Utpal Chattopadhyay

Senior Professor,
Department of Theoretical Physics,
Indian Association for the Cultivation of Science,
2A & B Raja S.C. Mullick Road, Jadavpur, Kolkata-700032, India.
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Research Area: Elementary Particle Theory: Areas in physics beyond the standard model particularly involving physics of low energy supersymmetry, including possible signatures from dark matter.

Education

- **Northeastern University**, Boston, USA.
  Ph.D., September 1998.
  Area of Research: Particle Physics Phenomenology (Supersymmetry/Supergravity).
  Thesis Advisor: Prof. Pran Nath.
  (1992-1998).

- **University of Pittsburgh**, Pittsburgh, USA
  M.S.: Passed Ph.D. qualifying examination and completed all the necessary courses for Ph.D. program in good standing.
  (1989-1992).

- **Saha Institute of Nuclear Physics**, Calcutta, India: Completed Post- M.Sc. Associateship program (1989).

- **Calcutta University**, Calcutta, India: i) **M.Sc.**, Physics, 1988, 1st Class ii) **B.Sc.**, Physics Hons. (St. Xavier's College), 1986, 1st Class.

Employment

- **Senior Professor**: Department of Theoretical Physics,
  Indian Association for the Cultivation of Science, Kolkata, India (**August 2016 - Present**).

Professor: Department of Theoretical Physics,
Indian Association for the Cultivation of Science, Kolkata, India (**August 2011 - July 2016**),
(**Head of the Dept.** : from April 2014 to March 2017).

Associate Professor: Department of Theoretical Physics,
Indian Association for the Cultivation of Science, Kolkata, India (**August 2006 - July 2011**).

Assistant Professor: Department of Theoretical Physics,
Indian Association for the Cultivation of Science, Kolkata, India (**August 2002 - July 2006**).

- **Visiting Fellow**: **Harish-Chandra Research Institute**, Allahabad, India (**April 2002 - July 2002**).

- **Visiting Fellow** (same as Post-doctoral Fellow): Department of Theoretical Physics, **Tata Institute of Fundamental Research**, Mumbai, India (**January 2000 - March 2002**).

- **Worked as an Industrial Process Development Software Designer** in Chicago, Illinois, USA (December 1998 to November 1999).

- **Teaching and Research Assistant: Northeastern University**, Boston, Massachusetts, USA (1992-1998).

- **Teaching and Research Assistant: University of Pittsburgh**, Pittsburgh, Pennsylvania, USA (1989-1992).

Teaching Experience

- **Graduate**: Experienced in teaching of courses like Quantum Field Theory (I and II), Supersymmetry and Supergravity in IACS. Tutored in the course "Applied Supersymmetry" in the XXVIII THEP SERC School, Indian Institute of Technology, Kanpur (A school for post-graduate courses in India for Theoretical High Energy Physics (THEP) students) during November 11 - 30, 2013.

- **Undergraduate**: Approximately 8 years of teaching experience in conducting problem solving sessions and performing grading of undergraduate courses, and a few

graduate level courses in two U.S. universities. Also taught courses related to undergraduate physics experiments.

Computational Skills

Skilled in Unix, Linux and Microsoft Windows environments including hardware and networking. Experienced in numerical work particularly relevant to high energy physics. Skilled in C, FORTRAN, Matlab, Maple, Mathematica and various packages relevant to High Energy Physics.

Conferences and List of relevant Talks

Presented talks at: • "Phenomenological Implication of Non- holomorphic Soft SUSY Breaking Interactions", 25th International Conference on Supersymmetry and the Unification of Fundamental Interactions (SUSY17), TIFR, Mumbai, India, December 11-15, 2017; • "Probing Non-holomorphic MSSM via precision constraints, dark matter and LHC data", PArticle physics, String theory and COSmology (PASCOS 2017), IFT, Madrid, Spain, June 19-23, 2017; • "Neutralino Dark Matter in SUSY models–In memory of Professor D.P. Roy", TIFR, April 13, 2017 and SINP, April 21, 2017, • "International Workshop on Frontiers in Electroweak Interactions of Leptons and Hadrons", held in Department of Physics, Aligarh Muslim University, Aligarh, India, during *November 2-6, 2016*; • "Workshop on LHC and Dark Matter (LHCDM), Organized by RECAPP, HRI, Allahabad and IACS, Kolkata, held in IACS during *9-28 February, 2015*; • "Current Trends in Particle Physics Research (CTPPR2014), Dept. of Physics, University of Kalyani, West Bengal *March 13-15, 2014*; • "Workshop on Status of Supersymmetry and Dark Matter (SUSY-DM), held during *October 3-5, 2013* in Centre for High Energy Physics, Indian Institute of Science, Bangalore; • "Workshop on "Dark Matter in the LHC Era: Direct and Indirect Searches", Saha Institute of Nuclear Physics, Kolkata, *January 4-8, 2011*, • Workshop on "The LHC and Related Physics", Harish-Chandra Research Institute (Allahabad), held during *September 21 to October 4, 2008*, • TeV scale Physics and Dark matter - workshop in particle physics at NORDITA, Stockholm, Sweden, held during *1st June to 31st July, 2008*, • Workshop on LHC Physics 2006 at Tata Institute of Fundamental Research, *September 2006* , • DAE-BRNS High energy physics symposium held in SINP, Kolkata, *November-December, 2004*, • Ninth International Symposium on Particles, Strings and Cosmology (PASCOS-03), Tata Institute of Fundamental Research,

Mumbai, India, *January 2003*, • VII Workshop on High Energy Physics Phenomenology, WHEPP7, Harish Chandra Research Institute, Allahabad, India, *January 2002*, • Centre for Theoretical Studies, Indian Institute of Science, Bangalore, *September 2001*, • Indian Institute of Astrophysics, Bangalore, *September 2001*, • Institute of High Energy Physics, Vienna, *July 2001*, • Harish Chandra Research Institute, Allahabad, India, *September 2000*, • Indian Institute of Technology, Kanpur, India, *September 2000*, • Purdue University, West Lafayette, USA, *September 1998*.

Schools/Workshop/Conferences participated: • "From Strings to LHC" held in Puri between 8th and 14th Dec, 2012, organized by TIFR, Mumbai, • "Workshop on Higgs and the Tops in the light of recent discoveries at LHC", held during August 24 to 26, 2012 in CHEP, IISc , Bangalore, "Conference on LHC and New Frontiers of Particle Physics", Dept. of Physics, University of Calcutta, December 7-9, 2009, • "Instructional Workshop on the Large Hadron Collider (LHC) and Related Physics", IISER, Kolkata, December 19-24,2008, • Higgs Hunters Meeting, February 7-8, 2008, held in Visva-Bharati, Santiniketan, West Bengal, organised by Visva-Bharati and RECAPP, HRI, Allahabad, • "From Strings to LHC-II", December 19-23, 2007, held in Bangalore, organised by TIFR, Mumbai, • Topical Meeting on Physics at the LHC organised by the Harish-Chandra Research Institute, Allahabad during December 16-21, 2006, • Workshop on CP studies and Non-standard Higgs Physics, May 14-15, 2004, held in CERN, Geneva, • Introductory School on Recent Developments in Supersymmetric Gauge Theories, 14 June - 25 June 2004, held in the Abdus Salam International Center for Theoretical Physics, Trieste, • Summer School in Cosmology and Astroparticle Physics, 28 June - 10 July, 2004, held in the Abdus Salam International Center for Theoretical Physics, Trieste, • Sixth International Conference on Particles, Strings and Cosmology, Boston, *March 1998*), • Meeting of the Division of Particles and Fields, American Physical Society (DPF-96), Minneapolis, *August 1996*.

Organisational Experience: Member of the National Organising Committee for the following events. • "25th International Conference on Supersymmetry and the Unification of Fundamental Interactions (SUSY17)" held at TIFR during December 11 to 15, 2017; • "Recent Trends in Condensed Matter and High Energy Physics", IACS *30 Jan to 1 Feb, 2017*; • "Workshop on LHC and Dark Matter (LHCDM), Organized by RECAPP, HRI, Allahabad and IACS, Kolkata, held in IACS during *9-28 February, 2015*; • "Current Trends in Particle Physics Research (CTPPR2014), Dept. of Physics, University

of Kalyani, West Bengal *March 13-15, 2014*; • "Workshop on Status of Supersymmetry and Dark Matter (SUSY-DM), held during *October 3-5, 2013* in Centre for High Energy Physics, Indian Institute of Science, Bangalore; • "Workshop on Dark Matter in the LHC Era:Direct and Indirect Searches", Saha Institute of Nuclear Physics, January 4-8, 2011, • *Joint Convenor* of *Topical Meeting on Beyond the Standard Model Physics at the LHC* held in IACS, Kolkata during January 15-17, 2009, • Member of the Local Organising Committee for the *21st International Workshop on Weak Interactions and Neutrinos WIN07*, held in the Saha Institute of Nuclear Physics, Kolkata during January 15-20, 2007, • Member of the Local Organising Committee for the *Topical Conference on Atomic, Molecular and Optical Physics (TC-2005)* held in Indian Association for the Cultivation of Science, Kolkata, December 2005, • Local coordinator of the *Workshop on Practicals of Parallel Computing* jointly conducted by IACS, Kolkata and JNCASR, Bangalore, and held in JNCASR, March 2003, • Member of the Local Organising Committee for the National Conference on Theoretical Physics, 2003, held in Indian Association for the Cultivation of Science, Kolkata, January 2003, • Worked as Scientific Secretary in the Sixth International Symposium on Particles Strings and Cosmology (PASCOS-98), held in Boston, March, 1998. **Personal Data**

- **Nationality:** Indian; **Date of Birth:** March 10, 1965; **Sex:** Male; **Marital Status:** Married.
- **Permanent Address:** 188/93A Prince Anwar Shah Road, Capricorn Castle, Apt-3C, Lake Gardens, Kolkata-700045, India.
- **E-mail:** tpuc@iacs.res.in, utpal.chattopadhyay@gmail.com

Awards/Visiting Awards

- Short term visiting fellowship from CERN (TH-PH division) during May 19 to June 12 2016.
- Short term visiting fellowship from CERN (TH-PH division) in July-August 2010 (for one month).
- Visiting fellowship from the Abdus Salam International Center for Theoretical Physics, Trieste, Italy in September-October, 2010 (for six weeks).

- Visiting fellowship from NORDITA, Stockholm, Sweden for participating in the workshop "TeV scale Physics and Dark matter" for one month in the summer of 2008.
- Short term visiting fellowships from CERN (TH-PH division) in April 2004 (for two months).
- Visiting fellowship from the Abdus Salam International Center for Theoretical Physics, Trieste, Italy in June-July, 2004 (for six weeks).
- Short term visiting fellowships from CERN (TH division) in June 2001 (for one month).
- Visiting support from the Institute of High Energy Physics, Vienna, in July 2001.
- Visiting fellowship from the International Center for Theoretical Physics, Trieste, Italy in July, 2001.
- Post-doctoral Research Fellowships offered from University of Florida, Gainesville in 2002, Harish-Chandra Research Institute, Allahabad 2002, Tata Institute of Fundamental Research, Mumbai in 1999. Indiana University, Bloomington in 1998 (stayed for two months after which moved to industry for a year).
- Research and Teaching Assistantship awards from University of Pittsburgh and Northeastern University.
- Council of Scientific and Industrial Research (CSIR) conducted National Eligibility Test (NET) fellowship in 1989.

Referee: Referee for Physical Review D, Nuclear Physics B, since 2004.

Administrative Experience:

- Worked as the Head of the Department, Dept. of Theoretical Physics, IACS from April, 2014 to March 2017.
- Served as the Chairman of the Computer Users' Committee, IACS from March 2013 to March 2015. The work of the committee involved designing critical server systems and networking facilities for the disaster recovery site of the Computer Centre, IACS apart from various routine assignments.

- Served as a Committee Member for Ph.D. Coursework Committee, Computer Advisory Committee, Resource and Space Allocation Committee and various other committees along with a few Internal Committees for various purposes as and when assigned.

Ph.D. Thesis Supervision:

• Dr. Debottam Das (2009, Present Position: Reader-F, Institute of Physics, Bhubaneswar, India);

• Dr. Manimala Chakraborti (2016, Present Position: Post-doctoral fellow, University of Bonn, Germany).

Present Research Scholars: Mr. Abhishek Dey (part time fellow, working in Maulana Azad College, Kolkata) and Ms. Samadrita Mukherjee.

Present Post-doctoral fellow: Dr. Abhaya Kumar Swain.

SPIRES Citation Index Record (Updated on March 9, 2018):

Citations:

• Total: **: 2217**

• Average: **:67**

• h-index=**23**

• **200**+ citations: **3**

• **100**+ (and < 200) citations: **3**

• **50**+ (and < 100) citations :**5**

Google Scholar Reference:

`https://scholar.google.co.in/citations?user=sY680IwAAAAJ&hl=en`

Publication list enclosed below

Publications

Articles published in Journals:

- **"Exploring Non-Holomorphic Soft Terms in the Framework of Gauge Mediated Supersymmetry Breaking"**
  U. Chattopadhyay, D. Das and S. Mukherjee.
  arXiv:1710.10120 [hep-ph]
  DOI:10.1007/JHEP01(2018)158
  JHEP **1801**, 158 (2018)
  IP-BBSR-2017-12
  INSPIRE-HEP entry

- **"How light a higgsino or a wino dark matter can become in a compressed scenario of MSSM"**
  M. Chakraborti, U. Chattopadhyay and S. Poddar.
  arXiv:1702.03954 [hep-ph]
  DOI:10.1007/JHEP09(2017)064
  JHEP **1709**, 064 (2017)
  INSPIRE-HEP entry

- **"Exploring viable vacua of the Z_3-symmetric NMSSM"**
  J. Beuria, U. Chattopadhyay, A. Datta and A. Dey.
  arXiv:1612.06803 [hep-ph]
  DOI:10.1007/JHEP04(2017)024
  JHEP **1704**, 024 (2017)
  INSPIRE-HEP entry

- **"Probing Non-holomorphic MSSM via precision constraints, dark matter and LHC data"**
  U. Chattopadhyay and A. Dey.
  arXiv:1604.06367 [hep-ph]
  DOI:10.1007/JHEP10(2016)027
  JHEP **1610**, 027 (2016)

- **"Status of the 98-125 GeV Higgs bosons scenario with updated LHC-8**

data"
B. Bhattacherjee, M. Chakraborti, A. Chakraborty, U. Chattopadhyay and D. K. Ghosh.
arXiv:1511.08461 [hep-ph]
DOI:10.1103/PhysRevD.93.075004
Phys. Rev. D **93**, no. 7, 075004 (2016)

- **"Reduced LHC constraints for higgsino-like heavier electroweakinos"**
  M. Chakraborti, U. Chattopadhyay, A. Choudhury, A. Datta and S. Poddar.
  arXiv:1507.01395 [hep-ph]
  DOI:10.1007/JHEP11(2015)050
  JHEP **1511**, 050 (2015)

- **"Higgsino Dark Matter in Nonuniversal Gaugino Mass Models"**
  M. Chakraborti, U. Chattopadhyay, S. Rao and D. P. Roy.
  arXiv:1411.4517 [hep-ph]
  10.1103/PhysRevD.91.035022
  Phys. Rev. D **91**, no. 3, 035022 (2015)

- **"Exploring MSSM for Charge and Color Breaking and Other Constraints in the Context of Higgs@125 GeV"**
  U. Chattopadhyay and A. Dey.
  arXiv:1409.0611 [hep-ph]
  10.1007/JHEP11(2014)161
  JHEP **1411**, 161 (2014)

- **"The Electroweak Sector of the pMSSM in the Light of LHC - 8 TeV and Other Data"**
  M. Chakraborti, U. Chattopadhyay, A. Choudhury, A. Datta and S. Poddar.
  arXiv:1404.4841 [hep-ph]
  10.1007/JHEP07(2014)019
  JHEP **1407**, 019 (2014)

- **"Implications of the 98 GeV and 125 GeV Higgs scenarios in nondecoupling supersymmetry with updated ATLAS, CMS, and PLANCK data"**
  B. Bhattacherjee, M. Chakraborti, A. Chakraborty, U. Chattopadhyay, D. Das and D. K. Ghosh.

arXiv:1305.4020 [hep-ph]
10.1103/PhysRevD.88.035011
Phys. Rev. D **88**, no. 3, 035011 (2013)

- **"Implication of a Higgs boson at 125 GeV within the stochastic superspace framework"**
  M. Chakraborti, U. Chattopadhyay and R. M. Godbole.
  arXiv:1211.1549 [hep-ph]
  10.1103/PhysRevD.87.035022
  Phys. Rev. D **87**, no. 3, 035022 (2013)

- **"Probing the light Higgs pole resonance annihilation of dark matter in the light of XENON100 and CDMS-II observations"**
  U. Chattopadhyay, D. Das, D. K. Ghosh and M. Maity.
  arXiv:1006.3045 [hep-ph]
  10.1103/PhysRevD.82.075013
  Phys. Rev. D **82**, 075013 (2010)

- **"Non-universal scalar mass scenario with Higgs funnel region of SUSY dark matter: A Signal-based analysis for the Large Hadron Collider"**
  S. Bhattacharya, U. Chattopadhyay, D. Choudhury, D. Das and B. Mukhopadhyaya.
  arXiv:0907.3428 [hep-ph]
  10.1103/PhysRevD.81.075009
  Phys. Rev. D **81**, 075009 (2010)

- **"Mixed Neutralino Dark Matter in Nonuniversal Gaugino Mass Models"**
  U. Chattopadhyay, D. Das and D. P. Roy.
  arXiv:0902.4568 [hep-ph]
  10.1103/PhysRevD.79.095013
  Phys. Rev. D **79**, 095013 (2009)

- **"Higgs funnel region of SUSY dark matter for small tan beta, RG effects on pseudoscalar Higgs boson with scalar mass non-universality"**
  U. Chattopadhyay and D. Das.
  arXiv:0809.4065 [hep-ph]

10.1103/PhysRevD.79.035007
Phys. Rev. D **79**, 035007 (2009)

- **"Non-zero trilinear parameter in the mSUGRA model: Dark matter and collider signals at Tevatron and LHC"**
  U. Chattopadhyay, D. Das, A. Datta and S. Poddar.
  arXiv:0705.0921 [hep-ph]
  10.1103/PhysRevD.76.055008
  Phys. Rev. D **76**, 055008 (2007)

- **"Looking for a heavy wino LSP in collider and dark matter experiments"**
  U. Chattopadhyay, D. Das, P. Konar and D. P. Roy.
  hep-ph/0610077
  10.1103/PhysRevD.75.073014
  Phys. Rev. D **75**, 073014 (2007)

- **"Large evolution of the bilinear Higgs coupling parameter in SUSY models and reduction of phase sensitivity"**
  U. Chattopadhyay, D. Choudhury and D. Das.
  hep-ph/0509228
  10.1103/PhysRevD.72.095015
  Phys. Rev. D **72**, 095015 (2005)

- **"Looking for a heavy Higgsino LSP in collider and dark matter experiments"**
  U. Chattopadhyay, D. Choudhury, M. Drees, P. Konar and D. P. Roy.
  hep-ph/0508098
  10.1016/j.physletb.2005.09.088
  Phys. Lett. B **632**, 114 (2006)

- **"Modular invariant soft breaking, WMAP, dark matter and sparticle mass limits"**
  U. Chattopadhyay and P. Nath.
  hep-ph/0405157
  10.1103/PhysRevD.70.096009
  Phys. Rev. D **70**, 096009 (2004)

- **"WMAP data and recent developments in supersymmetric dark matter"**
  U. Chattopadhyay, A. Corsetti and P. Nath.
  hep-ph/0310228
  10.1134/1.1772457
  Phys. Atom. Nucl. **67**, 1188 (2004), [Yad. Fiz. **67**, 1210 (2004)]

- **"Higgsino dark matter in a SUGRA model with nonuniversal gaugino masses"**
  U. Chattopadhyay and D. P. Roy.
  hep-ph/0304108
  10.1103/PhysRevD.68.033010
  Phys. Rev. D **68**, 033010 (2003)

- **"WMAP constraints, SUSY dark matter and implications for the direct detection of SUSY"**
  U. Chattopadhyay, A. Corsetti and P. Nath.
  hep-ph/0303201
  10.1103/PhysRevD.68.035005
  Phys. Rev. D **68**, 035005 (2003)

- **"Interpreting the new Brookhaven muon (g-2) result"**
  U. Chattopadhyay and P. Nath.
  hep-ph/0208012
  10.1103/PhysRevD.66.093001
  Phys. Rev. D **66**, 093001 (2002)

- **"Supersymmetric dark matter and Yukawa unification"**
  U. Chattopadhyay, A. Corsetti and P. Nath.
  hep-ph/0201001
  10.1103/PhysRevD.66.035003
  Phys. Rev. D **66**, 035003 (2002)

- **"b - tau unification, g(mu) - 2, the b —¿ s + gamma constraint and nonuniversalities"**
  U. Chattopadhyay and P. Nath.
  hep-ph/0110341

10.1103/PhysRevD.65.075009
Phys. Rev. D **65**, 075009 (2002)

- **"Constraints on explicit CP violation from the Brookhaven muon g-2 experiment"**
  T. Ibrahim, U. Chattopadhyay and P. Nath.
  hep-ph/0102324
  10.1103/PhysRevD.64.016010
  Phys. Rev. D **64**, 016010 (2001)

- **"Upper limits on sparticle masses from g-2 and the possibility for discovery of SUSY at colliders and in dark matter searches"**
  U. Chattopadhyay and P. Nath.
  hep-ph/0102157
  10.1103/PhysRevLett.86.5854
  Phys. Rev. Lett. **86**, 5854 (2001)

- **"Electron and neutron electric dipole moments in the focus point scenario of SUGRA model"**
  U. Chattopadhyay, T. Ibrahim and D. P. Roy.
  hep-ph/0012337
  10.1103/PhysRevD.64.013004
  Phys. Rev. D **64**, 013004 (2001)

- **"LHC signature of the minimal SUGRA model with a large soft scalar mass"**
  U. Chattopadhyay, A. Datta, A. Datta, A. Datta and D. P. Roy.
  hep-ph/0008228
  10.1016/S0370-2693(00)01120-5
  Phys. Lett. B **493**, 127 (2000)

- **"Constraining anomaly mediated supersymmetry breaking framework via on going muon g-2 experiment at Brookhaven"**
  U. Chattopadhyay, D. K. Ghosh and S. Roy.
  hep-ph/0006049

10.1103/PhysRevD.62.115001
Phys. Rev. D **62**, 115001 (2000)

- **"Effects of CP violation on event rates in the direct detection of dark matter"**
  U. Chattopadhyay, T. Ibrahim and P. Nath.
  hep-ph/9811362
  10.1103/PhysRevD.60.063505
  Phys. Rev. D **60**, 063505 (1999)

- **"Naturalness, weak scale supersymmetry and the prospect for the observation of supersymmetry at the Tevatron and at the CERN LHC"**
  K. L. Chan, U. Chattopadhyay and P. Nath.
  hep-ph/9710473
  10.1103/PhysRevD.58.096004
  Phys. Rev. D **58**, 096004 (1998)

- **"Probing supergravity grand unification in the Brookhaven g-2 experiment"**
  U. Chattopadhyay and P. Nath.
  hep-ph/9507386
  10.1103/PhysRevD.53.1648
  Phys. Rev. D **53**, 1648 (1996)