CURRICULUM VITAE

Name: **UTPAL SARKAR,** **FNA, FASc, FNASc**
J.C. Bose National Fellow of DST

Former ***Director & Outstanding Scientist,*** *Physical Research Laboratory, Ahmedabad*
Former ***Member, Council of the*** *Indian Space Research Organization, Bengaluru*

Present position **Visiting Professor, IIT-Kharagpur**

Address: *Visiting Professor, Physics Department*
Indian Institute of Technology, Kharagpur 721302, India
Mob:0 98985 86326 *e-mail*: utpal@phy.iitkgp.ernet.in

Field of specialization: Theoretical Particle and Astroparticle Physics

Past Responsibilities: *Dean*
Convener, INSA local chapter
Chairman, Academic Committee, PRL
Chairman, Theoretical Physics Division, PRL
Member, Sectional Committee II of INSA

Awards and Recognitions:

(a) Indian National Science Academy Young Scientist Award 1988.
(b) Associate of the ICTP, Trieste, Italy for the period 1995 - 2000.
(c) Alexander von Humboldt Fellowship, Germany, 1993.
(d) NSERC International Scientific Exchange Award, Canada ’90, ’93
(e) Senior Associate of the ICTP, Trieste for the period 2003-2009
(f) Fellow of the Indian National Science Academy, Delhi, 2007
(g) Fellow of the Indian Academy of Sciences, Bangalore, 2008
(h) Fellow of the National Academy of Sciences, Allahabad, 2009
(h) Clark Way Harrison distinguished visiting professor at the Washington University in St. Louis, USA, Jan-June '09, Jan-Dec '11
(i) Goyal Prize (Conferred at the Kurukshetra University), 2008
(j) J.C. Bose National Fellow of DST, 2013-2018.
(k) Nuclear Physics B Outstanding Referee Award, Elsevier, Aug 2014

Research Highlights *(Citations are as per SLAC Spires database)**:***

Number of publications in peer reviewed journals	180
Papers with more than 50 citations (cited 419, 401, 297, 131, 111, 107, 83, 66, 63, 59, 56, 53 and 51 times)	13
Total citations	4000
h-index	30
Number of papers in Phys Rev Lett	10
Number of papers in Phys. Rev. D (Rapid Comm.)	5

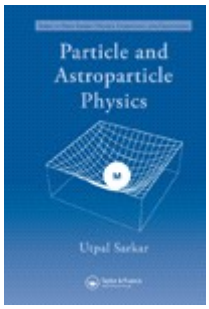
Publication statistics in peer reviewed journals:

Journal	Impact Factor	No of papers
Phys. Rept	20.03	1
Phys Rev Lett	7.33	10
JCAP	6.04	4
Phys Lett B	5.26	66
Eur Phys Jour C (Zeit Phys C)	5.25	8
Phys Rev D	4.92	63
Nucl Phys B	4.64	5
J. Phys. G	4.18	2
Mod Phys Lett A	1.08	12
Int Jour Mod Phys A	1	4
Other Journals	Less than 1	5
Weighted Average/Total	4.84	180

International assignments:

Institutes visited	**Period of visit**
ICTP, Trieste, Italy	Jun-Aug 83, Oct 94, Mar-Apr 98, May 01
Fermilab, Chicago, USA	July 85
Univ. Toronto, Canada	May – Jul 93
Univ. Waterloo, Canada	Apr – Jun 90
Univ. Hawaii	Mar 93
Univ. California at Riverside, USA	Apr 93, May – Jul 00, Sept – Oct 06
Univ. Dortmund, Germany	**Mar 94 – Feb 95**, **May – Oct 98**, May – Sept 06
CERN, Geneva, Switzerland	Aug – Sep 94
DESY, Hamburg	**May – Oct 98**, Aug – Oct 04
Max-Planck-Institut fur Kernphysik, Heidelberg, Germany	Feb – Apr 00, Oct – Dec 01, Nov – Dec 04
Washington Univ, St Louis, USA	**Jan-Jun 09, Jan-Dec 11,** Feb 14
Arizona State Univ, Tempe, AZ, USA	Jan 15, July 15

Text Book:



Particle and Astroparticle Physics

Utpal Sarkar

Publisher: Taylor and Francis, New York, USA
Series: Series in High Energy Physics, Cosmology and Gravitation
Published on: December 3, 2007
Number of Pages: 544

- Provides the required introductions to essential concepts, including field theory, group theory, supersymmetry, string theory, and cosmology
- Covers recent developments in models with extra dimensions and low-scale gravity, which are relevant to the next generation of accelerators
- Explores fascinating astroparticle topics, such as leptogenesis, dark matter, and dark energy
- Includes more discussions on the field as well as a glossary and other material on the author's web page **http://www.prl.res.in/~utpal/books**

From superstring theory to models with extra dimensions to dark matter and dark energy, a range of theoretically stimulating ideas have evolved for physics beyond the standard model. These developments have spawned a new area of physics that centers on the interplay between particle physics and cosmology—astroparticle physics. Providing the necessary theoretical background, **Particle and Astroparticle Physics** presents the many recent advances that have occurred in these fields.

Divided into five parts, the book begins with discussions on group and field theories. The second part summarizes the standard model of particle physics and includes some extensions to the model, such as neutrino masses and *CP* violation. The next section focuses on grand unified theories and supersymmetry. The book then discusses the general theory of relativity, higher dimensional theories of gravity, and superstring theory. It also introduces various novel ideas and models with extra dimensions and low-scale gravity. The last part of the book deals with astroparticle physics. After an introduction to cosmology, it covers several specialized topics, including baryogenesis/leptogenesis, dark matter, dark energy, and brane cosmology.

Endorsement:

"This book is an excellent, comprehensive and user-friendly introductory exposition of particle and astroparticle physics. It encapsulates the up-to-date excitement of these two fast developing fields from a mostly theoretical point of view. It covers all the essential fundamental topics as well as several currently active fields of research, with particular emphasis on neutrinos, CP violation, unification, dark matter, and dark energy. As such, it is eminently suitable for both a beginning physics graduate student as well as the seasoned researcher who wants to know in a nutshell the current thinking on these topics."

Ernest Ma
Physics Department, University of California, Riverside, CA 92521, USA

Other Publications:

Neutrinoless Double Beta Decay, edited by V.K.B. Kota and U. Sarkar,
Narosa Publication, 2007

Flavors of Research in Physics, edited by U. Sarkar,
INSA Ahmedabad chapter publication, 2008

Academic Record and Research Experience

Academic Qualifications:

Degree	Subject	Year	University
B.Sc.	Physics	1976*	Calcutta University
M.Sc.	Physics	1978**	Calcutta University
Ph.D. (Some Studies in Gauge Theories; Supervisor: Prof. Amitava Raychaudhuri)	Particle Physics	1984***	Calcutta University
Post-doctoral Research	Particle Physics	1984 – 86	University of Texas at Austin, USA
Post-doctoral Research	Particle Physics	1986 – 87	University of Toronto, Toronto, Canada

*Results announced in June 1977; **Results announced in June 1980;
***Thesis submitted in January 1983;

Ph.D. Students:

1.	Debajyoti Choudhury	PDFs at *TIFR*, Bombay; *Max Planck Institute, Munich*, Germany and *CERN, Geneva*, Switzerland. *Recipient of DST Swarna Jayanti Award.*
2.	Biswajoy Brahmachari	PDFs at *ICTP, Trieste*, Italy; *University of Maryland*, USA; *Indiana University, Bloomington*, USA.
3.	Manoj K. Samal	PDFs *Institute of Physics*, Bhubaneswar; *Indian Institute of Astrophysics*, Bangalore.
4.	Santosh K. Singh	PDFs at *HRI*, Allahabad; *SINP*, Kolkata
5.	Sudhanwa Patra	PDFs at *IOP*, Bhubaneswar; MPI-Heidelberg
6.	Chandan Hati	Third year student

Few important publications *(Citation as per SLAC-Spires HEP database):*

No	Name of Authors	Title	Journal	Citation
1.	J.C. Pati, A. Salam and U. Sarkar	$\Delta B=-\Delta L$, Neutron $\rightarrow e^-\pi^+$, e^-K^+, $\mu^-\pi^+$ and μ^-K^+ decay modes in $SU(2)_L$ x $SU(2)_R$ x $SU(4)_{col}$ and SO(10)	Phys. Lett. **B 133** (1983) 330	37
2.	S. Nandi and U. Sarkar	Solution to the neutrino mass problem in superstring E_6 theory	Phys. Rev. Lett. **56** (1986) 564	**131**
3.	T.R. Govindarajan, A.S. Joshipura, S.D. Rindani and U. Sarkar	Supersymmetric compactification of the heterotic string on coset spaces	Phys. Rev. Lett. **57** (1986) 2489	27
4.	Patrick J. O'Donnell and Utpal Sarkar	Baryogenesis via lepton number violating scalar interactions	Phys. Rev. **D 49** (1994) 2118	**63**
5.	M. Flanz, E.A. Paschos and U. Sarkar	Baryogenesis from a lepton asymmetric universe	Phys. Lett. **B 345** (1995) 248	**419**
6.	M. Flanz, E.A. Paschos, U. Sarkar and J. Weiss	Baryogenesis through mixing of heavy majorana neutrinos	Phys. Lett. **B 389** (1996) 693	**297**
7.	R.B. Mann and U. Sarkar	Test of equivalence principle from neutrino experiments	Phys. Rev. Lett. **76** (1996) 865	**53**
8.	E. Ma and U. Sarkar	Neutrino masses and leptogenesis with heavy higgs triplets	Phys. Rev. Lett. **80** (1998) 5716	**401**
9.	E. Ma, D.P. Roy and U. Sarkar	A Seesaw model for atmospheric and solar neutrino oscillations	Phys. Lett. **B 444** (1998) 391	**54**
10.	U. Sarkar	Degenerate Dirac neutrinos	Phys. Rev**. D 59** (1999) 037302	27
11.	E. Ma, M. Raidal and U. Sarkar	Verifiable model of neutrino masses from large extra dimensions	Phys. Rev. Lett. **85** (2000) 3769	**111**
12.	T. Hambye, E. Ma and U. Sarkar	Supersymmetric triplet Higgs model of neutrino masses and leptogenesis	Nucl. Phys. **B 602** (2001) 23	**107**
13.	H.V. Klapdor-Kleingrothaus and U. Sarkar	Implications of observed neutrinoless double beta decay	Mod. Phys. Lett. **A 16** (2001) 2469	49
14.	E. Ma, M. Raidal and U. Sarkar	Phenomenology of the neutrino mass giving Higgs triplet and the low-energy seesaw violation of lepton number	Nucl. Phys.**B 615** (2001) 313	**83**
15.	B. Brahmachari, E. Ma and U. Sarkar	Left-Right Model of Quark and Lepton Masses without a Scalar Bidoublet	Phys. Rev. Lett. **91** (2003) 011801	29
16.	M. Hirsch, J.W.F. Valle, M. Malinsky, J.C. Romao and U. Sarkar	Thermal leptogenesis in extended supersymmetric seesaw	Phys. Rev. **D 75** (2007) 011701 (rapid comm.)	24
17.	N. Sahu and U. Sarkar	Predictive model for dark matter, dark energy, neutrino masses and leptogenesis at the TeV scale	Phys. Rev. **D 76** (2007) 045014	32
18.	P. Gu, M. Lindner, U. Sarkar and X. Zhang	WIMP Dark Matter and Baryogenesis	Phys. Rev. **D 83** (2011) 055008	**66**
19.	R. Cowsik, S. Nussinov and U. Sarkar	Superluminal Neutrinos at OPERA Confront Pion Decay Kinematics	Phys. Rev. Lett. **107** (2011) 251801	45
20.	F.F. Deppisch, T.E. Gonzalo, S. Patra, N. Sahu and U. Sarkar	Signal of Right-handed charged gauge bosons at the LHC?	Phys. Rev. D 90 (2014) 5, 053014	**59**

Significant research contributions:

1.The original predictions of proton decay could not explain the baryon asymmetry of the universe, as they conserved a quantum number (B-L), which is the difference between baryon and lepton numbers. U. Sarkar (in collaboration with J.C. Pati and A. Salam) pointed out that it is possible to have proton decays that violate (B-L) quantum number, which could then explain the baryon asymmetry of the universe. The entire field of research on (B-L) violating proton decay started following this work, which is included in several text books.

2.The CP violation in oscillations of any neutral particle into its own antiparticle is a new phenomenon, proposed by U. Sarkar (jointly with M. Flanz and E.A. Paschos), which can generate a matter-antimatter asymmetry in the universe. They pointed out that in the seesaw models of neutrino masses, the heavy right-handed neutrinos could oscillate into antineutrinos and the CP violation in the neutrino mass matrix produces more right-handed neutrinos than antineutrinos, so that when they decay into ordinary light left-handed neutrinos, they generate a lepton asymmetry of the universe, which in turn, generates a baryon asymmetry in the presence of the sphalerons. This work has been cited 412 times as per SLAC Spires and 468 times according to Google Scholar.

3.When oscillation type CP violation (as mentioned in previous paragraph) generates a matter-antimatter asymmetry, U. Sarkar (with M. Flanz, E.A. Paschos and J. Weiss) demonstrated that there could be a resonant effect, which gave birth to resonant leptogenesis. Because of this large enhancement in the asymmetry, the scale of leptogenesis could be lowered to as low as TeV and then all the new physics associated with the leptogenesis mechanism becomes accessible to the next generation accelerators. This opens up a new possibility of testing these models of baryogenesis in the laboratory, making these models testable. This work has been cited 291 times according to SLAC Spires and 315 times according to Google Scholar.

4.In another seminal paper, the non-vanishing tiny neutrino masses was explained in an extension of the standard model with a triplet Higgs scalar, in which lepton number is broken explicitly. This mechanism can also generate a lepton asymmetry of the universe, and has many virtues, which allows this model to explain the dark matter and dark energy. This mechanism was proposed by U. Sarkar (with E. Ma). This paper has been cited 393 times in SLAC Spires and 468 times in Google Scholar.

5.The OPERA experiment claimed to have observed faster than light particles, but U. Sarkar (with R. Cowsik and S. Nussinov) pointed out that this is inconsistent with pion decays as observed in cosmic rays. Subsequently the experiment was repeated and they confirmed this theoretical estimate. This paper was recommended as editor’s suggested article in Phys Rev Lett and reported in Science News, and many international scientific magazines.

List of publications of Utpal Sarkar (7 pgs):

No	Authors	Title	Reference
1.	A. Raychaudhuri and U. Sarkar	New solutions of Yang- Mills equations with static external sources	Phys. Lett. B 102 (1981) 421
2.	A. Raychaudhuri and U. Sarkar	Static solutions of Yang- Mills equations with external sources	Phys. Rev. D 26 (1982) 2804
3.	U. Sarkar	(B-L) non- conserving proton decay in GUTs	Phys. Lett. B 114 (1982) 239
4.	A. Raychaudhuri and U. Sarkar	Low energy restoration of parity and maximal symmetry	Phys. Rev. D 26 (1982) 3212
5.	S.P.Misra, M.K. Parida and U. Sarkar	Hydrogen- antihydrogen oscillations- signature of intermediate mass scales in GUTs	Phys. Lett. B 120 (1983) 124
6.	C.C.Hazra, M.K.Parida and U. Sarkar	Are neutron- antineutron oscillations and proton decay mutually exclusive?	Phys. Lett. B 123 (1983) 413
7.	S.P. Misra and U. Sarkar	Neutron- antineutron oscillations, hydrogen-antihydrogen oscillations and double proton decay - are they suppressed by wave function effects?	Phys. Rev. D 28 (1983) 249
8.	J.C. Pati, A. Salam and U. Sarkar	$\Delta B = -\Delta L$, Neutron $\rightarrow e^- \pi^+$, $e^- K^+$, $\mu^- \pi^+$ and $\mu^- K^+$ decay modes in $SU(2)_L \times SU(2)_R \times SU(4)_{col}$ and SO(10)	Phys. Lett. B 133 (1983) 330
9.	A.K. Ray and U. Sarkar	Testing horizontal symmetries from nucleon decay experiments	Phys. Rev. D 29 (1984) 166 (Rapid Comm.)
10.	P. Majumdar, A. Raychaudhuri and U. Sarkar	Are neutron- antineutron oscillations allowed in supersymmetric grand unified theories?	Phys. Lett. B 137 (1984) 181
11.	S. Panda and U. Sarkar	Light Dirac neutrinos and mirror fermions	Phys. Lett. B 139 (1984) 42
12.	R.M. Godbole, U. Sarkar and O. Shanker	Low energy constraints on N = 2 supersymmetric models	Phys. Lett. B 142 (1984) 286
13.	A.S. Joshipura, P. Roy, U. Sarkar and O. Shanker	Superunified model with naturally ultralight Dirac neutrinos	Phys. Lett. B 150 (1985) 270
14.	K. Bandyopadhyay, A.K. Ray and U. Sarkar	Strangeness changing baryon non-conservation in nonsupersymmetric theories	Phys. Lett. B 151 (1985) 132
15.	A.S. Joshipura, R. Ramachandran and U. Sarkar	Compositeness versus elementarity in N= 2 susy theories	Phys. Lett. B 153 (1985) 40
16.	U. Sarkar	Backward hierarchy and susy SO(10) GUT	Phys. Lett. B 156 (1985) 61
17.	A.S. Joshipura, A. Mukherjee and U. Sarkar	Light Dirac neutrinos in N = 1 locally supersymmetric SU(5) GUT	Phys. Lett. B 156 (1985) 353
18.	C.B. Chiu and S. Nandi and U. Sarkar	Unitarity constraints on the nondegenerate Majorana neutrino model	Phys. Rev. Lett. 55 (1985) 2089
19.	S. Nandi and U. Sarkar	Solution to the neutrino mass problem in superstring E6 theory	Phys. Rev. Lett. 56 (1986) 564
20.	A.S. Joshipura and U. Sarkar	Phenomenologically consistent discrete symmetries in superstring theories	Phys. Rev. Lett. 57 (1986) 33
21.	T.R. Govindarajan, A.S. Joshipura, S.D. Rindani and U. Sarkar	Supersymmetric compactification of the heterotic string on coset spaces	Phys. Rev. Lett. 57 (1986) 2489
22.	K.Bandyopadhyay, A.K.Ray and U. Sarkar	Discriminating horizontal symmetries from operator analysis and proton decay experiments	Phys. Rev. D 33 (1986) 3293
23.	V. Gupta, H.S. Mani and U. Sarkar	Supersymmetric preon models with three fermion generations	Pramana 26 (1986) 311
24.	S. Mishra, S.P. Misra, S. Panda and U. Sarkar	Light Dirac neutrinos in left- right symmetric models	Phys. Rev. D 35 (1987) 975
25.	U. Sarkar	Pseudo- Dirac solar neutrinos?	Phys. Rev. D 35 (1987) 1528

26.	T.R. Govindarajan, A.S. Joshipura, S.D. Rindani and U. Sarkar	Coset spaces as alternatives to Calabi- Yau spaces in the presence of gaugino condensation	Int. Jour. Mod. Phys. A 2 (1987) 797
27.	A.S. Joshipura and U. Sarkar	Economic models for Dirac neutrinos in grand unified theories	Pramana 29 (1987) 247
28.	R.B. Mann and U. Sarkar	Neutrino masses in superstring theories with intermediate scales	Int.Jour.Mod.Phys. A 3 (1988) 2165
29.	D. Choudhury and U. Sarkar	B- anti-B mixing, ε'/ε and quark mass matrices	Phys. Lett. B 217 (1989) 341
30.	D. Choudhury and U. Sarkar	Model independent analysis of quark mass matrices	Phys. Rev. D 39 (1989) 3425
31.	U. Sarkar	Isospin breaking in superstring inspired model	Phys. Rev. D 40 (1989) 170
32.	D. Choudhury and U. Sarkar	Naturally light Majorana neutrinos with no neutrinoless double beta decay	Phys. Rev. D 41 (1990) 1591
33.	D. Choudhury and U. Sarkar	Large magnetic moments for near massless neutrinos	Phys. Lett. B 235 (1990) 113
34.	K. Bandyopadhyay, D. Choudhury and U. Sarkar	Neutrino mass matrices in horizontal models	Phys. Rev. D 43 (1991) 1646
35.	E. Bagan, R.B. Mann, U. Sarkar and T.G. Steele	Renormalization group evolution of the gluonic CP- violating operator	Phys. Rev. D 43 (1991) 2233
36.	M. Leblanc, R.B. Mann, U. Sarkar and H.B. Zhang	On the Yukawa couplings of N=2 superconformal theories	Phys. Lett. B 256 (1991) 179
37.	H.G. Blundell, R.B. Mann and U. Sarkar	Generalized two angle parametrization of the KM matrix	Phys. Rev. D 43 (1991) 2386
38.	M.K. Samal, D. Choudhury, R.B. Mann and U. Sarkar	Top quark mass and a symmetric CKM matrix	Phys. Rev. D 44 (1991) 2860
39.	M.K. Samal and U. Sarkar	17 keV Nondegenerate Majorana neutrino and neutrino mixing	Phys. Lett. B 267 (1991) 243
40.	D. Choudhury and U. Sarkar	A new mechanism to generate a 17 keV neutrino	Phys. Lett. B 268 (1991) 96
41.	M.K. Samal and U. Sarkar	Symmetric CKM matrix and quark mass matrices	Phys. Rev. D 45 (1992) 2421
42.	D. Choudhury, P.J. O'Donnell and U. Sarkar	Magnetic moments and the structure function of the proton	Zeit. Phys. C 54 (1992) 307
43.	B. Brahmachari, R.B. Mann, U. Sarkar and T. Steele	Higgs Effect in SU(15) GUT	Phys. Rev. D 45 (1992) 2467
44.	D. Choudhury and U. Sarkar	Neutrino Magnetic Moment and the 17 keV $\nu\tau$	Phys. Rev. Lett. 68 (1992) 2875
45.	K. Bandyopadhyay, A.K. Ray, D.Bhowmick and U.Sarkar	Distinguishability of some un-unified models	Phys. Rev. D 46 (1992) 914
46.	B. Brahmachari, K. Sridhar and U. Sarkar	Ruling out low energy left- right symmetry in unified theories	Phys. Lett. B 297 (1992) 105
47.	U. Sarkar	17 keV neutrino in a Zee- type model	Phys. Rev. D 47 (1993) 1114
48.	B. Brahmachari and U. Sarkar	Implications of Supersymmetric SU(15) Grand Unification	Phys. Lett. B 303 (1993) 260
49.	S. Sarkar, K. Bandyopadhyay, A.K. Ray and U. Sarkar	Distinguishability of Superstring E6 Inspired Low Energy Models and SU(5)c Color Model	Phys. Rev. D 47 (1993) 3768
50.	G. Bhattacharyya, A. Datta, A. Raychaudhuri and U. Sarkar	New bound on right handed charged gauge boson mass	Phys. Rev. D 47 (1993) R 3693 (Rapid Comm)
51.	B. Brahmachari, P.K. Patra, U. Sarkar and K. Sridhar	Higher dimensional operators to the rescue of minimal SU(5)	Mod. Phys. Lett. A 8 (1993) 1487
52.	A. Datta and S. Pakvasa and U. Sarkar	Higher dimensional operators and low energy left- right symmetry	Phys. Lett. B 313 (1993) 83
53.	A. Acker, H. Kikuchi, E. Ma and U. Sarkar	CP violation and leptogenesis	Phys. Rev. D 48 (1993) 5006
54.	P.J. O'Donnell and U. Sarkar	Three lepton decay modes of the proton	Phys. Lett. B 316 (1993) 121

55.	B. Brahmachari, U. Sarkar and K. Sridhar	Non-perturbative unification in the light of LEP results	Mod. Phys. Lett. A 8 (1993) 3349
56.	U. Sarkar	LEP constraints on Grand Unified Theories	Pramanna 41 (1993) 261
57.	P.J. O'Donnell and U. Sarkar	Baryogenesis via lepton number violating scalar interactions	Phys. Rev. D 49 (1994) 2118
58.	P.B. Pal and U. Sarkar	Proton decay and related processes in unified models with gauged baryon number	Phys. Rev. D 49 (1994) 3721
59.	A. Datta, S. Pakvasa and U. Sarkar	Corrections to mass scale predictions in SO(10) GUT with higher dimensional operators	Phys. Rev. D 50 (1994) 2192
60.	M. Flanz, E.A. Paschos and U. Sarkar	Baryogenesis from a lepton asymmetric universe	Phys. Lett. B 345 (1995) 248
61.	K. Bandyopadhyay, A.K. Ray, D. Bhowmick, and U. Sarkar	Bounds on Z' mass and mixing in ununified gauge models	Phys. Rev. D 51 (1995) 2118
62.	A. Datta, S. Pakvasa and U. Sarkar	Gravitational uncertainties on supersymmetric GUT predictions	Phys. Rev. D 52 (1995) 550
63.	P.J. O'Donnell and U. Sarkar	Neutrinoless double beta decay and CP violation	Phys. Rev. D 52 (1995) 1720
64.	E.A. Paschos, U. Sarkar and H. So	Baryon and Lepton Number Assignments in E6 Models	Phys. Rev. D 52 (1995) 1701
65.	R.B. Mann and U. Sarkar	Test of equivalence principle from neutrino experiments	Phys. Rev. Lett. 76 (1996) 865
66.	A. Ganguly, J.C. Parikh and U. Sarkar	Low energy leptogenesis in left-right symmetric models	Phys. Lett. B 385 (1996) 175
67.	M. Flanz, E.A. Paschos, U. Sarkar and J. Weiss	Baryogenesis through mixing of heavy majorana neutrinos	Phys. Lett. B 389 (1996) 693
68.	U. Sarkar	Electroweak baryogenesis and constraints on left-handed majorana neutrino mass	Phys. Lett. B 390 (1997) 97
69.	B. Brahmachari, P.J. O'Donnell and U. Sarkar	A model for the three lepton decay mode of the proton	Zeit. Phys. C 74 (1997) 171
70.	R. Adhikari and U. Sarkar	Baryogenesis through R- parity violation	Phys. Rev. D 55 (1997) 3836
71.	T. Hambye, R.B. Mann and U. Sarkar	Test of special relativity from K physics	Phys. Lett. B 421 (1998) 105
72.	R. Adhikari and U. Sarkar	Baryogenesis in a supersymmetric model without R- parity	Phys. Lett. B 427 (1998) 59
73.	T. Hambye, R.B. Mann and U. Sarkar	Test of Special Relativity and Equivalence Principle from K Physics	Phys. Rev. D 58 (1998) : 025003
74.	E. Ma and U. Sarkar	Neutrino masses and leptogenesis with heavy higgs triplets	Phys. Rev. Lett. 80 (1998) 5716
75.	S. Mohanty and U. Sarkar	Constraints on background torsion field from K physics	Phys. Lett. B 433 (1998) 424
76.	E. Ma and U. Sarkar	Gauged B-3Ltau and Baryogenesis	Phys. Lett. B 439 (1998) 95
77.	U. Sarkar and R. Vaidya	CP violation in the mass matrix of heavy neutrinos	Phys. Lett. B 442 (1998) 243
78.	E. Ma, D.P. Roy and U. Sarkar	A seesaw model for atmospheric and solar neutrino oscillations	Phys. Lett. B 444 (1998) 391
79.	S. Mohanty, D.P. Roy and U. Sarkar	Texture of a Four- Neutrino Mass Matrix	Phys. Lett. B 445 (1998) 185
80.	U. Sarkar	Degenerate Dirac neutrinos	Phys. Rev. D 59 (1999) 037302
81.	J. Faridani, S. Lola, P.J. O'Donnell and U. Sarkar	Scale of leptogenesis	Eur. Phys. Jour. C7 (1999) 543
82.	E. Ma, M. Raidal and U. Sarkar	Probing the exotic particle content beyond the standard model	Eur. Phys. Jour. C8 (1999) 301
83.	U. Sarkar	Naturally light sterile neutrinos	Phys. Rev. D 59 (1999) 031301 (Rapid Comm)
84.	H.V. Klapdor-Kleingrothaus, H. Paes and U. Sarkar	Test of special relativity and equivalence principle from neutrinoless double beta decay	Eur. Phys. Jour. A5 (1999) 3

85.	D. Delepine and U. Sarkar	Gravitino constraints on models of neutrino masses and leptogenesis	Phys. Rev. D 60 (1999) 055005
86.	S. Sarkar, A.K. Ray and U. Sarkar	Constraints on the $SU(5)_C$ x $SU(2)_L$ x $U(1)_Y$ model from LEP data	Int Jour Mod Phys A14 (1999) 1049
87.	E. Ma, S. Sarkar and U. Sarkar	Scale of $SU(2)_R$ symmetry breaking and leptogenesis	Phys. Lett. B 458 (1999) 73
88.	E. Ma, M. Raidal and U. Sarkar	Baryogenesis with scalar bilinears	Phys. Rev. D 60 (1999) 076005
89.	E. Ma, M. Raidal and U. Sarkar	Neutrino masses in supersymmetry: R-parity and leptogenesis	Phys. Lett. B 460 (1999) 359
90.	Y. Liu and U. Sarkar	About the mixing and CP violation in neutrino system	Comm. Theor. Phys. 34 (2000) 289
91.	H.V. Klapdor-Kleingrothaus, H. Paes and U. Sarkar	Effects on new gravitational interactions on neutrinoless double beta decay	Phys. Lett. B 478 (2000) 269
92.	U. Sarkar	Models of neutrino masses and baryogenesis	Pramana 54 (2000) 101
93.	T. Hambye, E. Ma and U. Sarkar	Leptogenesis from R parity nonconservation	Phys. Rev. D 62 (2000) 015010
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