



Professor , Department, Physics

Name: Dr. Ishwar Singh

Designation: Professor

Qualification: Ph.D

E-mail Address: ist11fph@iitr.ernet.in

Areas of Interest:

Electronic and Magnetic Properties of Narrow Band Solids
Foundations of Quantum Mechanics
Electronic Properties of Semiconductor Surfaces & Interfaces

Foreign Visits:

- March 80 to Sept.81 Research Associate, School of Physical Sciences, New University of Ulster, Coleraine, N. Ireland
- April 1981 University of Liverpool, Liverpool, U.K.
- April 1981 SRC Daresbury Lab., Daresbury, Warrington, U.K.
- Nov.83 to Nov.84 Visiting Scientist, Institut für Theoretische Physik, Freie Universität Berlin, 1000 Berlin 33, Germany

Research Fields:

- Electronic and Magnetic Properties of Strongly Correlated Systems: Heavy Fermions and High- T_c Superconductors.
- Electronic Properties of Semiconductor Surfaces and Interfaces.
- Conceptual Foundations of Quantum Mechanics, EPR Problem and Quantum Zeno Paradox.

Sponsored Research Projects:

Sl.No.	Project Title	Sponsoring Agency	Duration	Total Cost
1	Electronic Properties of Clean and Chemisorbed Semiconductor Surfaces	C.S.I.R	1985 to 1988	Rs. 1.00 lac
2	Electronic and Magnetic Properties of Heavy Fermions and Mixed Valence Systems	D.S.T.	1990 to 1994	Rs. 2.5 lacs
3	Study of Strongly Correlated Electronic Systems Using Quantum Monte Carlo and Simulation Technique	D.S.T.	2000 to 2004	Rs. 11.0 lacs

Conferences and Workshops Organized:

- Was Convener of the Workshop "Electronic Phase Transitions" held during Feb.24-27, 1983 in the Physics Department, IIT-Roorkee.
- Was Convener of the Workshop "Electron Correlations in Atoms and Solids", held during April 5-6, 1996 in the Department of Physics, IIT-Roorkee.
- Convener, Roorkee Centre; DST Sponsored "Theoretical Physics Seminar Circuit" Program since 1987 to 1997.
- Was convener of the Workshop "Frontiers in Physics" held during April 7-8, 2003 in the Physics Deptt.

Recent Papers in International and National Journals:

1. Transport Properties of Heavy Fermions and Mixed Valence Systems. Physics B (Nether lands) 205, 253 (1995) (with S. Panwar)
2. Quantum Monte Carlo Simulation Study of One-dimensional Strongly Correlated Systems. Physica B (Netherlands) 210, 59 (1995) (with K. Kumari)
3. Numerical Study of One-dimensional Strongly Correlated Systems. Physica St. Sol. (b) 190, (1995) (with K. Kumari)
4. Magnetic Susceptibility of Anderson Lattice with finite f-bandwidth, Physica St. Sol. (b) 190, 307 (1995) (with S. Panwar)
5. Hall Effect in Heavy Fermion Systems. Solid St. Commn. 98, 83 (1996) (with S. Panwar)
6. Transport Properties of Heavy Fermion Systems in "Advances in Theoretical Physics" Ed. A.P. Pathak, (Narosa Publishing House 1996)

7. Effect of finite f-bandwidth on Resistivity of Heavy Fermion Systems. (M. Sharma, K. Kumari and I. Singh) “Adv. in High Pressure Science and Technology” Eds. M. Yousuf, N. Subramanian and K.G. Rajan (Universities Press, 1997)
8. Heavy Fermions: Kondo Lattice Systems in “Electron Correlations in Atoms and Solids” Edited by A.N. Tripathi and I. Singh (Phonix Publishing House, 1998)
9. Quantum Monte Carlo Simulation Study of Two-Dimensional Hubbard Model Ind. J. of Pure & Appl. Phys. 36, 545 (1998) (with K. Kumari)
10. Electronic Specific heat and Spin-Susceptibility of heavy Fermion Systems: Role of s-f interactions. Ind. J. of Pure & Appl. Phys. 37, 627 (1999) (with M. Sharma)
11. Quantum Monte Carlo Simulation study of one-Dimensional Periodic Anderson Model: Int. J. of Mod. Phys. B 13, 3927 (1999) (with M. Sharma & K. Kumari)
12. Anomalous Electrical Resistivity and Hall Constant of Anderson Lattice with finite f-band width: Ind. J. Phys. 76A, 557 (2002) (with S. Panwar)
13. Anomalous Hall Constant of heavy Fermion Systems: Ind. J. of Pure and Appl. Phys. 41, 389 (2003) (with S. Panwar and P. Dua)
14. Role of Inter-site Exchange and Hybrid Interactions in Itinerant Ferromagnetism. Jr. of Phys. and Chem. of Solids 65, 1473 (2004). (with P. Dua).

A Variational Study of Superconducting Correlations within Periodic Anderson Model. Physica B (Netherlands) 359-361 ,816 (2005).(with P. Dua and S. Panwar).