

### Faculty Profile

1. Name: **ROHIT KUMAR**
2. Designation: **Assistant Professor**
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4. Date of Birth: **01-05-1985**
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6. Address: **Department of Physics, Siksha Bhavana, Visva-Bharati, Santiniketan-731235 West Bengal**
7. Research ID (Google Scholar, ORCID ID, Scopus ID, WOS ID, Vidyan ID, Research Gate):  
**Google scholar:** <https://scholar.google.com/citations?user=TdhZgkwAAAAJ&hl=en>  
**ORCID:** 0000-0002-8840-6261 (<https://orcid.org/0000-0002-8840-6261>)  
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**Research Gate ID:** <https://www.researchgate.net/profile/Rohit-Kumar-112/research>
8. Membership of Learned Societies: **NO**
9. Homepage (If any): **NO**
10. Publication Summary:
  - (a) No. of Research papers: **24 (Published)**
  - (b) No. of Book Chapters: **0**
  - (c) No. of Conference papers: **-0**
  - (d) h-index: **10** (Source: Google scholar)
  - (e) i-10 index: **11** (Source: Google scholar)
11. Date of Joining Visva-Bharati Service: **29-09-2022**
12. Education:

| Degree | Year | University/Institution                   |
|--------|------|------------------------------------------|
| Ph. D. | 2013 | Banaras Hindu University, Varanasi       |
| M. Sc. | 2007 | Banaras Hindu University, Varanasi       |
| B. Sc. | 2005 | Gurukula Kangri Viswavidyalaya, Haridwar |

### 13. Academic Positions held (in reverse chronological order)

| Sl. No. | Positions held                     | Institution                                                         | Period               |
|---------|------------------------------------|---------------------------------------------------------------------|----------------------|
| 1       | Assistant Professor                | Visva-Bharati, Santiniketan, West Bengal                            | Sep. 2022 to Present |
| 2       | Assistant Professor                | GLA University, Mathura, Uttar Pradesh                              | Jan. 2022- Sep. 2022 |
| 3       | Guest Faculty                      | University of Delhi, New Delhi                                      | Sep. 2021- Jan. 2022 |
| 4       | Post-Doctoral Fellow               | University of Delhi, New Delhi                                      | Apr. 2016- Apr. 2021 |
| 5       | Post-Doctoral Research Associate-I | S. N. Bose National Centre for Basic Sciences, Kolkata, West Bengal | Nov. 2013- Nov. 2015 |

14. Areas of Research:

- p-Form ( $p = 1, 2, 3, \dots$ ) Gauge Theories
- BRST Symmetries and Supersymmetries
- Constrained dynamics

15. Subject Specialization: Theoretical High Energy Physics (THEP)

16. Courses Teach / Taught:

|                       |                                                                          |
|-----------------------|--------------------------------------------------------------------------|
| Undergraduate Courses | Mathematical Physics, Electromagnetic Theory, Thermal Physics, Mechanics |
| Postgraduate Courses  | Quantum Field Theory                                                     |
| Ph.D. Course-work     | ----                                                                     |

17. Research Guidance:

- (a) No. of Postdoctoral students (Completed / Ongoing): **0**
- (b) No. of Doctoral students (Completed / Ongoing): **0**
- (c) No. of M.Sc. Dissertations: **07**

18. Research Collaboration (National / International): **NA**

19. Research Grants/Projects: **NIL**

| Sl. No. | Project Title | PI/Co-PI | Funding Agency | Amount | Completed/Ongoing |
|---------|---------------|----------|----------------|--------|-------------------|
|         |               |          |                |        |                   |

20. Professional Recognition/ Award/ Prize/Fellowship

| Sl. No. | Name of Award                | Awarding Agency | Year |
|---------|------------------------------|-----------------|------|
| 1       | UGC Post-Doctoral Fellowship | UGC, New Delhi  | 2016 |
| 2       | CSIR-UGC NET-JRF             | UGC, New Delhi  | 2008 |

21. Books / Book Chapters: **NIL**

| Sl. No. | Title | Name of Author(s) | Publisher | Year of Publication |
|---------|-------|-------------------|-----------|---------------------|
|         |       |                   |           |                     |

22. Detail of Patent received (if any): **NIL**

| Sl. No. | Patent Title | Name of Applicant(s) | Patent No. | Award Date | Agency/Country |
|---------|--------------|----------------------|------------|------------|----------------|
|         |              |                      |            |            |                |

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

1. *Continuous and Discrete Duality symmetries in 3D Field-Theoretic Model*  
International Conference on “Astroparticle Physics, Gravitation and Cosmology (APGC 2025)”  
GLA University, Mathura (2025)
2. *(Anti-)BRST Symmetries in FLRW in Model*  
3<sup>rd</sup> International Conference on “Advancement in Core and Frontier of Physics (ACFP-2024)”  
GLA University, Mathura (2024)
3. *Gauge-invariant massive 2-form theory: Augmented superfield formalism*  
Symposium on “Advances in Physics from Small to Large Scales (APSLS-2019)”  
Kumaun University, Nainital (2019)
4. *Massive 2-form theory*  
International Conference on “New Trends in Field Theories (NTFT-6)”  
Banaras Hindu University, Varanasi, India (2018)
5. *Gauge-invariant massive 2-form theory: Augmented superfield formalism*  
35<sup>th</sup> “Young Physicists’ Colloquium (YPC-2017)”  
Saha Institute of Nuclear Physics, Kolkata, India (2017)
6. *BRST symmetries in Jackiw-Pi model: Augmented superfield formalism*  
International Conference on “New Trends in Field Theories (NTFT-5)”  
Banaras Hindu University, Varanasi, India (2016)
7. *Free particle system on toric geometry: Superfield formalism*  
International Conference on “New Trends in Field Theories (NTFT-4)”  
Banaras Hindu University, Varanasi, India (2014)
8. *Supersymmetric Harmonic Oscillator: A model for Hodge theory*  
International Conference on “New Trends in Field Theories (NTFT-3)”  
Banaras Hindu University, Varanasi, India (2012)
9. *Modified version of 2D anomalous gauge theory: Some symmetries*  
XIX DAE-BRNS Symposium on High Energy Physics  
LNMIIT, Jaipur, India (2010)

### 24. List of Scientific Publications:

1. Aradhya Shukla, Dharm Veer Singh and **R. Kumar**  
(Anti-)BRST Symmetries in FLRW Model: Supervariable Approach  
Eur. Phys. J. Plus **139**, 201 (2024).
2. Ansha S. Nair, **R. Kumar** and Saurabh Gupta  
FLPR Model: Supervariable approach and a model for Hodge theory  
Eur. Phys. J. Plus **138**, 1107 (2023).
3. Debmalaya Mukhopadhyay, **R. Kumar** and Jan-e Alam  
The Polyakov loop dependence of bulk viscosity of QCD matter  
Nucl. Phys. B **974**, 115635 (2022).

4. S. Krishna, **R. Kumar** and R. P. Malik  
A massive field-theoretic model for Hodge theory  
Annals Phys. **414**, 168087 (2020).
5. Debmalaya Mukhopadhyay, **R. Kumar**, Jan-e Alam and Sushant K. Singh  
Hard thermal loop effective action of topologically massive gluons in 3+1 dimensions  
Phys. Rev. D **101**, 074039 (2020).
6. **R. Kumar** and A. Shukla  
Christ-Lee Model: Augmented supervariable approach  
Adv. High Energy Phys. **2018**, 7381387 (2018).
7. **R. Kumar** and Debmalaya Mukhopadhyay  
(3 + 1)-Dimensional topologically massive 2-form gauge theory: geometrical superfield approach  
Eur. Phys. J. C **78**, 452 (2018).
8. **R. Kumar** and S. Krishna  
Augmented superfield approach to gauge-invariant massive 2-form theory  
Eur. Phys. J. C **77**, 387 (2017).
9. S. Gupta and **R. Kumar**  
On augmented superfield approach to vector Schwinger model  
Int. J. Mod. Phys. A **31**, 1650173 (2016).
10. **R. Kumar** and A. Shukla  
Novel symmetries in Christ-Lee model  
Euro. Phys. Lett. **115**, 21003 (2016).
11. **R. Kumar**, S. Gupta and R. P. Malik  
Basic brackets of a 2D model for the Hodge theory without its canonical momenta  
Int. J. Theor. Phys. **55**, 2857 (2016).
12. S. Gupta and **R. Kumar**  
Nilpotent symmetries in Jackiw-Pi Model: augmented superfield approach  
Int. J. Theor. Phys. **55**, 927 (2016).
13. **R. Kumar**  
Off-shell nilpotent (anti-)BRST symmetries for a free particle system on a toric geometry: superfield formalism  
Euro. Phys. Lett. **106**, 51001 (2014).
14. **R. Kumar**, S. Krishna, A. Shukla and R. P. Malik  
Abelian p-form ( $p = 1, 2, 3$ ) gauge theories as the field theoretic models for the Hodge theory  
Int. J. Mod. Phys. A **29**, 1450135 (2014).
15. S. Gupta, **R. Kumar** and R. P. Malik  
Superfield approach to nilpotent symmetries in 3D Jackiw-Pi model of massive non-Abelian theory  
Can. J. Phys. **92**, 1033 (2014).
16. **R. Kumar**, S. Gupta and R. P. Malik  
An interacting gauge field theoretic model for the Hodge theory: basic canonical brackets  
Commun. Theor. Phys. **61**, 715 (2014).

17. **R. Kumar** and R. P. Malik  
Novel discrete symmetries in the general  $N = 2$  supersymmetric quantum mechanical model  
Eur. Phys. J. C **73**, 2514 (2013).
18. S. Gupta, **R. Kumar**  
Augmented superfield approach to non-Yang-Mills symmetries of Jackiw-Pi model: novel observations  
Mod. Phys. Lett. A **28**, 1350011 (2013).
19. **R. Kumar** and R. P. Malik  
Supersymmetric oscillator: novel symmetries  
Euro. Phys. Lett. **98**, 11002 (2012).
20. **R. Kumar**, S. Krishna, A. Shukla and R. P. Malik  
Dual-BRST symmetry: 6D Abelian 3-form gauge theory  
Eur. Phys. J. C **72**, 1980 (2012).
21. **R. Kumar** and R. P. Malik  
BRST analysis of topologically massive gauge theory: novel observations  
Eur. Phys. J. C **71**, 1710 (2011).
22. **R. Kumar** and R. P. Malik  
New observations in the BRST analysis of dynamical non-Abelian 2-form gauge theory  
Euro. phys. Lett. **94**, 11001 (2011).
23. S. Gupta, **R. Kumar** and R. P. Malik  
Absolutely anticommuting (Anti-)BRST symmetry transformations for topologically massive Abelian gauge theory  
Eur. Phys. J. C **70**, 491 (2010).
24. Gupta, **R. Kumar** and R. P. Malik  
On the free 4D Abelian 2-form and anomalous 2D Abelian 1-form gauge theories  
Eur. Phys. J. C **65**, 311 (2010).

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