**Curriculum Vitae - Sunil Mukhi**

February 2018

**1. General Information**

**Name:** **Sunil Mukhi**.

**Date of birth:** **November 20, 1956**.

**Present position:** **Senior Professor, Physics Programme**,

 Indian Institute of Science Education and Research (IISER), Pune, India (November 2012-present).

**Previous faculty** **Fellow** (1985-1990),

**positions:** **Reader** (1990-1995),

 **Associate Professor** (1995-2001),

 **Professor** (2001-2007),

 **Senior Professor** (2007-2012)

 **Chair, Department of Theoretical Physics** (2009-2012)

 All the above at: Tata Institute of Fundamental Research, Mumbai, India.

* **Chair, Physics Department** (2012-2017), IISER Pune.

**Education:** **B.Sc.** (1976, Physics and Mathematics), St Xavier's College, University of Bombay, India.

 **Ph.D.** (1981, Physics), State University of New York at Stony Brook, New York, USA.

**Postdoctoral** **International Centre for Theoretical Physics**, Trieste **positions:** (1981-84).

 **Tata Institute of Fundamental Research**, Mumbai

 (1984-85).

**Research areas:** **String Theory, Quantum Field Theory, Particle Physics**.

Topics of interest include: M-theory, AdS/CFT correspondence, dualities in string theory, non-commutative field theory and string theory, supersymmetric field theory, non-critical and topological strings, conformal field theory, entanglement entropy.

**Academy** **Fellow, Indian Academy of Sciences** (IAS), Bangalore.

**fellowships:** **Fellow, Indian National Science Academy** (INSA), New Delhi.

 **Fellow, The World Academy of Sciences** (TWAS), Trieste.

**Major awards** **J.C. Bose Fellowship**, Government of India (2008-present).

**and adjunct** **Adjunct Professor**, Harish-Chandra Institute, Allahabad **positions:** (2003-2008).

**Shanti Swarup Bhatnagar Award**, Physical Sciences (1999).

**Journal** Editor, **Journal of High Energy Physics** (JHEP) (since its **editorships:** inception in 1997).

* Editorial Board Member, **Current Science** (since 2015).

Editorial Board Member, **Pramana** (until 2006).

**Major** **Chair, Physics Programme**, IISER Pune (2012-present).

**administrative** **Dean, Student Activities**, IISER Pune (2013-present).

**positions held:** **Chair, Department of Theoretical Physics**, TIFR (2010- 2012).

 **Dean, Graduate Studies**, TIFR (2003-2005).

**Other** **Chair, Panel on Scientific Values**, Indian Academy of **administrative** Sciences (since January 2016).

**positions:** **Chair, Academic Ethics Committee,** IISER Pune (2014- present).

 **Chair, Academic Ethics Committee,** TIFR (2006-2011).

**Membership of**  **Selection Committee, INSPIRE Faculty Fellowship** **major committees:** (2012-present), Dept. of Science and Technology, Govt. of India.

 **Selection Committee, S.S. Bhatnagar Prize in Physical Sciences** (2010, 2014).

 **Selection Committee, SwarnaJayanti Fellowship Awards,**  Department of Science and Technology, Govt of India (2014).

 **Sectional Committee (Physics)**, Indian National Science Academy (2007-2009).

 **Womens’ Cell,** TIFR (2008-2012).

 **Endowment Committee,** TIFR (2000-2005).

 **Panel on Scientific Values,** Indian Academy of Science (since 2007).

 **Programme Advisory Committee (Physics),** Department of Science and Technology (1988-2001).

**Long-term** **CERN, Geneva** (one-year sabbatical, 1990-1991).

**academic visits:** **École Normale Supérieure, Paris** (three months, 1994).

 **Institute for Advanced Study, Princeton** (one-year sabbatical, 2001-2002).

 **Visiting Fellow Commoner, Trinity College, Cambridge** (Lent term, 2012).

 **Isaac Newton Institute for Mathematical Sciences,**

 January-May 2012.

**Conferences** **CERN Th-Institute on Recent Developments in**

**(co-)organised: M-theory,** Geneva (2016).

 **2nd Workshop on Developments in M-theory,** with Korea Institute of Advanced Studies, Gangwon-do, Korea (2015).

**Modern Developments in M-theory,** Banff International Research Station (2014).

**Programme on Mathematics and Applications of Branes in String and M-theory,** Isaac Newton Institute of Mathematical Sciences, Cambridge (Jan-May 2012).

**Bhabha Centenary Symposium,** TIFR (2009).

**Strings 2001,** TIFR Mumbai (2001).

**International Conference on Modern Quantum Field Theory II,** TIFR Mumbai (1994).

**International Conference on Modern Quantum Field Theory,** TIFR Mumbai (1990).

**Endowed lectures** **DAE-C.V. Raman lecture,** Mumbai (2013).

**delivered:** **Subashish Nag Memorial Endowment Lecture,** Institute of Mathematical Sciences, Chennai (2011).

 **A.V. Rama Rao Endowment Lecture,** IACS, Kolkata (2007).

 **Kumari L.A. Meera Memorial Lecture,** Bangalore (2004).

**2. Research experience**

**(i) Ph.D. Students**

* **Keshav Dasgupta** (1995-1998), presently a faculty member at McGill University, Montreal, Canada.
* **Nemani V. Suryanarayana** (1998-2001), presently a faculty member at the Institute of Mathematical Sciences, Chennai, India.
* **Bahniman Ghosh** (1997-2001), presently a faculty member at the Indian Institute of Technology, Kanpur, India.
* **Anindya Mukherjee** (2003-2007), presently employed with Fincad, a financial analytics software company, Vancouver, Canada.
* **Rahul Nigam** (2004-2008), presently a faculty member at the Birla Institute of Technology and Science, Hyderabad, India.
* **Turmoli Neogi** (2013-present).

**(ii) Publications**

**(a) Highly cited papers.**

[102 citations] **D2 to D2.** Bobby Ezhuthachan, Sunil Mukhi, Costis Papageorgakis. JHEP 0807:041, (2008), arXiv:0806.1639.

[181 citations] **M2-branes on M-folds.** Jacques Distler, Sunil Mukhi, Costis Papageorgakis, Mark van Raamsdonk. JHEP 0805:038 (2008), arXiv:0804.1256.

[235 citations] **M2 to D2.** Sunil Mukhi, Costis Papageorgakis. JHEP 0805:085 (2008), arXiv:0803.3218.

[72 citations] **Strings from quivers, membranes from moose.** Sunil Mukhi, Mukund Rangamani, Erik P. Verlinde. JHEP 0205:023, 2002, hep-th/0204147.

[119 citations] **PP wave limit and enhanced supersymmetry in gauge theories.** N. Itzhaki, Igor R. Klebanov, Sunil Mukhi. JHEP 0203:048, 2002, hep-th/0202153.

[160 citations] **Noncommutative tachyons.** Keshav Dasgupta, Sunil Mukhi, Govindan Rajesh. JHEP 0006:022, 2000, hep-th/0005006.

[112 citations] **Brane constructions, conifolds and M theory.** Keshav Dasgupta, Sunil Mukhi. Nucl.Phys. B551:204-228, 1999, hep-th/9811139.

[119 citations] **BPS nature of three string junctions.** Keshav Dasgupta, Sunil Mukhi. Phys.Lett. B423:261-264, 1998, hep-th/9711094.

[132 citations] **F theory at constant coupling.** Keshav Dasgupta, Sunil Mukhi. Phys.Lett. B385:125-131, 1996, hep-th/9606044.

[120 citations] **Orbifolds of M theory.** Keshav Dasgupta, Sunil Mukhi. Nucl.Phys. B465:399-412, 1996, hep-th/9512196.

[98 citations] **Two-dimensional black hole as a topological coset model of c = 1 string theory.** Sunil Mukhi, Cumrun Vafa. Nucl.Phys. B407:667-705, 1993, hep-th/9301083.

[146 citations] **The geometric background field method, renormalization and the Wess-Zumino term in nonlinear** σ**-models.** Sunil Mukhi. Nucl.Phys. B264:640, 1986.

[499 citations] **The background field method and the ultraviolet structure of the super-symmetric nonlinear** σ **model.** Luis Alvarez-Gaume, Daniel Z. Freedman, Sunil Mukhi. Ann.Phys. 134:85, 1981.

[Citation figures from HEP-INSPIRE database as on March 15, 2016.]

**(b) Research papers (all published).**

1. **Universal RCFT Correlators from the Holomorphic Bootstrap.** Sunil Mukhi, Girish Muralidhara, JHEP 1802 (2018) 028, arXiv:1708.06772.
2. **Entanglement, Replicas, and Thetas.** Sunil Mukhi, Sameer Murthy, Jie-Qiang Wu, JHEP 1801 (2018) 005, arXiv:1706.09426.
3. **Extended Supersymmetric BMS3 algebras and Their Free Field Realisations.** Nabamita Banerjee, Dileep P. Jatkar, Ivano Lodato, Sunil Mukhi, Turmoli Neogi, JHEP 1611 (2016) 059, arXiv:1609.09210.
4. **Two-dimensional RCFT’s without Kac-Moody symmetry.** Harsha R. Hampapura, Sunil Mukhi, JHEP 1607 (2016) 138, arXiv:1605.03314.
5. **Cosets of Meromorphic CFTs and Modular Differential Equations.** Matthias R. Gaberdiel, Harsha R. Hampapura, Sunil Mukhi, JHEP 1604 (2016) 156, arXiv:1602.01022.
6. **Free-field realisations of the BMS3 algebra and its extensions.** Nabamita Banerjee, Dileep P. Jatkar, Sunil Mukhi, Turmoli Neogi, JHEP 1606 (2016) 024, arXiv:1512.06240.
7. **On 2d Conformal Field Theories with Two Characters.** Harsha R. Hampapura, Sunil Mukhi. JHEP 1601 (2106) 005, arXiv:1510.04478.
8. **Modular invariance and entanglement entropy.** Sagar F. Lokhande, Sunil Mukhi. JHEP 1506 (2015) 106, arXiv:1504.01921.
9. **Unravelling the novel Higgs mechanism in (2+1)d Chern-Simons theories.** Sunil Mukhi. JHEP 1112:083 (2011), arXiv:1110.3048.
10. **The power of the Higgs mechanism: higher-derivative BLG theories.** Bobby Ezhuthachan, Sunil Mukhi, Costis Papageorgakis. JHEP 0904:101, (2009), arXiv:0903.0003.
11. **Constraints on `rare' dyon decays.** Sunil Mukhi, Rahul Nigam. JHEP 0812:056, (2008), arXiv:0809.1157.
12. **Higher-derivative 3-algebras.** Mohsen Alishahiha, Sunil Mukhi. JHEP 0810:032, (2008), arXiv:0808.3067.
13. **D2 to D2.** Bobby Ezhuthachan, Sunil Mukhi, Costis Papageorgakis. JHEP 0807:041, (2008), arXiv:0806.1639.
14. **M2-branes on M-folds.** Jacques Distler, Sunil Mukhi, Costis Papageorgakis, Mark van Raamsdonk. JHEP 0805:038 (2008), arXiv:0804.1256.
15. **M2 to D2.** Sunil Mukhi, Costis Papageorgakis. JHEP 0805:085 (2008), arXiv:0803.3218.
16. **Kinematical analogy for marginal dyon decay.** Anindya Mukherjee, Sunil Mukhi, Rahul Nigam. Mod.Phys.Lett. A24 (2009) 1507. arXiv:0710.4533.
17. **Dyon death eaters.** Anindya Mukherjee, Sunil Mukhi, Rahul Nigam. JHEP 0710:037,2007, arXiv:0707.3035.
18. **Noncritical-topological correspondence: Disc amplitudes and noncompact branes.** Anindya Mukherjee, Sunil Mukhi, Rahul Nigam. JHEP 0704:019,2007, hep-th/0612054.
19. **FZZ Algebra.** Anindya Mukherjee, Sunil Mukhi, Ari Pakman. JHEP 0701:025, 2007, hep-th/0606037.
20. **Noncritical string correlators, finite-N matrix models and the vortex condensate.** Anindya Mukherjee, Sunil Mukhi. JHEP 0607:017, 2006, hep-th/0602119.
21. **Bubbling orientifolds.** Sunil Mukhi, Mikael Smedback. JHEP 0508:005, 2005, hep-th/0506059.
22. **c = 1 matrix models: Equivalences and open-closed string duality.** Anindya Mukherjee, Sunil Mukhi. JHEP 0510:099, 2005, hep-th/0505180.
23. **Liouville D-branes in two-dimensional strings and open string field theory.** Debashis Ghoshal, Sunil Mukhi, Sameer Murthy. JHEP 0411:027, 2004, hep-th/0406106.
24. **Open string actions and noncommutativity beyond the large B limit.** Sunil Mukhi, Nemani V. Suryanarayana. JHEP 0211:002, 2002, hep-th/0208203.
25. **Strings from quivers, membranes from moose.** Sunil Mukhi, Mukund Rangamani, Erik P. Verlinde. JHEP 0205:023, 2002, hep-th/0204147.
26. **PP wave limit and enhanced supersymmetry in gauge theories.** N. Itzhaki, Igor R. Klebanov, Sunil Mukhi. JHEP 0203:048, 2002, hep-th/0202153.
27. **Star products from commutative string theory.** Sunil Mukhi. Pramana 58:21-26, 2002, hep-th/0108072.
28. **Derivative corrections from noncommutativity.** Sumit R. Das, Sunil Mukhi, Nemani V. Suryanarayana. JHEP 0108:039,2001, hep-th/0106024.
29. **Gauge invariant couplings of noncommutative branes to Ramond-Ramond backgrounds.** Sunil Mukhi, Nemani V. Suryanarayana. JHEP 0105:023, 2001, hep-th/0104045.
30. **Chern-Simons terms on noncommutative branes.** Sunil Mukhi, Nemani V. Suryanarayana. JHEP 0011:006, 2000, hep-th/0009101.
31. **Noncommutative tachyons.** Keshav Dasgupta, Sunil Mukhi, Govindan Rajesh. JHEP 0006:022, 2000, hep-th/0005006.
32. **A stable non-BPS configuration from intersecting branes and anti-branes.** Sunil Mukhi, Nemani V. Suryanarayana. JHEP 0006:001, 2000, hep-th/0003219.
33. **Brane - anti-brane constructions.** Sunil Mukhi, Nemani V. Suryanarayana, David Tong. JHEP 0003:015, 2000, hep-th/0001066.
34. **Killing spinors and supersymmetric AdS orbifolds.** Bahniman Ghosh, Sunil Mukhi. JHEP 9910:021, 1999, hep-th/9908192.
35. **Gravitational couplings, orientifolds and M planes.** Sunil Mukhi, Nemani V. Suryanarayana. JHEP 9909:017, 1999, hep-th/9907215.
36. **Brane constructions, fractional branes and Anti-de Sitter domain walls.** Keshav Dasgupta, Sunil Mukhi. JHEP 9907:008, 1999, hep-th/9904131.
37. **Brane constructions, conifolds and M theory.** Keshav Dasgupta, Sunil Mukhi. Nucl.Phys. B551:204-228, 1999, hep-th/9811139.
38. **Dualities and the SL(2,Z) anomaly.** Sunil Mukhi. JHEP 9812:006, 1998, hep-th/9810213.
39. **BPS nature of three string junctions.** Keshav Dasgupta, Sunil Mukhi. Phys.Lett. B423:261-264, 1998, hep-th/9711094.
40. **Anomaly inow on orientifold planes.** Keshav Dasgupta, Sunil Mukhi. JHEP 9803:004, 1998, hep-th/9709219.
41. **Gravitational couplings and Z(2) orientifolds.** Keshav Dasgupta, Dileep P. Jatkar, Sunil Mukhi. Nucl.Phys. B523:465-484, 1998, hep-th/9707224.
42. **A note on low dimensional string compactifications.** Keshav Dasgupta, Sunil Mukhi. Phys.Lett. B398:285-290, 1997, hep-th/9612188.
43. **Orbifold and orientifold compactifications of F-theory and M-theory to six dimensions and four dimensions.** Rajesh Gopakumar, Sunil Mukhi. Nucl.Phys. B479:260-284, 1996, hep-th/9607057.
44. **F theory at constant coupling.** Keshav Dasgupta, Sunil Mukhi. Phys.Lett. B385:125-131, 1996, hep-th/9606044.
45. **Orbifolds of M theory.** Keshav Dasgupta, Sunil Mukhi. Nucl.Phys. B465:399-412, 1996, hep-th/9512196.
46. **The topological matrix model of c = 1 string.** Camillo Imbimbo, Sunil Mukhi. Nucl.Phys. B449:553-568, 1995, hep-th/9505127.
47. **Topological 2-D string theory: Higher genus amplitudes and W∞identities.** Debashis Ghoshal, Camillo Imbimbo, Sunil Mukhi. Nucl.Phys. B440:355-372, 1995, hep-th/9410034.
48. **Topological Landau-Ginzburg model of two-dimensional string theory.** Debashis Ghoshal, Sunil Mukhi. Nucl.Phys. B425:173-190, 1994, hep-th/9312189.
49. **Perturbation of the ground varieties of c = 1 string theory.** Debashis Ghoshal, Porus Lakdawala, Sunil Mukhi. Mod.Phys.Lett. A8:3187-3200, 1993, hep-th/9308062.
50. **Two-dimensional black hole as a topological coset model of c = 1 string theory.** Sunil Mukhi, Cumrun Vafa. Nucl.Phys. B407:667-705, 1993, hep-th/9301083.
51. **Kleinian singularities and the ground ring of c=1 string theory.** Debashis Ghoshal, Dileep P. Jatkar, Sunil Mukhi. Nucl.Phys. B395:144-166, 1993, hep-th/9206080.
52. **Construction of physical states of nontrivial ghost number in c < 1 string theory.** Camillo Imbimbo, Swapna Mahapatra, Sunil Mukhi. Nucl.Phys. B375:399-420, 1992.
53. **Black hole solution and its infinite parameter generalizations in c = 1 string field theory.** Sudipta Mukherji, Sunil Mukhi, Ashoke Sen. Phys.Lett. B275:39-46, 1992.
54. **Null vectors and extra states in c = 1 string theory.** Sudipta Mukherji, Sunil Mukhi, Ashoke Sen. Phys.Lett. B266:337-344, 1991.
55. **String field theory in minimal model backgrounds and nonperturbative two-dimensional gravity.** Camillo Imbimbo, Sunil Mukhi. Nucl.Phys. B364:662-680, 1991.
56. **Fractional level current algebras and the classification of characters.** Sunil Mukhi, Sudhakar Panda. Nucl.Phys. B338:263-282, 1990.
57. **Contour integral representations for the characters of rational conformal field theories.** Sunil Mukhi, Sudhakar Panda, Ashoke Sen. Nucl.Phys. B326:351, 1989.
58. **Reconstruction of conformal field theories from modular geometry on the torus.** Samir D. Mathur, Sunil Mukhi, Ashoke Sen. Nucl.Phys. B318:483, 1989.
59. **On the classification of rational conformal field theories.** Samir D. Mathur, Sunil Mukhi, Ashoke Sen. Phys.Lett. B213:303, 1988.
60. **Differential equations for correlators and characters in arbitrary rational conformal field theories.** Samir D. Mathur, Sunil Mukhi, Ashoke Sen. Nucl.Phys. B312:15, 1989.
61. **Correlators of primary fields in the SU(2) WZW theory on Riemann surfaces.** Samir D. Mathur, Sunil Mukhi, Ashoke Sen. Nucl.Phys. B305:219, 1988.
62. **Correlation functions of current algebra theories on the torus.** Samir D. Mathur, Sunil Mukhi. Phys.Lett. B210:133, 1988.
63. **Multiloop correlators and bosonic string amplitudes in the operator formalism.** Sunil Mukhi, Sudhakar Panda. Phys.Lett. B203:387, 1988.
64. **The N=2 fermionic string: path integral, spin structures and supermoduli on the torus.** Samir D. Mathur, Sunil Mukhi. Nucl.Phys. B302:130, 1988.
65. **BRST quantization of twisted extended fermionic strings.** Samir D. Mathur, Sunil Mukhi. Phys.Rev. D36:465, 1987.
66. **Chiral fermions and the Witten index for the compactified heterotic string.** Camillo Imbimbo, Sunil Mukhi. Nucl.Phys. B263:629, 1986.
67. **Finiteness of nonlinear σ-models with parallelizing torsion.** Sunil Mukhi. Phys.Lett. B162:345,1985.
68. **The geometric background field method, renormalization and the Wess-Zumino term in nonlinear σ-models.** Sunil Mukhi. Nucl.Phys. B264:640, 1986.
69. **Index theorems and supersymmetry in the soliton sector. 2. Magnetic monopoles in (3+1) dimensions.** Camillo Imbimbo, Sunil Mukhi. Nucl.Phys. B249:143, 1985.
70. **Index theorems and supersymmetry in the soliton sector.** Camillo Imbimbo, Sunil Mukhi. Nucl.Phys. B247:471, 1984. 63. Topological invariance in supersymmetric theories with a continuous spectrum. Camillo Imbimbo, Sunil Mukhi. Nucl.Phys. B242:81, 1984.
71. **On constant configurations and the evaluation of the Witten index.** Luciano Girardello, Camillo Imbimbo, Sunil Mukhi. Phys.Lett. B132:69, 1982.
72. **QCD jets to all logarithmic orders.** Sunil Mukhi, George Sterman. Nucl.Phys. B206:221, 1982.
73. **The background field method and the ultraviolet structure of the super-symmetric nonlinear σ model.** Luis Alvarez-Gaume, Daniel Z. Freedman, Sunil Mukhi. Ann.Phys. 134:85, 1981.
74. **Massive vector multiplet coupled to supergravity.** Sunil Mukhi. Phys.Rev. D20:1839, 1979.

**(c) Review articles and conference proceedings.**

1. **Multiple Membranes in M-theory.** Jonathan Bagger, Neil Lambert, Sunil Mukhi, Constantinos Papageorgakis. Physics Reports 527:1, 2013, arXiv:1203.3546.
2. **The predictive power of symmetries: Lie algebras, super-algebras and 3-algebras in physics.** Sunil Mukhi."Symmetry - A Multidisciplinary Perspective", Ed. Inder Bir Passi, Ramanujan Mathematical Society Lecture Notes Series in Mathematics, Vol 16 (March 2012).
3. **The reciprocal interaction between mathematics and natural law.** Sunil Mukhi. "Math Unlimited: Essays in Mathematics", Ed. R. Sujatha, H.N. Ramaswamy, C.S. Yogananda, Science Publishers, CRC Press (2012).
4. **String theory: a perspective over the last 25 years.** Sunil Mukhi. Class. Quant. Grav. 28 (2011) 153001, arXiv:1110.2569 [physics.pop-ph].
5. **Gauge symmetry, unification and strings.** Sunil Mukhi. "Flavors of research in physics", Utpal Sarkar (Ed.), 125-136 (2010).
6. **Developments in high energy theory.** Sunil Mukhi and Probir Roy, in Pramana 73 (2009) 3, arXiv:0905.1793.
7. **Matrix models of moduli space.** Sunil Mukhi. Proceedings of the NATO Advanced Study Institute on "Applications of Random Matrices in Physics", Les Houches, June 2004, Ed. E. Brezin et al (Springer).
8. **Ramond-Ramond couplings of noncommutative branes.** Sunil Mukhi and Nemani V. Suryanarayana. Invited talk at Strings 2001, Mumbai, India, 5-10 Jan 2001, hep-th/0107087.
9. **Stable non-BPS states and their holographic duals.** Sunil Mukhi and Nemani V. Suryanarayana. Invited talk at Strings 2000, Ann Arbor, Michigan, 10-15 Jul 2000. Int. J. Mod. Phys. A16:966-975,2001, hep-th/0011185.
10. **Understanding fields using strings: A review for particle physicists.** Sunil Mukhi. Invited talk at the XIII DAE Symposium on High Energy Physics, Guwahati, India, Dec 1998, Pramana 54:543-559,2000, hep-ph/0002005.
11. **W∞ identities from topological 2-D string theory.** Sunil Mukhi. 11th International Conference on Mathematical Physics (ICMP-11) (Satellite colloquia: New Problems in the General Theory of Fields and Particles, Paris, France, 25-28 Jul 1994). In "Paris 1994, Mathematical physics" 736-739.
12. **Dualities in theories with 32 supersymmetries: A beginner's guide.** Sunil Mukhi. Prepared for ICTP Summer School in High-Energy Physics and Cosmology, Trieste, Italy, 2 Jun - 11 Jul 1997. In "Trieste 1997, High energy physics and cosmology" 1-28.
13. **Recent developments in string theory: A brief review for particle physicists.** Sunil Mukhi. Based on an invited talk at 12th DAE - HEP Symposium on High-Energy Physics, Gauhati, India, 26 Dec-1 Jan 1997. hep-ph/9710470.
14. **Orientifolds: the unique personality of each space-time dimension.** Sunil Mukhi. Based on talks given at Workshop on Frontiers in Field Theory, Quantum Gravity and String Theory, Puri, India, 12-21 Dec 1996, and at the Joint Paris-Rome-Utrecht-Heraklion-Copenhagen Meeting, Paris, France, Aug 1997. Published in "Puri 1996, Frontiers of field theory, quantum gravity and strings", 167-175, hep-th/9710004.
15. **Matrix models, quantum Penner action and two-dimensional string theory.** Camillo Imbimbo, Sunil Mukhi. Talk given at Institut d'Etudes Scientifiques de Cargese: Nato Advanced Summer Institute: "Low Dimensional Applications of Quantum Field Theory", Cargese, France, 11-29 Jul 1995. In "Cargese 1995, Low-dimensional applications of quantum field theory" 219-225, hep-th/9511127.
16. **Topological models of noncritical strings.** Sunil Mukhi. In "Trieste 1993, Proceedings, High energy physics and cosmology", 277-300.
17. **Recent developments in mathematics and quantum field theory.** Sunil Mukhi. Pramana J. Phys. 41 (1993) Suppl. 517-523.
18. **An introduction to continuum noncritical strings.** Sunil Mukhi. In "Trieste 1991, Proceedings, High energy physics and cosmology", vol.2 917-954.
19. **The two-dimensional string as a topological field theory.** Sunil Mukhi. Presented at NATO Advanced Research Workshop on New Developments in String Theory, Conformal Models and Topological Field Theory, Cargese, France, 12-21 May 1993, hep-th/9312190.
20. **Extra states in c < 1 string theory.** Sunil Mukhi. Talk given at Cargese Summer School, Cargese, France, Jul 16-27, 1991. Published in NATO ASI: Cargese 1991:0483-492 (QC174.45:N2:1991), hep-th/9111013.
21. **Feigin-Fuchs integrals and Rogers-Ramanujam identities in rational conformal field theory.** Sunil Mukhi. "Trieste 1989, Proceedings, Recent developments in conformal field theories" 70-80.
22. **SL(2,R) conformal field theory, minimal models and two-dimensional gravity.** Sunil Mukhi. Presented at the International Colloquium on Modern Quantum Field Theory, Bombay, India, Jan 8-14, 1990. Published in "Bombay Quantum Field Theory" 1990:0077-84 (QC174.45:I61:1990).
23. **Modular geometry and the classification of rational conformal field theories.** Sunil Mukhi. TIFR/TH/89-33, 3rd Regional Conf. on Mathematical Physics, Islamabad, Pakistan, Feb 18-24, 1989. In "Islamabad 1989, Proceedings, Mathematical physics" 258-282.
24. **Classical and quantum theory of supersymmetric σ-models.** Sunil Mukhi. "Trieste 1986, Proceedings, Superstrings, Unified Theories And Cosmology", 53-70.
25. **An introduction to Riemann surfaces for physicists.** Sunil Mukhi. In "Kanpur 1987, Proceedings, Particle Physics - Superstring Theory" 56-73.
26. **Nonlinear σ-models, scale invariance and string theories: A pedagogical review.** Sunil Mukhi. Based on a series of lectures given at TIFR Winter School in Theoretical Particle Physics, Panchgani, India, Jan 25 - Feb 7, 1986. Published in Indian Winter School 1986:0111 (QCD161:W55:1986).
27. **Topological properties of supersymmetric quantum field theories.** Sunil Mukhi. In Jammu 1984, Proceedings, High Energy Physics, Vol. 2, 29-39.

**(d) Books written/edited.**

1. **Lectures on Advanced Mathematical Methods for Physicists**. Sunil Mukhi and N. Mukunda, World Scientific (Singapore) and Hindustan Book Agency (India), 2010.
2. **From Strings to LHC, Proceedings of workshop, Goa, India, January 2-10, 2007.** Rohini Godbole, Sunil Mukhi, K. Sridhar, Sandip Trivedi, editors. (Trieste, Italy: SISSA (2007)).
3. **Strings 2001**. Atish Dabholkar, Sunil Mukhi and Spenta R. Wadia, editors. Proceedings of the Strings 2001 Conference, Tata Institute of Fundamental Research, Mumbai, 5-10 Jan 2001. Published by the American Mathematical Society.
4. **Frontiers of field theory, quantum gravity and strings**. Romesh Kaul, Jnan Maharana, Sunil Mukhi, S. Kalyana Rama, editors. Proceedings, Workshop on Frontiers in Field Theory, Quantum Gravity and String Theory, Puri, India, 12-21 Dec 1996. Commack, USA: Nova Sci. Publ. (1999).
5. **Modern quantum field theory 2**. Sumit R. Das, Gautam Mandal, Sunil Mukhi, Spenta R. Wadia, editors. Proceedings, 2nd International Colloquium on Modern Quantum Field Theory, Bombay, India, Jan 5-11, 1994. Singapore: World Scientific (1995), 327 p.
6. **Modern quantum field theory.** Sumit Das, Avinash Dhar, Sunil Mukhi, Ashok Raina, Ashoke Sen, editors. Proceedings, International Colloquium on Modern Quantum Field Theory, Bombay, India, Jan 8-14 1990. Singapore: World Scientific (1991), 567 p.

**3. Teaching experience (listed from Jan 2001)**

* **Graduate courses at the Tata Institute of Fundamental Research:**
	+ **Quantum mechanics II** (January-May 2011).
	+ **General relativity** (August-December 2009).
	+ **Particle physics** (August-December 2007).
	+ **LHC for string theorists** (August-December 2006).
	+ **Quantum field theory** (August-December 2005).
	+ **Quantum mechanics** (January-May 2003).
* **Undergraduate courses at the Indian Institute of Science Education and Research, Pune:**
	+ **The World of Physics I: Waves and Matter** (Spring 2016, shared).
	+ **Mathematical Methods** (Spring 2015).
	+ **The World of Physics III: Electricity and Magnet**ism (Fall 2014, shared).
	+ **The World of Physics II: Quantum Mechanics** (Spring 2014).
	+ **The Practice of Science: Ethics, Safety and Science Communication** (Spring 2014, shared).
	+ **Nuclear and Particle Physics** (Spring 2013).
	+ **Quantum Mechanics** (Spring 2010, as a guest teacher).
* **Invited short courses:**
	+ **Gauge fields**. Workshop on Ultracold Atoms, IISER Pune, December 2013.
	+ **M-theory and Membranes.** Advanced String School, Puri, October 2010.
	+ **Quantum Field Theory.** SERC Preparatory School in High Energy Physics, BITS Pilani Goa, October 2010.
	+ **A Practical Guide to String Theory.** 22nd Taiwan Spring School on Particles and Fields, April 2009.
	+ **String Theory.** SERC School, Guwahati, March 2009.
	+ **M-theory and Membranes.** 3rd Asian School on String Theory, Beijing, January 2009.
	+ **Introduction to Supersymmetry and Supergravity.** “From Strings to LHC II”, Bangalore, December 2007.
	+ **String Theory Basics.** “From Strings to LHC” Workshop, Goa, Jan 2007.
	+ **Supersymmetry.** Vietnam School of Physics, Nha Trang, Vietnam, Dec 2006.
	+ **Topological String Theory.** Harish-Chandra Research Institute, Allahabad, October 2006.
	+ **Introduction to String Theory.** Inter-University Centre for Astronomy and Astrophysics, Pune, Dec 2005.
	+ **Noncritical String Theory.** Harish-Chandra Research Institute, Allahabad, Feb 2005.
	+ **Matrix Models of Moduli Space.** Les Houches School on Random Matrices, June 2004.
	+ **Introduction to String Theory.** British Universities Summer School in Theoretical Elementary Particle Physics (BUSSTEPP) 2004, University of Plymouth, August 2004.
	+ **Topological Matrix Models, Liouville Matrix Model and c = 1 String Theory.** IPM String School and Workshop 2003, Iran, September 2003.
	+ **String Theory,** British Universities Summer School in Theoretical Elementary Particle Physics (BUSSTEPP) 2003, Queen Mary College, London, August 2003.
	+ **Closed Strings on pp-wave Background,** 7th KIAS-APCTP Winter School on Strings, Seoul and Phoenix Park, Korea, Feb 11-19, 2003.
	+ **Noncommutativity in String Theory,** Summer School on Prospects in Theoretical Physics, Institute for Advanced Study, Princeton, July 2002.

**4. Public/popular lectures (listed from Jan 2001)**

* **“From Basic Science to Social Benefit”**, programme organised at IISER Pune on Science Day, February 28 2016.
* **“The Relevance of Irrelevant Science”**, IIT-BHU, Varanasi and Fergusson College, Pune, January 2016.
* **“The Changing Face of Gravitation”**, Utkal University, March 2015.
* **“A World of Magnets and Miracles”**, Professor-X Science Festival, St Xavier's College Mumbai, January 10, 2015.
* **“String Theory and Quantum Gravity”**, Indian National Science Congress, January 6, 2015.
* **“Scientific Temper”**, Science Day, IISER Pune, February 28, 2014; Science Day, National Centre for Cell Science, February 28, 2015.
* **“Windows Onto Nature”**: Public Lecture, Homi Bhabha Centre for Science Education, April 20, 2013; Institute of Physics Bhubaneswar Foundation Day Lecture, September 4, 2013; “Singularity” Student Festival, IISER Bhopal, February 2, 1014.
* **“Consistent and Symmetric: The evolution of fundamental theory from gauge fields to strings”**: IISER Pune Colloquium, August 21, 2013; NISER Bhubaneswar Colloquium, September 6, 2013.
* **“2013 Nobel Prize in Physics: The Higgs Mechanism”**, IISER Pune, November 8, 2013.
* **Mentor’s talk** at Conclave of Ramanujan Fellows, Pune, December 14, 2013.
* **“The Higgs particle”**, IISER Pune (INSPIRE camp), Pune, December 11, 2012; Somaiya College, Mumbai, July 20, 2012; KIIT Bhubaneswar (INSPIRE camp), July 8, 2012.
* **“Thinking New Thoughts: Creativity in Science”**, DST Inspire Programme, Srinagar (Garhwal), November 12, 2011; Bhabha Centenary Lecture, Nehru Centre, Mumbai, 2008; Ahmedabad, 2009.
* **“String theory: A 3-point Perspective”**, VSRP talk, TIFR, June 6 2011.
* **“A Scientist's Conception of Time”**, Guild Art Gallery, Mumbai, July 22, 2011. http://www.youtube.com/watch?v=lYX8bPLJ7sw.
* **“String Theory and the Superworld”**, IISER Bhopal, April 11, 2011; Guindy college, Chennai, 2009; BITS Goa, IISER Trivandrum, 2010.
* **“Truth and Beauty in Science”**, IIST Trivandrum, March 5, 2011; TEDxBITS Goa, February 6, 2011, http://www.youtube.com/watch?v=FPdLSr9rtd0.
* **“Beyond the Gauge Principle”**, Subhashis Nag Memorial Endowment Lecture, Institute of Mathematical Sciences, January 2011.
* **“A Mathematician's Guide to Hindustani Classical Music”**, International Congress of Mathematicians (ICM), Hyderabad, August 2010.
* **“Creativity and Science”**, IISER Pune, CBS Mumbai, 2008.
* **“Miracles and Magnets: The Superworld”**, A.V. Rama Rao Endowment Lecture, Science Day, February 2007.
* **“String theory: Achievements and Prospects”**, Chulalongkorn University, Bangkok, December 2006.
* **“The Universe of Strings”**, IIT Kanpur, 2005, and Bangalore Planetarium, 2005.
* **“M”**, IIT Madras, 2005; St. Xavier’s College Mumbai, 2004.
* **“Unveiling the Special Theory of Relativity”**, Center for Philosophy and History of Science, University of Pune, 2005.
* **“What would Einstein have thought of String Theory?”**, Einstein Year Lecture, Indian Institute of Science Bangalore, 2005.
* **“Special Theory of Relativity”**, National Science Conference, Kolhapur, 2005.
* **“How does one become a scientist?”**, TIFR Open Day 2005; 2004; 2003.
* **“Nobel for a Minus Sign”**, HRI, Allahabad, 2005; TIFR, 2004.
* **“Careers in Pure Sciences”**, Jai Hind College, Mumbai, 2005.
* **“The Dual World of Science”**, Meera Memorial Lecture, Bangalore, 2004.
* **“Laws of a Beautiful Nature”**, Indian National Science Academy, New Delhi, 2003.
* **“The Universe of Strings”**, University of Hyderabad, 2003; VSRP lecture, TIFR, 2003.
* **“The Physics of Branes”**, Indian Academy of Sciences, Bangalore, 2002.
* **“String Theory: Harmonising the laws of nature”**, Centre for Philosophy and Foundations of Science, Delhi, 2001.

**5. Articles in popular media/policy journals (listed from Jan 2001)**

* **“Ethics and Indian science”** (Guest Editorial), Current Science, 25 March 2016, 110 (06).
* **“Goals, models, frameworks and the scientific method”** (Opinion), Current Science, 10 September 2015, 109 (05).
* **“Diversity of the science ecosystem”** (Opinion), Current Science, 10 October 2013, 105 (07).
* **“Higgs don't lie”**, BBC Knowledge, October 2012.
* **“Neutrinos: Back to the future?”**, BBC Knowledge, December 2011.
* **“Neutrinos: The law breakers”**, Times of India Crest, October 3, 2011.
* **“The moment of creation”**, The Last Word, BBC Knowledge, May/June 2011.
* **“What about the living particles?”**, The Last Word, BBC Knowledge, Jan/Feb 2011.
* **“Thinking new thoughts”**, Prayas Students' Journal of Physics (Indian Association of Physics Teachers), Vol. 4, No. 1, Jan. - Mar. 2010.
* **“Let's Get Physical”**, a series of 8 articles in Times of India, 2007.
* **“Dirac's Conception of the Magnetic Monopole and its Modern Avatars”**, Resonance, December 2005.
* **“Nobel for a Minus Sign”**, (with Rohini Godbole), Resonance, February 2005.

**6. Science popularisation**

I have delivered several talks each year to high-school and college students and general audiences about particle physics, unification and string theory, the Large Hadron Collider and supersymmetry, the nature of creativity, and how to pursue a career in science. I designed a Powerpoint slideshow accompanied by music and archival speeches, about the life of eminent Indian physicist Homi J. Bhabha, which was used as the curtain raiser at the Bhabha Centenary Symposium, 2009.

Most recently, I organised a programme of public lectures with the theme “From Basic Science to Social Benefit” at IISER Pune on February 28, 2016. The programme highlighted the way in which fundamental science, pursued without specific applications in mind, has impacted society through radically new applications in the areas of diagnostics, medicine, communications and informatics.

**7. Administrative experience**

I have actively participated in academic administration activities since the early 1990’s, first at the Tata Institute of Fundamental Research (TIFR) where I worked from 1985-2012 and then at the Indian Institute of Science Education and Research (IISER) to which I moved in 2012.

**Graduate Course Programme (TIFR):** I was the Graduate Course Coordinator for Physics at TIFR during the 1990’s and subsequently became Chair of the Graduate Committee for Physics. In 2003, I was appointed the first Dean of Graduate Studies of TIFR. At the time, the Institute had newly become a “Deemed University” and was able to grant its own doctoral degrees (previously these were granted through the University of Bombay). The position of Dean entailed working out the entire apparatus for administering the doctoral programme, right from the design of the degree certificate to the Graduate Course Guidelines which prescribed the procedures to be followed. The Dean reported to the Director and made regular presentations to the Academic Committee. I placed a strong emphasis on modernisation of the procedures.

**Endowment (TIFR):** From 2000-2005, I was a member of the Endownment Committee of TIFR. This committee had some success in raising contributions from two prominent industrialists in the field of Information Technology. One was a career development grant for Ph.D. students (which augmented the stipends granted by the Institute for a certain number of years) while the other was a more general travel endowment that could either be allocated to TIFR members for their own international travel, or used to invite distinguished visitors to the Institute.

**Department Chair (TIFR):** In 2009, I was appointed Chair of the Department of Theoretical Physics at TIFR. This is a prestigious theoretical physics department with a global reputation. The Chair’s role was to conduct the search and evaluation process to recruit outstanding faculty members, to oversee the recruitment and mentoring of students and postdoctoral fellows, to allocate funds for research, to present the Department’s views and requirements at Natural Science Faculty meetings, and to interface with the Dean of Faculty and the Director regarding institutional matters. Supporting and stimulating research, collaborations and conferences was also an important part of the daily activity.

**Ethics Committee (TIFR, IISER, Indian Academy of Sciences):** In 2006, partly in response to increased awareness nationwide, TIFR instituted an Academic Ethics Committee of which I was made the first Chair. The Committee drafted the first set of Ethics Guidelines, which are still available on the Institute’s website, and over the years conducted enquiries into a few cases of alleged misconduct. Since 2014 I have been Chair of the Academic Ethics Committee of IISER Pune, and since January 2016 I am the chair of the Committee on Scientific Values of the Indian Academy of Sciences, Bangalore. At both TIFR and IISER, I have conducted sessions to sensitise the academic community about various aspects of academic ethics.

**Chair, Physics Department (IISER):**

In November 2012, I moved from the Tata Institute to take up the challenge of chairing the Physics Programme at the relatively young Indian Institute of Science Education and Research in Pune. This institute has the goal of unifying undergraduate teaching and high-quality research in a single institution (in contrast to research institutions). The Physics Programme at IISER covers a wide canvas of experimental and theoretical areas of Physics, including condensed matter, atomic and molecular physics, optics and photonics, quantum information, nanoscience and nanomaterials, high energy physics, nonlinear dynamics, astronomy and astrophysics, and gravitation and string theory.

At IISER the Chair’s responsibilities are similar to those listed above for TIFR, but here experimental research becomes a major priority. The mentoring of undergraduate students is another important priority. The Chair’s role at IISER is to conduct the search and recruitment process for outstanding faculty members, to oversee the recruitment and mentoring of students and postdoctoral fellows, to assign teaching responsibilities, and to allocate funds for research.

**8. Extra-curricular activities and interests**

**Indian music – study and archival**

I have a strong interest in Indian Classical Music, and have studied both the theory and the practice at various stages of my life. In 2010, I delivered a pair of invited lectures on the appreciation of Indian Classical Music at the International Congress of Mathematicians (ICM) in Hyderabad and subsequently at IISER Trivandrum and other institutions.

I collect old private recordings by Indian classical musicians (primarily vocalists), digitise and archive them. Today I probably have one of the most extensive collections of this music in the country. I maintain a webpage on the late Pandit Kumar Gandharva, the leading intellectual among 20th century Indian Classical musicians, and have published articles about his work. I have prepared and delivered several multimedia presentations of his works.