Rohit Kumar

Assistant Professor

ORCID:0000-0002-8840-6261
Vidvan ID: 316604

Personal Information

Date Of Birth 01st May 1985

Address (Office) Department of Physics, Siksha Bhavana, Visva-Bharati, Santiniketan
Bolpur-731235, West Bengal, India

E-mails rohit.kumar@visva-bharati.ac.in
raviphynuc@gmail.com

Mobile No. +91-8335848762

Nationality Indian

Languages English & Hindi

Research Interests

- p-Form $(p = 1, 2, 3, ...)$ Gauge Theories
- BRST Symmetries and Supersymmetries
- Quantum Field theory
- Differential geometry and Gravity
- Constrained dynamics

Teaching Experience

Sep 2022- Present **Assistant Professor**
Department of Physics, Siksha Bhavana, Visva-Bharati, Santiniketan, West Bengal

Jan 2022- Sep 2022 **Assistant Professor**
Department of Physics, GLA University, Mathura, Uttar Pradesh

Sep 2021- Jan 2022 **Guest Faculty**
Department of Physics & Astrophysics, University of Delhi, Delhi

Research Experience

Apr 2016- Apr 2021 **Post-Doctoral Fellow**, *UGC, India*
Department of Physics & Astrophysics, University of Delhi, Delhi

Nov 2013- Nov 2015 **Post-Doctoral Research Associate-I**
Department of Theoretical Sciences
S. N. Bose National Centre for Basic Sciences, Kolkata, West Bengal

Education

2008-2013 **Ph. D. (Physics)**, *Banaras Hindu University, Varanasi.*
Thesis Title *BRST Approach to p-Form ($p = 1, 2, 3$) Gauge Theories*
Thesis Supervisor **Prof. R. P. Malik**

2007 **M.Sc. (Physics)**, *Banaras Hindu University, Varanasi*

2005 **B.Sc. (Physics, Mathematics)**, *Gurukula Kangri Viswavidyalaya, Haridwar*

Computer Skills

Tools & Technologies Microsoft Office, LaTeX, FOTRAN 77

Award & Fwllowship

Dec 2008 **CSIR-UGC NET JRF** - Physical Sciences

2016-2021 **UGC Post-Doctoral Fellowship**
Project Title Some Investigations in Higher Form Gauge Theories and Supersymmetry

Publications

2022 Debmalya Mukhopadhyay, **R. Kumar**, Jan-e Alam
The Polyakov loop dependence of bulk viscosity of QCD matter
Nucl. Phys. B **974**, 115635 (2022) [arXiv:2001.03947[hep-th]]

2020 S. Krishna, **R. Kumar** and R. P. Malik
A massive field-theoretic model for Hodge theory[1]
Annals Phys. **414**, 168087 (2020) [arXiv:1809.07664[hep-th]]

2020 Debmalya 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) [arXiv:1905.01721[hep-th]]

2018 **R. Kumar** and A. Shukla
Christ-Lee Model: Augmented supervariable approach
Adv. High Energy Phys. **2018**, 7381387 (2018) [arXiv:1702.04134[hep-th]]

2018 **R. Kumar** and Debmalya Mukhopadhyay

$(3+1)$-Dimensional topologically massive 2-form gauge theory: geometrical superfield approach

Eur. Phys. J. C **78**, 452 (2018) [arXiv: 1710.04882[hep-th]]

2017 **R. Kumar** and S. Krishna

Augmented superfield approach to gauge-invariant massive 2-form theory

Eur. Phys. J. C **77**, 387 (2017) [arXiv: 1705.00452[hep-th]]

2016 S. Gupta and **R. Kumar**

On augmented superfield approach to vector Schwinger model

Int. J. Mod. Phys. A **31**, 1650173 (2016) [arXiv: 1608.01613[hep-th]]

2016 **R. Kumar** and A. Shukla

Novel symmetries in Christ-Lee model

Euro. Phys. Lett. **115** , 21003 (2016) [arXiv: 1512.08241[hep-th]]

2016 **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) [arXiv: 1401.2590 [hep-th]]

2016 S. Gupta and **R. Kumar**

Nilpotent symmetries in Jackiw-Pi Model: augmented superfield approach

Int. J. Theor. Phys. **55**, 927 (2016) [arXiv:1411.6357[hep-th]]

2014 **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) [arXiv:1406.1348 [hep-th]]

2014 **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[2]

Int. J. Mod. Phys. A **29**, 1450135 (2014) [arXiv:1203.5519 [hep-th]]

2014 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) [arXiv:1108.1547 [hep-th]]

2014 **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) [arXiv:0908.2561 [hep-th]]

2013 **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) [arXiv:1303.5253 [hep-th]]

2013 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) [arXiv:1212.6143 [hep-th]]

2012 **R. Kumar** and R. P. Malik
Supersymmetric oscillator: novel symmetries
Euro. Phys. Lett. **98**, 11002 (2012) [arXiv:1110.0097 [hep-th]]

2012 **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) [arXiv:1111.5907 [hep-th]]

2011 **R. Kumar** and R. P. Malik
BRST analysis of topologically massive gauge theory: novel observations
Eur. Phys. J. C **71**, 1710 (2011) [arXiv:1104.1340 [hep-th]]

2011 **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) [arXiv:1012.5195 [hep-th]]

2010 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) [arXiv:1003.3390 [hep-th]]

2010 S. 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) [arXiv:0905.0934 [hep-th]]

***Complete list of publications is available at**  **and**  .

Talks, Conferences, Schools & Workshops Attended

2019 *Gauge-invariant massive 2-form theory: Augmented superfield formalism*
Symposium on "Advances in Physics from Small to Large Scales" (APSLS-2019)
Kumaun University, Nainital

2018 *Massive 2-form theory"*
International Conference on "New Trends in Field Theories (NTFT−6)"
Banaras Hindu University, Varanasi, India

2017 *Gauge-invariant massive 2-form theory: Augmented superfield formalism*
"35^{th} Young Physicists' Colloquium (YPC–2017)"
Saha Institute of Nuclear Physics, Kolkata, India

2016 *"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 GIAN: Workshop on "Cosmological & Theoretical Applications of Exact Solutions of Einstein's Equation"
CTP, Jamia Millia Islamia, Delhi

2014 *"Free particle system on toric geometry: Superfield formalism"*
International Conference on "New Trends in Field Theories (NTFT−4)"
Banaras Hindu University, Varanasi, India

2012 6^{th} One Day Conference on "New Trends in Research"
Banaras Hindu University, Varanasi, India

2012 *"Supersymmetric Harmonic Oscillator: A model for Hodge theory*
International Conference on "New Trends in Field Theories (NTFT−3)"
Banaras Hindu University, Varanasi, India

2011 International Conference on "QFT-2011"
IISER-Pune, Pune, India

2011 International Conference on "New Trends in Field Theories (NTFT−2)"
Banaras Hindu University, Varanasi, India

2011 Workshop on "Recent Trends in Nuclear & Particle Physics"
UGC Networking Programme, Banaras Hindu University, Varanasi, India

2010 *"Modified version of 2D anomalous gauge theory : Some symmetries"*
XIX DAE-BRNS Symposium on High Energy Physics
LNMIIT, Jaipur, India

2010 School on "Loop Quantum Gravity"
IMSc, Chennai, India

2010 XXV SERC Main School in Theoretical High Energy Physics
Panjab University, Chandigarh, India

2009 XXV SERC Preparatory School in Theoretical High Energy Physics
IIT-Madras, Chennai, India

2009 National Workshop on "Non-commutative Quantum Field Theory"
IIT-Kanpur, Kanpur, India

2008 XVIII DAE-BRNS Symposium on High Energy Physics
Banaras Hindu University, Varanasi, India

References

- **Prof. R. P. Malik**
  Department of Physics, Institute of Sciences
  Banaras Hindu University
  Varanasi−221 005, (U. P.), India
  E-mails: *malik@bhu.ac.in; rpmalik1995@gmail.com*

- **Prof. Amitabha Lahiri**
  Department of Theoretical Sciences
  S. N. Bose National Centre for Basic Sciences
  Kolkata−700 098, (W. B.), India
  E-mail: *amitabha@bose.res.in*

- **Prof. D. S. Kulshreshtha**
  Department of Physics & Astrophysics
  University of Delhi
  Delhi−110 007, India
  E-mail: *dskulsh@gmail.com*