

Curriculum Vitae - Aalok Misra

Personal Details

Name : Aalok Misra

Nationality : Indian

Marital Status: Married with two children

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Indian Institute of Technology Roorkee,
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Position: Professor

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Research Experience (excluding research done for Ph.D.)

| Duration | Organisation | Area(s) |
|---|--|--|
| Regular Associate 6 years (Jan 1, 2010 - Dec 31, 2015) | Abdus Salam ICTP | String theory |
| Junior Associate 6 years (Jan 1, 2004 - Dec 31, 2009) | Abdus Salam ICTP | String theory |
| 15 months (Sep 1, 2002 - Nov 30, 2003) | Institute of Physics Humboldt University, Berlin, Germany Host: Dieter Lüst | String Theory (Humboldt Fellowship) |
| 6 months of 2-year period (on extraordinary leave: July 1, 2002 - Nov 30, 2003) | Harish-Chandra Research Institute Allahabad | String Theory |
| 2 years (Dec 29, 1999 - Dec 28, 2001) | Institute of Physics Bhubaneswar | String Theory |
| 2 years (Dec 17, 1997 - Dec 16, 1999) | I.I.T., Kanpur | Gauge Field Theory |

Academic Record

| Name of Institute | Degree | Year |
|---|---------------------------|-----------------------------------|
| University of Rochester | Ph.D. (Nuclear Theory) | Th Def: 1997 Deg awarded: 1998 |
| University of Rochester | M.A. | 1994 |
| St.Stephen's College (University of Delhi) | B.Sc. Hons. (Physics) | 1992 |

Awards

- Alexander von Humboldt fellowship, 2002-2003.
- “Star Performer”, Indian Institute of Technology, Roorkee, India, 2004-2005.
- Department of Atomic Energy, Government of India, Young Scientist award, 2004
- Junior Associate, Abdus Salam ICTP, Trieste (Italy), Jan 1, 2004 - Dec 31, 2009.
- Regular Associate, Abdus Salam ICTP, Trieste (Italy), Jan 1, 2010 - Dec 31, 2015.
- Panel of invited reviewers for Zentralblatt Math (European Mathematical Society (EMS), the Heidelberg Academy of Sciences and Humanities and FIZ Karlsruhe (Leibniz association))

Ph.D. Students supervised

- Payal Kaura: 2004-2009, **thesis title:** *Study of Black Holes and Compactification Geometries in String Theory* (postdoc in theoretical Quantum Chemistry at the University of Washington, Pullman, USA)
- Pramod Kumar Shukla: 2006-2011, **thesis title:** *Topics in Large Volume Swiss Cheese Compactification Geometries* (Alexander von Humboldt Fellowship with Dieter Lüst at MPI, Munich 2011-2013; postdoc at University of Turino, Italy 2013-2015; postdoc at the Abdus Salam ICTP, Trieste, Italy 2015-2017; postdoc at IFT, Madrid, Spain: 2017 - (Oct) 2018; Director's visitor, ICTP, Trieste, Italy: Oct '18 - current); long term visitor, ICTP; to join as assistant professor, University of Allahabad).
- Mansi Dhuria: 2009-2014, **thesis title:** *Topics in String Phenomenology* (After completion of a postdoc at Theoretical Physics Division, Physical Research Laboratory, Ahmedabad 2014-2016, she was selected for the Science and Engineering Research Board national postdoctoral fellowship. However, she chose a postdoc position at IIT Bombay 2016-2018. She is currently an INSPIRE Faculty at IITRAM, Ahmedabad.)
- Karunava Sil: 2014-2018, **thesis title:** *Study of M Theory Uplift of Desingularized Conifold Geometries Relevant to Thermal QCD*; after postdocs at Indian Institute of Technology Ropar and Indian Institute of Technology Bhubaneswar, to join a joint postdoc at University of Cyprus (Nicolas Toubas) and Ecole Polytechnic (Herve Partouche).
- Vikas Yadav: 2015-2021, **thesis title:** *String/M-theory Dual of Large-N Thermal QCD-Like Theories at Intermediate Gauge/t Hooft Coupling and Holographic Phenomenology*
- Gopal Yadav: 2019-Ongoing

Master's/Bachelor's Project Students

Domestic

- Rajyavardhan Ray (2005; Ph.D. from Indian Institute of Technology Kanpur, India); ESF Young Researcher, CoSiMa, Dresden Center for Computational Material Science (DCMS), TU Dresden at IFW Dresden; assistant professor at Birla Institute of Technology, Mesra.
- Hari Shankar Solanki (2005; Ph.D. from Tata Institute of Fundamental Research, Mumbai, India in 2011; postdoc at the University of Basel, Switzerland)
- Kanishka Belani (2006)
- Pramod Kumar Shukla (2006; he later also got his Ph.D. in 2011 under my supervision; Alexander von Humboldt Fellowship with Dieter Lüst at MPI, Munich 2011-2013; postdoc at University of Turino, Italy 2013-2015; postdoc at the Abdus Salam ICTP, Trieste, Italy 2015-2017; postdoc at IFT, Madrid, Spain: 2017 - (Oct) 2018; Director's visitor, ICTP, Trieste, Italy: Oct '18; long term visitor, ICTP; to join as assistant professor, University of Allahabad)
- Nishita Desai (2006; Ph.D. from Harish-Chandra Research Institute for Mathematics and Mathematical Sciences, Allahabad, India in 2012 under supervision of B.Mukhopadhyaya; postdoc at University College London: 2012 - 2013; Alexander von Humboldt Fellow at University of Heidelberg 2013 - 2015; postdoc at Laboratoire Charles Coulomb (L2C) & Laboratoire Universite Particules Montpellier (LUPM), CNRS-Universit de Montpellier 2016; Ramanujan fellow, Tata Institute of Fundamental Research, Mumbai)
- Rajan Walia (2006; after a Ph.D. from IIT Roorkee; assistant professor at Deen Dayal Upadhyay Gorakhpur University)
- Kolekar Sanved (2008; Ph.D. from IUCAA, Pune under supervision of T.Padmanabhan; assistant professor at the Indian Institute of Astrophysics)
- Jaya Khanna (2008; M.S., University of Western Ontario, Canada; Ph.D. in Atmospheric Sciences from Princeton University; postdoc at The Jackson School of Geosciences, UT, Austin, USA); assistant professor in the National Institute of Science, Education and Research, School of Earth and Planetary Sciences, Bhubaneswar.
- Vishvas Pandey (2010; Ph.D. at Gent University, Belgium; currently postdoc at Fermi lab, USA (after a postdoc at Virginia tech, USA))
- Jyotiranjana Beuria (2012; Ph.D. from the Harish-Chandra Research Institute, Allahabad, India)
- Gurharsh Singh (2012)
- Shannon Serrao (2013; registered for a Ph.D. at Virginia Tech, USA)
- Abhijit Sen (2015; registered for a Ph.D. at University of Novosibirsk, Russia)
- Pranjal Pandey (2016; Ph.D. at Institute of Physics, Bhubaneswar)
- Ranit Das (2017; after doing his MS at SUNY, Stony Brook, USA, registered for a Ph.D. at Rutgers University, USA)
- Sharad Mishra (2018)
- Daattavya Agrawal (2020); got a Master's in Theoretical and Mathematical Physics, Oxford University

- Adhrit Ravichandran (2021)
- Sambit Sarkar (2022)

Foreign

Anne Franzen (2005), RWTH Aachen, Germany [Ph.D. (2015), Utrecht University, Netherlands under the supervision of G.t'Hooft]; Junior Researcher at Instituto Superior Tecnico, CAMGSD Center for Mathematical Analysis, Geometry and Dynamical Systems, Lisbon, Portugal.

List of Publications

• M-Theory Uplifts of String-theoretic Conifold backgrounds relevant to thermal QCD/QGP

1. *"Swiss-Cheese" Entanglement Entropy in "Large" N "Scenario" (LNS) when Page-ing " \mathcal{M}_{int} " QCD Above T_c (or Page Curve for High Temperature QCD Bath from \mathcal{M} Theory at Intermediate Coupling)*, G. Yadav and A. Misra, [arXiv:2207.04048 [hep-th]].
2. *McTEQ (M chiral perturbation theory-compatible deconfinement Temperature and Entanglement Entropy up to terms Quartic in curvature) and FM (Flavor Memory)*, G. Yadav, V. Yadav, A. Misra, JHEP 10 (2021) 220 [arXiv:2108.05372[hep-th]].
3. *(Phenomenology/Lattice-Compatible) $SU(3)$ $M\chi PT$ HD up to $\mathcal{O}(p^4)$ and the $\mathcal{O}(R^4)$ -Large- N Connection*, G. Yadav, V. Yadav, A. Misra, JHEP 08 (2021) 151 [arXiv:2011.04460[hep-th]].
4. *On M-theory Dual of Large- N Thermal QCD-like Theories up to $\mathcal{O}(R^4)$ and G-Structure Classification of Non-Supersymmetric Geometries*, V. Yadav, A. Misra, arXiv:2004.07259 [hep-th].
5. *The QCD Trace Anomaly at Strong Coupling from M-Theory*, A. Misra and C. Gale, Eur. Phys. J. C 80 (2020) 7, 620 [arXiv:1909.04062[hep-th]].
6. *On Bulk Viscosity at Weak and Strong 't Hooft Couplings*, A. Czajka, K. Dasgupta, C. Gale, S. Jeon, A. Misra, M. Richard and K. Sil, Modern Phys. Lett. A 35 (2020) 27, 2030012 [arXiv:1807.07950 [hep-th] - companion paper to arXiv:1807.04713 [hep-th]].
7. *Bulk Viscosity at Extreme Limits: From Kinetic Theory to Strings*, A. Czajka, K. Dasgupta, C. Gale, S. Jeon, A. Misra, M. Richard and K. Sil, JHEP07(2019)145 [arXiv:1807.04713 [hep-th]].
8. *M-Theory Exotic Scalar Glueball Decays to Mesons at Finite Coupling*, V. Yadav and A. Misra, JHEP1809(2018)133 [arXiv:1808.01182 [hep-th]].
9. *Delocalized SYZ Mirrors and Confronting Top-Down $SU(3)$ -Structure Holographic Meson Masses at Finite g and N_c with $P(article)$ $D(ata)$ $G(roup)$ Values*, Vikas Yadav, Aalok Misra, Karunava Sil, Eur. Phys. J. C77 (2017) no.10, 656 [arXiv:1707.028 [hep-th]].
10. *Resolved warped deformed conifolds and large- N thermal QCD via black M3-branes*, University of Rome La Sapienza, Italy, 12–18 July 2015, Proceedings of the Fourteenth Marcel Grossmann Meeting (MG14), World Scientific (2017), 4211-4215.
11. *Top-Down Holographic G-Structure Glueball Spectroscopy at $(N)LO$ in N and Finite Gauge Coupling*, Karunava Sil, Vikas Yadav, Aalok Misra, Eur. Phys. J. C **77**, no. 6, 381 (2017) [arXiv:1703.01306 [hep-th]].
12. *New Insights into Properties of Large- N Holographic Thermal QCD at Finite Gauge Coupling at (the Non-Conformal/Next-to) Leading Order in N* , Karunava Sil, Aalok Misra, Eur.Phys.J. C76 (2016) no.11, 618 [arXiv:1606.04949 [hep-th]].
13. *On Aspects of Holographic Thermal QCD at Finite Coupling*, Karunava Sil, Aalok Misra, Nucl.Phys. B910 (2016) 754-822 [arXiv:1507.02692 [hep-th]].

14. *Transport Coefficients of Black MQGP M3-Branes*, Mansi Dhuria, Aalok Misra, arXiv:1406.6076 [hep-th], Eur. Phys. J. C, 75 1 (2015) 16.
15. *Towards MQGP*, Mansi Dhuria, Aalok Misra, JHEP1311(2013)001 [arXiv:1306.4339 [hep-th]].

• **Applications of Local Two-Parameter Calabi-Yau's to String Cosmology/Phenomenology, Black Hole Attractors and Moduli Stabilization**

1. *A Healthy Electron/Neutron EDM in D3/D7 μ -Split SUSY*, Mansi Dhuria, Aalok Misra, Phys. Rev. D90 (2014) 8, 085023 [arXiv:1308.3233 [hep-ph]].
2. *Swiss-Cheese Gravitino Dark Matter*, Aalok Misra, Light Cone 2012: Hadronic and Particle Physics, Dec 10-15, 2012, University of Delhi, Nucl.Phys.Proc.Suppl. 251-252 (2014) 50-55.
3. *(N)LSP Decays and Gravitino Relic Abundance in Big Divisor (nearly) SLag D3/D7 μ -Split SUSY*, M.Dhuria, A.Misra, arXiv:1207.2774[hep-ph], Nucl. Phys. B867 (2013) 636-748.
4. *Local D3/D7 μ -Split SUSY, 125 GeV Higgs and Large Volume Ricci-Flat Swiss-Cheese Metrics: A Brief Review* (invited review), A. Misra, Published in Mod.Phys.Lett. A27 (2012) 1230013 [arXiv:1106.5359[hep-th]].
5. *Towards Large Volume Big Divisor D3-D7 ' μ -Split Supersymmetry' and Ricci-Flat Swiss-Cheese Metrics, and Dimension-Six Neutrino Mass Operators*, Mansi Dhuria, Aalok Misra, Nucl.Phys. B855 (2012) 439-507 [arXiv:1106.5359 [hep-th]].
6. *"Big" Divisor D3/D7 Swiss-Cheese Phenomenology*, invited review for Mod. Phys. Lett. A, Mod. Phys. Lett. A, Vol. 26, No. 1 (2011) 1 [arXiv:1010.2273[hep-th]].
7. *On 'Light' Fermions and Proton Stability in 'Big Divisor' D3/D7 Swiss Cheese Phenomenology*, A. Misra, P. Shukla, Eur. Phys. J. C (2011) 71:1662 [arXiv:1007.1157].
8. *Soft SUSY breaking parameters and RG running of squark and slepton masses in large volume Swiss Cheese compactifications*, A. Misra and P. Shukla, Physics Letters B 685 (2010) 347[arXiv:0909.0087 [hep-th]].
9. *Swiss-Cheese D3/D7 Soft Supersymmetry Breaking*, A. Misra and P. Shukla, Nuclear Physics B 827 (2010) pp.112-182 [arXiv:0906.4517 [hep-th]].
10. A. Misra, *Issues in Swiss-Cheese Compactifications*, (invited review) Mod. Phys. Lett. A, Vol. 23, No. 36 (2008) pp. 3031-3047 [arXiv:0809.5149 [hep-th]].
11. A. Misra and P. Shukla, *"Finite" Non-Gaussianities and Tensor-Scalar Ratio in Large Volume Swiss-Cheese Compactifications*, Nuclear Physics B 810 (2009) pp.174192 [arXiv:0807.0996 [hep-th]].
12. A. Misra and P. Shukla, *Large Volume Axionic Swiss-Cheese Inflation*, Nuclear Physics B 800 (2008) pp.384-400 [arXiv:0712.1260 (hep-th)].
13. A. Misra and P. Shukla, *Moduli stabilization, large-volume dS minimum without D3-bar branes, (non-)supersymmetric black hole attractors and two-parameter Swiss cheese Calabi-Yau's*, Nuclear Physics B 799 (2008) 165-198 [arXiv:0707.0105 (hep-th)].
14. P. Kaura and A. Misra, *On the existence of non-supersymmetric black hole attractors for two-parameter Calabi-Yau's and attractor equations*, Fortsch. Phys. vol 54, No. 12 (2006) [hep-th/0607132].

• **Non-Kähler Manifolds**

1. *Flow Equations for Uplifting Half-Flat to Spin(7) Manifolds*, A.Misra, Journal of Mathematical Physics, vol 47, No. 3 (2006), hep-th/0507147.

2. *Uplifting the Iwasawa*, A.Franzen, P.Kaura, A.Misra and R.Ray, Fortschritte der Physik, vol 54, No. 4 (2006), hep-th/0506224
3. *Uplifting the Iwasawa*, A. Misra, 11th International Symposium on Particles, Strings and Cosmology (PASCOS 2005), Gyeongju, Korea, 30 May - 4 Jun 2005, AIP Conf. Proc. 805, 370 (2006).

• Compact Calabi-Yau's and Supermanifolds Miscellania

1. *Super Picard-Fuchs Equation and Monodromies for Supermanifolds*, P.Kaura, A.Misra and P.Shukla, J.Math. Phys., vol 48, No.2, 022306-1 (2007) [hep-th/0603126].
2. A. Misra and A. Nanda, *Flux vacua statistics for two-parameter Calabi-Yau's*, Fortschritte der Physik 53, No. 3, 243 (2005), arXiv:hep-th/0407252.

• Heat Kernel Asymptotics and M-Theory Instantons

1. *Supersymmetry of Noncompact MQCD-Like Membrane Instantons and Heat Kernel Asymptotics*, K.Belani, P.Kaura and A.Misra, JHEP10(2006)023 [hep-th/0603063].
2. *On the exact evaluation of the membrane instanton superpotential in M-theory on G_2 -holonomy manifold*, Aalok Misra, JHEP10 (2002) 056 [hep-th/0205293].

• Mirror Symmetry, Orientifolds of Non-Compact and Multi-Parameter Compact Calabi-Yau's

1. A. Misra, *MQCD, ('barely') G_2 -manifolds and (orientifold of) a compact Calabi-Yau*, *International Journal of Modern Physics A*, 20:2059-2098,2005, arXiv:hep-th/0403012.
2. A. Misra, *Type IIA on a compact Calabi-Yau and $D = 11$ supergravity uplift of it orientifold*, Fort. der Physik, 52, No. 9, 831 (2004) [arXiv:hep-th/0311186].
3. *Orientifolds, Unoriented Instantons and Localization*, D.Diaconescu, B.Florea and A.Misra, JHEP 0307:041, 2003, hep-th/0305021.
4. *MQCD, ('Barely') G_2 Manifolds, Nonperturbative $N=1$ Superpotentials and an $N=1$ Triality*, Aalok Misra, talk given at the Seventh Workshop on QCD (session on "Strings, Branes and (De)Construction"), Jan 6-10, 2003, Villefranche-sur Mer, France [to appear in the proceedings], and Fourth Jena workshop on Gauge Fields and Strings, Feb 25 - Mar 1, 2003, Jena, Germany.
5. *('Barely') G_2 Manifolds, (Orientifold of) a Compact Calabi-Yau, an $N = 1$ Triality, Nonperturbative $N = 1$ Superpotentials and Mirror Symmetry*, talk given at the International Workshop "Supersymmetries and Quantum Symmetries" (SQS'03), 24-29 July, 2003, JINR, Dubhna, Russia [to appear in the proceedings], and XII Oporto Meeting on Geometry, Topology and Physics, July 17-20, 2003, University of Oporto, Portugal (without "Mirror Symmetry" in the title), and poster presented at XIV International Congress on Mathematical Physics, July 28-Aug 2, 2003, University of Lisbon, Portugal (without "Mirror Symmetry" in the title).
6. *On (Orientifold of) type IIA on a Compact Calabi-Yau*, Aalok Misra, Fortsch. der Physik, 52, 2004, hep-th/0304209.

• Noncommutative String Theory and SYM

1. *The Peculiarity of a Negative Coordinate Axis in Dyonic Solutions of Noncommutative $N=4$ Super Yang-Mills*, Aalok Misra, J. Math. Phys 43, No 10, 2002 [hep-th/010808].
2. *Noncommutative $\mathcal{N} = 2p - p'$ System*, Aalok Misra, Int. J. Mod. Phys. A 17, 1117 (2002)[hep-th/0106196].

3. *Noncommutative $\mathcal{N} = 2$ Strings*, Alok Kumar, Aalok Misra and Kamal L. Panigrahi, JHEP 0102 (2001) 037 [hep-th/0011206].

- **Trialities**

1. A. Misra, *An $\mathcal{N} = 1$ triality by spectrum matching*, Int. J. Mod. Phys. A 19, 1441 (2004)[arXiv:hep-th/0212054].
2. *Triality of Four Dimensional Strings and Networks*, Alok Kumar and Aalok Misra, JHEP 0009 (2000) 016, [hep-th/0007110].

- **Application of Path Integrals and Field-Dependent BRS Transformations to the Study of Propagators in Non-Covariant Gauges**

1. *Absence of Nonlocal Counter-terms in the Gauge Boson Propagator in Axial -type Gauges*, Satish D. Joglekar and Aalok Misra, Int. J. Mod. Phys. A16, 3731 (2001) [hep-th/0010075].
2. S. D. Joglekar and A. Misra, *Absence of nonlocal counterterms in the gauge boson propagator in the Axial type gauges*, To appear in the proceedings of 14th DAE Symposium on High-Energy Physics, Hyderabad, India, 18-22 Dec 2000.
3. *Field-Dependent BRS Transformations and Correct Prescription for $1/(\eta \cdot k)^p$ -Type Singularities in Axial Gauges*, talk given at the XXXVth Rencontres de Moriond session on QCD And High Energy Hadronic Interactions, Les Arcs, France, Mar 18-25, page 49 of the conference proceedings [hep-th/0004007].
4. *Wilson Loop and the Treatment of Axial Gauge Poles*, Satish D. Joglekar and Aalok Misra, Mod.Phys.Lett. A15 (2000) 541-546; Erratum-ibid. A15 (2000) 1539 [hep-th/9912020].
5. *Correct Treatment of $1/(\eta \cdot k)^p$ -Singularities in the Axial Gauge Propagator*, Satish D. Joglekar and Aalok Misra, Int.J.Mod.Phys. A15 (2000) 1453-1480; Erratum-ibid. A15 (2000) 3899.
6. *A Derivation of the Correct Treatment of $1/(\eta \cdot k)^p$ - Singularities in Axial Gauges*, Satish D. Joglekar and Aalok Misra, Mod.Phys.Lett. A14 (1999) 2083-2092; Erratum-ibid. A15 (2000) 1347, [hep-th/9904107].
7. *Relating Green's Functions in Axial and Lorentz Gauges using Finite Field-dependent BRS Transformation*, Satish D. Joglekar and Aalok Misra, J.Math.Phys. 41 (2000) 1755-1767, [hep-th/9812101].

- **Pion-Nucleon Effective Field Theories**

1. *Derivation of $O(q^4)$ Effective Lagrangian in the Presence of External Fields Directly Within Heavy Baryon Chiral Perturbation Theory* (Technical Report), Aalok Misra, hep-ph/0001232.
2. *Derivation of $O(q^4)$ Effective Pion-Nucleon Lagrangian Within Heavy Baryon Chiral Perturbation Theory* (Technical Report), Aalok Misra, hep-ph/9909498.
3. *Pion Double Charge Exchange within Heavy Baryon Chiral Perturbation Theory to One Loop*, Aalok Misra, Daniel S. Koltun, Phys.Rev.C61:024003,2000 [nucl-th/9810075].
4. *Derivation of the Effective Pion-Nucleon Lagrangian within Heavy Baryon Chiral Perturbation Theory*, Aalok Misra and Daniel S. Koltun, Nucl.Phys. A646 (1999) 343-363 [nucl-th/9805031].

Talks Given

Pion-Nucleon Effective Field Theories

1. “Pion Double Charge Exchange within the Framework of Heavy Baryon Chiral Perturbation Theory,” TRIUMF, Vancouver, Canada, Mar '97

2. “ChPT, BChPT, HBChPT and All That” (colloquium), I.I.T. Kanpur, India, Aug '98
3. “Two Topics in $SU(2)$ Heavy Baryon Chiral Perturbation Theory” (given at a QCD workshop) QCD98, The Institute of Mathematical Sciences, Chennai, India, Nov 30 - Dec 8, '98

Application of Path Integrals and Field-Dependent BRS Transformations to the Study of Propagators in Non-Covariant Gauges

1. “Relating Green’s Functions in Axial and Lorentz Gauges using Finite Field-dependent BRS Transformation,” Department of Atomic Energy meeting on high energy physics, Chandigarh, India, Dec 26 - Dec 30, '98
2. *Field-Dependent BRS Transformations and Correct Prescription for $1/(n.k)^p$ -Type Singularities in Axial Gauges*, XXXVth Rencontres de Moriond session on QCD And High Energy Hadronic Interactions, Les Arcs 1800, France, Mar 18-25, 2000.

String Theory

• Noncommutative String Theory

1. *Topics in Noncommutative $\mathcal{N} = 2$ Strings*, SISSA, Trieste, Italy, April 18, 2001.
2. *Topics in Noncommutative $\mathcal{N} = 2$ Strings*, DESY-Humboldt seminar at the Institute of Theoretical Physics, Humboldt University, Berlin, Germany, May 3, 2001.

• Mirror Symmetry, Orientifolds of Non-Compact and Multi-Parameter Compact Calabi Yau’s, Membrane Instantons and Trialities

1. $\mathcal{N} = 1$ *Superpotentials*, Institut für Physik, Humboldt University, Berlin, Germany, Dec 17, 2002.
2. *MQCD, (‘Barely’) G_2 Manifolds, Nonperturbative $\mathcal{N} = 1$ Superpotential and an $\mathcal{N} = 1$ Triality*, Seventh Workshop on Quantum Chromodynamics, January 6-10, 2003 at La Citadelle, Villefranche-sur-Mer, France.
3. *(‘Barely’) G_2 Manifolds, Nonperturbative $\mathcal{N} = 1$ Superpotential and an $\mathcal{N} = 1$ Triality*, CERN, Jan 14, 2003.
4. *An $N=1$ Triality, (Orientifold of) a compact Calabi-Yau, Picard-Fuchs Equation and nonperturbative $N=1$ Superpotentials using Mirror Symmetry*, Invited talk at the Fifth International Conference on “Symmetry in Nonlinear Mathematical Physics”, Institute of Mathematics, Kiev, Ukraine, Jun 23-29, 2003.
5. *(‘Barely’) G_2 Manifolds, Nonperturbative $\mathcal{N} = 1$ Superpotentials and an $\mathcal{N} = 1$ Triality*, Fourth Workshop on Gauge Fields and Strings, Feb 25 - Mar 1, 2003, Jena, Germany.
6. *(‘Barely’) G_2 Manifolds, Nonperturbative $\mathcal{N} = 1$ Superpotentials and an $\mathcal{N} = 1$ Triality*, Abdus Salam ICTP, Trieste, Italy, Apr 10, 2003.
7. *(‘Barely’) G_2 Manifolds, (Orientifold of) a Compact Calabi-Yau and Nonperturbative $\mathcal{N} = 1$ Superpotentials*, XII Oporto Meeting on Geometry, Topology and Physics, Oporto, Portugal, July 17-20, 2003.
8. *(‘Barely’) G_2 Manifolds, (Orientifold of) Calabi-Yau’s, an $\mathcal{N} = 1$ Triality, Nonperturbative $\mathcal{N} = 1$ Superpotentials and Mirror Symmetry*, International Workshop on Supersymmetries and Quantum Symmetries, JINR, Dubna, July 24-29, 2003.
9. *(‘Barely’) G_2 Manifolds, (Orientifold of) a Compact Calabi-Yau and Nonperturbative $\mathcal{N} = 1$ Superpotentials*, Poster presented at XIV International Congress on Mathematical Physics, University of Lisbon, Portugal, July 28 - Aug 2, 2003.

10. *String/M-Theory Duals in the Presence of Fluxes*, Department of Atomic Energy Young Scientist Award project selection presentation, BARC, Trombay, India, Oct 25, 2004.
11. *Flux Vacua Statistics for Two-Parameter Calabi-Yau's*, TIFR(Mumbai), India, Oct 26, 2004.
12. *(Orientifolds of) Compact Calabi-Yau's and String/M-theory compactifications*, International Workshop on String Theory, Khajuraho, India, Dec 15-23, 2004.
13. *Supermanifolds and Some Relevant Algebraic Geometry*, Symmetries Extra Dimensions and Unified Theories, IIT Mumbai, March 4-7, 2006.

• **Non-Kähler Geometries in String Theory**

1. *Uplifting the Iwasawa*, PASCOS05, Gyeongju, Korea, May 30-June 4, 2005.
2. *Uplifting the Iwasawa*, Physical Research Laboratory, Ahmedabad, India, May 19, 2005.
3. *Uplifting the Iwasawa to Manifolds of Exceptional Holonomy or $SU(3)$ Structure*, Institute of Advanced Study, Princeton, USA, Aug 2005.
4. *Uplifting the Iwasawa to 7-Folds of G_2 holonomy or $SU(3)$ Structure*, Department of Physics, Cornell University, USA, July 2005.
5. *Flux Compactification Geometries*, National string workshop, IIT Kanpur, Oct 2005.
6. *(String theory inspired) Excursions into (Complex) Differential Geometry of Non-Kähler Six-Folds and Their Exceptional Uplifts*, invited talk at the 71st meeting of the Indian Mathematical Society, Indian Institute of Technology Roorkee, Dec 26-29, 2005.

• **Applications of (Local) Two-Parameter (Swiss-Cheese) Calabi-Yau's to Moduli Stabilization, Local String Cosmology, Black Hole Attractors, Moduli Stabilization and Local String Phenomenology**

1. *Non-Supersymmetric Black Hole Attractors for Two-Parameter Calabi-Yau's and Attractor Equations*, Enrico Fermi Institute, University of Chicago, USA, July 21, 2006.
2. *(Non-)Perturbative Aspects of Black Hole Attractors and Moduli Stabilization for Two-Parameter Calabi-Yau's*, McGill University, Canada, July 2007.
3. *(Non-)Perturbative Aspects of Black Hole Attractors and Moduli Stabilization for Two-Parameter Calabi-Yau's*, Ohio State University, USA, July 2007.
4. *(Non-)Perturbative Aspects of Black Hole Attractors and Moduli Stabilization for Two-Parameter Calabi-Yau's*, Columbia University, USA, July 2007.
5. *dS Minimum Without anti-D3 Branes and Large Volume Axionic Swiss-Cheese Inflation*, PASCOS08, June 2-6, 2008, Perimeter Institute, Canada.
6. *dS Minimum Without Anti-D3 Branes, Large Volume Axionic Inflation, (Non-)Supersymmetric Black Hole Attractors and Swiss-Cheese Calabi Yau's*, Cornell University, May 21, 2008
7. *dS Minimum Without Anti-D3 Branes, Large Volume Axionic Inflation, (Non-)Supersymmetric Black Hole Attractors and Swiss-Cheese Calabi Yau's*, Caltech, June 6, 2008.
8. *dS Minimum Without Anti-D3 Branes, Large Volume Axionic Inflation, (Non-)Supersymmetric Black Hole Attractors and Swiss-Cheese Calabi Yau's*, UCLA, June 9, 2008.
9. *dS Minimum Without Anti-D3 Branes, Large Volume Axionic Inflation, (Non-)Supersymmetric Black Hole Attractors and Swiss-Cheese Calabi Yau's*, UC Berkeley, June 10, 2008.
10. *Stringy Two-Parameter Calabi-Yau Compactification Combo*, Current Trends in Field Theories, Banaras Hindu University, Varanasi, Nov 1-2, 2008.

11. *Applications of (Large Volume) Swiss-Cheese Compactifications*, Harvard University, April 30, 2009.
12. *Applications of Swiss-Cheese Compactifications*, McGill University, May 15, 2009.
13. *Swiss Cheese Phenomenology*, Alok Kumar Memorial Conference, Feb 17-19, 2010, Institute of Physics, Bhubaneswar.
14. *Swiss-Cheese Phenomenology and Large Volume Cosmo-Pheno Reconciliation*, Imperial College, London, May 26, 2010.
15. *Swiss-Cheese Phenomenology and Large Volume Cosmo-Pheno Reconciliation*, Enrico Fermi Institute, June 2, 2010.
16. *Swiss-Cheese Phenomenology and Large Volume Cosmo-Pheno Reconciliation*, Maryland Center for Fundamental Physics, University of Maryland, June 8, 2010.
17. *Swiss-Cheese Phenomenology and Large Volume Cosmo-Pheno Reconciliation*, Neils Bohr Institute, Copenhagen, June 15, 2010.
18. *Swiss-Cheese Phenomenology and Large Volume Cosmo-Pheno Reconciliation*, Max Planck Institute for Physics, Munich, June 21, 2010.
19. *Swiss-Cheese Phenomenology and Large Volume Cosmo-Pheno Reconciliation*, Max Planck Institute/Albert Einstein Institute for Gravitation at Golm, July 7, 2010.
20. *Towards Large Volume “Big Divisor” μ -Split Supersymmetry Scenario*, International Conference on New Trends in Field Theories, Feb 7-12, 2011, Banaras Hindu University, Varanasi.
21. *Large Volume Cosmo-Pheno Reconciliation, μ -Split SUSY and Ricci-flat Swiss Cheese Metrics*, Ohio State University, USA, May 16, 2011.
22. *Towards Large Volume D3/D7 μ -Split SUSY and Ricci Flat Swiss-Cheese Metrics*, University of California, Berkeley, USA, May 19, 2011.
23. *Large Volume Cosmo-Pheno Reconciliation, μ -Split SUSY and Ricci-flat Swiss Cheese Metrics*, Northeastern University, USA, May 20, 2011.
24. *Towards Big Divisor Swiss-Chesse μ -Split Supersymmetry Scenario*, University of Liverpool, UK, May 25, 2011.
25. *Towards Big Divisor Swiss-Chesse μ -Split Supersymmetry Scenario*, Centre for Research in String Theory, Queen Mary University of London, UK, May 26, 2011.
26. *Large Volume Cosmo-Pheno Reconciliation, μ -Split SUSY and Ricci-flat Swiss Cheese Metrics*, ETH Zurich, Switzerland, June 1, 2011.
27. *Aspects of Big Divisor D3/D7 μ -Split SUSY*, Purdue University, May 21, 2012.
28. *Aspects of Big Divisor D3/D7 μ -Split SUSY*, McGill University, May 24, 2012.
29. *Swiss-Cheese Gravitino Dark Matter*, Light Cone 2012, University of Delhi, Dec 10-15, 2012.
30. *Swiss-Cheese Gravitino Dark Matter*, Syracuse University, May 3, 2013.
31. *Gravitino Dark Matter and 125GeV Higgs*, Johns Hopkins University, May 7, 2013.
32. *Gravitino DM Relic Abundance due to Heavy Scalars and 125GeV Higgs in (D3-D7) μ -Split SUSY*, Scalars2013, Sep 12 - 16, 2013, University of Warsaw, Poland.
33. *Gravitino DM and a Healthy EDM in D3/D7 μ -Split Supersymmetry*, DESY Theory Workshop on Non-Perturbative QFT : Methods and Applications, Sep 24 - 27, 2013.
34. *Particle Cosmology and Phenomenology - Related aspects of D3/D7 μ -Split SUSY*, Northeastern University, Boston, USA, May 15, 2014.
35. *Particle Cosmology and Phenomenology - Related aspects of D3/D7 μ -Split SUSY*, Department of Mathematical Sciences, University of Liverpool, UK, May 21, 2014.

36. *Gravitino DM Relic Abundance and a Healthy EDM in μ -Split $D3/D7$ - Split Like SUSY*, Chalmers University of Technology, Göteborg, Sweden, May 14, 2015.

• **Applications of Conifolds to String/M-Theory**

1. *Local MQGP*, NSM 13, IIT Kharagpur, Dec 22-27, 2013
2. *Local MQGP Dynamics*, Department of Mathematical Sciences, U. Liverpool, UK, May 20, 2014.
3. *Local MQGP Dynamics*, Swansea University, UK, May 23, 2014.
4. *Local MQGP Dynamics*, Neils Bohr Institute, Copenhagen, May 27, 2014.
5. *MQGP Dynamics*, ‘New Trends in Field Theory’, Nov 1-5, 2014, Banaras Hindu University, Varanasi, India.
6. *Non-Kähler Resolved Warped Deformed Conifolds and Black M3-Branes in a Large- N MQGP Limit*, King’s College, London, UK, May 13, 2015.
7. *Resolved Warped Deformed Conifolds and Black M3-Branes in a Large- N MQGP Limit*, Purdue University, West Lafayette, Indiana, USA, May 19, 2015.
8. *Resolved Warped Deformed Conifolds and Black M3-Branes in a Large- N MQGP Limit*, Brown University, Providence, Rhode Island, USA, May 21, 2015.
9. *Resolved Warped Deformed Conifolds and Black M3-Branes in a Large- N MQGP Limit*, ‘eNLarge Horizons’, IFT, UAM-CSIC, Madrid, Spain, Jun 1-5, 2015.
10. *Resolved Warped Deformed Conifolds and Black M3-Branes in a Large- N MQGP Limit*, The Abdus Salam International Centre for Theoretical Physics, Trieste, Italy, PASCOS 2015, June 29 - July 3, 2015.
11. *Resolved Warped Deformed Conifolds and Black M3-Branes in a Large- N MQGP Limit*, Fourteenth Marcel Grossmann Meeting, University of Rome, July 12 - 18, 2015, La Sapienza, Rome, Italy.
12. *Thermal QCD at Finite Gauge Coupling from String/M-theory Involving Six-/Seven-Folds of $SU(3)/G_2$ -Structure*, Workshop: Applications of AdS/CFT to QCD and condensed matter physics, Centre de Recherches Mathematiques Universite de Montreal, Canada, Oct 19-23, 2015.
13. *Thermal QCD at Finite Gauge Coupling from String/M-theory Involving Six-/Seven-Folds of $SU(3)/G_2$ -Structure*, National Strings Meeting (NSM) 2015, IISER Mohali, Dec 6-11, 2015.
14. *Holographic Thermal QCD at Finite Gauge Coupling (‘MQGP’ Limit) and G -Structures*, The Southampton Theory Astrophysics and Gravity (STAG) Research Centre, University of Southampton, May 18, 2016.
15. *Holographic Thermal QCD at Finite Gauge Coupling (‘MQGP’ Limit) and G -Structures*, MPI for Physics, Munich, May 23, 2016.
16. *Holographic Thermal QCD at Finite Gauge Coupling (‘MQGP’ Limit) and G -Structures*, MPI Albert Einstein Institute for Gravitational Physics, June 14, 2016.
17. *Applied Top-Down Holographic Large- N Thermal QCD and G -Structures via Delocalized SYZ Mirrors*, Center for High Energy Physics, McGill University, June 6, 2017.
18. *Top-Down G -Structured Buchel Bound at Finite Coupling Sounds Good*, National String Meeting, NISER, Bhubaneswar, Dec 5-10, 2017.
19. *Applied Top-Down Holographic Large- N Thermal QCD and G -Structures via Delocalized SYZ Mirrors*, Department of Mathematical Sciences, University of Liverpool, UK, May 22, 2018.
20. *CMP-Related/Phenomenological Aspects of SYZ Mirror of Holographic String/M-theory Dual of Large- N Thermal QCD at Finite Coupling and G -Structure Torsion Classes*, Theoretical Physics group, Imperial College London, UK, May 23, 2018.

21. *Top-Down Holographic Large- N Thermal QCD at Finite Coupling*, New Trends in Field Theory-6, Banaras Hindu University, Varanasi, Nov 25-30, 2018.
22. *Top-Down Holographic Large- N Thermal QCD at Finite Coupling*, Purdue University, May 22, 2019.
23. *Top-Down Non-Conformal Holographic QCD at Finite Coupling*, International Conference on New Frontiers in Physics, (ICNFP) 2019, Aug 21-29, 2019, OAC, Crete, Greece.

International conferences/workshops/schools attended/visits made

1. The McGill-Rochester-Syracuse-Toronto conference on high energy physics, University of Rochester, USA, '95.
2. Spring workshop on "Superstrings and Related Matters", Abdus Salam ICTP, Trieste, Italy, 1999.
3. XXXVth Rencontres de Moriond session on QCD And High Energy Hadronic Interactions, Les Arcs 1800, France, Mar 18-25, 2000.
4. Strings 2001, Tata Institute of Fundamental Research, Mumbai, India, Jan 5-10, 2001.
5. Spring School on "Superstrings and Related Matters", Abdus Salam ICTP, Trieste, Italy, April 2- 10, 2001; I visited Abdus Salam, ICTP from April 1 to May 2, 2001.
6. Spring School on "Superstrings and Related Matters", Abdus Salam ICTP, Trieste, Italy, Mar 18 - 26, 2002.
7. 35th Symposium Ahrenschoop: Recent Developments in String/M-Theory and Field Theory, 26-30 August 2002, Alt-Schmöckwitz, Germany.
8. Seventh Workshop on Quantum Chromodynamics, January 6-10, 2003 at La Citadelle, Villefranche-sur-Mer, 06230, France.
9. Fourth Workshop on Gauge Fields and Strings, Feb 25 - Mar 1, 2003, Jena, Germany.
10. Invited talk at the Fifth International Conference on "Symmetry in Nonlinear Mathematical Physics", Insitute of Mathematics, Kiev, Ukraine, Jun 23-29, 2003.
11. Spring School on "Superstings and Related Matters", Abdus Salam ICTP, Trieste, Italy, Mar 31 - Apr 8, 2003.
12. XII Oporto Meeting on Geometry, Topology and Physics, Oporto, Portugal, July 17-20, 2003.
13. International Workshop on Supersymmetries and Quantum Symmetries, JINR, Dubna, July 24-29, 2003.
14. XIV International Congress on Mathematical Physics, July 28-Aug 2, 2003, University of Lisbon, Portugal
15. International Workshop on String Theory, Khajuraho, India, Dec 15-23, 2004.
16. PASCOS05, Gyeongju, Korea, May 30-June 4, 2005
17. Theory Group, Department of Physics, Harvard University, USA, June 7-Aug 8, 2005.
18. Institute of Advanced Study, Princeton, USA, Aug 2005.
19. Theory Group, Department of Physics, Cornell University, July 2005.

20. University of Rochester, NY, USA, Aug 2005.
21. Abdus Salam International Centre for Theoretical Physics, Trieste, Italy, June 1 - July 14, 2006 as a junior associate.
22. Symmetries Extra Dimensions and Unified Theories, IIT Mumbai, March 4-7, 2006.
23. Enrico Fermi Institute, University of Chicago, USA, July 2006 as a visiting scholar.
24. Michigan Center for Theoretical Physics, University of Michigan, Ann Arbor, USA, July, 2006.
25. Department of Physics, Theory Unit, CERN, Switzerland, June 1 - July 11, 2007.
26. Department of Physics, McGill University, Canada, July 2007.
27. Department of Physics, University of Pennsylvania, USA, July 2007.
28. Department of Physics, Ohio State University, USA, July 2007.
29. Department of Physics, Columbia University, USA, July 2007.
30. PASCOS08, June 2-4, 2008, Perimeter Institute, Canada
31. Perimeter Institute, Canada, May 22 - June 6, 2008
32. Cornell University, May, 2008
33. Caltech, USA, June 2008
34. UCLA, USA, June 2008
35. UC Berkeley, USA, June 2008
36. Abdus Salam ICTP, June 12 - July 23, 2008
37. Harvard University (C.Vafa, High Energy Theory Group), USA, April 26 - May 1, 2009
38. Institute of Advanced Study (School of Natural Science), Princeton, USA, May 1 - 14, 2009
39. McGill University (High Energy Theory Group), Canada, May 14-18, 2009.
40. Abdus Salam ICTP, May 19 - June 30, 2009.
41. Imperial College, London, May 26-30, 2010.
42. Enrico Fermi Institute, University of Chicago, May 31 - June 3, 2010.
43. Maryland Center for Fundamental Physics, University of Maryland, June 3 - 10, 2010.
44. Neils Bohr Institute, Copenhagen, June 11-17, 2010.
45. Max Planck Institute for Physics, Munich, June 17-31, 2010.
46. Max Planck Institute/Albert Einstein Institute for Gravitation, Golm, July 1-9, 2010.
47. International Conference on New Trends in Field Theories, Feb 7-12, 2011, Banaras Hindu University, Varanasi.
48. Ohio State University, USA, May 15-18, 2011.

49. University of California, Berkeley, USA, May 18-19, 2011.
50. Northeastern University, Boston, USA, May 20-21, 2011.
51. University of Liverpool, UK, May 23-25, 2011.
52. Centre for Research in String Theory, Queen Mary University of London, UK, May 26-28, 2011.
53. ETH Zurich, Switzerland, May 30-June 1, 2011.
54. CERN, Geneva, Switzerland, June 2 - July 2, 2011.
55. Purdue University, West Lafayette, USA, May 21 - 23, 2012
56. McGill University, Montreal, Canada, May 24 - 27, 2012.
57. The Abdus Salam International Centre for Theoretical Physics, May 28 - July 13, 2012.
58. Light Cone 2012, University of Delhi, Dec 10 - 15, 2012.
59. Syracuse University, May 2-4, 2013.
60. Johns Hopkins University, May 6-8, 2013.
61. The Abdus Salam International Centre for Theoretical Physics, May 18 - July 12, 2013.
62. *Scalars 2013*, Sep 12-16, 2013, University of Warsaw, Poland.
63. *Non-Perturbative Quantum Field Theory : Methods and Applications*, DESY Theory Workshop, Sep 24-27, 2013, DESY Hamburg, Germany.
64. Northeastern University, May 15-16, 2014.
65. Department of Mathematical Sciences, University of Liverpool, May 20-22, 2014.
66. Swansea University, May 22-24, 2014.
67. NBI, Copenhagen, May 25-28, 2014
68. CERN theory group, May 28 - June 30, 2014
69. *New Trends in Field Theory 4*, Nov 1-5, 2014, Banaras Hindu University, Varanasi, India.
70. *eNLarge Horizons*, June 1-5, 2015, IFT, UAM-CSIC, Madrid, Spain.
71. *PASCOS 2015*, June 29 - July 3, 2015, ICTP, Trieste, Italy.
72. *Fourteenth Marcel Grossmann Meeting*, July 12 - 18, 2015, University of Rome, La Sapienza, Italy.
73. *Workshop: Applications of AdS/CFT to QCD and condensed matter physics*, Centre de Recherches Mathematiques Universite de Montreal, Canada, Oct 19-23, 2015.
74. Southampton Theory Astrophysics and Gravity Research Centre, University of Southampton, UK, May 18-19, 2016.
75. Max Planck Institute for Physics, Munich, Germany, May 20 - June 2, 2016.
76. Max Planck Institute - Albert Einstein Institute for Gravitational Physics, Golm, Germany, June 3 - 18, 2016.

77. Center for High Energy Physics, McGill University, May 30 - July 15, 2017.
78. Department of Mathematical Sciences, University of Liverpool, May 21-22, 2018.
79. Theoretical Physics group, Imperial College London, May 23-24, 2018.
80. McGill's Center for High Energy Physics, McGill University, Montreal, Canada, May 25 - July 13, 2018.
81. *New Trends in Field Theory-6*, Banaras Hindu University, Varanasi, Nov 25-30, 2018.
82. Purdue University, May 20-25, 2019.
83. Center for High Energy Physics, McGill University, May 25 - July 6, 2019.
84. International Conference on New Frontiers in Physics, (ICNFP) 2019, Aug 21-24, 2019, Orthodox Academy of Crete, Kolymbari, Crete, Greece.
85. (was scheduled to visit but the visits were canceled due to COVID-19) Simons Center for Geometry and Physics, Stonybrook University, May 26-29, 2020; UC Santa Barbara, May 19 - 22, 2020; McGill University, May 29 - July 15, 2020.

Workshops and Lecture Series organized at IIT Roorkee

1. Convener, workshop *Theoretical High Energy Physics (THEP)-I*, Mar 16-20, 2005, Indian Institute of Technology, Roorkee, India sponsored by AICTE.
2. Convener, *International Workshop on Theoretical High Energy Physics 07*, March 15-20, 2007, Indian Institute of Technology, Roorkee, India sponsored by Simons Foundation (due to a strong recommendation by Edward Witten), Indo-US Forum of ST,ICTP, DST, DAE, HRI, IMSc, TIFR, SINP

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3. Coordinator, Mysteries of the Universe (MOU) Institute Lecture Series (ILS) at IIT Roorkee:

(a) MOU ILS 2020: Oct 17 - Nov 27, 2020

<https://iitr.ac.in/ils-mou/#/mou-1#mou-1>

with speakers

- J. Schwarz
- E. Witten
- C. Vafa
- J. Maldacena
- A. Ashtekar.

(b) MOU ILS 2021: Jan 9 - May 8, 2021

<https://iitr.ac.in/ils-mou/#/>

with speakers

- A.J.Leggett
- F.D.M.Haldane
- C.Kane
- J.B.Pendry
- T.V.Ramakrishnan
- S.Sachdev
- T.Padmanabhan
- J.Jain

- J.B.Burnell
- R.Narayan
- S-T Yau
- K. Rajagopal
- K. A. Moler
- R. H.Dijkgraaf
- R.Malhotra
- R.Godbole

4. Convener, Indian Strings Meeting (ISM) 2021,

<https://iitr.ac.in/ism21/#/>

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