

RESUME

Name: **Charanjit Singh Aulakh**

Date of Birth : 21 May 1954

Place of Birth: Simla H.P

Nationality: Indian

Present Post: Professor

Institution: Dept. of Physics, Panjab University, Chandigarh

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Academic : i) **B. Sc.** (Hons-Physics-I Div.)
St. Stephen's College ,Univ. of Delhi. 1973

ii) **M.Sc.** (Physics-I Div.)
Univ. of Delhi 1975

iii) **Ph.D.** City University of New York, 1983
Theoretical High Energy Physics
Ph.D Thesis Topic : Intermediate Mass Scales in Supersymmetric
Gauge Theories.
Thesis Advisor : Prof. R.N.Mohapatra.

Courses:

Quantum Mechanics

Relativistic Quantum Mechanics and Quantum Field Theory

Advanced Particle Physics (Standard Model)
Advanced Electrodynamics and General Theory of Relativity
Group Theory

Research Interests

- Supersymmetric Grand Unified Theories, specifically the Minimal Supersymmetric SO(10) GUTs introduced and studied with various collaborators since 1982.
- Supersymmetric Left Right Models
- Fermion Flavour problem
- Inflationary Cosmology.
- Supergravities, Kaluza Klein Theories, higher spin theories.
- Soliton Solutions in Higher dimensions.

Employment:

- (i) Teacher, The Doon School, Dehradun, 7/75 to 12/75
- (ii) Teaching/Research Asst., City Coll. of CUNY, New York, 9/77 to 7/83.
- (iii) Research Fellow, International Centre for Theoretical Physics, Trieste, Italy, 10/83 to 9/85.
- (iv) Research Fellow, Institut de Physique Nucleaire (Particle Theory Group), Orsay, France, 10/85 to 4/86.
- (v) Research Fellow, Neils Bohr Institute, Copenhagen, Denmark, 5/86 to 9/87.
- (vi) CTS Fellow, Centre for Theoretical Studies, Indian Institute of Science, Bangalore, 9/87 to 4/88.
- (vii) Senior Lecturer, Institute of Physics, Bhubaneshwar, 5/88 - 1/93.
- (viii) Assistant Professor, Institute of Physics, Bhubaneshwar, 2/93 - 5/96 (7/94-5/96 on lien).
- (ix) UGC Research Scientist B, Dept. of Physics, Panjab University, Chandigarh, 8/94- 11/94.
- (x) Reader, Dept. of Physics, Panjab University, Chandigarh, 11/94- 1/2/2001.

- (xi) Professor, Dept. of Physics, Panjab University, Chandigarh.,
1/2/2001- 31/5/2014
- xii) Adjunct Faculty, Indian Institute of Science, Education and
Research (Mohali), 2006-2009 ; 2011- 31/5/2014.
- xii) Professor, Indian Institute of Science, Education and Research
(Mohali), 1/6/2014-Present.

Other Professional Experience

- Visiting Scientist, Institut de Nucleaire (Particle Theory Group),
Orsay , France 1992.
- Visiting Scientist, CEA(Particle Theory Group), Saclay, France, 2002.
- Visiting Scientist International Centre for Theoretical Physics, Trieste
1995,1996,1997,1998,1999,2001, 2002,2003,2004,2005,
2006,2007, 2008,2010,2011,2012,2013.
- Visiting Scientist, CERN, Geneva, 2005.
- Visiting Scientist, Helsinki Institute of Physics 2005,2006,2007.
- Visiting Scientist, Academia Sinica , Taipei, Taiwan, 2006.
- Visting Scientis, Pontifical University of Santiago, Chile.
- Referee : Nuclear Physics B, Physical Review D, JHEP ,
Physics Letters B, MPLA..
- Lecturer, SERC-THEP, preparatory school , Goa, October, 2010 :
Lectures on Group Theory.

Organizer /Director:

- i) Workshop on Grand Unification and proton decay(GUT07)
International Centre for Theoretical Physics
Trieste, Italy, 22 July 2007 to 26 July 2007.
- ii) XXV SERC THEP Main School ,
Dept. of Physics, Panjab University
April 2-22, 2010

- iii) GoranFest : the joy of making Physics , Split, Croatia, June 9 - 12, 2010. Conference marking Prof. Goran Senjanovic's 60th birthday.
- iv) ICTP Summer School on Particle Physics, June 6-17, 2011, Trieste.
- v) Unification and Cosmology after Higgs Discovery and BICEP2, International workshop, Panjab University, May 13-15,2014.
- 5) Chairman, Physics Dept., Panjab University : 6/1/2010 –31/5/2013
- 6) UGC-CAS Coordinator, April 2011- present
- 7) Centre for NanoScience and Nanotechnology , Panjab University , Coordinator(ex-officio). 2010-2013.

Achievements and Awards

- National Science Talent Scholar 1970-77.
- Bourse Joliot Curie, Institut de Physique Nucleaire , Orsay, France, 1985-6.
- Associate, International Centre for Theoretical Physics, Trieste, Italy, 1988-94.
- UGC Research Scientist (1994)
- Principal Investigator, Dept. of Science and Technology, Govt. of India,
SERC project : Left Right Supersymmetric Unification"
2000-2004
- Principal Investigator , DST-SERC project, "Minimal Supersymmetric Grand Unification", 2006-2009.
- Senior associate, International Centre for Theoretical Physics, Trieste, Italy, 2014-2019.

Languages : Punjabi, Hindi, English, French, Italian, Spanish.

Rudiments: Sanskrit, Russian, German.

Papers by Charanjit S. Aulakh

1 Summary:

1. **35** Journal papers, **14** Conference proceedings, **13** preprints.
2. **HEP-Inspire Citations**(<http://inspirehep.net/>) :
Journal papers : **1904**, All papers : **2090**.
Average Citations per paper: Journal : **51.5**, All papers : **38.0**.
H-Index : Journal papers : **18** , All papers : **20**.
3. **Google Scholar** : <http://scholar.google.co.in>
: Citations **2368**, H-Index **18**, I-10 index **26**.
4. **Scopus** : Citations **1234**, H-Index **14**.

2 Articles published in Journals

1. C. S. Aulakh, I. Garg and C. K. Khosa, Nucl. Phys. B **882** (2014) 397 [arXiv:1311.6100 [hep-ph]].
2. “**Supersymmetric Seesaw Inflation**” (2012) C. S. Aulakh and I. Garg. Phys. Rev. D **86**, 065001,1-17.(5 citations INSPIRE Nov 30, 2013)
3. “**The New Minimal Supersymmetric GUT : Spectra, RG analysis and Fermion Fits**” (2012)C. S. Aulakh and S. K. Garg. Nucl. Phys. B **857**, 101-142. (20 citations INSPIRE Nov 30, 2013)
4. “**Correcting $\alpha(3)(M(Z))$ in the NMSGUT**” (2009) C. S. Aulakh and S. K. Garg. Mod. Phys. Lett. A **24**, 1711-1719. (13 citations INSPIRE Nov 30, 2013)
5. “**Pinning down the new minimal supersymmetric GUT**” (2008) C. S. Aulakh. Phys. Lett. B **661**, 196-200. (18 citations INSPIRE Nov 30, 2013)
6. “**MSGUT : From bloom to doom**” (2006) C. S. Aulakh and S. K. Garg. Nucl. Phys. B **757**, 47-78 (59 citations INSPIRE Nov 30, 2013)
7. “**On the consistency of MSGUT spectra**” (2005) C. S. Aulakh. Phys. Rev. D **72**, 051702,1-5.(32 citations INSPIRE Nov 30, 2013)
8. “**SO(10) MSGUT: Spectra, couplings and threshold effects**” (2005)C. S. Aulakh and A. Girdhar. Nucl. Phys. B **711**, 275-313. (86 citations INSPIRE Nov 30, 2013)
9. “**The Minimal supersymmetric grand unified theory**” (2004) C. S. Aulakh, B. Bajc, A. Melfo, G. Senjanovic and F. Vissani. Phys. Lett. B **588**,196-202. (153 citations INSPIRE Nov 30, 2013)
10. “**SO(10) a la Pati-Salam**” (2005)C. S. Aulakh and A. Girdhar. Int. J. Mod. Phys. A **20**, 865-893. (62 citations INSPIRE Nov 30, 2013)
11. “**SO(10) theory of R-parity and neutrino mass**” (2001) C. S. Aulakh, B. Bajc, A. Melfo, A. Rasin and G. Senjanovic. Nucl. Phys. B **597**, 89-109. (120 citations INSPIRE Nov 30, 2013)
12. “**Intermediate scales in supersymmetric GUTs: The Survival of the fittest**” (1999) C. S. Aulakh, B. Bajc, A. Melfo, A. Rasin and G. Senjanovic. Phys. Lett. B **460**, 325-332. (27 citations INSPIRE Nov 30, 2013)

13. **“Seesaw and supersymmetry or exact R-parity”** (1999) C. S. Aulakh, A. Melfo, A. Rasin and G. Senjanovic. Phys. Lett. B **459**, 557-562. (84 citations INSPIRE Nov 30, 2013)
14. **“Dense string networks and the one scale model with friction”** (1999) C. S. Aulakh, M. Nagasawa and V. Soni. Phys. Lett. B **471**, 13-19.
15. **“Minimal supersymmetric left-right model”** (1998) C. S. Aulakh, A. Melfo and G. Senjanovic. Phys. Rev. D **57**, 4174-4178. (160 citations INSPIRE Nov 30, 2013)
16. **“Supersymmetry and large scale left-right symmetry”** (1998) C. S. Aulakh, A. Melfo, A. Rasin and G. Senjanovic. Phys. Rev. D **58**, 115007,1-12. (108 citations INSPIRE Nov 30, 2013)
17. **“Reconciling supersymmetry and left-right symmetry”** (1997) C. S. Aulakh, K. Benakli and G. Senjanovic. Phys. Rev. Lett. **79**, 2188-2191. (130 citations INSPIRE Nov 30, 2013)
18. **“Hypercharged vortices and strings with signature change horizon”** (1995) C. S. Aulakh. Mod. Phys. Lett. A **10**, 2501-2508.
19. **“Topological electropoles in (4+1)-dimensional EYMCS theory”** (1994) C. S. Aulakh, and V. Soni. Mod. Phys. Lett. A **9**, 2139-2146.
20. **“Charged topological solitons in (4+1)-dimensional YMCS theory”** (1992) C. S. Aulakh. Mod. Phys. Lett. A **7**, 2469-2476.
21. **“Topological soliton multiplets in (4+1)-dimensional YMCS theory”** (1993) C. S. Aulakh and V. Soni. Int. J. Mod. Phys. A **8**, 1653-1666.
22. **“Syncyclons or solitonic signals from extra dimensions”** (1992) C. S. Aulakh. Mod. Phys. Lett. A **7**, 2119-2128.
23. **“Even Integer Lattices From Simply Laced Gko Cosets”** (1991) C. S. Aulakh and S. Mahapatra. Int. J. Mod. Phys. A **6**, 3781-3796.
24. **“Curiouser And Curiouser At Integer Central Charge”** (1990) C. S. Aulakh. Mod. Phys. Lett. A **5**, 315-320.
25. **“Consistently Truncated Open Superstring”** (1986) C. S. Aulakh. Phys. Lett. B **175**, 297-303.
26. **“Infinite Dimensional Gauge Structure of Kaluza-Klein Theories. 2. $D > 5$ ”** (1986) C. S. Aulakh and D. Sahdev. Phys. Lett. B **173**, 241-246. (9 citations INSPIRE Nov 30, 2013)
27. **“On the Reducibility of (16+16) Supergravity”** (1986) C. S. Aulakh, J. P. Derendinger and S. Ouvry. Phys. Lett. B **169**, 201-204. (8 citations INSPIRE Nov 30, 2013)
28. **“The Infinite Dimensional Gauge Structure of Kaluza-Klein Theories. 1. $D = 1+4$ ”** (1985) C. S. Aulakh and D. Sahdev. Phys. Lett. B **164**, 293-300. (36 citations INSPIRE Nov 30, 2013)
29. **“Infinite Parameter Symmetries And The Higgs Effect In Gravity Coupled Sigma Models In (d+4)-dimensions”** (1985) C. S. Aulakh and D. Sahdev. Nucl. Phys. B **262**, 107-119.
30. **“Supersymmetry and the Calculation of Neutrino Masses”** (1983) C. S. Aulakh and R. N. Mohapatra. Phys. Lett. B **121**, 147-150. (36 citations INSPIRE Nov 30, 2013)
31. **“Neutrino as the Supersymmetric Partner of the Majoron”** (1982) C. S. Aulakh and R. N. Mohapatra. Phys. Lett. B **119**, 136-140. (424 citations INSPIRE Nov 30, 2013)
32. **“Implications of Supersymmetric SO(10) Grand Unification”** (1983) C. S. Aulakh and R. N. Mohapatra. Phys. Rev. D **28**, 217-227. (141 citations INSPIRE Nov 30, 2013)
33. **“Higher Spin Fields With Mixed Symmetry”** (1986) C. S. Aulakh, I. G. Koh and S. Ouvry. Phys. Lett. B **173**, 284-288. (94 citations INSPIRE Nov 30, 2013)
34. **“Of Towers and Ladders: Infinite Parameter Symmetries in Kaluza-Klein Theories”** (1984) C. S. Aulakh. Phys. Lett. B **146**, 33-37. (6 citations INSPIRE Nov 30, 2013)
35. **“Effective Potentials In Different Supergravities”** (1983) C. S. Aulakh, M. Kaku and R. N. Mohapatra. Phys. Lett. B **126**, 183-188. (4 citations INSPIRE Nov 30, 2013)

3 Conference Proceedings

1. **“Susy Seesaw Inflation and NMSO(10)GUT”** (2012) C. S. Aulakh. AIP Conf. Proc. **1534**, 192-201. Proceedings of Workshop on Dark Matter, Unification and Neutrino Physics (CETUP* 2012) : Lead/Deadwood, South Dakota, USA, July 10-August 1, 2012.
2. **“Emergence of the NMSGUT”** (2007) C. S. Aulakh. AIP Conf. Proc. **939**, 31-39. Proceedings International Workshop on Theoretical High Energy Physics, Roorkee, India, 15-20 March 2007. (4 citations INSPIRE Nov 30, 2013)
3. **“MSGUT: The Next Avtar”** (2006) C. S. Aulakh. Conf. Proc. C **060726**, 320-323. Proceedings of 33rd International Conference on High Energy Physics (ICHEP 2006) : Moscow, Russia, July 26-August 2, 2006.
4. **“MSGUT: From futility to precision”** 2004 C. S. Aulakh. Proc. 5th Rencontres du Vietnam : New Views in Particle Physics.
5. **“GUT genealogies for SUSY seesaw Higgs”** 2001 C. S. Aulakh. Proceedings, 9th International Conference, SUSY'01,p242-244 Dubna, Russia, June 11-17, 2001
6. **“New regime for dense string networks”** (1999) C. S. Aulakh. In COSMO - 99: Proceedings. Edited by U. Cotti, R. Jeannerot, G. Senjanovic, A. Smirnov. Singapore, World Scientific, 2000. 483p
7. **“Baryon asymmetry through interaction between sphaleron and cosmological defect”** 1997 M. Nagasawa, C. S. Aulakh and V. Soni. Proceedings, 3rd RESCEU International Symposium,p 269-271 Tokyo, Japan, November 10-13, 1997.
8. **“Supersymmetric unification at the millenium”** (2000) C. S. Aulakh. Pramana **55**, 137-149.
9. **“Supersymmetric unification in the light of neutrino mass”** (2000)C. S. Aulakh. Pramana **54**, 639-659.
10. **“Left-right SUSY and the fate of R-parity”** (1997) C. S. Aulakh. In *Trieste 1997, Phenomenological aspects of superstring theories* p232-242 (8 citations INSPIRE Nov 30, 2013)
11. **“Charged topological solitons in YMCS theory”** (1992) C. S. Aulakh. In *Kuala Lumpur 1992, Fifth Asia-Pacific Physics Conference, vol. 1* 381-388
12. **“Syncyclons”** (1992) C. S. Aulakh. In *Kuala Lumpur 1992, Fifth Asia-Pacific Physics Conference, vol. 1* 377-380
13. **“Generalized minimal models?”** (1990) C. S. Aulakh. In *Teheran 1990, Proceedings, Mathematical physics* 25-32
14. **“Integer Lattices In Rcft”** (1990) C. S. Aulakh. In *Bombay 1990, Proceedings, Modern quantum field theory* 234-240.

4 Submitted/Preprints/Unpublished

1. **“Grand Yukawonification”** C. S. Aulakh and C. K. Khosa. arXiv:1308.5665v2 [hep-ph]. 15 pages.
2. **“NMSGUT-III: Grand Unification upended”** C. S. Aulakh. arXiv:1107.2963 [hep-ph], 88 pages. 6 citations INSPIRE Nov 30, 2013)
3. **“Babel on the Petaplex site: On Rival Computational methods in SO(10) MSGUTs”** C. S. Aulakh. arXiv:0807.1792 [hep-ph], 12 pages.
4. **“The New Minimal Supersymmetric GUT : Spectra, RG analysis and fitting formulae”** C. S. Aulakh and S. K. Garg. hep-ph/0612021, 61 pages. (37 citations INSPIRE Nov 30, 2013)
5. **“MSGUT reborn?”** C. S. Aulakh. hep-ph/0607252, 21 pages.

6. **“Fermion mass hierarchy in the Nu MSGUT. I. The Real core”** C. S. Aulakh. hep-ph/0602132, 27 pages. (29 citations INSPIRE Nov 30, 2013)
7. **“MSGUTs from germ to bloom: Towards falsifiability and beyond”** C. S. Aulakh. hep-ph/0506291, 40 pages. (36 citations INSPIRE Nov 30, 2013)
8. **“Taming asymptotic strength”** C. S. Aulakh. hep-ph/0210337, 17 pages. (18 citations INSPIRE Nov 30, 2013)
9. **“Truly minimal unification: Asymptotically strong panacea?”** C. S. Aulakh. hep-ph/0207150, 7 pages. (9 citations INSPIRE Nov 30, 2013)
10. **“Charged topological solitons in (4+1)-dimensional YMCS theory”** C. S. Aulakh.
11. **“Integer Lattices, Generalized Duality And Rcft”** C. S. Aulakh.
12. **“Intermediate Mass Scales In Supersymmetric Gauge Theories”** (1983) C. S. Aulakh, PhD thesis, 203 pages, City University of New York.
13. **“Local Supersymmetry And Hi-lo Scale Induction”** (1983) C. S. Aulakh.