

## Curriculum Vitae

*Name* : Spenta R. Wadia

*Date and Place of Birth* : 1 August 1950, Mumbai, India

*Institution* : International Centre for Theoretical Sciences (ICTS-TIFR),  
Tata Institute of Fundamental Research,  
Shivakote,  
Bangalore 560089, India

*Telephone* : +91 80 46536010 (office); +91 9867005229 (cell)

*E-mail* : spenta.wadia@icts.res.in  
spenta.wadia@gmail.com

### Current Position:

- Aug. 2015 – : Emeritus Distinguished Professor, ICTS-Tata Institute of Fundamental Research
- Aug. 2017 – : Infosys Homi Bhabha Chair Professor, International Centre for Theoretical Sciences (ICTS-TIFR) Bangalore

### Appointments:

- Oct. 2007 – July 2015: (Founding) Director, International Centre for Theoretical Sciences (ICTS-TIFR), Tata Institute of Fundamental Research, Bangalore, India
- Aug. 2008 – July 2015 Distinguished Professor, Tata Institute of Fundamental Research, Mumbai, India
- 2007-2009 – Chair, Department of Theoretical Physics, Tata Institute of Fundamental Research, Mumbai, India
- Oct. 1982 – July 2015: Member of Natural Sciences Faculty, Tata Institute of Fundamental Research, Mumbai, India
- Aug. 1980 – May 1982: Staff Scientist, Enrico Fermi Institute, University of Chicago, USA
- Aug. 1978 – July 1980: Postdoctoral fellow, Enrico Fermi Institute, University of Chicago, USA; mentors: Yoichiro Nambu and Leo Kadanoff

### Education:

- Doctor of Philosophy, City University of New York, 1978; mentor: Bunji Sakita
- Master of Science, Indian Institute of Technology, Kanpur, 1973
- Bachelor of Science, St. Xavier's College, Bombay University, 1971

### Awards and Honours:

- KITP - Simons Distinguished Scientist, 2018-19
- Infosys Foundation Homi Bhabha Chair 2017-
- PI for Airbus Corporate Foundation Teaching and Research Chair at ICTS: Mathematics of Complex Systems, 2013-2016
- J. C. Bose National Fellow, Govt of India 2006-2011; 2011-16

- Distinguished Alumnus, St. Xavier's College, Bombay University, 2009
- TIFR Alumni Association Excellence Award, 2016
- TWAS (The World Academy of Sciences) Physics Prize, 2004
- Steven Weinberg Prize of the International Centre for Theoretical Physics, Trieste, Italy, 1995

#### **Fellowship of Professional Societies:**

- International Honorary Member, American Academy of Arts and Sciences, USA
- Fellow, Indian National Science Academy, Delhi, India
- Fellow, Indian Academy of Sciences, Bangalore, India
- Fellow, National Academy of Sciences, Allahabad, India
- Fellow, TWAS (The World Academy of Sciences), Trieste, Italy
- Fellow, New York Academy of Sciences, New York, USA

#### **Visiting positions on sabbatical leave from TIFR:**

- Member, Institute for Advanced Study, Princeton, New Jersey, USA, 1990-92
- Scientific Associate, Theory Division, CERN, Geneva, Switzerland, 1996-97
- Scientific Associate, Theory Division, CERN, Geneva, Switzerland, 2003-04

#### **Selected Publications:**

1. **“The Role of Surface Variables in the Vacuum Structure of Yang-Mills Theory”**  
S. Wadia and T. Yoneya.  
DOI:10.1016/0370-2693(77)90010-7  
Phys. Lett. **66B**, 341 (1977).
2. **“A Study of U(N) Lattice Gauge Theory in 2-dimensions”**  
S. R. Wadia.  
arXiv:1212.2906 [hep-th]  
EFI-79/44-CHICAGO, ICTS-2012-13, TIFR-TH-2012-47
3. **“ $N = \infty$  Phase Transition in a Class of Exactly Soluble Model Lattice Gauge Theories”**  
S. R. Wadia.  
DOI:10.1016/0370-2693(80)90353-6  
Phys. Lett. **93B**, 403 (1980).
4. **“On the Dyson-Schwinger Equations Approach to the Large  $N$  Limit: Model Systems and String Representation of Yang-Mills Theory”**  
S. R. Wadia.  
DOI:10.1103/PhysRevD.24.970  
Phys. Rev. D **24**, 970 (1981).
5. **“Nambu-Jona-Lasinio Type Effective Lagrangian - 2: Anomalies and Nonlinear Lagrangian of Low-Energy, Large N QCD”**  
A. Dhar, R. Shankar and S. R. Wadia.  
DOI:10.1103/PhysRevD.31.3256  
Phys. Rev. D **31**, 3256 (1985).
6. **“Conformal Invariance and String Theory in Compact Space: Bosons”**  
S. Jain, R. Shankar and S. R. Wadia.  
DOI:10.1103/PhysRevD.32.2713  
Phys. Rev. D **32**, 2713 (1985).

7. **“Quantization of the Liouville Mode and String Theory”**  
S. R. Das, S. Naik and S. R. Wadia.  
DOI:10.1142/S0217732389001209  
Mod. Phys. Lett. A **4**, 1033 (1989).
8. **“Excitations and interactions in  $d = 1$  string theory”**  
A. M. Sengupta and S. R. Wadia.  
DOI:10.1142/S0217751X91000988  
Int. J. Mod. Phys. A **6**, 1961 (1991).
9. **“Classical solutions of two-dimensional string theory”**  
G. Mandal, A. M. Sengupta and S. R. Wadia.  
DOI:10.1142/S0217732391001822  
Mod. Phys. Lett. A **6**, 1685 (1991).
10. **“Nonrelativistic fermions, coadjoint orbits of  $W(\infty)$  and string field theory at  $c = 1$ ”**  
A. Dhar, G. Mandal and S. R. Wadia.  
hep-th/9207011  
DOI:10.1142/S0217732392002512  
Mod. Phys. Lett. A **7**, 3129 (1992)
11. **“Absorption versus decay of black holes in string theory and  $T$  symmetry”**  
A. Dhar, G. Mandal and S. R. Wadia.  
hep-th/9605234  
DOI:10.1016/0370-2693(96)01127-6  
Phys. Lett. B **388**, 51 (1996)
12. **“Gauge theory description of D-brane black holes: Emergence of the effective SCFT and Hawking radiation”**  
S. F. Hassan and S. R. Wadia.  
hep-th/9712213  
DOI:10.1016/S0550-3213(98)00372-1  
Nucl. Phys. B **526**, 311 (1998)
13. *“Microscopic formulation of black holes in string theory”*  
J. R. David, G. Mandal and S. R. Wadia.  
hep-th/0203048  
DOI:10.1016/S0370-1573(02)00271-5  
Phys. Rept. **369**, 549 (2002)
14. **“Aspects of semiclassical strings in  $AdS(5)$ ”**  
G. Mandal, N. V. Suryanarayana and S. R. Wadia.  
hep-th/0206103  
DOI:10.1016/S0370-2693(02)02424-3  
Phys. Lett. B **543**, 81 (2002)
15. **“Finite temperature effective action,  $AdS(5)$  black holes, and  $1/N$  expansion”**  
L. Alvarez-Gaume, C. Gomez, H. Liu and S. Wadia.  
hep-th/0502227  
DOI:10.1103/PhysRevD.71.124023  
Phys. Rev. D **71**, 124023 (2005)
16. **“Blackhole/String Transition for the Small Schwarzschild Blackhole of  $AdS(5) \times S^{**5}$  and Critical Unitary Matrix Models”**  
L. Alvarez-Gaume, P. Basu, M. Marino and S. R. Wadia.  
hep-th/0605041  
DOI:10.1140/epjc/s10052-006-0049-x  
Eur. Phys. J. C **48**, 647 (2006)

17. **“The Incompressible Non-Relativistic Navier-Stokes Equation from Gravity”**  
S. Bhattacharyya, S. Minwalla and S. R. Wadia.  
arXiv:0810.1545 [hep-th]  
DOI:10.1088/1126-6708/2009/08/059  
JHEP **0908**, 059 (2009)
18. **“Chern-Simons Theory with Vector Fermion Matter”**  
S. Giombi, S. Minwalla, S. Prakash, S. P. Trivedi, S. R. Wadia and X. Yin.  
arXiv:1110.4386 [hep-th]  
DOI:10.1140/epjc/s10052-012-2112-0  
Eur. Phys. J. C **72**, 2112 (2012)
19. **“Phases of large  $N$  vector Chern-Simons theories on  $S^2 \times S^1$ ”**  
S. Jain, S. Minwalla, T. Sharma, T. Takimi, S. R. Wadia and S. Yokoyama.  
arXiv:1301.6169 [hep-th]  
DOI:10.1007/JHEP09(2013)009  
JHEP **1309**, 009 (2013)
20. **“Unitarity, Crossing Symmetry and Duality of the S-matrix in large N Chern-Simons theories with fundamental matter”**  
S. Jain, M. Mandlik, S. Minwalla, T. Takimi, S. R. Wadia and S. Yokoyama.  
arXiv:1404.6373 [hep-th]  
DOI:10.1007/JHEP04(2015)129  
JHEP **1504**, 129 (2015)
21. **“Gravitational collapse in SYK models and Choptuik-like phenomenon”**  
A. Dhar, A. Gaikwad, L. K. Joshi, G. Mandal and S. R. Wadia.  
arXiv:1812.03979 [hep-th]  
DOI:10.1007/JHEP11(2019)067  
JHEP **1911**, 067 (2019)
22. **“A Microscopic Model of Black Hole Evaporation in Two Dimensions”**  
A. Gaikwad, A. Kaushal, G. Mandal and S. R. Wadia.  
arXiv:2210.15579 [hep-th] (2022)  
DOI:10.1007/JHEP08(2023)171  
JHEP **08**, 171 (2023)

#### **Selected Recent Talks:**

- *A Brief History of a Science Initiative in India - ICTS-TIFR*, Alladi Ramakrishnan Centenary Conference, IMSc Chennai, 16 December 2023.
- *Black Holes, Quantum Mechanics and Space-time*, Abdus Salam Memorial Lecture, Jamia Millia Islamia, New Delhi, 10 March 2023.
- *The Journey of Time*, TDU, Bengaluru, 20 February 2023.
- *Dynamics of Complete Black Hole Evaporation in 2-dim Gravity*, Abu Dhabi Meeting on Theoretical Physics, Abu Dhabi, 10 January 2023.
- *Glimpses of Theoretical Physics at TIFR: 1982-2022*, Landmarks@TIFR, TIFR-Mumbai, 17-18 December 2022.
- *A Microscopic Model of Black Hole Evaporation in 2-dim.*, New York University, New York, 15 Nov 2022.
- *Modelling Black Hole Formation and Evaporation in the Sachdev-Ye-Kitaev (SYK) Model and its Dual Gravity Theory*, Conference on “The Dual Mysteries of Gauge Theories and Gravity”, IIT Madras, Chennai, 21 October 2020.
- *Black Hole Dynamics in the SYK Model Holographic to 2-dim Gravity*, Online Conference on “Frontiers of holographic duality”, Steklov Mathematical Institute, Moscow, 6 May 2020

- *Black Holes: Beacons in our Search for a Quantum Theory of Space-time*, India Science Festival, IISER-Pune, 11-12 January 2020.
- *Pure States, Black Hole Formation and Choptuik Scaling in the SYK Model*, Tenth Crete Regional Meeting on String Theory, Kolymbari, 18 September 2019.
- *Black Hole Formation in the Sachdev-Ye-Kitaev (SYK) Holographic Toy Model of Quantum Gravity in 2-dims*, International Conference on Frontiers of Fundamental Physics, The International Centre for Theoretical Physics Asia-Pacific (ICTP-AP), Beijing, China, 14 May 2019.
- *Why Do We Need a Quantum Theory of Gravity?*, IISER Thiruvananthapuram, 20 October 2019; Department of Physics and Astrophysics, University of Delhi, 17 October 2019; BHU, Varanasi, 8 March 2019.
- *Space-time and Gravity: From Newton to Hawking and Beyond*, ICTS Einstein Lecture, Assam University, Silchar, 8 October 2018.
- *Gravitational Collapse in the SYK Model*, Black Holes, Quantum Information and Space-time Reconstruction, CERN, Geneva, 23 August 2018.

### Doctoral Students:

1. **Sanjay Jain**, Thesis: *Conformally Invariant Field Theory in 2-dims and Strings in Curved Space, 1987*  
Presently Professor, Department of Physics and Astronomy, University of Delhi; Current research: Complexity theory, Evolutionary networks.
2. **R. Shankar**, Thesis: *Nambu-Jona-Lasinio Type Effective Actions for Large N Quantum Chromodynamics, 1987*  
Retired Professor, The Institute for Mathematical Sciences, Chennai; Current research: Field theory applications to condensed matter systems; study of Himalayan glaciers.
3. **Gautam Mandal**, Thesis: *An Approach to the Theory of Strings Based on the Space of 2-dim. Field Theories, 1989*  
Presently Senior Professor and Chair, Department of Theoretical Physics, TIFR; Current research: String theory, Quantum Gravity.
4. **Anirvan Sengupta**, Thesis: *String Backgrounds in 1+1 Dims., 1992*  
Presently, Professor, Dept. of Physics and Astronomy, Rutgers University, USA and Flatiron Institute, New York; Current research: Biological Physics, Neuroscience, Condensed Matter Theory.
5. **Porus Lakdawala**, Thesis: *Complexity at the Edge of Order and Chaos, 1996*  
Presently, Senior System Administrator, Oracle Corporation, California, USA.
6. **Justin Raj David**, Thesis: *String Theory and Black Holes, 1999*  
Presently, Professor and Chair Centre for High Energy Physics, Indian Institute of Science, Bangalore; Current research: String theory, Quantum Gravity.
7. **Pallab Basu**, Thesis: *Black Holes and the Finite Temperatures Gauge Theory, 2007*  
Presently, Senior Lecturer, University of the Witwatersrand, Johannesburg; Current research: String theory, Quantum Gravity.

### Synergistic Activities:

- Editor, Asian Journal of Mathematics, International Press, Boston, 2015 -
- Editorial Committee, Asia Pacific Physics Newsletter (APPN), World Scientific, 2016 -
- Vice-President, Indian National Science Academy 2022 -
- Chair, Advisory Board of Bengaluru Science & Technology (BeST) Cluster, Govt of India 2020-

- Member, International Advisory Committee (IAC) of the International Institute of Physics (IIP), Natal, Brazil, 2017 -
- Member, ICTS International Advisory Board, 2008 -
- Member, ICTS Management Board, 2020 -
- Member Advisory Board, Asia Pacific Mathematics Newsletter, World Scientific, 2010 -
- Editor, European Journal of Physics C, 2012-2015
- Member, Committee on International Scientific Affairs, American Physical Society (APS) 2020-2022
- Member, Promotions & Assessment Committee, Indian Institute of Science, Bengaluru, 2014-2022
- Member, Mega Sciences Theme Group for Science, Technology and Innovation Policy (STIP) 2020, Govt of India
- Member, Science Council of Asia Pacific Centre for Theoretical Physics (APCTP), S. Korea, 2010-2018
- Chair, Sectional Committee for Physics, Indian National Science Academy, New Delhi, 2017-2019
- Member, Physical Sciences Jury Panel, Infosys Science Foundation Prize for Physical Sciences, 2015-2017
- Council Service, Indian Academy of Sciences, Bangalore, 2013-2015
- Member, Program Advisory Committee, IAS Nanyang Technological University, Singapore 2009-2015
- Member, Commission on Mathematical Physics (C-18), International Union of Pure and Applied Physics (IUPAP), 1997-1999 and 1999-2002
- Organiser “Strings 2001” at TIFR-Mumbai
- Organiser “Strings 2015” at ICTS-TIFR, Bangalore