CURRICULUM VITÆ

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3. Date of Birth : 17 December 1962

4. Educational Qualification

Sl. No.	Degree	University	Year	Subject	Percentage
1	B. Tech	I.I.T Kharagpur	1984	Metallurgical Engineering	70% (I Class)
2	Ph. D.	I.I.Sc. Bangalore	1992	Theoretical Condensed Matter Physics	

Thesis Topic: Studies in Density Functional Theory of Freezing: Colloids, Interfaces and the Flux Lattice in High T_c Superconductors.

Thesis Supervisors: Profs. T.V. Ramakrishnan and H.R. Krishnamurthy

5. (a) Professional training and research experience

1. Post-Doctoral position, Institut für Physik, Johannes Gutenberg Universität, Mainz, Germany (October 1991 - October 1993).
2. Visiting Scientist, Jawaharlal Nehru Center for Advanced Scientific Research, Bangalore, 560012, India (November 1993).
3. Visiting Scientist, Materials Science Division, I.G.C.A.R. Kalpakkam, 603102 India (December 1993- October 1994).
4. Alexander von Humboldt Fellow, Institut für Physik, Johannes Gutenberg Universität, Mainz, Germany (October 1998 - January 2000)

5. (b) Employment Details

1. Scientific Officer "SD" , I.G.C.A.R. Kalpakkam, 603102, India (October 1994-August 1996).
2. Scientific Officer "E" , I.G.C.A.R. Kalpakkam, 603102, India (August 1996-June 2000).
3. Reader, S. N. Bose National Centre for Basic Sciences, Kolkata 700098, India (July 2000- July 2006)
4. Associate Professor, S. N. Bose National Centre for Basic Sciences, Kolkata 700098, India (August 2006- present)

6. Awards, Distinctions and Scholarships Recieved

- Fellow of the Indian Academy of Sciences, Bangalore, 2006.
- The Alexander von Humboldt Fellowship, 1997 to 2000.
- Associate of the Indian Academy of Sciences, Bangalore, 1994 to 1999.
- Council for Scientific and Industrial Research Senior Research Fellowship 1989 to 1991.
- Council for Scientific and Industrial Research Junior Research Fellowship 1986 to 1989.
- Jagadish Bose National Science Talent Search Scholarship 1980 to 1985.

List of Publications

I. articles in refereed journals/invited contributions to books:

[1] S. Sengupta and A. K. Sood, *Theory of liquid-bcc-fcc coexistence in charge-stabilised colloidal systems* ,Phys. Rev. A, **44**, 1233, (1991).

[2] Surajit Sengupta, C.Dasgupta, H.R. Krishnamurthy, Gautam I. Menon and T.V. Ramakrishnan, *The freezing of the vortex liquid in high T_c superconductors: A density functional approach*, Phys. Rev. Lett., **67**, 3444, (1991).

[3] Surajit Sengupta, Y.J. Marathe and S. Puri, *Cell dynamical simulation of magnetic hysteresis in the two -dimensional Ising system*,Phys. Rev. B, **44**, 7828 (1992).

[4] Surajit Sengupta, P. Nielaba and D. Marx, *Density functional theory of magnetisation driven phase transitions in fluids with internal quantum states*, Europhys. Lett, **20**, 383, (1992).

[5] A.C. Mitus, D. Marx, S. Sengupta, P. Nielaba, A. Z. Patashinskii and H. Hahn, *Locating liquid -solid transitions in computer simulations based on local structure analysis*, J. Phys.: Condens. Matter **5**, 8509, (1993).

[6] D, Marx, S. Sengupta, P. Nielaba, *Diatomic molecules, rotations and path -integral Monte Carlo simulations:N_2 and H_2 on graphite*, J. Chem. Phys. **99**, 6031, (1993).

[7] S. Sengupta, D. Marx and P. Nielaba, *Herringbone orientational transition in monolayer N_2 adsorbed on graphite by density functional theory*, Europhys. Lett. **20**, 383, (1992).

[8] O. Opitz, D. Marx, S. Sengupta, P. Nielaba and K. Binder, *On the order of the herringbone transition of N_2 on graphite: a Monte Carlo study*, Surf. Sci. Lett. **297**, L122-L126, (1993).

[9] D. Marx, S. Sengupta, P. Nielaba and K. Binder, *Clarification of the head-tail ordering of CO on graphite: a Monte Carlo study*, Phys. Rev. Lett. **72**, 262, (1994).

[10] S. Sengupta, D. Marx, P. Nielaba and K. Binder, *Phase diagram of a model anticlustering binary mixture in two dimensions: A semi -grand -canonical Monte Carlo study*, Phys. Rev. E, **49**, 1468 (1994).

[11] D. Marx, S. Sengupta, O. Opitz, P. Nielaba and K. Binder, *N_2 Monolayers physisorbed on graphite: the herringbone transition revisited*, Molec. Phys. **83**, 31, (1994).

[12] D. Marx, S. Sengupta, P. Nielaba and K. Binder, *Monte Carlo investigation of Head -Tail ordering of CO monolayers on graphite*, Surf. Sci. **321**, 195 (1994).

[13] S. Sengupta, H. R. Krishnamurthy and T. V. Ramakrishnan, *A microscopic theory of the b.c.c. - f.c.c. interface*, Europhys. Lett. **27**, 587, (1994).

[14] Madan Rao, Surajit Sengupta and H. K. Sahu, *Kinematic Scaling and Cross - over to Scale Invariance in Acicular Martensites*, Phys. Rev. Lett. **75**, 2164, (1995).

[15] J. Chakravarty, H. R. Krishnamurthy, A.K. Sood and S. Sengupta, *Re-entrant Melting in Laser Field Modulated Colloidal Suspensions*, Phys. Rev. Lett, **75**, 2232, (1995).

[16] Madan Rao and Surajit Sengupta, *Rao and Sengupta reply*, Phys. Rev. Lett. **76**, 3235 (1996).

[17] J. Chakravarty, H.R. Krishnamurthy, S. Sengupta and A.K. Sood, *Density Functional Theory of Charge Stabilised Colloidal Suspensions*, *Ordering and Phase Transitions in Charged Colloids*, A.K. Arora and B.V.R. Tata, Eds., (VCH Publishers, New York, 1995).

[18] G.I. Menon, C. Dasgupta, H. R. Krishnamurthy, T.V. Ramakrishnan and S. Sengupta, *Density Functional Theory of Flux Lattice Melting in High- T_c Superconductors*, Phys. Rev. B, **54**, 16192 (1996).

[19] Madan Rao and Surajit Sengupta, *Droplet Fluctuations in the Morphology and Kinetics of Martensites*, Phys. Rev. Lett. **78**, 2168 (1997).

[20] P. Nielaba and S. Sengupta, *Perturbation density functional theory for phase transitions in a two dimensional antiferro - fluid.* Phys. Rev. E, **55**, 3754 (1997).

[21] Madan Rao, Surajit Sengupta and R. Shankar, *Shape deformation driven Structural transitions in Quantum Hall Skyrmions*, Phys. Rev. Lett. **79**, 3998 (1997).

[22] G. Ghosh, V.S. Sastry, C.S. Sundar, Surajit Sengupta and T. S. Radhakrishnan, *Low temperature hcp to monoclinic structural transition in solid C_{70}: The ephemeral nature of the intermediate phase.* Phys. Rev. B, **58**, 14094, (1998).

[23] Rao, M. and Sengupta, S. *Arrested states in solids.* Curr. Sc. **77**, 382 (1999).

[24] Sengupta, S., Nielaba, P., Rao, M. and Binder, K. *Elastic constants from microscopic strain fluctuations.* Phys. Rev. E **61**, 1072 (2000).

[25] S. Sengupta, P. Nielaba and K. Binder *Defect fugacity, Spinwave Stiffness and T_c of the 2-d Planar Rotor Model* Europhys. Lett., **50**, 668 (2000)

[26] Surajit Sengupta, Peter Nielaba and K. Binder *Elastic moduli, dislocation core energy, and melting of hard disks in two dimensions* Phys. Rev. E **61**, 6294 (2000).

[27] W. Strepp, S. Sengupta, P. Nielaba *Phase transitions of hard disks in external periodic potentials: A Monte Carlo study* Phys. Rev. E **63**, 46106 (2001).

[28] W. Strepp, S. Sengupta, and P. Nielaba *Phase transitions of soft disks in external periodic potentials: A Monte Carlo study* Phys. Rev. E **66**, 056109 (2002).

[29] Abhishek Chaudhuri, P. A. Sreeram, Surajit Sengupta *Growing smooth interfaces with inhomogeneous, moving external fields: dynamical transitions, devil's staircases and self-assembled ripples* Phys. Rev. Lett. **89** 176101 (2002). (vjnano)

[30] K. Zahn, A. Wille, G. Maret, S. Sengupta, P. Nielaba *Elastic properties of 2D colloidal crystals from video microscopy* Phys. Rev. Lett. **90**, 155506 (2003).

[31] M. Rao and S. Sengupta *Nucleation of Solids in Solids: Ferrites and Martensites* Phys. Rev. Lett. **91**, 045502 (2003); *Erratum:* Phys. Rev. Lett. **91**, 209901 (2003).

[32] Abhishek Chaudhuri, P.A. Sreeram, Surajit Sengupta *A Kinetics Driven Commensurate -Incommensurate Transition* Phase Transitions, **77**, 691 (2004).

[33] Debasish Chaudhuri and Surajit Sengupta, *A numerical renormalization group study of laser induced freezing* Europhys. Lett., **67**, 814 (2004); *Erratum:* Europhys. Lett., **68**, 160 (2004)

[34] Debasish Chaudhuri and Surajit Sengupta, *Constrained deformation of a confined solid: Anomalous failure by nucleation of smectic bands* Phys. Rev. Lett., **93**, 115702 (2004).(vjnano)

[35] Madan Rao and Surajit Sengupta, *A mesocopic model of a two dimensional solid-state structural transformation:statics and dynamics* J. Phys.: Condens. Matter, **16**, 7733, (2004)

[36] S. Chakraverty, M. Bandyopadhyay, S. Chatterjee, A. Frydman, S. Sengupta, S. Dattagupta and P. A. Sreeram, *Memory in a magnetic nanoparticle system: Polydispersity and interaction effects* Phys. Rev. B., **71**, 054401 (2005).(vjnano)

[37] A. Sengupta, S. Sengupta and G.I. Menon, *Probing disordered substrates by imaging the adsorbate in its fluid phase* Europhys. Lett., **70**, 635 (2005).

[38] A. Chaudhuri, S. Sengupta and Madan Rao, *Stress relaxation in a perfect nanocrystal by coherent ejection of lattice layers* Phys. Rev. Lett., **95**, 266103 (2005). Erratum: Phys. Rev. Lett. **96**, 179906 (2006). (vjnano)

[39] D. Chaudhuri and S. Sengupta, *Direct test of defect-mediated laser-induced melting theory for two-dimensional solids* Phys. Rev. E, **73**, 011507, (2006).

[40] S. Datta, D. Chaudhuri, T. Saha-Dasgupta and S. Sengupta, *Electrical transport in deformed nanostrips: electrical signature of reversible mechanical failure* Euro. Phys. Lett. **73**, 765, (2006).

[41] A. Ricci, P. Nielaba, S. Sengupta, and K. Binder, *Lack of long-range order in confined two-dimensional model colloidal crystals* Phys. Rev. E **74**, 010404(R) (2006).(vjnano)

[42] A. Ricci, P. Nielaba, S. Sengupta, and K. Binder, *Ordering of Two-Dimensional Crystals Confined in Strips of Finite Width* Phys. Rev. E **75**, 011405 (2006).(vjnano)

[43] A. Sengupta, S. Sengupta and G. I. Menon, *Driven Disordered Periodic Media with an Underlying Structural Phase Transition* cond-mat/0609422.

[44] D. Chaudhuri, A. Chaudhuri and S. Sengupta *Heat conduction through a trapped solid: effect of structural changes on thermal conductance.* J. Phys. Condens. Matt. **19**, 152201 (2007). (IOP Select)

II. published contributions in academic conferences:

[1] D. Marx, S. Sengupta, P. Nielaba and K. Binder, *The phase diagram of a two -dimensional fluid with internal quantum states*, J. Phys: Condens. Matt. **6**, A175, (1994). Proceedings of the 2^{nd} Liquid Matter Conference, Firenze, Italy, September, 1993.

[2] Madan Rao, Surajit Sengupta and H. K. Sahu, *Emergence of Scale Invariance in Martensite Growth*, *Non Linear Phenomenona in Materials Science III, Solid State Phenomena Vol. 42-43*, G. Ananthakrishna, L.P. Kubin and G. Martin, Eds. (SciTech Publications Ltd. Switzerland, 1995). Proceedings of the Conference on Non Linear Phenomenon in Materials Science, Bangalore, India, January, 1995.

[3] Madan Rao and Surajit Sengupta, *Kinematic Theory for Scale Invariant Patterns in Acicular Martensites*, Physica A **224**, 403, (1996). Proceedings of the Conference on Dynamics of Complex Systems, Calcutta, India, August 1995.

[4] Madan Rao and Surajit Sengupta, *Droplet free energy functional for martensite morphology*, to appear in *Defects in Condensed Media*, K. Krishan, C. S. Sundar and V. Kumar, Eds. Bull. Mater. Sci. (1997). Proceedings of the Conference on Defects in Condensed Media, Kalpakkam, India, September, 1995.

[5] Surajit Sengupta, *Density Functional Theory for ordering in discrete systems: Flux lattices and Adsorbates*, Indian Journal of Pure and Applied Physics, **34**, 626 (1996). Proceedings of the DAE Solid State Physics Symposium, Calcutta, India, December 1995.

[6] Madan Rao, Surajit Sengupta and R. Shankar, *Structural Transitions in Skyrmion Lattices*, *Frontiers in Materials Modelling and Design*, V. Kumar, Surajit Sengupta and Baldev Raj, Eds. (Springer, Heidelberg, 1997).

[7] Madan Rao, Surajit Sengupta and R. Shankar, *Shape and phase transitions in quantum - Hall Skyrmions*, Physica E, **1**, 54, (1997).

[8] Kurt Binder, Surajit Sengupta and Peter Nielaba, *The liquid-solid transition of hard discs: first-order transition or Kosterlitz-Thouless- Halperin-Nelson-Young scenario?*, J. Phys. Condens. Matter **14**, 2323 (2002).

[9] Abhishek Chaudhuri and Surajit Sengupta, *Profile-driven interfaces in 1+1 dimensions: periodic steady states, dynamical melting and detachment*, Physica A, **318**, 30 (2003).

[10] Surajit Sengupta and Madan Rao, *Statistical mechanics of nucleation in solids: a kinetics driven morphological transition*, Physica A, **318**, 251 (2003).

[11] W. Strepp, S. Sengupta, M. Lohrer, P. Nielaba, *Phase transitions in model colloids in reduced geometry*, Mathematics and Computers in Simulation, **62**, 519, (2003).

[12] P. Nielaba, K. Binder, D. Chaudhuri, K. Franzrahe, P. Henseler, M. Lohrer, A. Ricci, S. Sengupta and W. Strepp, *Elastic properties, structures and phase transitions in model colloids*, J. Phys.: Condens. Matter **16**, S4115 (2004).

[13] D. Chaudhuri, S. Sengupta, *Mechanical Failure of a Small and Confined Solid*, Ind. J. Phys. **79**, 941 (2005).

[14] K. Franzrahe, P. Henseler, A. Ricci, W. Strepp, S. Sengupta, M. Dreher, Chr. Kircher, M. Lohrer, W. Quester, K. Binder, P. Nielaba, *Two-dimensional model colloids and nano wires: phase transitions, effects of external potentials and quantum effects*, Comp. Phys. Comm. **169**, 197 (2005).

[15] A. Chaudhuri, D. Chaudhuri, S. Sengupta, *Induced Interfaces at nano-scales: Structure and Dynamics*, Int. J. Nanosc. **4**, 995, (2005).

[16] A. Sengupta, S. Sengupta and G. I. Menon, *Nonequilibrium crystalline and amorphous states of polymorphic solids driven over quenched disorder*, Physica A, (2007) (in press).

III. Book(s) edited:

Frontiers in Materials Modelling and Design, Proceedings of the Conference on Frontiers in Materials Modelling and Design, at Kalpakkam, India on August 20-23 1996. V. Kumar, Surajit Sengupta and Baldev Raj, Eds. (Springer, Heidelberg, 1997).

IV. Report on Academic Activities:

[1] Teaching:

1. Taught courses for Post B.Sc. Integrated Research at SNBNCBS on "Statistical Mechanics I" 2003 and 2004 (together with Prof. S. Dattagupta),
2. Taught courses for Post M.Sc. at SNBNCBS:
   - "Classical Many Body Physics" (2001 and 2003),
   - "Phase Transitions and the Renormalization Group"(2002),
   - "Computational Physics II" (2006)
3. Taught a course on "Molecular Simulations" at the SERC Summer School on "Statistical Mechanics" at the Indian Institute of Science, Bangalore, March 2005.
4. Taught a course on "Phase Transitions" at the SERC School on "Statistical Mechanics" at the Department of Chemistry, Indian Institute of Technology, Kanpur in February-March 2000.

[2] Thesis guidance:

1. Abhshek Chaudhuri, topic: "*Statics and Dynamics of Fluctuations in Interfaces Driven by Non-Uniform Fields*" (submitted)
2. Debashis Chaudhuri, topic: "*Statics and Dynamics of Confined Systems*" (submitted)
3. Ankush Sengupta, topic: "*Crystalline and Amorphous States of Driven Solids*".
4. Jayee Bhattacharyya, topic: "*Equilibrium and Dynamic Aspects of Structural Transitions*".
5. Tamoghnya Kanti Das, topic: "*Moving surfaces and interfaces in solids*"
6. Arya Paul, topic: "*Mechanisms of microstructure selection in solid state transitions*"

[3] (Co)Organizing scientific meetings;

1. Frontiers of Materials Modelling and Design, August 20-23, IGCAR, Kalpakkam, 1996 (with Vijay Kumar and Baldev Raj),
2. *India and Abroad: a conference in condensed matter physics -III*, January 2-4, JNCASR, Bangalore, 2002 (with Srikanth Sastry and Gautam Menon),
3. *India and Abroad: a conference in condensed matter physics -III*, January 2-4, SNBNCBS, 2003 (with Srikanth Sastry and Gautam Menon),

4. *(PATTERN04) Pattern Formation in Nonequilibrium Systems: Satellite meeting to STATPHYS-22*, SNBNCBS, July 11-13, 2004 (with Sanjay Puri),
5. *The Indo Israeli meeting in condensed matter physics*, Toshali Sands, Puri, April 17-21, 2005 (with P. A. Sreeram).
6. *Understanding Molecular Simulations*, Centre for Computational Materials Science, JNCASR, Jan 21-27, 2007 (with S. Sastry).
7. *Nucleation Aggregation and Growth*, Centre for Computational Materials Science, JNCASR, Jan 29-31, 2007 (with S. Sastry and C. Chakravarty).

[4] Other administrative experience:

- Functioned as the coordinator for the Post M.Sc. and the Post B.Sc. Integrated research courses at the S. N. Bose Centre and have served in the academic committees of the Centre for both the streams.
- Functioned as the Computer in-charge and coordinator of the Computer User's Committee at the S. N. Bose Centre since joining.
- Member of Book Selection Committee and former member of the Purchase Sub-Committee of the S. N. Bose Centre.

Referees:

1. Prof. T. V. Ramakrishnan,
   Department of Physics,
   Benares Hindu University,
   Varanasi 221005,
   tvrama@bhu.ac.in, tvrama2002@yahoo.co.in

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