Details: Educational, Teaching and Research Experience

Name: Ayan Chatterjee

Designation: Assistant Professor.

Research interests: Black hole physics, Quantum gravity.

Personal Details

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Professional Qualifications

1. Ph.D., Saha Institute of Nuclear Physics and Homi Bhabha National Institute, (2010).
2. Post M.Sc., from Saha Institute of Nuclear Physics, Kolkata (2003).
3. NET- JRF of CSIR- UGC (2001-2002).

Employment History

Sl. No.	Designation	Institute	Year(s)
1	Post Doctoral Fellow	The Institute of Mathematical Sciences	2010- 2012
2	Post Doctoral Visiting Fellow	Tata Institute of Fundamental Research	2012
3	Post Doctoral Visiting Scientist	Tata Institute of Fundamental Research	2012
4.	Assistant Professor	Central University of Himachal Pradesh	2012 to present

Personal Distinctions

1. IUCAA visiting Associateship, of Inter University Center for Astronomy and Astrophysics, August 1, 2020 - July 31, 2023.
2. Fellow Lifetime Member of IAGRG, Indian Association of General Relativity and Gravitation (IAGRG).
3. Member of Council (2020-2024), Indian Association of General Relativity and Gravitation (IAGRG).

4. IUCAA visiting Associateship, of Inter University Center for Astronomy and Astrophysics, August 1, 2017 - July 31, 2020.

5. Second best paper award, Indian Physical Society, August, 2012.

6. Research Fellowship for Ph.D., Saha Institute of Nuclear Physics (Department of Atomic Energy), 2002-2009.

Invited Seminars and Invited Conference Presentations (last 5 years)

Sl.No.	Title of the Talk	Name of the Conference/ Seminar
1.	Non- Minimal Coupled theory of gravity and black hole entropy	HEPCATS Meeting, IIT Mandi, 27th January, 2023.
2.	Boundary Data for a quantum horizon	32nd Conference and Meeting of the Indian Association for General Relativity and Gravitation, IISER Kolkata, 19-21 December, 2022.
3.	Dynamics and Symmetries of Conformal Killing Horizons.	HEPCATS Meeting, CUHP, 02nd September, 2022.
4.	Exact solutions in higher curvature theories	HEPCATS Meeting, IISER Mohali, 18th December, 2021.
5.	Trapped Surfaces in Gravity	HEPCATS Meeting, IIT Ropar, 31st July- 1st August, 2021.
6.	Supertranslations for a dynamical horizon	HEPCATS Meeting, IISER Mohali, 30th January, 2021.
7.	How to find Trapped Surfaces in Gravitational Collapse	HEPCATS Meeting, IISER Mohali, 30-31 July, 2020.
8.	Exponential Corrections to Black Hole Entropy	Meeting of IAGRG, IIT Gandhinagar, December 19- 20, 2020
9.	Trapped surfaces: Classical and quantum aspects	Seminar at Department of Physics, IIT Kharagpur, September 10, 2020
10.	Entropy of Black Holes from Horizon Microstates	HEPCATS Meeting, IISER Mohali, 7th December, 2019.
11.	Quasilocal conformal Killing horizons	International Conference on General Relativity and Cosmology (ICGC), IISER Mohali, December 14-18, 2015.
12.	First law of black holes from local Lorentz transformations	Meeting of IAGRG, 2017, IIT Guwahati, May 18-20, 2017.

Thesis Supervision

1. M.Sc. Thesis: 29 completed, 3 in progress.

2. Ph.D. thesis:

Name of the Scholar	Title of the Thesis	Awarded/ Submitted	Month and Year
Suresh Chand	Studies on formation and evolution of compact objects in the Universe	Awarded	February, 2022
Akshay Kumar	Spacetime geometry in strong fields (project JRF)	Ongoing	2020- ongoing
Sahil Devdutt	Synopsis not yet submitted	Ongoing	2022- ongoing

Research Projects and Income

Sl. No.	Title of the Project	Funding Agency	Project Status completed / on-going
1.	Mechanics and theormodynamics of black holes in gravity and supergravity	UGC (6.00 Lakh)	Completed
2.	NPDF for Dr. Avirup Ghosh at CUHP (PDF/2016/003009)	DST- SERB	Funding approved, Dr. Ghosh did not join.
3.	Analytical and Numerical study of black holes in strong gravity regime	DAE- BRNS (Rs. 27, 37,350.00)	Ongoing
4.	Gravitational Imprisonment: Trapped Surfaces in Gravitational Collapse	DST- MATRICS (Rs. 6,60,000.00)	Ongoing (Till February, 2023)
5.	DST- Inspire with Mr. Sahil DevDutt	DST- Inspire	Ongoing

Professional Contributions (last 7 years)

1. Organised School of Gravitation, and Astroparticle Physics (SGAP), at CUHP, 2016.
2. Convenor, HEPCATS meeting, CUHP, 02nd September, 2022.
3. Organised talks and seminars in DPAS, CUHP.

Teaching

B.Sc.: Mathematical physics-I (Theory and Lab), Mathematical physics -III (Theory and Lab), Thermal physics (Theory and Lab), Classical dynamics (Theory and Lab).

M.Sc.: Quantum mechanics I, Quantum mechanics II, Quantum field theory, Gauge theory, Quantum chromodynamics, Classical mechanics, Mathematical physics, statistical mechanics, Atomic, molecular and laser physics, general physics laboratory, modern physics laboratory.

University Administration

- Member, School board, School of Physical and Material Sciences, CUHP (2012-2015).
- Member, Board of studies, Department of Physics and Astronomical Science, CUHP (2012-2015).
- Member, Admission committee, CUHP.
- RD Coordinator, Department of Physics and Astronomical Science, CUHP.

Publications

Sl. No.	Title of the Article/ Paper	Name of the journal	Vol. No. Page and Year	Impact Factor (Thomson- Reuters)
1.	Spherical gravitational collapse in 4D Einstein–Gauss–Bonnet theory.	Physics of the Dark Universe	Vol-39 Page-101171 (2023).	5.09
2.	Gravitational Collapse in the Einstein- Gauss-Bonnet Gravity	Physical Review D	Vol- 106 No.- 4, Page-044049 (2022).	5.407
3.	Gravitationally collapsing stars in f(R) gravity	Eur. Phys. J. C	Vol-81,No.4, Page- 273 (2021).	4.991
4.	Dynamical horizons and supertranslation transitions of the horizon	Physical Review D	Vol-103,No-2, Page-024046 (2021).	5.407
5.	Exponential Corrections to Black Hole Entropy	Physical Review Letters	Vol- 125,No.-4, Page- 041302 (2020).	9.185
6.	Marginally trapped surfaces in spherical gravitational collapse	Physical Review D	Vol-102,No-6, Page-064048 (2020).	5.407

7.	Joining spacetimes on fractal hypersurfaces	Nuclear Physics B	Vol-940,pg, 239, (2019).	2.759
8.	Quasilocal first law of black hole dynamics from local Lorentz transformations	European Physical Journal C	Vol-78, No-7, page-550 (2018).	4.991
9.	Entropy of black holes in N=2 Supergravity	Indian Journal of Physics	Vol-92, No-7, pg-927 (2018).	1.947
10.	Quasilocal rotating conformal Killing Horizons	Physical Review D	Vol-92, No-4, Page-044003 (2015).	5.407
11.	Quasilocal conformal Killing Horizons: Classical phase space and the first law	Physical Review D	Vol-91, Page-064054 (2015).	5.407
12.	Hawking radiation from dynamical horizons	Physical Review D	Vol-87, No-8 Page-084051 (2013).	5.407
13.	Local Symmetries of Non- expanding horizons	Classical and Quantum Gravity	Vol-29 page-235010 (2012).	3.528
14.	Physical process first law and increase of horizon entropy for black holes in Gauss-Bonnet gravity	Physical Review Letters	Vol- 108 Page- 091301 (2012).	9.185
15.	Horizon mechanics and asymptotic symmetries with a Immirzi like parameter	Classical and Quantum Gravity	Vol-28 page-225013 (2011)	3.528
16.	Gauge invariant coupling of fields to torsion: a string inspired model	Physical Review D	Vol-83, Page-106007 (2011).	5.407
17.	Non- minimally coupled scalar fields. Holst action and Black hole mechanics	Annals of Physics	vol-326 pg- 307, (2011).	2.73

18.	Laws of Black Hole Mechanics from Holst Action	Physical Review D	Vol-80 Page- 064036 (2009).	5.407
19.	Generic weak isolated horizons	Classical and Quantum Gravity	Vol- 23 page-7521 (2006)	3.528
20.	Kalb-Ramond field interactions in a braneworld scenario	Physical Review D	Volume-72 Pg-066013 (2005)	5.40