Faculty Profile

1. Name: Nabarun Chakrabarty

2. Designation: Assistant Professor, Department of Physics, Siksha Bhavana, Visva-Bharati

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7. Research ID: https://scholar.google.com/citations?user=sQrsBr0AAAAJ&hl=en

8. Membership of Learned Societies: NA

9. Homepage: NA

10. Publication Summary

No. of Research papers - 29 (Published)

No. of Book Chapters - 0

No. of Conference papers - 2

h-index - 17

i-10 index - 20

11. Date of Joining Visva-Bharati: 18.12.2023

12. Education

Degree	Year	University/Institution
Ph.D. (Theoretical Particle Physics)	2017	Harish-Chandra Research Institute, Allahabad, India
M.Sc. (Physics)	2011	University of Calcutta,

		Kolkata, India
B.Sc. Hons. (Physics)	2009	Bidhannagar Govt. College, University of Calcutta, Kolkata, India

13. Academic Positions held (in reverse chronological order)

S. No	Positions held	Institution	Period
1.	Assistant Professor	Visva-Bharati, Santiniketan, India	2023 - Present
2.	Assistant Professor (Senior Grade)	Jaypee Institute of Information Technology, Noida, India	2023 - 2023
3.	DST INSPIRE Faculty	IIT Kanpur, India	2020 - 2023
4.	C V Raman Postdoctoral Fellow	Indian Institute of Science, Bengaluru, India	2019 - 2020
5.	Postdoctoral Fellow	National Center for Theoretical Sciences, Hsinchu, Taiwan	2017 - 2019

14. Areas of Research

Electroweak radiative corrections, Rare Higgs decays, Electroweak vacuum stability, Chern-Simons geometry, Particle dark matter, Cosmological phase transitions, Gravitational Wave signatures, Collider physics

15. Subject Specialization

Theoretical particle physics, Beyond Standard Model physics, Dark matter, Higgs physics, Interface of particle physics and cosmology

16. Courses taught/Currently teaching

Undergraduate Courses	Mathematical Methods II (CBCS), Mathematical Methods III (CBCS), Statistical Mechanics lab (CBCS), Electricity and Magnetism (NEP), Computational Physics (NEP)

Postgraduate Courses	Classical Mechanics, Computational Physics
Ph.D. Course-work	

17. Research Guidance

(a) No. of Postdoctoral fellows (Completed / Ongoing): 0

(b) No. of Postdoctoral students (Completed / Ongoing): 0

(c) No. of M.Sc. dissertations (Completed / Ongoing): 2

18. Research Collaboration

National: Indian Association for the Cultivation of Science; IISER Berhampur; IIT Guwahati, Physical Research Laboratroy; Indian Institute of Science

International: NCTS, Taiwan; LAPTh, France; Kyushu University, Japan, University of Witwatersrand, South Africa

19. Research Grants/Projects

S. No.	Project Title	PI/Co-PI	Funding Agency	Amount / Period
1.	New physics through extended Higgs sectors: theoretical and experimental perspectives	PI	DST INSPIRE Faculty Award	35 Lakhs INR / 5 years

20. Professional Recognition / Award / Prize / Fellowship

Sl. No.	Name of Award	Awarding Agency	Year
1.	INSPIRE Faculty Award	DST, Govt. of India	2020
2.	Institute Postdoctoral Fellowship	IIT Kanpur, India	2019
3.	HETG Postdoctoral Fellowship	Academia Sinica, Taiwan	2019
4.	Postdoctoral Fellowship	Eotvos Lorand University, Hungary	2019
5	C V Raman postdoctoral fellowship	Indian Institute of Science, India	2019
6.	Postdoctoral Fellowship	National Center for Theoretical	2017

		Sciences, Taiwan	
7.	Postdoctoral Fellowship	Tata Institute of Fundamental Research, India	2017
8.	Postdoctoral Fellowship	Institute of Theoretical Physics, Chinese Academy of Sciences, China	2016
9.	Infosys Award	Harish-Chandra Research Institute, India	2016
10.	Sujan Kumar Seal Memorial Scholarship (awarded for securing a rank 1 in the M.Sc. Examination, Dept. of Physics)	University of Calcutta, India	2011
11.	Prof. S.N. Bose Memorial Prize (awarded to the best outgoing student in the M.Sc. Batch, Dept. of Physics)	University of Calcutta, India	2011
12.	AIR 25 in Joint Entrance Screening Test (JEST)	Institute of Mathematical Sciences, India	2011
13.	AIR 16 in Graduate Aptitude Test in Engineering (GATE)	IIT Madras, India	2011
14.	AIR 02 in National Eligibility Test (NET)	CSIR, India	2011
15.	AIR 05 in IIT-JAM	IIT Kharagpur, India	2009

21. Books/Book Chapters: NA

22. Details of Patents: NA

23. Talks Delivered at International / National Conferences / Seminars / Symposium

• Fermi-ball in a multicomponent dark matter framework and its gravitational wave signatures

– Conference Talk, Phoenix, IIT Hyderabad, July 12, 2025

• Dark matter relic density beyond the leading order: A case study

– Invited Seminar, IISER Thiruvananthapuram, June 28, 2023

• Thermally corrected masses and freeze-in dark matter: a case study

– Conference Talk, IMHEP 2022, IOP Bhubaneswar, Feb 16–23, 2023

• Fingerprinting the contribution of colored scalars to the H+W−Z(γ) vertex

– Seminar, Pheno Coffee Journal Club, CHEP, IISc Bangalore, Aug 2021

• Charged scalars confronting the neutrino mass and the muon g−2 anomaly

– Invited Seminar, HRI, Feb 2019

– Invited Seminar, IIT Kanpur, Feb 2019

– Invited Talk, Annual Theory Meeting, NCTS Taiwan, Dec 2018

– Conference Talk, HEP Phenomenology XVI, IIT Guwahati, Dec 2019

– Seminar, CHEP In-house Symposium, IISc Bangalore, Jan 2020

• Dark matter relic density beyond the leading order

– Invited Talk, Director's Seminar, NCTS Taiwan, May 2019

• Extended Higgs sectors, vacuum stability and related issues

– Invited Seminar, Academia Sinica, Taiwan, June 2018

– Invited Seminar, National Taiwan University, June 2018

– Invited Seminar, IACS Kolkata, April 2018

– Invited Seminar, IIT Guwahati, April 2018

• Quantum effects in the inert doublet model post Higgs discovery

– Conference Talk, CHEP, IISc Bangalore, Dec 2016

• Vacuum (meta)stability with multi-Higgs doublets and dark matter

– Academic Visit, Orsay, France, June 2016

– Academic Visit, Grenoble, France, June 2016

– Academic Visit, Annecy, France, May 2016

– Academic Visit, Bonn, Germany, May 2016

– Academic Visit, Oxford, UK, May 2016

– Academic Visit, Durham, UK, May 2016

• Vacuum stability in two-Higgs doublets and dark matter

– Workshop Talk, Kavli-IPMU-Durham-KIAS Workshop, Tokyo, Sept 2015

– Conference Talk, XXI DAE-BRNS HEP Symposium, IIT Guwahati, Dec 2014

24. List of Scientific Publications

29. Single-step first order phase transition and gravitational waves in a SIMP dark matter scenario, Nabarun Chakrabarty, Himadri Roy, Tripurari Srivastava, Nuclear Physics B 998 (2024) 116392.

28. The muon g − 2 and W -mass anomalies explained and the electroweak vacuum stabilised by extending the minimal Type-II seesaw, Nabarun Chakrabarty, Physical Review D 108 (2023) 075024.

27. Muon g − 2 and W -mass in a framework of colored scalars: an LHC perspective, Nabarun Chakrabarty*, Indrani Chakraborty, Dilip Kumar Ghosh, Gourab Saha, The European Physical Journal C 83 (2023) 870.

26. Muon g − 2 in a 2HDM assisted by inert scalars: probing at the ILC, Nabarun Chakrabarty*, Indrani Chakraborty, Physical Review D 107 (2023) 075013.

25. Muon g − 2 in a Type-X 2HDM assisted by inert scalars: probing at the LHC, Nabarun Chakrabarty, Physical Review D 107 (2023) 075012.

24. Thermally corrected masses and freeze-in dark matter: a case study, Nabarun Chakrabarty*, Partha Konar, Rishav Roshan, Sudipta Show, Physical Review D 107 (2023) 035021.

23. Two Component Doublet-Triplet Scalar Dark Matter stabilising the Electroweak vacuum, Nabarun Chakrabarty*, Rishav Roshan, Arunansu Sil, Physical Review D (2022) 11, 115010.

22. Flavour-alignment in an S3-symmetric Higgs sector and its RG-behaviour, Nabarun Chakrabarty*, Indrani Chakraborty, Chinese Physics C 46 (2022) 12, 123102.

21. Doubly charged scalars and vector-like leptons confronting the muon g − 2 anomaly and Higgs vacuum stability, Nabarun Chakrabarty, The European Physical Journal Plus 136 (2021) 11, 1183.

20. Relic density of dark matter in the inert doublet model beyond leading order for the low mass region: 1. Renormalisation and constraints, Shankha Banerjee, Fawzi Boudjema, Nabarun Chakrabarty*, Hao Sun, Physical Review D 104 (2021) 075002.

19. Relic density of dark matter in the inert doublet model beyond leading order for the low mass region: 2. Co-annihilation, Shankha Banerjee, Fawzi Boudjema, Nabarun Chakrabarty*, Hao Sun, Physical Review D 104 (2021) 075003.

18. Relic density of dark matter in the inert doublet model beyond leading order for the low mass region: 3. Annihilation in 3-body final state, Shankha Banerjee, Fawzi Boudjema, Nabarun Chakrabarty*, Hao Sun, Physical Review D 104 (2021) 075004.

17. Relic density of dark matter in the inert doublet model beyond leading order for the low mass region: 4. The Higgs resonance region, Shankha Banerjee, Fawzi Boudjema, Nabarun Chakrabarty*, Hao Sun, Physical Review D 104 (2021) 075005.

16. Probing the H±W∓Z interaction at the high energy upgrade of the LHC, Amit Adhikary, Nabarun Chakrabarty, Indrani Chakraborty, Jayita Lahiri, The European Physical Journal C 81 (2021) 6, 554.

15. Fingerprinting the contribution of colored scalars to the H+W−Z(γ) vertex, Nabarun Chakrabarty*, Indrani Chakraborty, Dilip Kumar Ghosh, The European Physical Journal C 80 (2020) 12, 1120.

14. Multicomponent dark matter in extended U(1)_{B−L}: neutrino mass and high scale validity, Subhaditya Bhattacharya, Nabarun Chakrabarty*, Rishav Roshan, Arunansu Sil, Journal of Cosmology and Astroparticle Physics 04 (2020) 013.

13. Relic density of Dark Matter in the Inert Doublet Model beyond Leading Order. I) The Heavy Mass Case, Shankha Banerjee, Fawzi Boudjema, Nabarun Chakrabarty*, Guillaume Chalons, Hao Sun, Physical Review D 100 (2019) 9, 095024.

12. A revisit to scalar dark matter with radiative corrections, Shankha Banerjee, Nabarun Chakrabarty*, Journal of High Energy Physics 1905 (2019) 150.

11. Ameliorating the Higgs mass fine-tuning problem with multi-Higgs doublet models, Nabarun Chakrabarty, Indrani Chakraborty, International Journal of Modern Physics A 34 (2019) no.05, 1950025.

10. Charged scalars confronting neutrino mass and muon g-2 anomaly, Nabarun Chakrabarty*, Cheng-Wei Chiang, Takahiro Ohata, Koji Tsumura, Journal of High Energy Physics 1812 (2018) 104.

9. High-scale validity of a two Higgs doublet scenario: predicting collider signals, Nabarun Chakrabarty*, Biswarup Mukhopadhyaya, Physical Review D 96 (2017) 035028.

8. Diphoton excess via Chern-Simons interaction in a warped geometry scenario, Nabarun Chakrabarty*, Biswarup Mukhopadhyaya, Soumitra SenGupta, Physical Review D 95 (2017) 015007.

7. High-scale validity of a two Higgs doublet scenario: metastability included, Nabarun Chakrabarty*, Biswarup Mukhopadhyaya, The European Physical Journal C 77 (2017) no.3, 153.

6. Phenomenological signatures of additional scalar bosons at the LHC, Stefan von Buddenbrock, Nabarun Chakrabarty, Alan S. Cornell, Deepak Kar, Mukesh Kumar, Tanumoy Mandal, Bruce Mellado, Biswarup Mukhopadhyaya, Robert G. Reed, Xifeng Ruan, The European Physical Journal C 76 (2016) 580.

5. High-scale validity of a model with Three-Higgs-doublets, Nabarun Chakrabarty, Physical Review D 93 (2016) 075025.

4. Same-sign tri-leptons with a left-sneutrino as the lightest minimal supersymmetric particle, Nabarun Chakrabarty, Arindam Chatterjee, Biswarup Mukhopadhyaya, Physics Letters B 754 (2016) 14-17.

3. Dark matter, neutrino masses and high scale validity of an inert Higgs doublet model, Nabarun Chakrabarty*, Dilip Kumar Ghosh, Biswarup Mukhopadhyaya, Ipsita Saha, Physical Review D 92 (2015) 015002.

2. Radiative Return for Heavy Higgs Boson at a Muon Collider, Nabarun Chakrabarty*, Tao Han, Zhen Liu, Biswarup Mukhopadhyaya, Physical Review D 91 (2015) 015008.

1. High-scale validity of a two-Higgs doublet scenario: a study including LHC data, Nabarun Chakrabarty*, Ujjal Kumar Dey, Biswarup Mukhopadhyaya, Journal of High Energy Physics 12 (2014) 166.

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Last updated on (15 / 09/ 2025)