Resume of

URJIT AJITLAL YAJNIK

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1 Higher Education

M.Sc. (Physics) 5-yr. integrated	1980	:	First Class with distinction Indian Institute of Technology, Bombay
Ph.D.	1986	:	Theoretical Particle Physics, University of Texas at Austin

2 Postdoctoral Research

Research Associate	:	Weinberg Theory Group, University of Texas at Austin	June 1986 - January 1987
Visiting Fellow	:	Tata Institute of Fundamental Research, Mumbai	February 1987- July 1989

3 Faculty Positions

Professor	:	IIT Bombay	May 2014 Higher Academic Grade
Professor	:	IIT Bombay	March 2001 onward
Associate Professor	:	IIT Bombay	July 1994 - March 2001
Assistant Professor	:	IIT Bombay	Nov. 1990 - July 1994
Lecturer	:	IIT Bombay	Aug. 1989 - Nov. 1990

3.1 Centre for Advanced Study, IIT Bombay

Convener of the Centre, with a mandate to implement ICTP Trieste-IIT Bombay MoU fostering national and international collaboration

4 Honours

- Institute Chair Professor, IIT Bombay March 2021 onwards (three year tenure)
- Institute Chair Professor, IIT Bombay August 2014 - July 2017
- Elected Fellow of the Gujarat Academy of Sciences 2006

5 Sabbatical positions

- Physics Department, McGill University, Montréal January - May and Oct - Dec 2010

- University of California, Irvine, June 15 - August 14, 2010
- Physics Department, LPS, Université de Montréal, May 2010
- Physics Department, LPS, Université de Montréal, May - June 1999
- Physics Department, McGill University, Montreal January - April 1999

6 Administrative positions

- *Dean, Student Affairs* September 2011- May 2015
- *Dean, Academic Programmes and Student Affairs*,
  On deputation to :
  Indian Institute of Technology, Gandhinagar July 2008 - December 2009
- *Head, Computer Centre* February 2008 - June 2008
- *Chairman, Cultural Affairs*, July 2000 - June 2003
  Students' Gymkhana.

6.1 Administrative services

- Member of Senate (external), National Instiute of Design Ahmedabad, 2019 - 21
- Advisory committee Physics Department, IIT Ropar 2018 -21
- Invited member of Senate, National Institute of Design Ahmedabad 2019 -21
- Standing Committee (academic recruitment), IIT Bhilai 2018 - 20
- Curriculum committees of IIT Delhi, IIT Ropar, BRA-NIT Jalandhar, IIT Indore

6.2 Administrative training conducted

Co-ordinator, MHRD supported *LEAP* - Training Program for Academic Leadership, February - March 2019

7 Research interests

Grand unified theories, General Relativity, semi-calssical Gravity, Cosmology. Topological methods.

Current area of work :

- Beyond Standard Model with right-handed neutrinos
- Supersymmetric unification
- Cosmology – inflation, Dark Matter, Dark Energy

8 Extended visits

- Université de Montréal, Canada, July 2019; June - July 2017; October - November 2015; November 2013; May 2012
- Perimeter Institue for Theoretical Physics, Waterloo, Canada, August 2010
- Fermi National Accelerator Laboratory, Batavia, Illinois, USA, July 2006
- Perimeter Institue for Theoretical Physics, Waterloo, Canada, June 2006
- Center for HEP, Astroparticle Physics and Cosmology, Abdus Salam ICTP, Trieste, Italy, May - June 2006
- Korea Institute for Advanced Study, Seoul, Korea, June-July 2004
- Michigan Centre for Theoretical Physics, Ann Arbor, USA, July 2003
- Extended Workshop on Astroparticle Physics, Abdus Salam ICTP, Trieste, Italy, November-December 1997

9 Postdoctoral supervision

1. Dr. Prativa Pritimita August 2019 - July 2022
2. Dr. Ila Garg December 2016 - November 2018
3. Dr. Mansi Dhuria August 2016 - July 2018
4. Dr. Piyali Bannerjee October 2012 - April 2016

   Collaboration continued under DST Women Scientists Scheme 2017 -2021
5. Dr. K. Venkataratnam September 2010 - August 2012
6. Dr. Surya Narayana Nayak 2001- 2003

10 Doctoral supervision

10.1 Completed

1. Supriya Senapati, 2022 - Neutrino masses and mixing : a left-right theory approach
2. Chayan Majumdar, 2022 - Phenomenological and Comological signatures of certain left-right theories
3. Rajesh Goswami 2020, "Inflationary cosmology : Primordial Universe and its imprints on the Cosmic Microwave Background"
4. Haresh Raval 2017, "Implications of a quadratic gauge in non-perturbative QCD"

5. Debasish Borah 2012, "Neutrino Masses, Parity Symmetric Particle Physics and Cosmology"

6. Brijesh Kumar Singh 2011, "Topological Objects and Vacuum Stability in Quantum Field Theory" (co-supervised with P. Ramadevi)

7. Sasmita Mishra 2011, "Accomplishing parity breaking and supersymmetry breaking in the context of cosmology"

8. Anjishnu Sarkar 2009, "Left-Right supersymmetric extension of Standard Model and its Cosmological signature"

9. Narendra Sahu 2005, "Bounds on neutrino masses from baryongenesis in thermal and non-thermal scenarios"

10. Susmita Bhowmik Duari 1997, "Baryogenesis at the electroweak scale - topological defects and sources of CP violation"

10.2 Ongoing

1. Zafri Ahmad Borboruah, started July 2019 - Left-Right symmetry, Cosmology and collider signatures

2. Lekhika, started January 2020 - Cosmology in Supersymmetric theories

3. Himanshu Gaur, started January 2020 - Entanglement entropy in quantum field theory

11 M Tech (dual degree BTech EP+ MTech Nanoscience) thesis supervision

1. Anindita Maiti, "Holographic Techniques in Condensed Matter Physics" 2017

12 Sponsored projects and grants

1. "Magnetogenesis : Linking Fundamental Physics and Astro-physics" 2018 - 2021
   as Co-PI with PI S. Shankaranarayanan
   ISRO Respond scheme
   Allocation : Rs 5642000

2. "New Symmetries beyond the Electroweak Scale" 2010 - 2013
   Co-PI : P. Ramadevi and Rohini Godbole, IISc, Bangalore
   Total allocation to IIT Bombay : Rs. 1261000
   Allocation to IISc Bangalore : Rs. 222000

3. "Cosmology in Supersymmetric and String Unification" 2004 - 2007
   Department of Science and Technology, India
   Co-PI : S. Uma Sankar and P. Ramadevi
   Total allocation : Rs. 100200

4. "Baryogenesis in some unified models of Elementary Particle Physics" 1998 - 2001
   Department of Science and Technology, India
   Co-PI : S. Uma Sankar
   Total allocation : Rs. 801000

5. Anomaly induced Baryon-number violation in the early Universe" 1994 - 1997
   Department of Science and Technology, India
   Total allocation : Rs. 456000

12.1 International research and mobility grants

- Quebec Government grant of CAD 16000 during 2012-14
- Quebec Government grant of CAD 12000 during 2014-16
- Quebec Government grant of CAD 12000 during 2017-19

13 International collaboration and grants

- Canadian Commonwealth Scheme grant of CAD 10000 to Brijesh Kumar to work for six months during 2010-11 at Univ. de Montreal
- Canadian Commonwealth Scheme grant of CAD 10000 to Sasmita Mishra to work for six months during 2011-12 at McGill University
- Canadian Commonwealth Scheme grant of CAD 10000 to Debasish Borah to work for six months during 2012 at McGill University

These activities have forged collaborations have led to an MOU being signed between IIT Bombay and Universite de Montreal.

14 Conference organising commitees

Advisory. Committee "Frontiers in High Energy Physics", organsied by University of Hyderabad and IIT Hyderabad, October 14 - 17, 2019

Organiser. Diamond Jubilee Conference "Physics Perspectives at Powai", upcoming at IIT Bombay, October 12 - 13, 2018

Member. Organising Committee, International Workshop on Unification and Cosmology, "UNICOS 2014" Punjab University Chandigarh, May 2014

Working. Group Coordinator, Astroparticle Physics and Cosmology, Thirteenth Workshop on High Energy Physics Phenomenology, TIFR, (Puri), December 2013

Research. advisory committee, Twelfth Workshop on High Energy Physics Phenomenology, TIFR, Mumbai (Mahabaleshwar), January 2012

National. organising committee, Tenth Workshop on High Energy Physics Phenomenology, Institute of Mathematical Sciences, Chennai, January 2008

National. organising committee and International advisory committee, International Workshop on Theoretical High Energy Physics, Indian Institute of Technology Roorkee, March 16 - 20, 2007

Organiser. session on Cosmology, Annual IAGRG meeting, Jamia Millia University, New Delhi, February 5 - 8, 2007

National. Organising Committee, DAE Symposium on High Energy Physics, Indian Institute of Technology, Kharagpur, December 11 - 16, 2006

Convener,. "Symmetries, extra dimensions and unified theories" (SyXD), Indian Institute of Technology, Bombay, March 4 - 7, 2006

Organising. Committee, Workshop on High Energy Physics Phenomenology - 8, Indian Institute of Technology, Bombay, January 4-16, 2004

Director,. SERC Preparatory School in Theoretical High Energy Physics, Indian Institute of Technology, Bombay, December 2-21, 2002

Convener,. Asymptotic domains of Theoretical Physics, Indian Institute of Technology, Bombay Feb 22-23, 2002

Working. Group Co-ordinator, Neutrinos and Astroparticle Physics, Workshop on High Energy Physics Phenomenology - 7, Harish-Chandra Research Institute, Allahabad, January 4-15, 2002.

Working. Group Coordinator, Neutrinos and Astroparticle Physics, Workshop on High Energy Physics Phenomenology - 6, January 3 - 14, 2000.

15 Courses at national schools :

1. "General Theory of Relativity and Black Hole Physics", at SERC Preparatory School on THEP, Delhi University, October 2008

2. Training programme in Physics for Engineering college teachers of Gujarat, June 2008

3. "Supersymmetric Standard Model", Guest Faculty, at SERC Advanced School on THEP, May 2008

4. "Cosmology for High Energy Physicists", at SERC Advanced School on THEP, February 2006

5. "Cosmology and High Energy Physics", Guest Faculty at SERC Advanced School on THEP, PRL, Ahmedabad 1993

6. "Quantum Field Theory Methods", at IUCAA school on Gravitation and Quantum Field Theory, Pune 1988

16 Social outreach

- Resource person, *Hoshangabad Science Teaching Programme* in Hindi language and other material creation, Eklavya, Bhopal, since 1987.

- Member, Governing Body of Eklavya, since 2004.

- Resource person, "learner centred" science curriculum and textbook development in Gujarati language, Vikram Sarabhai Community Science Centre, Ahmedabad, 1993 - 97.

List of Publications

Urjit A. Yajnik

17 Editor of Proceedings

1. "Proceedings of UNICOS-2014 International Workshop on Unification and Cosmology after Higgs discovery and BICEP2" May 2014 (with C. S. Aulakh and Kuldeep Kumar), *Pramana J. Phys.* **86** (2016) 191-494

2. "High energy physics phenomenology", (with S. Uma Sankar), Proceedings, WHEPP-8, Mumbai, India, January 5-16, 2004, *Pramana J. Phys.* **63** (2004) 1099-1421

18 Lecture Courses

- "Cosmology for Particle Physicists" in *Surveys in Theoretical High Energy Physics-2*, Raghavan Rangarajan and M. Sivakumar, eds., Hindustan Book Agency, (2014) pp 187-262

- "Quantum Field Theory Methods" in *Geometry, Fields, and Cosmology : Techniques and Applications*, B. R. Iyer and C. V. Vishveshwara eds., Kluwer Academic Publishers, (1997) pp 447-478

19 Edited conference reports

1. "Discussion on a possible neutrino detector located in India", (with M. V. N. Murthy) in the Proceedings of WHEPP-6, *Pramana* **55** (2000) 347-355

2. "Neutrino and astroparticle physics : Working group report" (with S. mohanty) in the Proceedings of WHEPP-6, *Pramana* **55** (2000) 315-325

20 Journal Publications

1. **Dark Matter in the Alternative Left Right Model** Mariana Frank (Concordia U., Montreal), Chayan Majumdar (Indian Inst. Tech., Mumbai and Middle East Tech. U., Ankara), Poulose Poulose (Indian Inst. Tech., Guwahati), Supriya Senapati (Indian Inst. Tech., Mumbai and Massachusetts U., Amherst), Urjit A. Yajnik (Indian Inst. Tech., Mumbai) e-Print: 2211.04286[hep-ph]. Accpeted for publication in JHEP.

2. R. B. MacKenzie, V. Massart, M. B. Paranjape, G. Semenoff and U. A. Yajnik, *Gravitational fields and quantum mechanics*, *Int. J. Mod. Phys. D* **31** (2022) 2242002. [Gravity Research Foundation Special Mention essay].

3. C. Majumdar, S. Senapati, S. U. Sankar and U. A. Yajnik, *Neutrino mass and charged lepton flavor violation in an extended left-right symmetric model*, *Nucl. Phys. B* **985** (2022) 116009, [2207.13026].

4. "Vacuum structure of Alternative Left-Right Model", Mariana Frank, Chayan Majumdar, Poulose Poulose, Supriya Senapati, Urjit A. Yajnik, *JHEP* 03 (2022) 065

5. "Effect of large light-heavy neutrino mixing and natural type-II seesaw dominance to lepton flavor violation and neutrinoless double beta decay" Nitali Dash, Sudhanwa Patra, Prativa Pritimita and Urjit A. Yajnik, *Eur.Phys.J.C* 82 (2022) 9, 847

6. "Domain walls and CP violation with left right supersymmetry: implications for leptogenesis and electron EDM", Piyali Banerjee and Urjit Yajnik, *JHEP* 07 (2021) 039

7. "Reheating constraints to modulus mass for single field inflationary models." Rajesh Goswami and Urjit A. Yajnik, *Nucl.Phys.* **B 960** (2020) 115211

8. "Exploring $0\nu\beta\beta$ and leptogenesis in the alternative left-right model", Mariana Frank, Chayan Majumdar, P. Poulose, Supriya Senapati and Urjit A. Yajnik, Phys.Rev. ***D*102** (2020) 7, 075020

9. "Neutrino mass, mixing and muon $g-2$ explanation in $U(1)_{L_\mu - L_\tau}$ extension of left-right theory" Chayan Majumdar, Sudhanwa Patra, Prativa Pritimita, Supriya Senapati, Urjit A. Yajnik, *JHEP* 09 (2020) 010

10. "New ultraviolet operators in supersymmetric SO(10) GUT and consistent cosmology" Pyali Bannerjee and Urjit A. Yajnik, *Phys. Rev.* **D101** (2020) 075041

11. "Evolution of black hole shadow in the presence of ultralight bosons", Rittick Roy, and Urjit A. Yajnik, *Phys.Lett.* **B803** (2020) 135284

12. "$0\nu\beta\beta$ in left-right theories with Higgs doublets and gauge coupling unification", Chayan Majumdar, Sudhanwa Patra, Supriya Senapati, Urjit A. Yajnik, *Nucl.Phys.* **B951** (2020) 114875

13. "Vacuum Decay Induced by False Skyrmions", Éric Dupuis, Mareike Haberichter, Richard MacKenzie, M.B. Paranjape, U. A. Yajnik, *Phys.Rev.* **D99** (2019) no.1, 016016

14. "Reconciling low multipole anomalies and reheating in single field inflationary models", Rajesh Goswami, Urjit A. Yajnik. *JCAP* **1810** (2018) 018

15. "Topological pseudo-defects of a supersymmetric SO(10) model and cosmology" Ila Garg, Urjit A. Yajnik. *Phys. Rev.* **D98** (2018) 063523

16. "Tunneling decay of false vortices with gravitation", Éric Dupuis, Yan Gobeil, Bum-Hoon Lee, Wonwoo Lee, Richard MacKenzie, Manu B. Paranjape, Urjit A. Yajnik, Dong-han Yeom. *JHEP* **1711** (2017) 028

17. "Infrared Abelian dominance without Abelian projection" Haresh Raval, Urjit A. Yajnik, *Phys. Rev.* **D91** (2015) 085028

18. "Production and decay rates of excited leptons in a left-right symmetric scenario" Piyali Banerjee, Urjit A. Yajnik, *Phys. Rev.* **D90** (2014) 095023

19. "The Battle of the Bulge: Decay of the Thin, False Cosmic String", Bum-Hoon Lee, Wonwoo Lee, Richard MacKenzie, M.B. Paranjape, U. A. Yajnik, Dong-han Yeom, *Phys. Rev.* **D88** (2013) 105008

20. "Tunneling decay of false vortices" Bum-Hoon Lee, Wonwoo Lee, Richard MacKenzie, M.B. Paranjape, U. A. Yajnik, Dong-han Yeom, *Phys. Rev.* **D88** (2013) 085031

21. "Supersymmetry Breaking and Dilaton Stabilization in String Gas Cosmology", (with Sasmita Mishra, Wei Xue, McGill U., Robert Brandenberger, McGill U.), *J. Cosmol. Astropart. Phys.,* **0912,** (2012) 015

22. "Spontaneous parity breaking and supersymmetry breaking in metastable vacua with consistent cosmology" (with Debasish Borah) *JHEP,* **1112** (2011) 072

23. "Supersymmetric Left-Right models with Gauge Coupling Unification and Fermion Mass Universality" (with Debasish Borah), *Phys.Rev.* **D83** (2011) 095004

24. "Fate of the false monopoles: Induced vacuum decay", (with Brijesh Kumar, and M. B. Paranjape, Montreal U.), *Phys. Rev.* **D82** (2010) 025022

25. "Spontaneously broken parity and consistent cosmology with transitory domain walls" (with Sasmita Mishra) *Phys. Rev.* **D81**, 045010 (2010)

26. "Graceful exit via monopoles in a theory with O'Raifeartaigh type supersymmetry breaking" (with Brijesh Kumar) *Nucl. Phys.* **B831**, 162-177 (2010)

27. "Spontaneous Parity Violation in a Supersymmetric Left-Right Symmetric Model" (with Sudhanwa Patra, Anjishnu Sarkar, Utpal Sarkar), *Phys. Lett.* **B679** 386-389 (2009)

28. "Gauge mediated supersymmetry breaking and the cosmology of Left-Right symmetric model" (with Sasmita Mishra and Anjishnu Sarkar) *Phys. Rev.* **D 79**, 065038 (2009)

29. "On stability of false vacuum in supersymmetric theories with cosmic strings" (with Brijesh Kumar) *Phys. Rev.* **D 79**, 065001 (2009)

30. "PeV scale left-right symmetry and baryon asymmetry of the Universe" (with Anjishnu Sarkar), *Nucl. Phys.* **B 800**, 253-269 (2008).

31. "Cosmology in a supersymmetric model with gauged B - L" (with Anjishnu Sarkar), *Phys. Rev.* **D 76** 025001 (2007)

32. "Baryogenesis via leptogenesis in presence of cosmic strings" (with N. Sahu and P. Bhattacharjee), *Nucl. Phy.* **B 752**, 280-296 (2006)

33. "Dark matter and leptogenesis in gauged B - L symmetric models embedding nu-MSM" (with N. Sahu), *Phys. Lett.* **B 635**, 11-16 (2006)

34. "Gauged B - L symmetry and baryogenesis via leptogenesis at TeV scale" (with N. Sahu), *Phys. Rev.* **D71**, 023507 (2005)

35. "B-L cosmic strings and baryogenesis" (with P. Bhattacharjee and N. Sahu), *Phys. Rev* **D70,** 083534, (2004)

36. "Quantum Mechanical stability of fermion-soliton systems" with N. Sahu, *Phys. Lett.* **B 596,** 1-7 (2004)

37. "Quantum Mechanical Spectra of Charged Black Holes" (with S. Das, P. Ramadevi and A. Sule) *Phys. Lett.* **B 565,** 201 (2003)

38. "Black hole area quantization", (with S. Das and P. Ramadevi) *Mod. Phys. Lett.* **A17**, 993 (2002)

39. "Transient domain walls and lepton asymmetry in the left-right symmetric model", (with J. M. Cline, S. N. Nayak and M. Rabikumar) *Phys. Rev.* **D66**, 065001 (2002)

40. "Leptogenesis in the Left-Right symmetric model" (with J. Cline) *Pramana* **55** (2000) 315-317

41. "Inflation with bulk fields in the Randall-Sundrum warped compactification?" (with J. Cline) *Pramana* **55** (2000) 317-320

42. "Topological defects in the Left-Right symmetric model and their relevance to cosmology", (with H. Widyan, A. Mukherjee, S. Mahajan and D. Choudhuri) *Phys. Rev.* **D59** 103508, 1-9 (1999).

43. "Topological defects in the Left-Right symmetric model" (with H. Widyan, A. Mukherjee, S. Mahajan and D. Choudhuri) *Pramana* **51**, (1998) 276-280

44. "Canonical quantization inside the Schwarzschild black hole", (with K. Narayan) *Class. Quantum Grav.* **15** 1315-1321 (1998)

45. "Schwarzschild blackhole with global monopole charge" (with N. Dadhich and K. Narayan) *Pramana* **50**, 307-314 (1998)

46. "Bubble wall dynamics, generalised Yukawa couplings and adequate electroweak baryogenesis in two Higgs doublet model" (with S. Bhowmik Duari), *Mod. Phys. Lett.* **A11**, 2481-2487 (1996)

47. "Cosmic strings at the electroweak phase transition: an application" (with S. Bhowmik Duari), *Nucl. Phys.* suppl.**B43** (1995) 282-285

48. "Cosmic strings at the electroweak phase transition" (with S. Bhowmik Duari) *Phys. Lett.* **B326**, 212-215 (1994)

49. "Gravitational particle production in inflation : a fresh look" *Phys. Lett.* **B234**, 271-275 (1990)

50. "Exotic configurations for gauge theory strings" *Phys. Lett.* **B184**, 229-232 (1987)

51. "Analytical approach to string induced phase transition" (with T. Padmanabhan), *Phys. Rev.* **D35**, 3100 (1987)

52. "Phase transition induced by cosmic strings" *Rapid Communications, Phys. Rev.* **D34**, 1237-1240 (1986)

53. "$SO(10)$ vortices and the electroweak phase transition" (with A. Stern) *Nucl. Phy.* **B267**, 158-180 (1986)

54. "Zero-energy modes, charge conjugation, and fermion number" (with E. C. G. Sudarshan), *Phys. Rev.* **D33**, 1830-1832 (1986)

21 Regular articles under review with journals

1. **Symmetry Resolved Entanglement Entropy in Hyperbolic de Sitter Space** Himanshu Gaur (Indian Inst. Tech., Mumbai), Urjit A. Yajnik (Indian Inst. Tech., Mumbai) e-Print: 2211.11218[hep-th]

2. **Primordial black holes from D-parity breaking in SO(10) grand unified theory** Sasmita Mishra, Urjit A. Yajnik e-Print: 2211.11980[astro-ph.CO]

3. **Cogenesis of visible and dark sector asymmetry in a minimal seesaw framework** Utkarsh Patel (Indian Inst. Tech., Bhilai), Sudhanwa Patra (Indian Inst. Tech., Bhilai), Lekhika Malhotra (Indian Inst. Tech., Mumbai), Urjit A. Yajnik (Indian Inst. Tech., Mumbai) e-Print: 2211.04722[hep-ph]

4. **Charge imbalance resolved Rényi negativity for free compact boson: Two disjoint interval case** Himanshu Gaur (Indian Inst. Tech., Mumbai), Urjit A. Yajnik (Indian Inst. Tech., Mumbai) e-Print: 2210.06743[hep-th]

5. "Cosmic Ferromagnetism of Magninos" R.B. MacKenzie, M.B. Paranjape, U.A. Yajnik, e-Print: arXiv:1901.00995 [astro-ph.CO]

22 Conference Papers

1. "Determining neutrino mass hierarchy in an extended Left-Right model", Prativa Pritimita, Urjit A. Yajnik, Nitali Dash, Sudhanwa Patra, 20th conference in the FPCP series, e-Print: 2207.11006 [hep-ph]

2. "Muon (g-2) anomaly in extended left-right symmetric model", Prativa Pritimita, Chayan Majumdar, Sudhanwa Patra, Supriya Senapati, Urjit A. Yajnik, *PoS* ICHEP2020 (2021) 308

3. "Neutrino mass, $0\nu\beta\beta 0\nu\beta\beta$ signature in doublet left-right symmetric theories and its cosmological implications", Chayan Majumdar, Sudhanwa Patra, Supriya Senapati, Urjit A. Yajnik, *PoS* ICHEP2020 (2021) 209

4. "PAAI in the sky : towards a particulate mechanism for Dark energy and concordant Dark Matter" R.B. MacKenzie, M.B. Paranjape, U.A. Yajnik, to appear in Springer proceedings of *International Workshop on Frontiers of High Energy Physics, FHEP 2019*, October 2019.

5. "$0\nu\beta\beta$ Signature in LRSM with Higgs Bidoublet and Doublets" Chayan Majumdar, Sudhanwa Patra, Supriya Senapati, Urjit A. Yajnik, *FHEP 2019* Hyderabad, *Springer Proc.Phys.* **248** (2020) 265-271

6. "Ferromagnetic instability in PAAI in the sky", R.B. MacKenzie, M.B. Paranjape, U.A. Yajnik, to appear in Springer proceedings of *Inernational Symposium on Quantum Theory and Symmetries QTS*-XI, CRM, Université de Montréal, July 2019

7. "Tunneling decay of self-gravitating vortices" Éric Dupuis, Yan Gobeil, Bum-Hoon Lee, Wonwoo Lee, Richard MacKenzie, Manu B. Paranjape, Urjit A. Yajnik, Donghan Yeom. 2018. 5 pp. in *EPJ Web Conf.* **168** (2018) 03004

8. "Infrared Abelian Dominance in a Special Gauge", Haresh Raval, Urjit A. Yajnik *Springer Proc.Phys.* **174** (2016) 55-60

9. "Flowering to bloom of PeV scale supersymmetric left-right symmetric models", Urjit A. Yajnik, Anishnu Sarkar, Sasmita Mishra, Debasish Borah, at *International Workshop on Unification and Cosmology after Higgs Discovery and BICEP2,* Chandigarh, 2014, *Pramana* **86** (2016) 295-305.

10. "Spontaneous parity breaking and metastable SUSY breaking : cosmological constraint" (with Sasmita Mishra and Debasish Borah), Proceedings of the 10th Symposium on Cosmology and Particle Astrophysics, CosPa 2013, Honolulu, 2013, e-conf C131112 (2014)

11. "The relevance of Very Light Dark Matter" at International Conference on Frontiers of Physics, Kolymbari, Crete, June 2012,*EPJ Web Conf.* **70** (2014) 00046

12. "Left-right symmetry, supersymmetry: Cosmological constraint", (with Sasmita Mishra and Debasish Borah), 11th Conference on the Intersections of Particle and Nuclear Physics, CIPANP 2012, Florida, in AIP Conference Proceeding, **1560** 284 (2013)

13. "Gauged B-L unification and cosmology", Plenary talk at *International Workshop on Theoretical High Energy Physics (IWTHEP 2007)*, IIT Roorkee, AIP Conf. Proc. **939** 79-84 (2007)

14. "Naturalness of parity breaking in a supersymmetric SO(10) model" (with Anjishnu Sarkar), AIP Conf. Proc. 903:685-688, (2007), *Supersymmetry and Unification of Fundamental Interactions (SUSY06),* U. C. Irvine, USA

15. "Magnetic domain walls of relic fermions as dark energy" AIP Conf. Proc. **805**:459-462, (2006) , *Particles, strings and cosmology, (PASCOS), Gyeongju, S. Korea*

16. "Particle Physics implications of WMAP measurements", WHEPP-8, IIT Bombay, *Pramana* **63**:1317-1330 (2004)

17. "Leptogenesis with Left Right domain walls" (with J. Cline and M. Rabikumar) *Pramana* **62**:771-774 (2004), [ArXiv:hep-ph/0304020]

18. "Baryogenesis" in the proceedings of the XIII DAE Symposium on High Energy Physics, Chandigarh *Pramana* **54** (2000) 471-485; *hep-ph/0112020*

19. "Baryogenesis at the Electroweak Scale" in *The Early Universe*, Proceedings of the Symposium on Early Universe, IIT Madras, 1994, V. B. Johri, ed., Hadronic Press, (1996) 138-154

20. "What do we expect from Quantum Gravity?" in *Advances in Gravitation and Cosmology*, B. R. Iyer *et al* eds., Wiley Eastern Publishers (1993) 75-76

21. "Electroweak baryogenesis and Higgs mass" (with H. Nagar and S. Bhowmik Duari), in *Proceedings of the IV School on Non-accelerator Particle Physics*, E. Bellotti et al, ed.s, World Scientific Pub. Co. (1996) 537

22. "Enhancement in baryon asymmetry production in the two Higgs doublet model" (with S. Bhowmik Duari) in *Proceedings of the Europhysics Conference on High Energy Physics*, J. Lemmone et al, ed.s, World Scientific Pub. Co. (1996) 414-415

23 Invited Talks and Plenary Reviews (since 2004)

1. "Symmetries beyond the Standard Model : cosmology and non-accelerator signatures", seminar at Mitchell Institute, Texas A&M University, 03 August 2022

2. "Emergent Dark Energy", at Anomalies 2021, IIT Hyderabad, 11 November 2021

3. "PAAI in the sky : Towards a particulate explanation of Dark Energy", Hiroshima University - IIT Bombay meeting, 25 October 2021

4. "Sphalerons and matter-antimatter asymmetry of the Universe", lectures at DTP, Tata Institute of Fundamental Research, Mumbai, 24 - 26 February 2020

5. "PAAI in the sky : Towards a particulate explanation of Dark Energy" *Frontiers of High Energy Physics*, University of Hyderabad, 14 - 17 October 2019

6. "Ferromagnetic instability in *PAAI* in the sky" *Quantum Theory and symmetries*, Université de Montréal, July 1 - 5 2019

7. "Is inflation featureless?" TevPa, Berlin, August 27 - 31, 2018

8. "Pseudo-defects, Fermion number and induced stability", BASIC, Long Island, the Bahamas, July 09 - 13, 2018

9. "Towards a computable model of concordant Dark Energy and Dark Matter", Blueprints Beyond the Standard Model, TIFR, Mumbai January 5-8, 2018

10. "Baryogenesis - Leptogenesis : seeking supersymmetry connection", 35th International Conference on Supersymmetry and the Unification of Fundamental Forces (SUSY 2017), TIFR, Mumbai, December 11 - 15, 2017

11. "Relaxation of Quantum Black hole", The First Symposium of the BRICS Association on Gravity, Astrophysics and Cosmology (BRICS-AGAC) Yangzhou University, China, October 18-20, 2017

12. "Cosmological implication of unification with D-parity", Recent Progress in PArticle physics, String theory and COSmology (PASCOS 2017), Instituto de Fisica Téorica, UAM-CSIS, Madrid June 19 - 23, 2017

13. "Baryogenesis and Leptogenesis", Candles Of Darkness, ICTS - TIFR, Bengaluru June 05 - 09 2017

14. "Right handed symmetry at a low scale" Program on *Exploring the Energy Ladder of the Universe* Mainz Institute for Theoretical Physics, Mainz University, Mainz, May 30 - June 10, 2016

15. "Early Universe and gauge symmetry breaking" at Programme on *Early Universe, Cosmology and Fundamental Physics*, KITPC, Chinese Academy of Sciences Beijing, September 7 - 25, 2015

16. "Cosmology aith PeV scale gauged B-L symmetry" Program on *Crossroads of neutrino physics* Mainz Institute for Theoretical Physics, Mainz University, Mainz, July 25 - August 8, 2015

17. "Leptogenesis : the scale gauged B-L symmetry" at *International Workshop on Baryon and Lepton number violation*, Univ. of Massachussetts, Amherst, April 26 - 30, 2015

18. "Plausibility of low scale left-right symmetry", Theory Group Colloquium, PRL, Ahmedabad, July 05, 2015

19. "Baryon asymmetry : cosmology and unifica- tion perspective" *LHC-DM workshop*, SINP Kolkata, February 2015

20. "Neutrinos and Cosmology" Plenary talk at Workshop on *Invisible Matters : neutrinos and Dark Matter,* IIT Hyderabad, Oct 30 - Nov. 1, 2014

21. "Topological objects and vacuum stability" seminar at U. de Montreal, November 27, 2013

22. "Spontaneous parity breaking and metastable SUSY breaking : cosmological constraint" 21st International Conference on Supersymmetry and Unification of Fundamental Interactions, SUSY 2013, ICTP, Trieste, August 2013

23. "Neutrino masses and *CP* phases : cosmology and unification perspective" Double Beta Decay and Neutrinos, IIT Ropar and Punjab University Chandigarh, April 2013

24. "Baryon asymmetry of the Universe and $C\,P$ violation" at Programme on CP violation, PRL and ICTS; Mahabaleshwar, February 2013

25. "Dark Energy from ultra-low energy phase transition and concordant Dark Matter" Indo-UK workshop, IUCAA, August 2011

26. "Type of see-saw and neutrino Dark Matter" *Nu Horizons IV,* HRI, Allhabad February 2011

27. "Spontaneously broken parity and Warm Dark Matter" *Dark Matter in the LHC era,* SINP Kolkata January 2011

28. "Induced fermion number and quantum mechanical stability of solitonic objects", U. de Montreal, March 18, 2010

29. "Spontaneous parity violation and leptogenesis", Aspects of neutrinos, *NuGoa,* organised by TIFR, April 8-14, 2009

30. "Cosmology with spontaneously broken parity at low scale", Workshop on the origins of P, CP and T violation, *CTP@ICTP*, Abdus Salam ICTP, Trieste July 2-5, 2008

31. "Soliton-fermion systems", Strings and superstrings in observational Cosmology, APC Université Paris 7, Paris, December 10-13, 2007

32. "Soliton-fermion systems and stabilised vortex loops" (with Abhijit Gadde and Narendra Sahu (Ahmedabad, Phys. Res. Lab), Presented at the 17th DAE-BRNS HEP symposium held at IIT Kharagpur, India. e-Print: arXiv:0705.0903 [hep-ph]

33. "Inflation and Dark Energy : prospects for unification?", plenary talk, unpublished, presented at Workshop on Theoretical High Energy Physics - I, IIT Roorkee, March 16 - 20, 2005

34. "Grand unification in the light of new cosmology", Coorg meeting of the Indian Academy of Sciences, February 2004

24 Science, Society and outreach

24.1 Talks

Recent :

1. "The birth of the Standard Model of Cosmology : pioneering contributions of Steven Weinberg", Colloquium, TIFR Mumbai, 17 November 2021

2. "From Electroweak Unification to Dreams of a Final Theory : some highlights of hte work of Steven Weinberg", Physics Department, IIT Bombay, 04 August 2021

3. "Unified theory and the tale of two vacuum energies", Research Scholars Symposium *SymPhy*, Physics Department, IIT Bombay, October 2020

Please visit link to public lectures http://home.iitb.ac.in/~yajnik/publectlist.html for archived talks on Unified theories and current developments in Cosmology.

24.2 Articles

1. "The passing of a titan : Steven Weinberg (1933-2021)", Rohini Godbole and Urjit Yajnik, *Physics News*, Bulletin of the Indian Physics Association, vol. 51(3), (2022), 32-35.

2. “Steven Weinberg (1933-2021)”, Rohini Godbole and Urjit Yajnik, *Current Science*, **21**, no. 5 (2021) 0719

3. “The Life and Science of Thanu Padmanabhan” e-Print: 2110.03208 [physics.hist-ph], pp 12-15

4. “Bose’s derivation, the crucial link to quantum mechanics”, *Physics News, Bull. IPA*, vol 49, No. 2-3, 2019

5. “E. C. G. Sudarshan (1931 - 2018)” *Current Science*, **114** (2018) 2565

6. “Reflections on James Bond of AI” *AI & Society.,* Springer Nature, (2017)

7. “The conception of photons - Part II” in *Resonance*, pp 49 - 69, January 2016

8. “The conception of photons - Part I” in *Resonance,* pp 1085-1110, December 2015

9. “Prediction and identification of gravitational waves”, Physics News, Bulletin of Indian Physics Association, Vol 46, Nos. 1-2, pp 19-25, 2016

10. “Symmetry and Mathematics : pioneering insights into the structure of Physics; E C G Sudarshan talks to U A Yajnik”, Resonance, pp 264-276, March 2015