Curriculum Vitae

Dr. Dheeraj Shukla
Assistant Professor (GUEST) in Physics
Department of Physics
University of Allahabad, Prayagraj
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Contact Information

Address for Correspondence:	Dr. Dheeraj Shukla, c/o - Anil Shukla, Village/Post- Sagarraipur, Jangiganj Bhadohi, U.P.- 221 310, INDIA
E-mail:	shudheer.phy@gmail.com
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Personal Information

Gender:	Male
Date of Birth:	23^{th} August, 1986
Marital Status:	Married
Nationality:	Indian
Languages Known:	Hindi, Sanskrit, English, Punjabi

Academic Qualifications

Doctor of Philosophy (Ph. D.) Theoretical High Energy Physics	Banaras Hindu University, Varanasi (Degree Awarded, January 12, 2017)
Master of Science (M. Sc.) Physics (Nuclear & Particle)	Banaras Hindu University, Varanasi (July 2010, First Division)
Bachelor of Science (B. Sc.) Physics, Chemistry, Mathematics	Veer Bahadur Singh Purvanchal University, Jaunpur (December 2007, Second Division)
Higher Secondary (10 + 2) Physics, Chemistry, Mathematics, Hindi, English	M. P. Board, Bhopal (June 2004, First Division)
High School (10) Hindi, English, Sanskrit, Science, Mathematics, Social Science	M. P. Board, Bhopal (June 2001, First Division)

Research Experience

Banaras Hindu University, Varanasi UGC CRET Fellow	30^{th} September 2010 - 6^{th} August 2012
Banaras Hindu University, Varanasi Junior Research Fellowship BSR-RFSMS Scheme, UGC	7^{th} August 2012 - 6^{th} August 2014
Banaras Hindu University, Varanasi Senior Research Fellowship BSR-RFSMS Scheme, UGC	7^{th} August 2014 - 11^{th} February 2014
Panjab University, Chandigarh Research Associate CSIR- Project	19^{th} January 2017- 11^{th} December 2017

Research Interests

- Quantum Field theory
- (Non-)Abelian p-Form Gauge Theories
- (Anti-)BRST and (Anti-)dual-BRST Symmetries
- Superfield Approach to BRST Formalism
- Superspace Approach to BRST Formalism
- Hodge Theory and Differential Geometry
- Supersymmetry in Quantum Mechanics
- Supersymmetry in Gauge Theories
- Gauge Theories and Gravity

- QFT in Curved Background
- Neutrino Cosmology
- Differential Geometry

Academic Achievements

- Qualified *NET-LS* in 2012
- UGC *Research Fellowship for Meritorious Students, 2012*

Computer Skills

- Microsoft Office
- LaTeX
- Mathematica

List of Research Papers (Published/Communicated)

1. S. Krishna, **D. Shukla** and R. P. Malik
   A Novel Observation in the BRST Approach to a Free Spinning Relativistic Particle
   Int. J. Mod. Phys. A **28**: 1350108 [p01-p14], (2013)
   arXiv: 1210.7321 [hep-th].
2. T. Bhanja, **D. Shukla** and R. P. Malik
   Novel Symmetries in the Modified Version of Two Dimensional Proca Theory
   Eur. Phys. J. C **73**: 2535 [p01-p13], (2013)
   arXiv: 1305.1013 [hep-th].
3. **D. Shukla**, T. Bhanja and R. P. Malik
   Self-Dual Chiral Boson: Augmented Superfield Approach
   Eur. Phys. J. C **74**: 3025 [p01-p16], (2014)
   arXiv:1312.5521 [hep-th].
4. **D. Shukla**, T. Bhanja and R. P. Malik
   Canonical Brackets of a Toy Model for the Hodge Theory without its Canonical Conjugate Momenta
   Int. J. Mod. Phys. A **30**: 1550115 [p01-p21], (2015)
   arXiv:1412.0215 [hep-th].
5. **D. Shukla**, T. Bhanja and R. P. Malik,
   Supersymmetric Unitary Operator in QED with Dirac and Complex Scalar Field: Superfield Approach
   Euro. Phys. Lett. **112**: 11001 [p01–p06], 2015
   arXiv:1508.06852 [hep-th].

6. **D. Shukla** T. Bhanja and R. P. Malik
Supervariable Approach to the Nilpotent Symmetries for a Toy Model of the Hodge Theory
Advances in High Energy Physics **2016**: 2618150, 13 pages (2016)
arXiv:1407.6574 [hep-th]

7. S. Krishna, **D. Shukla** and R. P. Malik,
An Interacting $N = 2$ Supersymmetric Quantum Mechanical Model: Novel Symmetries
Int. J. of Mod. Phys. A **31**:1650113 [p01-p13],(2016)
arXiv:1505.06045 [hep-th].

8. T. Bhanja , **D. Shukla** and R. P. Malik,
Superspace Unitary Operator in Superfield Approach to Non-Abelian Gauge Theory with Dirac Fields
Advances in High Energy Physics **2016**: 6367545, 11 pages (2016)
arXiv:1509.07319v2 [hep-th].

9. **Dheeraj Shukla**
Interior of Schwarzschild Black Hole as a Relativistic Free Particle
arXiv:1402.3053 [hep-th]
(Communicated).

10. **Dheeraj Shukla, Kuldeep Kumar**
Superunitary operator and BRST transformations for non-Abelian two-form
EPL (Europhysics Letters), **120**: 6, 15 pages (2018)
https://arXiv:1612.09545 [hep-th]

11. Manmohan Gupta, Gulsheen Ahuja, Madan Singh, **Dheeraj Shukla**
CP Invariants in Flavor Physics
Conference Proceedings of **Cosmology, Gravitational Waves and Particles**
Nanyang Technological University, Singapore, $6^{th} - 10^{th}$ February 2017.

Books Published

1. Differential Geometry of Gauge and Gravity Theories
(Communicated),

2. Notes on Electrodynamics
(Under preperation).

Scientific Talks Delivered

1. *Title:* **BRST Approach to Spinning Relativistic Free Particle**
6^{th} One Day Conference on "New Trends in Research", 2012
Department of Physics, Banaras Hindu University, Varanasi, India.

2. *Title:* **Self-Dual Chiral Boson: Superfield Approach**
6^{th} One Day Conference on "New Trends in Research", 2014
Department of Physics, Banaras Hindu University, Varanasi, India.

3. *Title:* **Superfield Approach to Self-Dual Chiral Bosonic System**
   International Conference on "New Trends in Field Theories (NTFT_4), 2014"
   Department of Physics and DST-CIMS, Banaras Hindu University, Varanasi, India.

4. *Title:* **2D QED and Neutrino Like Particles**
   "Workshop on Light from Dark Side of the Universe, 2015"
   Department of Physics, Banaras Hindu University, Varanasi, India.

5. *Title:* **$\mathcal{N} = 2$ SUSY Quantum Mechanical Particle in the Background of Magnetic Monopole**
   International Conference on "New Trends in Field Theories (NTFT_5), 2016"
   Department of Physics and DST-CIMS, Banaras Hindu University, Varanasi, India.

6. *Title:* **Symmetry: A Window to Physics**
   Popular level talk at *Department of Physics, Assam University, Silchar, Assam,* 29^{th} December 2017.

7. *Title:* **Superunitary Operator for 2-Form Electrodynamics**
   International Conference on "New Trends in Field Theories (NTFT_6), November 2018"
   Department of Physics and DST-CIMS, Banaras Hindu University, Varanasi, India.

Conferences, Schools & Workshops Attended

1. "Summer School on Gravitation and Cosmology, 2010"
   Harish-Chandra Research Institute, Allahabad, India

2. Summer School on "Experimental Nuclear Physics", 2011"
   Department of Physics, Banaras Hindu University, Varanasi, India.

3. International Conference on "New Trends in Field Theories (NTFT_2), 2011"
   Department of Physics, Banaras Hindu University, Varanasi, India.

4. International Conference on "New Trends in Field Theories (NTFT_3), 2012"
   Department of Physics, Banaras Hindu University, Varanasi, India.

5. 6^{th} One Day Conference on "New Trends in Research", 2012
   Department of Physics, Banaras Hindu University, Varanasi, India.

6. "13^{th} Preparatory SERC School in Theoretical High Energy Physics, 2013"
   Department of Physics, Tezpur University, Assam, India.

7. "Autumn School on Cosmology, 2013"
   BITS-Pilani, Pilani, Rajasthan, India.

8. 7^{th} One Day Conference on "New Trends in Research, 2013"
   Department of Physics, Banaras Hindu University, Varanasi, India.

9. Instructional School for Lecturers on "Geometric Topology, 2104"
   DST-CIMS, Banaras Hindu University, Varanasi, India.

10. XXIX SERC Main School on "Theoretical High Energy Physics, 2014"
    BITS-Pilani, Goa Campus, Goa, India.

11. 8^{th} One Day Conference on "New Trends in Research, 2015"
    Department of Physics, Banaras Hindu University, Varanasi, India.

12. 7^{th} One Day Conference on "New Trends in Research"
    Department of Physics, Banaras Hindu University, Varanasi, India, 2014.

13. International Conference on "New Trends in Field Theories (NTFT_4)"
    Department of Physics, Banaras Hindu University, Varanasi, India, 2014.

14. Workshop on "Light from Dark Side of the Universe"
Department of Physics, Banaras Hindu University, Varanasi, India, 2015.

15. Winter School on "Beyond the Standard Model Physics"
Department of Physics, Banaras Hindu University, Varanasi, India, 2015.

16. International Conference on "New Trends in Field Theories (NTFT_5), 2016"
Department of Physics and DST-CIMS, Banaras Hindu University, Varanasi, India.

17. International Conference on "New Trends in Field Theories (NTFT_6), 2018"
Department of Physics and DST-CIMS, Banaras Hindu University, Varanasi, India.

Visits

1. Prof. V. Ravindran, 2010
Harish-Chandra Research Institute, Allahabad, U.P.

2. Dr. Suvrat Raju, 2011
Harish-Chandra Research Institute, Allahabad, U.P.

3. Dr. Anirban Basu, 2012
Harish-Chandra Research Institute, Allahabad, U.P.

4. Prof. T. R. Govindarajan, 2013
Institute of Mathematical Sciences &
Chennai Mathematical Institute, Chennai, Tamilnadu.

5. Prof. T. Padmanabhan, 2016
Inter-University Centre for Astronomy and Astrophysics,
Pune, Maharashtra.

6. Prof. Pankaj Sharan, 2016
Deptt. of Physics, Jamia Millia Islamia,
New Delhi.

7. Prof. D. V. Ahluwalia, January 2018
Indian Institute of Technology,
Guwahati, Assam.

8. Dr. Swastik Bhattacharya, September 2019
Birla Institute of Technology & Science,
Hyderabad Campus, Telangana.

9. Prof. E. Harikumar, September 2019
University of Hyderabad (Central),
Hyderabad, Telangana

Teaching Experience

1. Taught one semester course in B. Sc. - II at BHU, Varanasi.

2. Taught one semester course in B. Sc. - I, III at S. G. G. S. College, Sector- 26, Chandigarh.

3. Taught one Semester course in B. Sc. - II at Panjab University, Chandigarh.

4. Worked as Principal cum Teacher's Trainer at RKT Public School, Ayodhya.
5. Taught as guest faculty the B. Sc. & M. Sc. at Physics Deptt. Allahabad University.
6. Taught for an an year at the post of Asst. Prof. in Physics at BUEST, Baddi, Solan, Himachal Pradesh.
7. Teaching the UG and PG physics at University of Allahabad on the post of Guest Faculty (Asstt. Prof.) since February 2021.

Declaration

I hereby declare that the information furnished above is true, correct and complete to the best of my knowledge.

Date: 15/03/2022
Place: Prayagraj, Uttat Pradesh

Dr. Dheeraj Shukla
