany (January 2017 – November 2018).
- ◆ Postdoctoral Research Fellow, Department of Physics, Ben-Gurion University, Israel (December 2018 – September 2019).

- ◆ Postdoctoral Research Fellow, School of Physics and Astronomy, Tel Aviv University, Israel (October 2019 – February 2020).

### (C) Areas of Research Interest:

- Electron localization-delocalization phenomena in low dimensional structures with quasiperiodic and fractal geometries.
- Nature of single electron states and two-terminal transport properties of quasiperiodic and disordered systems.
- Staggered localization in fractal electronic and waveguide networks.
- Flat band states in self-similar lattices with closed loop geometries.
- Electronic states in ladder networks, hierarchical lattices and aperiodic nanostructures.
- Spin polarized transport and spin filtering effects in periodic and aperiodic magnetic chains.
- Fractional Quantum Hall effect and behavior of anyons in model lattice structures.
- Topological flat band states in tight-binding lattice models.
- Effect of spin-orbit coupling in mesoscopic ring geometries.

**Ph.D. Thesis Title:** [Electron states, charge and spin transport in low dimensional structures with quasi-periodic and fractal geometries.](#)

### (D) List of Publications:

#### (a) In Journals:

1. Ankita Bhattacharya and **Biplab Pal**, “[Flat bands and nontrivial topological properties in an extended Lieb lattice](#)”, *Phys. Rev. B* **100**, 235145 (2019).
2. **Biplab Pal**, “[Quasiperiodic magnetic chain as a spin filter for arbitrary spin states](#)”, *Phys. Rev. B* **99**, 134431 (2019).
3. **Biplab Pal**, “[Nontrivial topological flat bands in a diamond-octagon lattice geometry](#)”, *Phys. Rev. B* **98**, 245116 (2018).
4. **Biplab Pal** and Kush Saha, “[Flat bands in fractal-like geometry](#)”, *Phys. Rev. B* **97**, 195101 (2018).
5. **Biplab Pal** and Paramita Dutta, “[Spin filtering and switching action in a diamond network with magnetic-nonmagnetic atomic distribution](#)”, *Scientific Reports* **6**, 32543 (2016).

6. Atanu Nandy, **Biplab Pal** and Arunava Chakrabarti, “Tight-binding chains with off-diagonal disorder: Bands of extended electronic states induced by minimal quasi-one-dimensionality”, *Europhys. Lett.* **115**, 37004 (2016).
7. **Biplab Pal**, Rudolf A. Römer and Arunava Chakrabarti, “Spin filter for arbitrary spins by substrate engineering”, *J. Phys.: Condens. Matter* **28**, 335301 (2016).
8. Atanu Nandy, **Biplab Pal** and Arunava Chakrabarti, “Flat band analogues and flux driven extended electronic states in a class of geometrically frustrated fractal networks”, *J. Phys.: Condens. Matter* **27**, 125501 (2015).
9. Atanu Nandy, **Biplab Pal** and Arunava Chakrabarti, “Exotic electron states and tunable magneto-transport in a fractal Aharonov-Bohm interferometer”, *Phys. Lett. A* **378**, 3144 (2014).
10. **Biplab Pal** and Arunava Chakrabarti, “Engineering bands of extended electronic states in a class of topologically disordered and quasiperiodic lattices”, *Phys. Lett. A* **378**, 2782 (2014).
11. **Biplab Pal**, “Absolutely continuous energy bands and extended electronic states in an aperiodic comb-shaped nanostructure”, *Physica Status Solidi B* **251**, 1401 (2014).
12. **Biplab Pal** and Arunava Chakrabarti, “Absolutely continuous energy bands in the electronic spectrum of quasiperiodic ladder networks”, *Physica E* **60**, 188 (2014).
13. **Biplab Pal**, Santanu K. Maiti and Arunava Chakrabarti, “Complete absence of localization in a family of disordered lattices”, *Europhys. Lett.* **102**, 17004 (2013).
14. **Biplab Pal**, Pinaki Patra, Jyoti Prasad Saha and Arunava Chakrabarti, “Engineering wave localization in a fractal waveguide network”, *Phys. Rev. A* **87**, 023814 (2013).
15. **Biplab Pal** and Arunava Chakrabarti, “Nature of electron states and magneto-transport in a graphene geometry with a fractal distribution of holes”, *Eur. Phys. J. B* **85**, 307 (2012).
16. **Biplab Pal** and Arunava Chakrabarti, “Staggered and extreme localization of electron states in fractal space”, *Phys. Rev. B* **85**, 214203 (2012).
17. **Biplab Pal**, Arunava Chakrabarti and Nitai Bhattacharya, “On the extendedness of eigenstates in a hierarchical lattice: A critical view”, *Solid State Communications* **151**, 1894 (2011).

**(b) In Peer-reviewed Conference Proceedings:**

1. **Biplab Pal**, “Spin filtering action in a magnetic-nonmagnetic superlattice structure”, *AIP Conference Proceedings* **1832**, 130002 (2017).
2. **Biplab Pal**, “Electronic states and transport properties of a 1D quantum wire with side-coupled quantum dots”, *AIP Conference Proceedings* **1536**, 59 (2013).
3. **Biplab Pal** and Arunava Chakrabarti, “Absolutely continuous spectrum and ballistic transport in a one-dimensional quasiperiodic system”, *AIP Conference Proceedings* **1512**, 962 (2013).

**(c) Manuscripts submitted:**

1. **Biplab Pal**, Wei Wang, Sourav Manna, and Anne E. B. Nielsen, “[Anyons and Fractional Quantum Hall Effect in Fractal Dimensions](#)” (submitted); arXiv:1907.03193.

**(E) Scholarships / Achievements / Awards / Recognitions:**

- West Bengal Govt. Merit-cum-Means scholarship (2008-2010) for pursuing Postgraduate studies.
- *Sidhartha Sengupta memorial medal* from the University of Kalyani for being 1<sup>st</sup> class 1<sup>st</sup> in M. Sc. in Physics.
- *DST-INSPIRE Fellowship (2011-2016)* from Department of Science and Technology (DST), Govt. of India for pursuing Ph. D.
- *CEFIPRA-ESONN Indo-French Fellowship 2014* for participating in European School on Nanosciences and Nanotechnologies (ESONN) at Grenoble, France.
- South Asian Physics Foundation (SAPF) Student Travel Grant Award 2014 for presenting a paper in ICNSNT-2014 at Colombo, Sri Lanka.
- Best Student Presentation Award and Medal in ICNSNT-2014 at Colombo, Sri Lanka.
- Qualified in Joint CSIR-UGC National Eligibility Test (NET).
- Worked as a referee for the international journals *Physica B: Condensed Matter* and *Physica E: Low-dimensional Systems and Nanostructures* (Elsevier Publication).
- Delivered an invited talk as an ESONN fellow in the annual meeting of CEFIPRA 2014 at IACS, Kolkata to promote CEFIPRA-ESONN Fellowship.
- Best Research Scholar Award - 2015 (in Science Faculty) awarded by the University of Kalyani.
- *Newton-Bhabha Fellowship 2015* by British Council and DST, India to visit the University of Warwick, UK for a period of 3 months.
- Selected by DST, India and Lindau Scientific Council for participation in the *66<sup>th</sup> Lindau Meeting of Nobel Laureates and Students* at Lindau, Germany.
- *Postdoctoral Research Fellowship* to work at the **Max Planck Institute for the Physics of Complex Systems** (MPIPKS), Dresden, Germany.
- *Kreitman Postdoctoral Scholarship* to work at the **Ben-Gurion University**, Israel.
- *Postdoctoral Fellowship* to work at the **Tel Aviv University**, Israel.

**(F) Conference / Symposium / Seminar participated or paper presented / talk delivered:**

**National Level:**

- Condensed Matter Days 2010, A National Conference on Condensed Matter Physics at University of Kalyani, Kalyani, India, 25 - 27th August 2010 (participated as a M. Sc. student).
- Condensed Matter Days 2011, A National Conference on Condensed Matter Physics at Gauhati University, Gauhati, India, 24 - 26th August 2011 (presented a poster presentation).
- Quantum Mechanics: Inception, Evolution and Future, A UGC sponsored National Seminar at Narasinha Dutt College, Howrah, India, 24 - 26th November 2011 (delivered a contributed talk).
- Seminar at the Department of Physics, University of Kalyani, Kalyani, India on 19th April 2012 (delivered an annual oral presentation).
- Condensed Matter Days 2012, A National Conference on Condensed Matter Physics at Birla Institute of Technology, Mesra, India, 29 - 31st August 2012 (presented a poster presentation).
- 57th DAE Solid State Symposium at IIT Bombay, Mumbai, India, 3 - 7th December 2012 (presented a poster presentation).
- Condensed Matter Days 2013, A National Conference on Condensed Matter Physics at NIT, Rourkela, India, 29 - 31st August 2013 (presented a poster presentation).
- DAE-BRNS 7th National Symposium on Pulsed Laser Deposition on Thin Films and Nanostructured Materials at IIT-KGP, West Bengal, India, 14 - 16th November 2013 (presented a poster presentation).
- One Day National Seminar on Condensed Matter Physics and Materials organized by Department of Physics, University of Kalyani, 31st December, 2013 (presented a poster).
- National conference on Nanoscience and Nanotechnology (NS&NT-2014) at CRNN, University of Calcutta, India, 18 - 19th September, 2014 (presented a poster).
- Bringing the Nanoworld Together Seminar 2014 (BTNT-2014) at SINP, Kolkata, India, 24 - 25th November, 2014 (participant).
- Physics and Applied Mathematics Researchers' Meet - 2015 at Indian Statistical Institute, Kolkata, India, 18 - 20th March, 2015 (delivered a short contributory talk).
- Workshop on Frontiers in Condensed Matter Physics (CONDMAT 2016) at IOP, Bhubaneswar, India, 22 - 27th February, 2016 (participated).
- National conference on Emerging Trends in Condensed Matter Physics & Material Science (ETCMPMS-2016) at University of Kalyani, West Bengal, India, 18 - 19th March, 2016 (presented an oral presentation).

- 34<sup>th</sup> Young Physicist Colloquium (YPC-2016) organized by Indian Physical Society at SINP, Kolkata, India, 18 -19th August, 2016 (presented an oral presentation).
- 61st DAE Solid State Physics Symposium at the KIIT University, Bhubaneswar, India, 26 - 30th December 2016 (presented a poster presentation).

### International Level:

- ICRAM - 2012, An International Conference on Recent Trends in Advanced Materials at VIT University, Vellore, India, 20 - 22nd February 2012 (presented a poster presentation).
- RAM - 2013, An International Conference on Recent Trends in Applied Physics & Material Science at Govt. College of Engineering and Technology, Bikaner, Rajasthan, India, 1 - 2nd February 2013 (presented a poster presentation).
- International Conference on Recent Advances in Physics for Interdisciplinary Developments (ICRAPID - 2014) at Sathyabama University, Chennai, India, 23 - 24th January, 2014 (presented a poster presentation).
- International Conference on Nano Science & Engineering Applications (ICONSEA - 2014) at Centre for Nano Science and Technology (CNST), Jawaharlal Nehru Technological University (JNTU), Hyderabad, India, 26 - 28th June, 2014 (presented an oral presentation).
- International Conference on Nanoscience and Nanotechnology (ICNSNT-2014) at Colombo, Sri Lanka, 12 - 13th August, 2014 (presented an oral presentation).
- Theory of Condensed Matter Group Scientific Meeting, University of Warwick, UK, 4th June 2015 (attended).
- International Conference on Nanoscience, Nanotechnology and Advanced Materials (NANOS 2015) at GITAM University, Visakhapatnam, India, 14 - 17th December, 2015 (presented an oral presentation).
- Workshop and school on Fundamentals on Quantum Transport at ICTP, Trieste, Italy, 31st July - 11th August, 2017 (participated and presented a poster presentation).
- Winter School on Numerical Methods for Strongly Correlated Quantum Systems at the Faculty of Physics, University of Marburg, Germany, 19 - 23th February, 2018 (participated and presented a poster presentation).
- Conference on Spins in a Quantum 1D Multi-particle Environment: from Exotic Phases and Non-trivial Topology to Protected Transport at the Department of Physics, LMU Munich, Germany, 2 - 5th September, 2019 (presented a poster presentation).
- Conference on Signatures of Topology in Condensed Matter at ICTP, Trieste, Italy, 21 - 25th October, 2019 (presented a poster presentation).

### **(G) International Visits / Exposers:**

- ✓ I have participated in an advanced European School on Nanosciences and Nanotechnologies ESONN'2014 (Eleventh Edition) organized jointly by Joseph Fourier University, Grenoble INP, CNRS and CEA at Grenoble, France from 24th August, 2014 to 13th September, 2014. Selected by CEFIPRA and ESONN committee as one of the eight Indian Ph. D. students from all over India to participate in ESONN'2014.
- ✓ I have participated and delivered an oral presentation in the International Conference on Nanoscience and Nanotechnology (ICNSNT-2014) at Colombo, Sri Lanka, 12 – 13th August, 2014. Received the best student presentation award.
- ✓ I have worked as a Newton-Bhabha Fellow in the Disordered Quantum Systems Group (DisQS), University of Warwick, UK for a period of 3 months (June – August, 2015) under the supervision of Prof. Rudolf A. Römer. Selected jointly by British Council and DST as one of the twenty-six candidates across all science and technology subject areas from all over India.
- ✓ I have participated in the 66<sup>th</sup> Lindau Nobel Laureates Meeting in Germany as a part of the Indian team of young scientists, and also visited many German research laboratories during the Post-Lindau programme conducted by DFG. Selected by DST, DFG and Lindau Scientific Council as one of the ten Indian Ph. D. students from all over India to participate in the 66<sup>th</sup> Lindau Nobel Laureates Meeting.
- ✓ I have visited the Center for Theoretical Physics of Complex Systems (PCS), Institute for Basic Science (IBS), Daejeon, South Korea [from 8th November, 2016 to 14th November, 2016]. Gave an oral presentation on my research works during the visit.
- ✓ I have participated and presented a poster presentation in the Workshop and School on Fundamentals on Quantum Transport at ICTP, Trieste, Italy, 31st July – 11th August, 2017.
- ✓ I have worked at the Max Planck Institute for the Physics of Complex Systems (MPIPKS), Germany as a post-doctoral research fellow in the Condensed Matter Physics Division (January, 2017 – November, 2018).
- ✓ I have worked as a post-doctoral research fellow both in the Department of Physics, Ben-Gurion University (December, 2018 – September, 2019) and in the School of Physics and Astronomy, Tel Aviv University (October, 2019 – February, 2020) under the mentorship of Prof. Amnon Aharony.



**(H) Computer Skills:**

- Operating systems known: Windows, Linux - Mint, Fedora, Ubuntu etc.
- Have expertise in handling different scientific softwares (tools) in both Linux and Windows operating systems.
- Programming languages known: FORTRAN, Mathematica, Matlab
- Numerical simulation techniques known: Monte-Carlo simulation technique.

Dated: March 6, 2020

*Biplab Pal*

(BIPLAB PAL)

Signature