Faculty Details proforma for DU Web-site

(PLEASE FILL THIS IN AND Email it to websiteDU@du.ac.in and
cc: director@ducc.du.ac.in

Title	Prof.	First Name	Supriya	Last Name	KAR	Photograph
Designation		Professor				
Address		C-16 Delhi University House MAURICE NAGAR New Delhi 110 007				
Phone No Office						
Residence						
Mobile		+91 99 1191 8174				
Email		skkar@physics.du.ac.in and supriya.k.kar@gmail.com				
Web-Page		http://fy.chalmers.se/~supriya				

Educational Qualifications

Degree	Institution	Year
Ph.D.	Institute of Physics (DAE), Bhubaneswar	1995
M.Phil. / M.Tech.	Institute of Physics (DAE), Bhubaneswar	1991
PG	Utkal University (Vani Vihar) Bhubaneswar	1989/90
UG	Utkal University (F.M. College) Baleshwar	1987
Any other qualification	None	

Career Profile

(1) **Department of Physics & Astrophysics, University of Delhi as a Faculty Member since 2002 (19 years)**
(2) **Department of Physics & Astrophysics, University of Delhi as Professor since 2013**
(3) **Indian Institute of Technology, Kanpur as Assistant Professor during 2001-2002 (2 years)**
(4) **Chalmers Univ. of Technology, Goteborg, Sweden as (NFR) Research Associate during 1998-2000 (2 years)**
(5) **University of Tokyo, Komaba, Tokyo, Japan as JSPS Post-Doctoral Fellow during 1996-98 (2 years)**
(6) **Harish-Chandra Research Inst, Allahabad as a Post-Doctoral Research Associate during 1995-96 (1 year)**

Some Administrative Assignments

1] Deputy Superintendent of Examinations:

1.1 M.Sc.-Physics and PhD course-work examination (3-times) during 2006 Nov-Dec, 2010 Nov-Dec & 2011 April-May
1.2 PhD Entrance Exam at DU for (SINP) Saha Institute of Nuclear Physics-Kolkata (5-times) during 2011-2015

2] Member of Committees:

2.1 Expert, Selection Committees in DU
2.2 Faculty of Science since March 2018 - 2021
2.2 Board of Research Studies (Sciences) since July 2018 -2021 March
2.3 Committee of Courses for M.Sc-Physics: 2014-16, 2017-
2.4 Time-Table for M.Sc-Physics 2014 -2021 March
2.5 Departmental: Executive Committee during 2010-2012 and 2019-
Library, TPSC (a number of times) during 2003-2012

3] Academic responsibilities outside Delhi University:

Refereed manuscript to Journals (EPJ-C, CQG, Pramana), External Examiner of PhD theses (9), Resource person, Confidential work at UPSC, SSC and at some Universities (M.Sc, PhD and Entrance Exams)

Areas of Interest / Specialization

High Energy Physics, Gravitation and Cosmology

Keywords: Quantum Gravity, Superstrings & D-branes, Higher-forms, Non-commutative geometry:

RESEARCH INNOVATIONS:

(i) Non-perturbative quantum gravity (geometric torsion dynamics)
(ii) Mass generation without Higgs Mechanism: a non-pertubation technique
(iii) Cosmological pair production of universe/anti-universe (Big Bang)
(iv) Quintessence Cosmology, Gravitational Instanton and Gravitational wave
(v) de Sitter tunneling, black hole thermodynamics and accelerated expansion of universe
(vi) Non-commutative space-time, New geometries and Emergent gravity

Subjects Taught

1- At the University of Delhi , Department of Physics & Astrophysics (2002 - till date)

***PG Core courses:**

(i) **Classical Mechanics (2003, 2004, 2005, 2006 & 2008)**
(ii) **Quantum Mechanics (2014, 2015 & 2016)**
(iii) **Radiation Theory (2002, 2003, 2004, 2005, 2008 & 2009)**
(iv) **Electromagnetic Theory (2009)**
(v) **Nuclear Physics (previous) Laboratory (2015, 2021)**

***PG Special (Elective) Courses:**

(i) **An Introduction to String Theory (2010, 2011, 2012, 2013, 2014, 2015, 2016, 2019,2021)**
(ii) **General Theory of Relativity: GTR-I (2009, 2010, 2016, 2017, 2020)**
(iii) **Cosmology: GTR-II (2017 & 2018)**
(iv) **Quantum Field Theory-I (2008)**
(v) **Particle Physics-I (2007, 2008, 2009, 2012, 2013, 2014 & 2018)**
(vi) **Particle Physics-II (2012, 2013, 2014, 2017, 2018, 2019, 2020)**
(vii) **Computer Lab (2019)**

2- At I.I.T. Kanpur (2001-2002):

(i) **Mechanics (2001 & 2002)**
(ii) **Electromagnetism & Quantum Theory (2001 & 2002)**
(iii) **Electricity & Magnetism Lab (2002)**

Research Guidance

- ***Supervision of Doctoral Thesis:***

1) ***"String and Space-time Geometries"***
Mr. Sumit Majumdar (CSIR Fellowship) during 2003-2006, moved to a job

2) ***"Geometric Aspects of D-brane in String Theory"***
Dr. Abhishek Kumar Singh (CSIR Fellowship), 2008-2013, PhD awarded in 2014 March

3) ***"D-brane-world and String Theory"***
Dr. Sunita (UGC Fellowship) 2009-2014, PhD awarded in 2015 February

4) ***"Black holes, Branes and Strings"***
Dr. K. Priyabrata Pandey (Dept. Fellowship) 2009-2014, PhD awarded in 2015 September

5) ***"AdS/CFT duality and Emergent Gravity"***
Ms. Richa Kapoor (CSIR Fellowship) 2010 October-2016 (moved)

6) ***"(Anti) de Sitter Black Holes in String Theory"***
Mr. Deobrat Singh (UGC Fellowship) since 2011, PhD awarded in 2021 March

7) ***"Black holes and D-brane-world Geometries"***
Ms. Richa (DST Fellowship) during 2010-2013 July (moved)

8) ***"(Anti) de Sitter Vacua and D-branes in Superstring Theory"***
Mr. Prashant Kumar (CSIR Fellowship) 2013 August – 2015 (moved)

9) ***"Some Aspects of Non-Perturbative Quantum Gravity in a Two Form Gauge Theory"***
Mr. Nitish (Dept. Fellowship) since 2016, PhD awarded in 2021 March

10) ***Broad subject: "High Energy Physics and Gravitation Theory"***
Mr. Rohit K. Gupta (Dept. Fellowship) since 2016 Dec, in progress

11) ***Broad subject: "High Energy Physics and Gravitation Theory"***
Mr. Jitesh Kumar (Faculty Member@ Rajdhani College) since 2017 Sept, in progress

12) ***Broad subject: "High Energy Physics and Gravitation Theory"***
Ms. Monika (CSIR Fellowship) since 2018 Sept, in progress
13) ***Broad subject: "High Energy Physics and Gravitation Theory"***
Ms. Pratibha (Dept. Fellowship) since 2018 Sept, in progress
14) *Broad subject: :High Energy Physics and Gravitation"*
Mr. Pradeep Kumar (CSIR Fellowship) since 2021 Feb, in progress

- ***Advisor: UGC Post Doctoral Fellowship 2016-2021***
Post Doctoral Fellow: Dr. Rohit Kumar, *PhD (BHU-Varanasi)*

- ***No. of PhD course-work dissertation supervised: 15***
- ***No. of PG (III and IV-semesters) dissertation supervised: 20***
- ***No. of UG dissertation (summer projects/internship) supervised: 19***

Publications Profile

List against each head(If applicable) (as Illustrated with examples)

1. ***Books/Monographs (Authored)***

[57] Kar, Supriya.
2021 (Book) Non-commutative Geometry: A Perspective on String and Field Theories. Singapore: World Scientific Publication (in press)- by invitation.

[56] Kar, Supriya.
2017 Editor, Special Issue "Black Holes and Cosmology"
Journal of Astrophysics ad Aerospace Technology (2017)

[55] Kulshreshtha, Daya S., Supriya Kar, Vinod Nautiyal, Usha Kulshrestha and

Swarnendu Sarkar, 2014 (Edited Volume)
International Conference on Light-Cone Physics: Hadronic and Particle Physics, Nuclear Physics Proceedings Supplements 251-252 (2014)

2. ***Research papers published in Refereed/Peer Reviewed Journals***

[54] Nitish, R and Supriya Kar
2021, Geometric torsion, four-form, Riemann duals and Quintessence
https://doi.10.1142/S0218271821500115
International Journal of Modern Physics D30 (2021) 2150011, 20pp

[53] Gupta, Rohit K, *Supriya Kar and R. Nitish*
2020, Aspects of Gravitational Wave/Particle Duality:
Bulk Torsion/Boundary Gravity Correspondence
International Journal of Modern Physics D29 (2020) 02, 2050019

[52] Nitish, R, Rohit K. Gupta and *Supriya Kar*
2020, Perspective of Perihelion precession in Torsion Modified Gravity
International Journal of Modern Physics D (2020) 2050074, 11 pages

[51] *Kar, Supriya, R. Nitish and Deobrat Singh*
2019, CFT$_6$ Bulk/Boundary AdS$_Q$5 Correspondence and Emergent Gravity
Physica Scripta 94 (2019) 7, 075301

[50] *Kar, Supriya and R. Nitish*
2019, Mass Generation from a Non-perturbative Correction:
Massive NS-field and Graviton in (3+1) Dimensions
Progress in Theoretical and Experimental Physics 4 (2019) 043B02

[49] *Kar, Supriya*
2017, Towards Non-perturbation Theory of Emergent Gravity
e-Print: arXiv:1610.07347 [hep-th]

[48] *Singh Deobrat and Supriya Kar*
2016, Origin of dark energy in the universe: Can D-instanton be a source a quintessence?
International Journal of Innovative Research in Science, Engineering & Technology 5, no.8, Pp:15785-15780

[47] *Kar Supriya, K. Priyabrat Pandey, Abhishek K. Singh and Sunita Singh*
2016, Gravity dual D3-braneworld and Open/Closed string duality
International Journal of Innovative Research in Science, Engineering & Technology 5, no.9, 15926-15929

[46] Pandey Priyabrat, Abhishek K. Singh, Sunita Singh and Supriya Kar
2016, Non-perturbative quantum effects in stringy degenerate geometries:
Vacuum created pair of ($D\bar{D}$)3-brane by a two form
International Journal of Innovative Research in Science, Engineering & Technology 5, no.10, 17600-17614

[45] Kar Supriya
2016, Quintessential Cosmology and D-instanton
Review article (invited),

Journal of Astrophysics & Aerospace Technology (2015)

[44] Pandey Priyabrat, Sunita Singh and Abhishek Singh and Supriya Kar ;
2015, Quintessence and effective AdS brane geometries,
International Journal of Modern Physics A30 (2015) 13, 1550065,
arXiv:1405.6113 [hep-th]

[43] Kapoor Richa, Supriya Kar and Deobrat Singh;
2015, Quantum effects in topological and Schwarzschild de Sitter brane: Aspects of torsion on a pair of D4-brane/anti-brane universe,
International Journal of Modern Physics D24 (2015) 02, 155015,
arXiv:1407.7756 [hep-th]

[42] Singh, Sunita, Priyabrat Pandey, Abhishek Singh and Supriya Kar ;
2014, Quantum Kerr tunneling vacua on a pair of D4-brane/anti-brane:
An emergent Kerr black hole in 5D,
Nuclear Physics B879 (2014) 216-234, arXiv:1310.4424 [hep-th]

[41] Singh, Sunita, Priyabrat Pandey, Abhishek Singh and Supriya Kar ;
2014, Quantum Kerr(Newman) degenerate vacua in 4D on a non BPS brane,
International Journal of Modern Physics A29 (2014) 1450164, arXiv:1311.3605 [hep-th]

[40] Pandey, Priyabrat, Sunita Singh and Abhishek Singh and Supriya Kar ;
2014, Quintessence and effective RN de Sitter brane geometries,
European Physical Journal C74 (2014) 11, 3173, arXiv:1405.3931 [hep-th]

[39] Pandey, Priyabrat, Sunita Singh and Abhishek Singh and Supriya Kar ;
2014, Non-perturbative quantum effects in stringy degenerate geometries:
Vacuum created pair of D3-brane/anti-brane by a two form, arXiv: 1405.7917 [hep-th]

[38] Pandey, Priyabrat, Sunita Singh and Abhishek Singh and Supriya Kar ;
2013, Emergent gravity/Non-linear U(1) gauge theory correspondence;
J. of Astrophysics and Aerospace Technology 3 (2013) 1, 10000101, arXiv;1002.3976 [hep-th]

[37] Supriya Kar ; 2013 Editorial article
Non-Perturbative Quantum Gravity in Five Dimensions;
Journal of Astrophysics and Aerospace Technology 3 (2013) e106

[36] Singh, Abhishek, Priyabrat Pandey, Sunita Singh and Supriya Kar ;
2013, Discrete torsion, de Sitter tunneling and AdS brane:
U(1) gauge theory on D4-brane and an effective curvature;
Journal of High Energy Physics 1303 (2013) 033, arXiv:1303.4344 [hep-th]

[35] Singh, Abhishek, Priyabrat Pandey, Sunita Singh and Supriya Kar ;
2013, Emergent Schwarzschild and Reissner-Nordstrom Balck Holes in 4D:
An effective curvature sourced by a B2-field on a D4-brane;
Physical Review D88 (2013) 066001, arXiv: 1305.3525 [hep-th]

[34] Kar, Supriya.,, K. Priyabrat Pandey, Sunita Singh and Abhishek K. Singh.
2010, Gravity Dual D3-Braneworld and Open/Closed String Duality, arXiV: 1002.1906 [hep-th]

[33] Kar, Supriya.
2009, Non-commutative D-Brane World, Black Holes and Extra Dimensions.
International Journal of Modern Physics A24: 3571-3576.

[32] Kar, Supriya.
2006, Noncommutative brane-world, (Anti) de Sitter vacua and extra dimensions,
Journal of High Energy Physics 0610: 052.

[31] Kar, Supriya.
2006, Tunneling between de Sitter and AdS black holes in a non-commutative D3-brane formalism, Physical Review D74:126002.

[30] Kar, Supriya. and Sumit Majumdar.
2006, Non-commutative D(3)-brane, black holes and attractor mechanism.
Physical Review D74:0606026

[29) Kar, Supriya. and Sumit Majumdar.
2006, Black hole geometries in non-commutative string theory.
International Journal of Modern Physics A21:6087-6114

[28] Kar, Supriya. and Sumit Majumdar.
2006, Scattering of non-commutative strings: A Note on signature change at Planck scale.
International Journal of Modern Physics A21:2391-2403.

[27] Jain, Pankaj., Supriya Kar and Sukanta Panda.
2003, Brane production and the neutrino nucleon cross-section at ultrahigh-energies in low scale gravity models; International Journal of Modern Physics D12:1593-1602.

[26] Kar, Supriya.
2003, D-branes, cyclic symmetry and non-commutative geometry,
Modern Physics Letters A18:1053-1065.

[25] Jain, Pankaj, Supriya Kar, Douglas W. McKay, Sukanta Panda and John P. Ralston.
2002, Angular dependence of neutrino flux in KM**3 detectors in low scale gravity Model, Physical Review D66:065018.

[24] Kar, Supriya. and Sudhakar Panda.
2002, Electromagnetic Strings: Complementarity between Time and Temperature,
Journal of High Energy Physics: 0211:052.

[23] Kar, Supriya.
2001, Generalized Dirichlet Branes and Zero Modes.
International Journal of Modern Physics A1: 41-56.

[22] Kar, Supriya.
2000, Non-commutativity, Zero Modes and D-Brane Geometry.
Nuclear Physics B577:171-182.

[21] Kar, Supriya.

1999, Path integral formulation of Dirichlet string in general backgrounds, Nuclear Physics B554:163-182.

[20] Kar, Supriya. and Yoichi Kazama. 1999, Interaction of D string with F string: A Path integral formalism. International Journal of Modern Physics A14:1531-1550.

[19] Kar, Supriya. 1997, D-branes and Twelve Dimensions, Nuclear Physics B497:110-126.

[18] Kar, Supriya., Alok Kumar and Gautam Sengupta. 1996, Exact Type IIB Superstring Backgrounds, Physics Letters B375: 121-126.

[17] Kar, Supriya., Jnanadeva Maharana and Sudhakar Panda. 1996, Dualities in five-dimensions and charged string solutions, Nuclear Physics B465:439-457.

[16] Kar, Supriya., Jnanadeva Maharana and Harvendra Singh. 1996, S-duality and cosmological constant in string theory, Physics Letters B374:43-48.

[15] Kar, Supriya. and Jnandeva Maharana. 1995, Planckian scattering of non-Abelian gauge particle, International Journal of Modern Physics A10: 2733-2746.

[14] Kar, Supriya. and Alok Kumar. 1994, Target space of an asymmetric chiral gauged WZW model, Modern Physics Letter A9: 853-859.

[13] Kar, Supriya. S. Pratik Khastgir and Gautam Sengupta. 1993, Four-dimensional stringy black membrane. Physical Review D47:3643-3646.

[12] Kar, Supriya and Alok Kumar. 1992, Hidden isometry in a chiral gauged WZW model, Hep-th/9209068

[11] Kar, Supriya. and Alok Kumar. 1992, Target space structure of a chiral gauged Wess-Zumino-Witten model. Physics Letter B291:246-250.

[10] Kar, Supriya. S. Pratik Khastgir and Alok Kumar. 1992, An Algorithm to generate classical solutions of string effective action, Modern Physics Letter A7:1545-1552.

3. *a) Research papers published in Academic Journals other than Refereed/Peer Reviewed Journals:*

NONE

b) ***Research papers published in Refereed/Peer Reviewed Conferences***

[9] Singh, Abhishek, K. Priyabrat Pandey, Sunita Singh and Supriya Kar;
2018, Cosmological Pair Creation of Universe and Anti-Universe at Big Bang,
Springer Proceedings Physics 203 (2018) 305-308

[8] Singh, Sunita, Supriya Kar, K. Priyabrat Pandey and Abhishek K. Singh;
2018, Degenerate Quantum Vacua and Kerr Family of Black Holes,
Springer Proceedings Physics 203 (2018) 271-273

[7] Singh, Deobrat, Richa Kapoor and Supriya Kar;
2016, Torsion Geometries in U(1) Gauge Theory on D5-brane
Springer Proceedings Physics 174 (2016) 507-512

[6] Singh, Abhishek, Priyabrat Pandey, Sunita Singh and Supriya Kar .
2014, Discrete Torsion, (Anti) de Sitter D4-Brane and tunneling
Nuclear Physics B Proceedings Supplements 251-252 (2014) 141-145.

[5]. Kar, Supriya., K. Priyabrat Pandey, Sunita Singh and Abhishek K. Singh
2011, Curved D-Braneworld Action in 4D and Black Holes.
Proceedings of the Conference in Honour of Murray Gell-Mann's 80th Birthday: 559-566.
Singapore: World Scientific Publication.

[4]. Kar, Supriya., K. Priyabrat Pandey, Sunita Singh and Abhishek K. Singh.
2011, D-Braneworld Black Holes.
Proceedings of the Conference in Honour of Murray Gell-Mann's 80th Birthday: 567-574
Singapore: World Scientific Publication.

[3]. Kar, Supriya,.
2000, Path Integral Formalism for a Dirichlet String.
Varmland. Proceedings of Nordic Conference.

[2]. Kar, Supriya.,
1993, Space-time Interpretations of Chiral Gauged WZW Model.
Trieste. ICTP Proceedings of High Energy Physics & Cosmology: 412-419

c) Research papers Published in Conferences other than Refereed/Peer Reviewed Conferences

[1]. Kar, Supriya.,
2008, Non-commutative Braneworld and (Anti) de Sitter Black Holes,
Proceedings of the Workshop on Physics of Warped Extra Dimensions: 187-192
[IIT Khragapur)

4. ***Other publications (Edited works, Book reviews, Festschrift volumes, etc.)*** – *NONE*

Conference Organization/ Presentations (in the last three years)

List against each head(If applicable)

Organization of a Conference:

1. *Member, Technical Program Committee,*
   Int'l Conference on Geometry, Topology and Applications
   2016 Jan 14-16, Bangkok, Thailand

2. *Member, Technical Program Committee,*
   Int'l Conference on Geometry, Topology and Applications
   2015 Jan 29-31, Shanghai, China

3. ***Participation in some of the Conferences in last 5-years:***

(1) *2021 March 23,* Invited speaker at Feynmania 2021, ARSD College Fest, University of Delhi
***Title:* "Nobel Prize 2020 in Physics: Massive Black Hole Formation"**

(2) *2019 March 28-31,"Recent Developments in String Theory and Cosmology" at NISER, Bhubaneswar*
-Invited to deliver a talk on "Shades of Quantum Gravity"

(2) 2018 Nov 25-30, "Recent Trends in Quantum Field Theory" at BHU, Varanasi
-Invited to deliver a talk on "BTZ black hole and Quantum Gravity"

(3) *2018 April 6-8, Int'l Conference "Recent Developments in Cosmology" at BHU, Varanasi*
-Invited speaker

(4) *2017 Dec.14-15, Faculty Development Programme at Rajdhani College, University of Delhi*
-Invited to deliver a talk on "Tensors and Geometry"

(5) 2017 March 6-11, School on "Computational High Energy Physics" at University of Hyderbad
-Resource person (delivered a set of lectures on General Relativity & Cosmology)

(6) 2016 Nov.06-10, Int'l Conference "New Trends in Quantum Field Theory" at BHU, Varanasi
-Invited speaker

(7) *2015 Aug 23-29, Int'l Conference "SUSY 2015" at Lake Tahoe, California, USA organized by the University of California-Davis -**invited speaker***

(8) *2015 June 21-26, Int'l Conference "STRINGS 2015" at Bengaluru organized by ICTS-TIFR*

Research Projects (Major Grants/Research Collaboration)

(1) ***DST Research Project 2003-2006: Fast Track Proposal for Young Scientists***
(2) ***DST Research Project 2010-2013***
(3) ***Research Grants during 2008-2015 from Delhi University***

Awards and Distinctions

(1) **2020, Outstanding Reviewers Award** 2019 for Classical & Quantum Gravity Journal by Institute of Physics Publication, UK

(2) **2019 Invited to deliver two research talks** at an Int'l conference SUSY at Texas, Austin, USA
(3) **2016, Member, Technical Program Committee**, Int'l Conference 2016 Jan 14-16 on "Geometry, Topology & Applications" at Bangkok, Thailand

(4) **2015, Member, Technical Program Committee**, Int'l Conference 2015 Jan 29-31 on "Geometry, Topology & Applications" at Shanghai, China

(5) **2013 Invited to author a book** "Non-commutative Geometry: Perspective in String and Field Theories" by World Scientific, Singapore

(6) **2013-17 Editor**, HEP-The Scientific World Journal, Hindwai Publication
(7) **2011- Editor**, Journal of Astrophysics & Aerospace Tech, LA, USA
(8) **2010- Editor**, ISRN (Int'l Scholarly Research Network) Geometry Journal
(9) **2002 Selected for Fast Track Young Scientists** by DST, New Delhi, India
(10). **2000 Selected for Fast Track Young Scientists** by DST, New Delhi, India

(11).**1998 NFR (Post Doctoral) Fellow** 1998-2000, Gothenburg, Sweden
(12).**1996 JSPS (Post Doctoral) Fellow** 1996-97 and 1997-98 at University of Tokyo, Komaba, Japan
(13).**1995 Post Doctoral Fellowship** 1995-96 at HRI (DAE), Allahabad, India
(14).**1991 Doctoral Fellowship** 1991-95 at IoP (DAE), Bhubaneswar, India
(15).**1990 Pre-Doctoral Fellowship** 1990-91 at IoP (DAE), Bhubaneswar, India

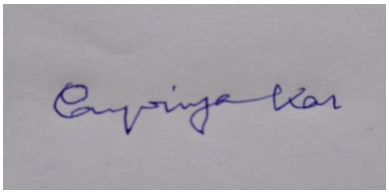
(16).**1990 (M.Sc) and 1987 (B.Sc) University rank(s),** Utkal University, Bhubaneswar, India
(17).**1990 Selected for CSIR fellowship**

Association With Professional Bodies

Member , Indian Physics Association, Mumbai

Other Activities in last 5-years

2017 December, **Invited Speaker** at the Faculty Development Programme, Rajdhani College, University of Delhi
2018 April 24, **Invited IPA Colloquium** entitled "Black Holes and Ghosts" at BHU-Varanasi
2019 April, **Seminar talk** entitled "BTZ Black Hole and Quantum Gravity" at SINP, Kolkata
2021 March, **Invited speaker** at Feynmania 2021, ARSD College Annual Fest, University of Delhi



Signature of the Faculty Member