# Parthapratim Pradhan

## Curriculum Vitae (Updated September, 2023)

**Contact Information:**

*Office:*
**Department of Physics, Hiralal Majumdar Memorial College for Women, Dakshineswar, Kolkata, West Bengal 700035, India, Email:pppradhan77@gmail.com**

## Current Position:

I am currently working as an Associate Professor at the Department of Physics in Hiralal Mazumdar Memorial College for Women, Dakshineswar, Kolkata, West Bengal 700035, India.

## Post-Doctoral Experience :

After completion of my Ph.D., I have been working mostly by myself, with occasional collaboration with staff members of research institutes in India (TIFR, Mumbai, SINP, Kolkata, JU, Kolkata & RKMVU, Belur Math, Howrah).

## Area of Research:

General Relativity, Gravitation, Strong Gravity, Quantum Gravity, Mathematical Physics

## Education :

**Ph.D in Science**
Institution: Jadavpur University, Kolkata
Work done at: Astroparticle Physics Division, Saha Institute of Nuclear Physics, Kolkata
Year: 2014

**Post Graduation (M.Sc.) in Physics**
Institution: Department of Physics, Jadavpur University, Kolkata
Specialization: *Application of Computer Science in Physics*
Performance: *First Class*
Year: 2000

## Research Experience:

*Thesis Title:*
**Study of Geodesics in Extremal Black Hole Spacetime.**
*Thesis Advisor:*
**Professor Parthasarathi Majumdar, Department of Physics, Indian Association For The Cultivation Science,**
**Email: bhpartha@gmail.com**

## Educational Activities:

- **From 02.06.2003 to 03.04.2017, I served as an Assistant Professor (Stage-III) in Physics at Vivekananda Satavarshiki Mahavidyalaya, Manikpara, Jhargram-721513, West Bengal, India**

- **From 04.04.2017 to date, I am serving as an Associate Professor at Hiralal Mazumdar Memorial College for Women, Dakshineswar, Kolkata, West Bengal 700035, India.**

**Courses Taught:**

**At the College where I teach, I have taught the following courses :**

- **Mathematical Physics**
- **Classical Mechanics**
- **Thermodynamics**
- **Electrodynamics**
- **Quantum Mechanics**
- **Special theory of Relativity**
- **Computer programming in C, PYTHON**

**Laboratory Experience:**

**I have conducted B.Sc(H) Physics courses Laboratory as per the University syllabus. I have also conducted Computer programming in C and Fortran-77 as per syllabus.**

**Computer Languages Known:**

PYTHON, Fortran-77, C

**Operating System Used:**
Linux, Windows

**Software Handled:**
Mathematica, Maple, MATLAB

## Awards:

- I have been awarded travel grant of $800.00 (USD) for attending workshop Cosmology and String theory-2019 held at Simon Center for Geometry and Physics, Stony Brook University, Stony Brook, USA.
- I have been awarded travel grant of 40,000 Yen for attending KIAS-YITP joint workshop: Strings, Gravity and Cosmology, 19-22 September, 2017 held at Yukawa Institute for Theoretical Physics, Kyoto University, Japan.
- I have been selected as a Visiting Associate of IUCAA, Pune, India for the period 01/08/2015-31/07/2018.
- I have been awarded UGC Travel Grant of Rs. 1,32,568.00 for attending Marcel Grossman Meeting-MGXIII held at Stockholm University, Stockholm for the period 1-7 July, 2012.
- I have been awarded Council of Scientific & Industrial Research (CSIR) Junior Research Fellowship (JRF) in Physical Sciences by Govt. of India in June 2001 for pursuing PhD program.
- I have been qualified in Graduate Aptitude Test in Engineering (GATE) in Physics conducted by all Indian Institute of Technology (IITs) in the year 2000.
- I have been qualified in Joint Entrance Screening Test (JEST) in Physics conducted by all Research Institute of India in April 2001 to obtain fellowship for pursuing PhD program.

## Invitation:

- I have been invited by Professor Brendan Hassett, Director, ICERM, Brown University to participate in Fall 2020 semester program "Advances in Computational Relativity," to be held September 9 December 11, 2020, at the Institute for Computational and Experimental Research in Mathematics (ICERM) at Brown University.

- I have been invited by Professor Martin Rocek of C. N. Yang Inst. for Theor. Physics, Professor Cumrun Vafa (Donner Professor) of Harvard University for 2021 Simons Summer Workshop

- I have been invited by Professor Marilena Loverde of C.N. Yang Inst. for Theor. Physics, Professor Martin Rocek of C.N. Yang Inst. for Theor. Physics, an Professor Cumrun Vafa (Donner Professor) of Harvard University, for 2019 Simons Summer Workshop: Cosmology and String Theory July 15 August 9, 2019

- I have been invited by Professor Philippe LeFloch of Sorbonne University, Professor Jeff Jauregui of Union College, Professor Michael Anderson of State University of New York at Stony Brook, and Professor Christina Sormani of City University of New York for the Simons Center's Workshop: " Convergence and Low Regularity in General Relativity" held from 2019-04-29 to 2019-05-03 at the Simons Center for Geometry and Physics.

- I have been invited by Professor Piotr Chrusciel of University of Vienna, Professor Richard Schoen of Stanford University, Professor Christina Sormani of City University of New York, Professor Mu-Tao Wang of Columbia University and Professor Shing-Tung Yau (WILLIAM CASPAR GRAUSTEIN PROFESSOR OF MATHEMATICS) for Simons Center's Workshop: Mass in General Relativity held from 2018-03-26 to 2018-03-30 at the Simons Center for Geometry and Physics.

- I have been invited by Professor Demetre Kazaras of Duke University, Professor Marcus Khuri of State University of New York at Stony Brook and Professor Christina Sormani of City University of New York for "Spring School on Geometric Aspects of General Relativity", March 22-25, 2018.

## Professional Activities:

- **Life Member of Indian Physical Society**

- **As a Journal Referee:**

  - Mathematical Reviews, American Mathematical Society
  - European Physical Journal C (EPJ C)
  - Annalen der Physik (ADP)
  - Communications in Theoretical Physics (CTP)
  - Astrophysics and Space Science
  - Journal of Astronomy and Astrophysics
  - Modern Physics Letters A (MPLA)

- Journal of Physics Communications
- Advances in High Energy Physics (AHEP)
- Galaxies
- General Relativity and Gravitation
- Symmetry
- Canadian Journal of Physics (CJP)
- Particles, MDPI

- **As a Convener: National level seminar on "Recent Advancement in Physics" to be held at Department of Physics, V. S. Mahavidyalaya, West Midnapur, India.**

## Scientific Publication

### Google Scholar Citations: 683, h-index: 16, i10-index:24
### ORCID iD: 0000-0002-1065-5399

**Peer Reviewed Journal Articles**

1. **Entropy product function and central charges in NUT geometry**, P. Pradhan,
   *International Journal of Modern Physics A*, **2350090 (2023)**, Accepted Date: 24 June 2023
   **DOI: 10.1142/S0217751X23500902** [IF: ]

2. **Energy formula, surface geometry and energy extraction for Kerr-Sen black hole**, P. Pradhan,
   *General Relativity and Gravitation* , **55: 25 (2023)**, Accepted Date: 8 January 2023
   **DOI: 10.1007/s10714-023-03065-z** [Impact Factor: 2.589].

3. **Erratum to "Black hole Interior Mass Formula"**, P. Pradhan,
   *Euro. Phys. J. C.*, 81 859 (2021), Accepted Date: 28 September 2021,
   **DOI: 10.1140/epjc/s10052-021-09672-x** [Impact Factor: 5.436].

4. **Erratum to " Thermodynamic products for Sen Black hole "**, P. Pradhan,
   *Euro. Phys. J. C.*, 81 896 (2021), Accepted Date: 17 September 2021,
   **DOI: 10.1140/epjc/s10052-021-09699-0** [Impact Factor: 5.436].

5. **Energy formula for Newman-Unti-Tamburino class of black holes**, P. Pradhan,
   *General Relativity and Gravitation* , **53: 69 (2021)**, Accepted Date: 4 July 2021
   **DOI: 10.1007/s10714-021-02836-w** [Impact Factor: 2.589].

6. **Null Geodesics and QNMs in the field of Regular Black Holes**, M. Mondal, A. K. Yadav, P. Pradhan, S. Islam and F. Rahaman *Int. J. Mod. Phys. D* , **30** 2150095 (2021), Accepted Date: .
**DOI: 10.1142/S0218271821500954** [Impact Factor: 1.949].

7. **Area (or entropy) products for Newman-Unti-Tamburino class of Black Holes**, P. Pradhan, *Phys. Lett. B*, **Vol. 807, 135521 (2020)**,
**DOI: 10.1016/j.physletb.2020.135521** [Impact Factor: 4.383].

8. **Geodesic stability and Quasi normal modes via Lyapunov exponent for Hayward Black Hole**, M. Mondal, P. Pradhan, F. Rahaman, I. Karar, *Mod. Phys. Lett. A* **Vol. 35 (30), 2050249 (2020)**,
**DOI: 10.1142/S0217732320502491** [Impact Factor: 1.391 ].

9. **Study of energy extraction and epicyclic frequencies in Kerr-MOG (Modified Gravity) black hole**, P. Pradhan, *Euro. Phys. J. C.*, 79 401 (2019),
**DOI: 10.1140/epjc/s10052-019-6907-0** [Impact Factor: 4.843].

10. **Extended Phase Space Thermodynamics of Black Holes in Massive Gravity**, P. Pradhan, *Mod. Phys. Lett. A* **Vol. 34 (9), 1950063 (2019)**,
**DOI: 10.1142/S0217732319500639** [Impact Factor: 1.198].

11. **Horizon Areas and Logarithmic Correction to the Charged Accelerating Black Hole Entropy**, P. Pradhan, *Universe* **5(2), 57 (2019)**,
**DOI: 10.3390/universe5020057** [Impact Factor: 2.165].

12. **Thermodynamic Volume Product in Spherically Symmetric and Axisymmetric Spacetime**, P. Pradhan, *Advances in High Energy Physics*, **Volume 2018, Article ID 5816826, 15 pages**,
**DOI: 10.1155/2018/5816826** [Impact Factor: 1.740 ].

13. **Thermodynamic Product Formula in Modified Gravity and Kerr-MOG/CFT Correspondence**, P. Pradhan,
*Eur. Phys. J. Plus* , **133: 187 (2018)**,
**DOI: 10.1140/epjp/i2018-12019-9** [Impact Factor: 1.70].

14. **Circular Geodesics, Paczyński-Witta Potential Form and QNMs in the Eikonal limit for Ayón-Beato-García Black Hole**, P. Pradhan, *Universe* **4(3), 55 (2018)**,
**DOI: 10.3390/universe4030055** [Impact Factor: 2.165].

15. $P - V$ **criticality of conformal gravity holography in four dimensions**, P. Pradhan, *Mod. Phys. Lett. A* **Vol. 33, (2018) 1850030**,
**DOI: 10.1142/S021773231850030X** [Impact Factor: 1.198 ].

16. **Circular Geodesics in Tidal Charged Black Hole** , P. Pradhan, *Int. J. Geom. Meth. Mod. Phys.* , **Vol. 14** 185011 (2018) (26 pages),
**DOI: 10.1142/S0219887818500111** [Impact Factor: 1.068].

17. **Thermodynamic properties of Kehagias-Sfetsos black hole and KS/CFT correspondence**, P. Pradhan,
*Europhys. Lett.* , **120: 40006 (2017)**,
**DOI: 10.1209/0295-5075/120/40006** [Impact Factor: 1.968].

18. **CFT and Logarithmic Corrections to the Black Hole Entropy Product Formula** , P. Pradhan, *Advances in High Energy Physics*, **Volume 2017 (2017), Article ID 2367387, 8 pages**,
**DOI: 10.1155/2017/2367387** [Impact Factor: 1.740 ].

19. **Mass-independent area (or entropy) and thermodynamic volume products in conformal gravity** , P. Pradhan, *Mod. Phys. Lett. A* **Vol. 32, (2017) 1750090**,
**DOI:10.1142/S0217732317500900** [Impact Factor: 1.198 ].

20. **Circular Orbits in the Taub-NUT and mass-less Taub-NUT Space-time** , P. Pradhan, *Int. J. Geom. Meth. Mod. Phys.* , **Vol. 14** 1750101 (2017),
**DOI: 10.1142/S0219887817501018** [Impact Factor: 1.068].

21. **Entropy Product Formula for Gravitational Instanton** , P. Pradhan, *Advances in High Energy Physics*, **Volume 2017 (2017), Article ID 7471640, 7 pages**,
**DOI: 10.1155/2017/7471640** [Impact Factor: 1.839 ].

22. **Behavior of a test gyroscope moving towards a rotating traversable wormhole**, C. Chakraborty & P. Pradhan, *JCAP*, **Vol. 03** 035 (2017),
**DOI: 10.1088/1475-7516/2017/03/035** [Impact Factor: 5.634].

23. **Area products for $\mathcal{H}^{\pm}$ in AdS space**, P. Pradhan,
*Galaxies* , **2017, 5 (1), 10**,
**DOI: 10.3390/galaxies5010010** [Impact Factor: Not Available].

24. **Logarithmic Corrections to the Black Hole Entropy Product of $\mathcal{H}^{\pm}$ via Cardy Formula**, P. Pradhan,
*Europhys. Lett.* , **116: 50002 (2016)**,
**DOI:10.1209/0295-5075/116/50002** [Impact Factor: 1.968].

25. **Enthalpy, Geometric Volume and Logarithmic correction to Entropy for Van-der-Waals Black Hole**, P. Pradhan,
*Europhys. Lett.* , **116: 10001 (2016)**,
**DOI:10.1209/0295-5075/116/10001** [Impact Factor: 1.968].

26. **Surface Area Products for Kerr-Taub-NUT Spacetime**, P. Pradhan, *Europhys. Lett.* , **115: 30003 (2016)**, **DOI: 10.1209/0295-5075/115/30003** [Impact Factor: 1.968].

27. **Area Functional Relation for 5D-Gauss-Bonnet-AdS Black Hole**, P. Pradhan, *General Relativity and Gravitation* , **48:116 (2016)**, **DOI: 10.1007/s10714-016-2109-3** [Impact Factor: 1.668].

28. **Thermodynamic Product Relations for Generalized Regular Black Hole** , P. Pradhan, *Advances in High Energy Physics*, **Volume 2016 (2016), Article ID: 8086740, 6 pages**, **DOI: 10.1155/2016/8086740** [Impact Factor: 1.839 ].

29. **Thermodynamic Products in Extended Phase Space** , P. Pradhan, *Int. J. Mod. Phys. D* , **26** 1750010 (2017), **DOI: 10.1142/S0218271817500109** [Impact Factor: 1.949].

30. **Logarithmic corrections in black hole entropy product formula**, P. Pradhan, *General Relativity and Gravitation* , **48:98 (2016)**, **DOI: 10.1007/s10714-016-2084-8** [Impact Factor: 1.668].

31. **Stability analysis and quasinormal modes of Reissner Nordstrøm Spacetime via Lyapunov exponent**, P. Pradhan, *Pramana* , **87: 5 (2016)**, **DOI: 10.1007/s12043-016-1214-x** [Impact Factor: 0.692].

32. **Thermodynamic products for Sen black hole**, P. Pradhan, *Euro. Phys. J. C.*, 76: 131 (2016), **DOI: 10.1140/epjc/s10052-016-3976-1** [Impact Factor: 5.436].

33. **Area(or entropy) product formula for a regular black hole**, P. Pradhan, *General Relativity and Gravitation* , **48:19 (2016)**, **DOI: 10.1007/s10714-015-2012-3** [Impact Factor: 1.668].

34. **Thermodynamic Product Formula for Taub-NUT Black Hole**, P. Pradhan, *JETP* , **vol. 149, iss. 1 (2016), pp. 1-5**, **DOI: 10.7868/S0044451016010000** [Impact Factor: 0.931 ].

35. **Entropy Product Formula for spinning BTZ Black Hole**, P. Pradhan, *JETP Letters* , **vol. 102, iss. 7 (2015), pp. 481-485**, **DOI: 10.7868/S0370274X15190054** [Impact Factor: 1.359].

36. **Thermodynamic Relations for Kiselev and Dilation Black Hole**, B. Majeed, M. Jamil and P. Pradhan,

*Advances in High Energy Physics*, **Volume 2015 (2015), Article ID 124910, 11 pages**,
**DOI: 10.1155/2015/124910** [Impact Factor: 2.624].

37. **Area Products and Mass Formula for Kerr-Newman-Taub-NUT Spacetime**, P. Pradhan, *Mod. Phys. Lett. A* , **Vol. 30, No. 35 (2015) 1550170**, **DOI:10.1142/S0217732315501709** [Impact Factor: 1.198 ].

38. **Thermodynamic product formula for Hořava-Lifshitz black hole**, P. Pradhan,
*Phys. Lett. B*, **Volume 747, 30 July 2015, Pages 64-67**,
**DOI: 10.1016/j.physletb.2015.05.054** [Impact Factor: 6.131].

39. **Horizon Straddling ISCOs in Spherically Symmetric String Black Holes** P. Pradhan,
*Int. J. Mod. Phys. D (2015)*,
**DOI: 10.1142/S0218271815500868** [Impact Factor: 1.741].

40. **Circular Geodesics in the Kerr-Newman-Taub-NUT Spacetime**, P. Pradhan,
*Classical and Quantum Gravity, Volume 32, Number 16 (2015)*,
**DOI: 10.1088/0264-9381/32/16/165001** [Impact Factor: 3.168].

41. **Charged Dilation Black Holes as Particle Accelerators**, P. Pradhan, *Astroparticle Physics*, **62** (2015) 217-229,
**DOI: 10.1016/j.astropartphys.2014.09.005** [Impact Factor: 4.4].

42. **String black holes as particle accelerators to arbitrarily high energy**, P. Pradhan,
*Astrophys. Space. Sci. Volume 352, Issue 1, pp 129-134* ( July 2014),
**DOI: 10.1007/s10509-014-1896-9** [Impact Factor: 2.401].

43. **Black hole Interior Mass Formula**, P. Pradhan,
*Euro. Phys. J. C.*, 74: 2887 (2014),
**DOI: 10.1140/epjc/s10052-014-2887-2** [Impact Factor: 5.436].

44. **Lense-Thirring Precession in Plebański-Demiański Spacetimes**, C. Chakraborty & P. Pradhan, *Euro. Phys. J. C.*, 73: 2536 (2013),
**DOI: 10.1140/epjc/s10052-013-2536-1** [Impact Factor: 5.436].

45. **Lyapunov exponent and Charged Myers Perry Spacetimes**, P. Pradhan,
*Euro. Phys. J. C.*, 73: 2477 (2013),
**DOI: 10.1140/epjc/s10052-013-2477-8** [Impact Factor: 5.436].

46. **Extremal Limits and Kerr Spacetime**, P. Pradhan & P. Majumdar, *Euro. Phys. J. C.*, 73: 2470 (2013), **DOI: 10.1140/epjc/s10052-013-2470-2** [Impact Factor: 5.436 ].

47. **Circular Orbits in Extremal Reissner Nordstrøm Spacetime**, P. Pradhan & P. Majumdar, *Phys. Lett.* , **A 375** (2011), **DOI: 10.1016/j.physleta.2010.11.015** [Impact Factor: 1.766 ].

**Awaiting Peer Review**

- **Extremal limits and Bañados-Silk-West effect**, P. Pradhan, arXiv:1608.04723 [gr-qc].
- **ISCO, Lyapunov exponent and Kerr-Newman Spacetimes**, P. Pradhan, arXiv:1212.5758 [gr-qc].

**Conference Proceedings**

- **ISCO and Principal Null Congruences in Extremal Kerr Spacetime**, P. Pradhan, *Journal of Physics: Conference Series* 405 (2012) 012027.
- **No ISCOs in Charged Myers Perry Spacetimes by Measuring Lyapunov Exponent**, P. Pradhan, *The Thirteenth Marcel Grossmann Meeting:* pp. 1092-1094, (2015).
- **Lyapunov Exponent and Extremal Black Hole**, P. Pradhan, *The Thirteenth Marcel Grossmann Meeting:* pp. 1378-1379, (2015).
- **Stability of Equatorial Circular Geodesics for Kerr-Newman Spacetime via Lyapunov Exponent**, P. Pradhan, *The Thirteenth Marcel Grossmann Meeting:* pp. 1892-1894, (2015).
- **Extremal Versus Non-Extremal Black Hole**, P. Pradhan, *The Thirteenth Marcel Grossmann Meeting:* pp. 1915-1920, (2015).

**Invited Talk Presented**

- **Lyapunov Exponent and Extremal Reissner Nordstrøm Black Hole**, *Thirteenth Marcel Grossman Meeting held at Stockholm University, Stockholm, 1-7 July, 2012.*
- **Extremal Versus Non-Extremal Black Hole**, *Thirteenth Marcel Grossman Meeting held at Stockholm University, Stockholm, 1-7 July, 2012.*

**Invited Poster Presented**

- **Lense-Thirring Precession in Modified Gravity (MOG)** *International Workshop on Advances in Astroparticle Physics and Cosmology (AAPCOS-2020), Saha Institute of Nuclear Physics (SINP), Kolkata, India, 6-10 January, 2020.*

- **Thermodynamic Product Formula in Modified Gravity and Kerr-MG/CFT Correspondence**, *KIAS-YITP joint workshop-2017 "Strings, Gravity and Cosmology", Yukawa Institute for Theoretical Physics, Kyoto University, Japan, 19-22 September, 2017.*

- **ISCOs in Extremal Gibbons-Maeda-Garfinkle-Horowitz-Strominger Black Holes**, *Equations of Motion in Relativistic Gravity held at Physikzentrum Bad Honnef, Germany, 18-22 February, 2013.*

- **Extremal Limits and Kerr Spacetime**, *Equations of Motion in Relativistic Gravity held at Physikzentrum Bad Honnef, Germany, 18-22 February, 2013.*

- **Stability of Equatorial Circular Geodesics for Kerr-Newman Spacetime via Lyapunov Exponent**, *Thirteenth Marcel Grossman Meeting held at Stockholm University, Stockholm, 1-7 July,2012.*

- **ISCO and Principal Null Congruences in Extremal Kerr Spacetime**, *COSGRAV-2012, held at Indian Statistical Institute, Kolkata, 7-11 February, 2012.*

**Schools/Workshops Attended**

- **Advances in Computational Relativity**, *Institute for Computational and Experimental Research in Mathematics (ICERM), Brown University, September 9-December 11, 2020* (Online mode).

- **Simons Summer Workshop: Cosmology and String Theory July 15 - August 9, 2019**, *Organized by Simon Center For Geometry and Physics, Stony Brook University, USA*

- **US-India Advanced Studies Institute: Classical and Quantum Information**, *Organized by ICTS, Bangalore, India, December 26, 2016-January 6, 2017.*

- **Refresher course in Astronomy and Astrophysics**, *Organized by IUCAA, Pune, India, May 5-June 5, 2015.*

- **UGC Sponsored Refresher course in Methodology in Physicsl Science-Theory & Practice**, *Organized by Academic Staff College, Jadavpur University, Kolkata, India, 22 November-11 December, 2010.*

- **UGC Sponsored Orientation Programme**, *Organized by Academic Staff College, Jadavpur University, Kolkata, India, 20 August-17 September, 2007.*

- **UGC Sponsored Refresher course in Physics**, *Organized by Academic Staff College, University of Calcutta, Calcutta, India, 6-25 November, 2006.*
- **2nd Amal Kumar Raychaudhuri School on General Relativity.**, *Organized by Saha Institute of Nuclear Physics and Indian Association for the Cultivation of Science, Kolkata., October 9-24, 2006.*
- **"Training of Teachers in e-Learning" sponsored by Department of Information Technology, Ministry of Communication & Information Technology, Govt. of India**, *Organized by DOEACC Centre, Kolkata, India, 22 August-23 September, 2005.*