

Curriculum Vitae - Rajesh Gopakumar

- I. Name: **RAJESH GOPAKUMAR**
- II. Address : INTERNATIONAL CENTRE FOR THEORETICAL SCIENCES (ICTS-TIFR)
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- III. Date of Birth: DECEMBER 14, 1967

IV. Educational Qualifications:

Sl.No.	Degree	University	Year	Subjects
1.	M.Sc. (5 yr.)	Indian Institute of Technology, Kanpur	1992	Physics,
2.	Ph.D.	Princeton University, New Jersey, USA	1997	Physics

V(a). Professional Experience:

1. **Professional Training, Research Experience and Affiliations:**

- **Aug. 2015 – present:** *Centre Director*, International Centre for Theoretical Sciences, (ICTS-TIFR), Bangalore, India.
- **Apr. 2015 – present:** *Senior Professor I*, Tata Institute of Fundamental Research, at ICTS-TIFR, Bangalore, India.
- **Jan. 2012 — Mar. 2015:** *Professor H+*, Harish-Chandra Research Institute, Allahabad, India.
- **Jan. 2009 — Jan.2012:** *Professor H*, Harish-Chandra Research Institute, Allahabad, India.
- **Feb. 2004 — Jan.2009:** *Professor G* , Harish-Chandra Research Institute, Allahabad, India.
- **Nov. 2001 — Feb. 2004:** *Associate Professor of Physics*, Harish-Chandra Research Institute, Allahabad, India.
- **1998 – 2001:** *Post-Doctoral Fellow* with Department of Physics, Harvard University, U.S.A.
- **1997 – 1998:** *Post-Doctoral Fellow* with Department of Physics, Harvard University and University of California, Santa Barbara, U. S.A.
- **1992 – 1997 :** Research in Quantum Field Theory and String Theory at Princeton University, New Jersey, U.S.A. Awarded the Doctor of Philosophy (Physics) by Princeton University
Title of thesis: **The Master Field in Large N Gauge Theories**
Thesis supervisor: **Prof. David J. Gross**
- **1987-1992 :** Integrated 5 year Masters Programme at I.I.T. Kanpur.
- **Summer 1991 :** Visiting Research Student at Tata Institute of Fundamental Research, Mumbai under fellowship from JNCASR, Bangalore.
- **2001 — 2004:** *Visiting Member* (Long Term), Institute for Advanced Study, Princeton, U.S.A.
- **2003 – 2006:** *Adjunct Faculty*, Indian Institute of Technology, Kanpur, India.
- **2004 – 2009:** *Adjunct Faculty*, Tata Institute for Fundamental Research, Mumbai, India.
- **2010 – 2013:** *Adjunct Faculty*, International Centre for Theoretical Sciences, (ICTS-TIFR), Bangalore, India.
- **2013 – 2015:** *Senior Associate*, International Centre for Theoretical Sciences, (ICTS-TIFR), Bangalore, India.
- **2016 – 2018:** *Honorary Professor*, Jawaharlal Nehru Centre for Advanced Scientific Research, (JNCASR), Bangalore, India.

V. (b) Teaching Experience:

2. **Teaching:**

- 1992-1997 : Teaching Assistant for various undergraduate courses at Princeton University. Also Teaching Assistant to Prof. David Gross' graduate course on Quantum Field Theory.
- Current : Graduate courses at HRI on Quantum Field Theory, Advanced Quantum Field Theory, Supersymmetric Quantum Field Theory, General Relativity, Classical Mechanics and Particle Physics. Graduate Course at ICTS-TIFR on Statistical and Quantum Field Theory. I have also taught half of a special topics course on the physics of black holes to students at IIT, Kanpur.

V. (c) Phd. Students:

- Suvankar Dutta (2007, Ph.d at HRI, now faculty at IISER, Bhopal, India),
- Ayan Mukhopadhyay (Ph.d at HRI, now faculty at IIT-Madras),
- Shailesh Lal (Ph.d at HRI, now Marie Curie postdoc at Univ. of Porto),
- Arunabha Saha (Ph.d. at HRI, now postdoc at Univ. of Geneva),
- Roji Pius (Ph.d. at HRI, now at Univ. of California, Davis).
- Mritunjay Verma (Ph.d. at HRI, now at Univ. of Naples)
- Pronobesh Maity (Enrolled at ICTS-TIFR for Ph.d)
- Also mentored the thesis of Arjun Bagchi (Phd with Ashoke Sen at HRI, now faculty at IIT-Kanpur)

VI. (b)List of Research Publications

(In reverse order of appearance)

- L. Eberhardt, M. R. Gaberdiel and R. Gopakumar, “The Worldsheet Dual of the Symmetric Product CFT,” JHEP **1904**, 103 (2019) [arXiv:1812.01007 [hep-th]].
- R. Gopakumar and A. Sinha, “On the Polyakov-Mellin bootstrap,” JHEP **1812**, 040 (2018) [arXiv:1809.10975 [hep-th]].
- M. R. Gaberdiel and R. Gopakumar, “Tensionless String Spectra on AdS_3 ,” JHEP **1805**, 085 (2018) [arXiv:1803.04423 [hep-th]].
- M. R. Gaberdiel, R. Gopakumar and C. Hull, “Stringy AdS_3 from the Worldsheet,” JHEP **1707**, 090 (2017) [arXiv:1704.08665 [hep-th]].
- M. R. Gaberdiel, R. Gopakumar, W. Li and C. Peng, “Higher Spins and Yangian Symmetries,” JHEP **1704**, 152 (2017) [arXiv:1702.05100 [hep-th]].
- L. Eberhardt, M. R. Gaberdiel, R. Gopakumar and W. Li, “BPS spectrum on $\text{AdS}_3 \times \text{S}^3 \times \text{S}^3 \times \text{S}^1$,” JHEP **1703**, 124 (2017) [arXiv:1701.03552 [hep-th]].
- R. Gopakumar, A. Kaviraj, K. Sen and A. Sinha, “A Mellin space approach to the conformal bootstrap,” JHEP **1705**, 027 (2017) arXiv:1611.08407 [hep-th].
- R. Gopakumar, A. Kaviraj, K. Sen and A. Sinha, “Conformal Bootstrap in Mellin Space,” Phys. Rev. Lett. **118**, no. 8, 081601 (2017)
- M. R. Gaberdiel and R. Gopakumar, “String Theory as a Higher Spin Theory,” JHEP **1609**, 085 (2016) [arXiv:1512.07237 [hep-th]].
- M. R. Gaberdiel and R. Gopakumar, “*Stringy Symmetries and the Higher Spin Square*,” J. Phys. A **48**, no. 18, 185402 (2015) [arXiv:1501.07236 [hep-th]].
- M. R. Gaberdiel and R. Gopakumar, “*Higher Spins and Strings*,” JHEP **1411**, 044 (2014) [arXiv:1406.6103 [hep-th]].
- M. R. Gaberdiel, R. Gopakumar and M. Rangamani, “*The Spectrum of Light States in Large N Minimal Models*,” JHEP **1401**, 116 (2014) [arXiv:1310.1744 [hep-th]].
- M. R. Gaberdiel and R. Gopakumar, “*Large $N=4$ Holography*,” JHEP **1309**, 036 (2013) [arXiv:1305.4181 [hep-th]].
- R. Gopakumar and R. Pius, “*Correlators in the Simplest Gauge-String Duality*,” JHEP **1303**, 175 (2013) [arXiv:1212.1236].

- M. R. Gaberdiel and R. Gopakumar, “*Minimal Model Holography*,” J. Phys. A **46**, 214002 (2013) [arXiv:1207.6697 [hep-th]]
- R. Gopakumar, A. Hashimoto, I. R. Klebanov, S. Sachdev and K. Schoutens, “*Strange Metals in One Spatial Dimension*,” Phys. Rev. D **86**, 066003 (2012) [arXiv:1206.4719 [hep-th]]
- M. R. Gaberdiel and R. Gopakumar, “*Triality in Minimal Model Holography*,” JHEP **1207**, 127 (2012) [arXiv:1205.2472 [hep-th]].
- A. Castro, R. Gopakumar, M. Gutperle and J. Raeymaekers, “*Conical Defects in Higher Spin Theories*,” JHEP **1202**, 096 (2012) [arXiv:1111.3381 [hep-th]]
- M. R. Gaberdiel, R. Gopakumar, T. Hartman and S. Raju, “*Partition Functions of Holographic Minimal Models*,” JHEP **1108**, 077 (2011) [arXiv:1106.1897 [hep-th]]
- R. Gopakumar, “*What is the Simplest Gauge-String Duality?*,” arXiv:1104.2386 [hep-th]
- R. Gopakumar, R. K. Gupta and S. Lal, “*The Heat Kernel on AdS* ,” JHEP **1111**, 010 (2011) [arXiv:1103.3627 [hep-th]]
- M. R. Gaberdiel and R. Gopakumar, “*An AdS_3 Dual for Minimal Model CFTs*,” Phys. Rev. D **83**, 066007 (2011) [arXiv:1011.2986 [hep-th]]
- M. R. Gaberdiel, R. Gopakumar and A. Saha, “*Quantum W -symmetry in AdS_3* ,” JHEP **1102**, 004 (2011) [arXiv:1009.6087 [hep-th]]
- A. Bagchi, R. Gopakumar, I. Mandal and A. Miwa, “*GCA in 2d*,” JHEP **1008**, 004 (2010) [arXiv:0912.1090 [hep-th]]
- J. R. David, M. R. Gaberdiel and R. Gopakumar, “*The Heat Kernel on $AdS(3)$ and its Applications*,” JHEP **1004**, 125 (2010) [arXiv:0911.5085 [hep-th]]
- A. Bagchi and R. Gopakumar, “*Galilean Conformal Algebras and AdS/CFT* ,” JHEP **0907**, 037 (2009) [arXiv:0902.1385 [hep-th]]
- J. David, R. Gopakumar and A. Mukhopadhyay “*Worldsheet Properties of Extremal Correlators in AdS/CFT* ,” JHEP **0810**, 029 (2008) [arXiv:0807.5027 [hep-th]].
- S. Dutta and R. Gopakumar, “*Free Fermions and Thermal AdS/CFT* ,” JHEP **0803**, 011 (2008) [arXiv:0711.0133 [hep-th]] .
- O. Aharony, J. David, R. Gopakumar, Z. Komargodski and S. Razamat ” *Comments on worldsheet theories dual to free large N gauge theories*” Phys. Rev. D **75**, 106006 (2007) [arXiv: hep-th/0703141].
- Justin R. David, R. Gopakumar, “*From spacetime to worldsheet: Four point correlators*,” [arXiv:hep-th/0606078]

- S. Dutta, R. Gopakumar, “*On Euclidean and Noetherian entropies in AdS space*,” Phys. Rev. **D 74**, 044007 (2006), [arXiv:hep-th/0604070]
- R. Gopakumar, “*From Free Fields to AdS - III*,” Phys. Rev. **D 72**, 066008 (2005), [arXiv:hep-th/0504229]
- R. Dijkgraaf, R. Gopakumar, H. Ooguri and C. Vafa, “*Baby universes in string theory*,” Phys. Rev. **D 73**, 066002 (2006) [arXiv:hep-th/0504221]
- R. Gopakumar, “*Free field theory as a string theory?*,” Comptes Rendus Physique **5**, 1111 (2004) [arXiv:hep-th/0409233]
- R. Gopakumar, “*From Free Fields to AdS - II*,” Phys. Rev. **D 70**, 025010 (2004), [arXiv:hep-th/0402063]
- R. Gopakumar, “*From Free Fields to AdS*,” Phys. Rev. **D 70**, 025009 (2004), [arXiv:hep-th/0308184]
- R. Gopakumar, “ *$N = 1$ theories and a geometric master field*,” JHEP **0305**, 033 (2003) [arXiv:hep-th/0211100]
- R. Gopakumar, “*String interactions in PP-waves*,” Phys. Rev. Lett. **89**, 171601 (2002) [arXiv:hep-th/0205174]
- R. Gopakumar, M. Headrick and M. Spradlin, “*On noncommutative multi-solitons*,” Commun. Math. Phys. **233**, 355 (2003) [arXiv:hep-th/0103256]
- M. Aganagic, R. Gopakumar, S. Minwalla and A. Strominger, “*Unstable solitons in noncommutative gauge theory*,” JHEP **0104**, 001 (2001) [arXiv:hep-th/0009142]
- R. Gopakumar, S. Minwalla and A. Strominger, “*Symmetry restoration and tachyon condensation in open string theory*,” JHEP **0104**, 018 (2001) [arXiv:hep-th/0007226]
- R. Gopakumar, S. Minwalla, N. Seiberg and A. Strominger, “*OM theory in diverse dimensions*,” JHEP **0008**, 008 (2000) [arXiv:hep-th/0006062]
- R. Gopakumar, J. M. Maldacena, S. Minwalla and A. Strominger, “*S-duality and noncommutative gauge theory*,” JHEP **0006**, 036 (2000) [arXiv:hep-th/0005048]
- R. Gopakumar, S. Minwalla and A. Strominger, “*Noncommutative solitons*,” JHEP **0005**, 020 (2000) [arXiv:hep-th/0003160]
- R. Gopakumar and M. B. Green, “*Instantons and non-renormalisation in AdS/CFT*,” JHEP **9912**, 015 (1999) [arXiv:hep-th/9908020]
- R. Gopakumar and C. Vafa, “*M-theory and topological strings. II*,” [arXiv:hep-th/9812127]
- R. Gopakumar and C. Vafa, “*On the gauge theory/geometry correspondence*,” Adv. Theor. Math. Phys. **3**, 1415 (1999) [arXiv:hep-th/9811131]

- R. Gopakumar and C. Vafa, “*M-theory and topological strings. I,*” [arXiv:hep-th/9809187]
- R. Gopakumar and C. Vafa, “*Topological gravity as large N topological gauge theory,*” Adv. Theor. Math. Phys. **2**, 413 (1998) [arXiv:hep-th/9802016]
- V. Balasubramanian, R. Gopakumar and F. Larsen, “*Gauge theory, geometry and the large N limit,*” Nucl. Phys. B **526** (1998) 415 [arXiv:hep-th/9712077]
- R. Gopakumar and C. Vafa, “*Branes and fundamental groups,*” Adv. Theor. Math. Phys. **2** (1998) 399 [arXiv:hep-th/9712048]
- R. Gopakumar and S. Ramgoolam, “*Scattering of zero-branes off elementary strings in matrix theory,*” Nucl. Phys. B **514** (1998) 177 [arXiv:hep-th/9708022]
- O. J. Ganor, R. Gopakumar and S. Ramgoolam, “*Higher loop effects in M (atrix) orbifolds,*” Nucl. Phys. B **511** (1998) 243 [arXiv:hep-th/9705188]
- R. Gopakumar, “*BPS states in matrix strings,*” Nucl. Phys. B **507** (1997) 609 [arXiv:hep-th/9704030]
- R. Gopakumar and S. Mukhi, “*Orbifold and orientifold compactifications of F -theory and M -theory to six and four dimensions,*” Nucl. Phys. B **479** (1996) 260 [arXiv:hep-th/9607057]
- R. Gopakumar, “*The Master Field in Generalised QCD_2 ,*” Nucl. Phys. B **471** (1996) 246 [arXiv:hep-th/9512225]
- R. Gopakumar and D. J. Gross, “*Mastering the master field,*” Nucl. Phys. B **451** (1995) 379 [arXiv:hep-th/9411021]

VII. (a) Selected Professional recognition, Awards and Fellowships:

- Elected Fellow of The World Academy of Sciences (TWAS), 2015.
- *J. C. Bose Fellowship* of Dept. of Science and Technology, Govt. of India (2015-2020).
- *G. D. Birla Award* for Scientific Research, 2013.
- *TWAS Prize* in Physical Sciences, 2013.
- *S. S. Bhatnagar Award* in Physical Sciences, 2009.
- *ICTP Prize* for 2006 (in honor of G.C. Wick) awarded by Abdus Salam International Centre for Theoretical Physics, Trieste.
- *B. M. Birla Science Prize* in Physics, 2004.
- *Swarnajayanthi Fellowship* 2006, of Dept. of Science and Technology, Govt. of India.

- Elected Fellow of The National Academy of Sciences, India (NASI), Allahabad, Oct. 2014.
- Elected Fellow of The Indian National Science Academy (INSA), New Delhi, Oct. 2009.
- Elected Fellow of The Indian Academy of Sciences (IAS), Bangalore, Jan. 2009.
- Founding Member (now alumnus), Global Young Academy of Scientists (GYA), 2010-12.
- Visiting Member (long term), School of Natural Sciences, Institute for Advanced Study, Princeton, U.S.A. (2001–2005).
- String Theory Distinguished Visiting Lectureship at University of Wisconsin, Madison, U.S.A. (May, 2004).
- Invited Lecturer at Einstein Symposium 2005, Library of Alexandria, Egypt, May 2005.
- Invited Visiting Research Professor, Mathematical Sciences Research Institute (MSRI), University of California, Berkeley, (Spring 2006).
- Distinguished IGA Lecturer, Instt. of Geometry and its Applications, University of Adelaide, Australia (Mar. 2012).
- Member (DAE), Editorial Board, Physical Review Letters, American Physical Society (APS), (2014- present)
- Honorary Professor, JNCASR, Bangalore, (2016-18).
- Invited Plenary Lecture at Strings 2001, Tata Institute of Fundamental Research, Mumbai (2001).
- Invited Plenary Lecture at Strings 2004, College de France, Paris, Jun. 2004.
- Invited Plenary Lecture at Strings 2006, Beijing, China, Jun. 2006.
- Invited Plenary Lecture at Strings 2011, Uppsala, Sweden, Jun. 2011.
- Invited Plenary Lecture at Strings 2014, Princeton, USA, Jun. 2014.
- Invited Plenary Lecture at Strings 2016, Beijing, China, Aug. 2016.
- Invited Plenary Lecture at PASCOS 2016, Vietnam, Jul. 2016.
- Member, International Advisory Committee, Strings 2014, Princeton.
- Member, Local Organising Committee, Strings 2015, Bangalore.
- Member, Local Advisory Committee, Strings 2016, Beijing.
- Member, International Advisory Committee, Strings 2017, Tel-Aviv, Israel.

- Member, International Advisory Committee, Strings 2018, Okinawa, Japan.
- Member, International Advisory Committee, Strings 2019, Brussels, Belgium.
- Member, Scientific Program Committee, Strings 2019, Brussels, Belgium.
- Member, International Advisory Committee, String Math 2012 (Bonn), 2013 (Simons Centre, Stony Brook), 2014, (Univ. of Alberta), 2016 (Paris).
- Co-Director, ICTP Spring School on String Theory, Trieste, (2014-2017).
- Secretary, C18 Commission on Mathematical Physics, International Union of Pure and Applied Physics (IUPAP) (2018-)
- Member, C18 Commission on Mathematical Physics, International Union of Pure and Applied Physics (IUPAP) (2011-2017).
- Member, Board of NBHM-DAE - National Board of Higher Mathematics (2015-).
- Isaac Newton Institute Silver Jubilee Lecture, University of Durham, UK (May. 2012).
- Delivered Popli Memorial Lectures 2010, St. Stephen's College, New Delhi, Feb. 2010.
- Co-Chair, Indo-UK Frontiers of Science (Royal Society, UK- DST, India), Oct. 2014.
- Member of Organising Committee of APCTP schools on String Theory, Seoul, Korea, in Dec. 2001, in Feb. 2004, in Feb. 2005.
- Served as Council Member, Indian National Science Academy (INSA), (2014-16).
- A. K. Raychaudhuri Memorial Lecturer, IACS Kolkata (Jun. 2012).
- Delivered Subhashis Nag Memorial Lectures, IMSc Chennai, Jan. 2009.
- Raja Ramanna Lecture of JNCASR, Bangalore, Sept. 2016.
- Best Student Award in M.Sc. Physics, I.I.T. Kanpur (1992).
- Awarded National Talent Search (NTS) Scholarship (1985)

VII. (b) Other Organisational And Professional Activities:

- Organiser of “Workshop on String theory”, H.R.I. Allahabad, Dec. 2002.
- Member, National Organising Committee, ISM04, Khajuraho, Dec. 2004.
- Organiser (and lecturer) of “Symposium on String Theory” for undergraduates on occasion of National Academy of Sciences, India Platinum Jubilee, Oct. 2005.
- Organiser of ICTS program *Monsoon Workshop on String Theory*, TIFR, Mumbai, Jun.-Aug. 2008.

- Member, Program Committee, International Centre for Theoretical Sciences, TIFR (2008-2012).
- Chairperson, Session on String theory and Geometry, Indo-US Frontiers of Science Symposium, Mar. 2009.
- Selected as one of the "Global Young Scientists" by Inter Academy Panel (IAP) for WEF, Summer "Davos" (2009).
- Member, Organising Committee, 3rd Asian Winter School on String Theory, Particle Physics and Cosmology, Mahabaleshwar (Jan. 2010).
- Member, National Organising Committee, ISM2011, Puri, Jan. 2011.
- Member, Organising Committee, Indo-US Frontiers of Science Meeting, Irvine, USA, 2011.
- Member, Organising Committee, 4th Asian Winter School on String Theory, Particle Physics and Cosmology, Tohoku, Japan (Jan. 2012).
- Co-Organiser, HRI Workshop on Higher Spin Theories and Holography, HRI (Nov. 2011).
- Co-Organiser, ICTS Meeting on Random Matrix Theory and its Applications, ICTS, Bangalore (Jan. 2012).
- Member, National Steering Committee for SERC school in theoretical high energy physics, (2011- present).
- Member, Commission on Mathematical Physics, International Union of Pure and Applied Physics (IUPAP) (2011-).
- Member, Steering committee, Kavli Asian Winter Schools in String Theory (2016-present)
- Co-Organiser, Discussion Meeting on String Theory, ICTS-TIFR Bangalore, (Jun. 2012).
- Chair of Parallel Session on Strings and Branes at 20th International Conference on General Relativity and Gravitation (GR20) at Warsaw University (Jul. 2013).
- Member, Organising Committee, Strings 2015, ICTS-TIFR, Bangalore, Jun. 2015.
- Co-organiser, ICTS Discussion Meeting on New Questions in QFT from CMT. Dec. 2015.
- Co-organiser, mini-symposium on Gravitational Waves, Indian Academy of Sciences, mid-year meeting, Jul. 2016.
- Co-organiser, String theory-Past and Present, ICTS-TIFR, Jan. 2017.

- Co-organiser, ICTS at Ten, ICTS-TIFR, Jan. 2018.
- Co-organiser, 20 years of AdS-CFT, ICTS-TIFR, Jun. 2018.
- Co-organiser, Gauge Theory Ideas in Number Theory, ICTS-TIFR, Dec. 2018.
- Co-organiser, Crete Meetings in String Theory, Kolymbari, (2015, 2017, 2019)
- Invited contribution on “Geometry and String Theory” to special issue of *Current Science*(vol. **81**, no. 12), Dec. 2001.
- Invited contribution on “String Theory and the Conundrums of Quantum Gravity” in *Current Science, Special Issue on GR Centenary* **109**, 2265 (2015).
- Invited Editorial on the LIGO gravitational waves discovery (with Spenta Wadia) in *Current Science*, **110**, 1131, (2016).
- Invited contribution on “Large N and Topological Strings” for *Encyclopedia of Mathematical Physics*, Elsevier Publishers (2003).

VIII.(a)Invited Lectures at Conferences and Colloquia:

- ICTP Workshop on String Theory and Quantum Gravity, Trieste, Mar. 1995.
- Workshop on Quantum Gravity and String Theory, Puri, Dec. 1998
- ICTP Workshop on Gauge theory and Quantum Gravity, Trieste, July 1999
- Millenium Meeting on String Theory, Bangalore, Dec. 1999
- E. S. Fradkin Memorial Conference, Moscow, June 2000
- Strings 2001, TIFR Mumbai, Jan. 2001
- Ringberg Symposium “Quantum Gauge Theories on Non-Commutative Space-Time Structures”, Ringberg, Germany, Mar. 2001.
- Fuji-Yoshida Workshop on String Theory
Fuji-Yoshida, Japan, Aug. 2001.
- Colloquium, School of Physical Sciences, TIFR, Mumbai, Sep. 2001.
- Colloquium, Institute for Mathematical Sciences, Chennai, Dec. 2001.
- Indo-Russian workshop on String Theory and Integrable Models,
IMSc, Chennai, Jan. 2002.
- Colloquium, Dept. of Physics, I.I.T. Kanpur, Feb. 2002.
- Colloquium, School of Mathematics, TIFR, Mumbai, Apr. 2002.

- Theoretical Physics-2003, Indian Association for the Cultivation of Sciences Kolkata, Jan. 2003.
- Stanford-Weizmann Workshop on String Theory, Stanford University, Feb. 2003.
- Amsterdam Workshop on Quantum Gravity and String Theory, University of Amsterdam, Jun. 2003.
- Colloquium, Saha Instt. for Nuclear Physics, Kolkata, Oct. 2003.
- Colloquium, Harish-Chandra Research Institute, Nov. 2003.
- Workshop on Geometry and Topology inspired by Physics, Kochi, Dec. 2003.
- National workshop on String Theory, IIT Kanpur, Dec. 2003.
- Hamilton Institute March Meeting, Trinity College, Dublin, Mar. 2004.
- Colloquium, IIT Guwahati, Apr. 2004.
- Strings 2004, College de France, Paris, Jun. 2004.
- Strings at CERN workshop, CERN, Geneva, Jul. 2004.
- Workshop on Strings and Cosmology, IUCAA, Pune, Oct. 2004.
- Colloquium, IOP, Bhubaneshwar, Nov. 2004.
- Plenary Talk, DAE Symposium, SINP, Kolkata, Dec. 2004.
- Indian Strings Meeting (ISM04), Khajuraho, Dec. 2004.
- Plenary Talk, THEP1, IIT, Roorkee, Mar. 2005.
- Theoretical Physics Colloquium, TIFR, May 2005.
- Einstein Symposium 2005, Library of Alexandria, Egypt, June 2005.
- Amsterdam Workshop on Quantum Gravity and String Theory, University of Amsterdam, Jun. 2005.
- Third Crete Regional meeting on String Theory Kolymbari, Greece, Jun. 2005.
- Colloquium, S.N. Bose Centre, Kolkata, July 2005.
- National String Theory Workshop, IIT Kanpur, Sep. 2005.
- “Physics 2005: 100 years after Einstein’s Revolution”, IIT Kanpur, Oct. 2005
- Workshop on Harmonic Analysis, HRI, Oct. 2005.
- ”Einstein’s Legacy in the New Millennium”, Puri, Dec. 2005.

- Workshop on Teichmuller theory and Moduli problems, HRI, Jan. 2006.
- Bathsheva Rothschild Indo-Israeli Workshop on String Theory, Feb. 2006.
- New Developments in the Geometry and Physics of Gromov-Witten Theory, MSRI, Berkeley, May 2006.
- Strings 2006, Beijing, China, June 2006.
- Joint Mathematics-Physics Colloquium, TIFR, Mumbai, Jun. 2006.
- 36th Ahrenshoop Symposium on Elementary Particles, Berlin, Aug. 2006.
- 24th IAGRG meeting (of General Relativists and Cosmologists), Jami Millia, New Delhi, Feb. 2007.
- Colloquium at Indian Institute of Science, Bangalore, Mar. 2007.
- Solvay workshop on Gauge theory, String Theory and Geometry, Brussels, May 2007.
- ICTP Prize Lecture, ASICTP, Trieste, Aug. 2007.
- XXVIII Brazilian National Meeting of Particles and Fields, Aguas de Lindoia, Sep. 2007.
- Indian Strings Meeting ISM07, HRI, Allahabad, Oct. 2007.
- Indian Strings Meeting ISM08, Pondicherry, Dec. 2008.
- Pan-IIT Physics Retreat, IIT-Madras, Dec. 2008.
- Joint Maths-Physics Colloquium, CMI, Chennai, Dec. 2008.
- S. L. Sircar Memorial Lecture, IACS, Kolkata, Dec. 2008.
- Subhasis Nag Memorial Lecture, IMSc Chennai, Jan. 2009.
- 3rd Natl. Frontiers of Science meeting, INSA Delhi, Jan. 2009.
- String Theory and Fundamental Physics, Kanha, Feb. 2009.
- Colloquium, NISER, Bhubaneshwar, Feb. 2009.
- 3rd Indo-US Frontiers of Science Meet, Agra, Mar. 2009.
- Colloquium, IISER, Pune, Mar. 2009.
- Seminar, KITP Workshop on String Theory, Santa Barbara, USA, May 2009.
- String Fest, IST, Lisbon, Portugal, Jun. 2009.
- Fifth Crete Regional meeting on String Theory, Kolymbari, Greece, Jul. 2009.

- Quantum Theory and Symmetries (QTS) 6, Lexington, Kentucky, Jul. 2009.
- Young Indian Scientists Colloquium, TIFR, Mumbai, Sep. 2009.
- Colloquium, IISER, Bhopal, Nov. 2009.
- *Discussion meeting on String Theory*, TIFR, Mumbai, Jan. 2010.
- *Bhabha Centenary Meeting*, BHU, Varanasi, Jan. 2010.
- *National Strings Meeting*, IIT-Bombay, Mumbai, Feb. 2010.
- *Wits Workshop on Gauge theories and String Theories*, University of Witwatersrand, Johannesburg, South Africa, Apr. 2010.
- *String Meet*, CHEP, IISc, Bangalore, May. 2010.
- LPTHE-ENS Mini-String Conference, Paris, Jun. 2010.
- Colloquium, NCBS (TIFR), Bangalore, Jul. 2010.
- Mid-Year Meeting, Indian Academy of Sciences, Bangalore, Jul. 2010.
- LMS Durham Symposium 2010, Durham, UK, Jul. 2010.
- International Conference on Strings, M-theory and Quantum Gravity, Ascona, Switzerland, Jul. 2010.
- KITPC-CAS Workshop on AdS/CMT, Beijing, Nov. 2010.
- Symposium on Quantum Gravity, INSA Anniversary Meeting, Bangalore, Dec. 2010.
- Plenary Talk, Indian Strings Meeting 2011, Puri, Jan. 2011.
- Bhubaneswar Symposium on Noncommutative Geometry, Number Theory and Physics, IMA, Bhubaneswar, Jan. 2011.
- New Frontiers in Quantum Field Theory, BHU, Varanasi, Feb. 2011.
- QFT 2011, IISER, Pune, Feb. 2011.
- Seminar on Gravitation and Cosmology, RKM Vivekananda University, Belur, Mar. 2011.
- Workshop on Holography and Higher Spin Theories, Simons Center for Geometry and Physics, Stony Brook, USA, Mar. 2011 (over skype).
- Great Lakes Meeting, Univ. of Chicago, Chicago, USA, Apr. 2011.
- Solvay Workshop on Gauge Theories, Strings and Geometry, Brussels, May 2011.
- Strings 2011, Stockholm, Sweden, Jun. 2011.

- Benasque workshop on String Theory, Benasque, Spain, Jul. 2011.
- KIAS-YITP Workshop on String Theory, Holography and Beyond, Seoul, Sep. 2011.
- Review Talk, XVII European Workshop on String Theory, Padua, Italy, Sep. 2011.
- Review Talk, National Strings Meeting, Delhi University, New Delhi, Dec. 2011.
- Colloquium, Dept. of Mathematics, Univ. of Adelaide, Australia, Mar. 2012.
- Workshop on Higher Spin Theory, Schrodinger Institute, Vienna, Apr. 2012.
- Workshop on Strings, Branes and M-theory, Newton Instt., Cambridge, UK, May 2012.
- A. K. Raychaudhuri Memorial Lecture, IACS, Kolkata, May 2012.
- Newton Instt. Silver Jubilee Lecture, Dept. of Maths. Durham University, UK, May 2012.
- Amsterdam workshop on String Theory, Univ. of Amsterdam, Jul. 2012.
- Scattering Amplitudes, Gauge Theories and String theories, ICTS-TIFR, Bangalore, Sep. 2012.
- Yukawa International Seminar (YKIS), Kyoto University, Oct. 2012.
- New Trends in Field Theory, Benares Hindu University, Varanasi, Nov. 2012.
- Colloquium Talk, IRCMS meeting, Bose Institute, Kolkata, Nov. 2012.
- Plenary Talk, Indian Strings Meeting 2012, Puri, Dec. 2012.
- Bangkok Workshop on Gauge Theory, String Theory and Gravity, Chulalongkorn University, Bangkok, Jan. 2013.
- Second Solvay Workshop on Higher Spin Theories, Solvay Institutes, Brussels, Feb. 2013.
- Conference on Higher Spin Theories, Galileo Galilei Instt., Florence, May 2013.
- Seventh Crete Regional Meeting on String Theory, Kolympari, Greece, Jun. 2013.
- Open questions in an Open Universe, Bogazici University, Istanbul, Aug. 2013.
- Colloquium, Dept. of Mathematics, Univ. of Cape Town, Sep. 2013.
- Fourth Wits Workshop on Gauge Theory, String theory and Integrability, Univ. of Witwatersrand, Johannesburg, Sep. 2013.
- International Conference on Teichmüller theory and interfaces with ergodic theory and group actions, JNU, New Delhi, Oct. 2013.

- Review Talk, National String Meeting, IIT-Kharagpur, Dec. 2013.
- Neve Shalom Seminar, Neve Shalom, Israel, May 2014.
- Plenary Talk, Strings 2014, Princeton, Jun. 2014.
- Workshop Seminar, Amsterdam Workshop on String Theory, Jul. 2014.
- Recent Developments in String Theory, Ascona, Switzerland, Jul. 2014.
- Public Lecture, BITS-Pilani, Goa Campus, Oct. 2014.
- TWAS Prize Lecture, TWAS General Body Meeting, Muscat, Oman, Oct. 2014.
- Mathematics Colloquium, Dept. of Maths., I. I. T. Kanpur, Nov. 2014.
- Special Plenary Talk, Indian Mathematical Society Annual Meeting, ISM Dhanbad, Dec. 2014.
- Discussion Meeting on String Theory, ICTS-TIFR, Bangalore, Feb. 2015.
- Science at ICTS (Campus Inaugural Event), ICTS-TIFR, Bangalore, Jun. 2015.
- AndyFest (60th Birthday of Andrew Strominger), Harvard University, Jul. 2015.
- CMI Silver Jubilee Lecture, Chennai Mathematics Institute, Chennai, Sep. 2015.
- KIAS-YITP Workshop on String Theory, Seoul, Korea, Sep. 2015.
- Quantum Spacetime Seminar, TIFR-Mumbai, Sep. 2015.
- GM Thomas Endowment Lecture, CMS College, Kottayam, Oct. 2015.
- Higher Spin Gauge Theories, NTU, Singapore, Nov. 2015.
- Special Session on GR100, Indian Academy of Sciences Meeting, IISER-Pune, Nov. 2015.
- All about AdS_3 , ETH-Zurich, Nov. 2015.
- Einstein Lecture, Jain College, Bengaluru, Jan. 2016.
- Quantum Field Theory, String Theory and Beyond, (75th Birthday of David Gross), Hebrew University, Jerusalem, Mar. 2016.
- Plenary Talk, String Field Theory and Related Topics(2016), ICTP-SAIFR, Sao Paulo, Brasil, Jun. 2016.
- Plenary Talk, PASCOS 2016, Vietnam, Jul. 2016.
- Plenary Talk, Strings 2016, Beijing, Aug. 2016.

- String Theory in London (STiL 16), King's College London, UK, Aug. 2016.
- Raja Ramanna Lecture of JNCASR, Bangalore, Sept. 2016.
- DTP colloquium, TIFR-Mumbai, Oct. 2016.
- Institute Colloquium, IISER-Trivandrum, Nov. 2016.
- Colloquium, IPR, Gandhinagar, Nov. 2016.
- MukhiFest, IISER-Pune, Dec. 2016.
- Vijyoshi-KVPY Science Camp Lecture, IISc, Bangalore, Dec. 2016.
- Conference on Mathematical Physics, Rikkyo University, Tokyo, Japan, Jan. 2017.
- UPES Distinguished Lecture, UPES, Dehradun, Feb. 2017.
- Colloquium, ITP-Chinese Academy of Sciences, Beijing, May 2017.
- Simons workshop - Bootstrap 2017, ICTP-SAIFR, Sao Paulo, Brazil, May 2017.
- Recent Developments in String Theory, Ascona, Switzerland, Jul. 2017.
- Twentieth Anniversary Meeting of NCTS, National Tsing-Hua University, Taiwan, Aug. 2017.
- Bangalore Area Strings Meeting, ICTS-TIFR, Aug. 2017.
- Integrability and Chaos in Multicomponent Systems, FEPU, Vladivostok, Russia, Oct. 2017.
- PCTS workshop on Twenty Years of AdS/CFT, Princeton University, USA, Nov. 2017.
- IACS Colloquium, IACS, Kolkata, Feb. 2018.
- Aryabhatta Colloquium, Dept. of Physics, IIT-Madras, Chennai, Mar. 2018.
- Bootstrap Approach to Conformal Field Theories and Applications, OIST, Okinawa, Mar. 2018.
- Plenary Talk, at Higher Spins, Strings and Duality, Pucon, Chile, Apr. 2018.
- Special Colloquium, IUCAA, Pune, May 2018.
- Higher spins and Strings, OIST, Okinawa, Japan, Jul. 2018.
- Talk at Bootstrap 2018 Workshop, Caltech, Jul. 2018.
- Number Theory and Physics, KIAS, Seoul, Aug. 2018.
- Physics Colloquium, IISc, Bangalore, Nov. 2018.

- Colloquium, Physical Research Laboratory, Ahmedabad, Nov. 2018.
- Symposium on Trends in Physics, IIT-Gandhinagar, Nov. 2018.
- Indian Strings Meeting-2018, IISER-Trivandrum, Dec. 2018.
- Triangle Seminar in String Theory, City, University of London, UK, Feb. 2019.
- 5th Indo-Israeli Meeting on String theory, Nazareth, Israel, Feb. 2019.
- Workshop on Higher Spins and Strings, Erwin Schroedinger Instt., Vienna, Apr. 2019.
- Physics Colloquium and Institute Colloquium, IISER-Kolkata, Aug. 2019.
- Institute Colloquium, Indian Statistical Institute, Kolkata, Aug. 2019.

VIII.(b)Invited Lectures at Schools and Workshops:

- Lecture Series on Topological Strings and Large N Gauge Theory in “Recent Advances in String Theory”, University of Tokyo, Dec. 1999
- Lecture Series at fifth APCTP school on String and Field Theory, Seoul, Korea, Dec. 2000.
- Lecture Series at Trieste Spring School on Quantum Gravity and String Theory ICTP, Trieste, Apr. 2001.
- Lecture Series at the first Crete Regional meeting on String Theory Kolymbari, Greece, Jun. 2001.
- Lecture Series at the IMSc Workshop on String Theory IMSc, Chennai, Nov. 2001.
- Lecture Series at the Shiraz Summer school on String Theory Shiraz, Iran, April 2002.
- Lecture Series on Large N Field Theories at the XVIII SERC HEP school IIT, Madras, Chennai, Feb. 2003.
- Lecture Series at the second Crete Regional meeting on String Theory Kolymbari, Greece, Jun. 2003.
- Lecture Series at IPM String School and Workshop 2003, Anzali, Iran, Sep. 2003.
- Distinguished String Theory Lecturer Series, University of Wisconsin, Madison, USA, May 2004.
- Lecture Series at Hangzhou School on Mathematical Physics, Centre for Math. Sciences, Hangzhou, China, Jul. 2004.
- Lecture Series on Instanton Physics at the XX SERC HEP school IIT, Kanpur, Dec. 2004.
- Lectures at the School on Physics of Turbulence SN Bose Centre, Kolkata, Feb. 2009.
- Lectures at *Stringfest: Perspectives from a Younger Generation*, IST, Lisbon, Portugal, Jun. 2009.
- Popli Memorial Lectures, St. Stephen’s College New Delhi, Feb. 2010.
- Lecture Series at the ICTP Spring School theory on Superstring Theory ASICTP, Trieste, Mar. 2011.

- Lectures on Scattering Amplitudes and AdS/CFT, RADCOR School SINP, Kolkata, Apr. 2011.
- Lecture Series at the School on Applied AdS/CFT Isfahan, Iran, May. 2011.
- Lecture Series at the CERN Winter School on Supergravity, Strings and Gauge Theories CERN, Geneva, Feb. 2012.
- Lecture Series as IGA Distinguished Lecturer, Institute of Geometry and its Applications (IGA), University of Adelaide, Mar. 2012.
- Lecture Series at Indian String School, Puri, Oct. 2012.
- Lecture Series at UGC Winter School on High Energy Physics, BHU, Varanasi, Feb. 2013.
- Lecture Series on AdS/CFT Correspondence and Applications at SERC-THEP School, IIT-Kanpur, Nov. 2013.
- Lecture Series at Asian Winter School, Puri, Jan. 2014.
- Two Lectures at the School and Workshop on Symplectic Geometry and Contact Topology, HRI, Allahabad, Dec. 2014.
- Lecture Series at the Spring School on Superstring Theory, ICTP, Trieste, Apr. 2015.
- Lecture Series at GRaB100, NTU, Taipei, Taiwan, Jul. 2015.
- Lecture Series at the summer school on Statistical Physics, Brandeis University, USA, Jul. 2015.
- Lecture Series at Asian Winter School on String Theory, Okinawa, Japan, Jan. 2016.
- Lecture Series at the Spring School on Superstring Theory, ICTP, Trieste, Mar. 2016.
- Lecture Series at the School on Fundamental Aspects of String Theory, ICTP-SAIFR, Sao Paulo, Brazil, May 2016.
- Lecture Series at the Indian String School, Puri, India, Feb. 2017.
- Lecture Series at the GGI Workshop on AdS_3 , Florence, Italy, Mar. 2017.
- Lectures at Exact Methods in Low dimensional Physics, Cargese Summer School, Jul. 2017.
- Lectures on Conformal Bootstrap, IISER-Pune, Aug. 2017.
- Lectures at J-Holomorphic Curves and Gromov-Witten Invariants, ICTS-TIFR, Dec. 2017.

- Lectures at Modern Aspects of String Theory Workshop, SINP, Kolkata, Feb. 2018.
- Lectures in KIAS program on Arithmetic Geometry and QFT, KIAS, Seoul, Aug. 2019.

In addition I have given invited Seminars at Albert Einstein Institute, Potsdam; University of Amsterdam; California Institute of Technology; CERN, Geneva; Cornell University; University of Chicago; University of California at Berkeley; University of California at Santa Barbara; University of Southern California, Los Angeles; University of California at San Diego; University of Cape Town; DESY, Hamburg; Duke University; Cambridge University; ETH, Zurich; ENS, Paris; Gauhati University; Harvard University; ASICTP, Trieste; Institute of Physics, Czech Academy of Sciences, Prague; ICTS-TIFR, Bangalore; I.I.T. Kanpur; I.O.P. Bhubaneswar; Institute for Advanced Study, Princeton; ITEP, Moscow; ITP-Chinese Academy of Sciences; Jagiellonian University, Cracow; Jawaharlal Nehru University; KITP, Santa Barbara; University of KwaZulu Natal, Durban; Academia Sinica, Beijing; University of Paris; Princeton University; Massachusetts Institute of Technology; Raman Research Institute; University of Rochester; Rutgers University; University of Southern California; Stanford University; Syracuse University; Tata Institute of Fundamental Research; Utrecht University; Weizmann Institute.

I have also given popular talks on "Spacetime and String Theory", "String Theory and the Quest for Quantum Spacetime", "Hawking and his legacy in Fundamental Physics" to students at Techkriti07, IIT-Kanpur and RKM Vidyamandir, Belur, IISER Pune, IISER Bhopal, IISER-Kolkata, NISER Bhubaneswar, North Bengal University, Lucknow University, BITS-Goa, Science Day talk at BITS-Hyderabad, National Science day talk at HRI, TEDx talk at PES University, Infosys Campus.

IX. General Publications:

1. *Geometry and String Theory in Current Science, Special Issue*(vol. **81**, no. 12), Dec. 2001.
2. *Space, Time and Einstein* in special Einstein Issue of *Frontline*, May 15, 2005.
3. *Spacetime and String Theory* (with S. Minwalla) in *Hindustan Times*, Aug.6, 2006.
4. *What is the AdS/CFT correspondence?*, **Physics News**, Jan. 2010 issue.
5. *Spacetime and String Theory in Flavours of Research in Physics*, INSA, (ed. U. Sarkar)(2010).
6. *Three Decades of String Theory in India* in *Indian Physical Society, Special Issue* (2011).
7. *Variational Principles in Physics and Mathematics* in *Math Unlimited* (ed. R. Sujatha et.al.), CRC Press (2011).
8. *String Theory and the Conundrums of Quantum Gravity* in *Current Science, Special Issue on GR Centenary* **109**, 2265 (2015).

9. *Gravitational Waves: Beginning of a Turning Point in Astronomy* (with Spenta Wadia) - Op.ed article in *Indian Express*, Feb. 12, 2016.
10. *Seeing the Universe in a New Light*, (with Spenta Wadia) - Guest Editorial in *Current Science*, **110**, 1131, (2016).
11. *Exploring the Universe in a New Light*, (with Spenta Wadia) - News Article in *Asia Pacific News Letter*, May, 2016 issue, vol.5, p62.
12. *Stephen Hawking (1942-2018)* (with Spenta Wadia) - Invited Scientific Obituary in *Current Science*, **114**, 1560, (2018).