

List of Publications

Surajit Sengupta

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- [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 anti-clustering 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, *N₂ 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 C₇₀: 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 mesoscopic 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. Datta- gupta 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 (2007). (vjnano)
- [43] 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)
- [44] A. Sengupta, S. Sengupta and G. I. Menon, *Driven Disordered Periodic Media with an Underlying Structural Phase Transition* Phys. Rev. B **75**, 180201(R) (2007)
- [45] A. Chaudhuri, D. Chaudhuri and S. Sengupta, *Fluctuations at a Constrained Liquid-Solid Interface* Phys. Rev. E **76**, 021603 (2007).
- [46] Manish K. Sahai and Surajit Sengupta, *Dynamical transitions of a driven Ising interface* Phys. Rev. E **77**, 032601 (2008).
- [47] Debasish Chaudhuri and Surajit Sengupta, *Anomalous structural and mechanical properties of solids confined in quasi-one-dimensional strips*, J. Chem. Phys. **128**, 194702 (2008).
- [48] Jayee Bhattacharya, Surajit Sengupta and Madan Rao, *Non-affine deformations and shape recovery in solids undergoing martensitic transformations in two dimensions*, J. Stat. Mech. (2008) P06003.
- [49] K. Franzrahe, P. Keim, G. Maret, P. Nielaba, S. Sengupta, *Nonlocal elastic compliance for soft solids: Theory, simulations and experiments*, Phys. Rev. E, **78**, 026106 (2008).
- [50] Y.-H. Chui, S. Sengupta and K. Binder, *Soliton staircases and standing strain waves in confined colloidal crystals*, Europhys. Lett. **83**, 58004 (2008).

- [51] Jayee Bhattacharya, Arya Paul, Surajit Sengupta and Madan Rao, *Non-affine deformation in microstructure selection in solids: I. Molecular dynamics* J. Phys.: Condens. Matter **20**, 365210 (2008)
- [52] Arya Paul, Jayee Bhattacharya, Surajit Sengupta and Madan Rao, *Non-affine deformation in microstructure selection in solids: II. Elastoplastic theory for the dynamics of solid state transformations* J. Phys.: Condens. Matter **20**, 365211 (2008)
- [53] Swastika Chatterjee, Surajit Sengupta, T. Saha-Dasgupta, Koustav Chatterjee and Nibir Mandal, *Site preference of Fe atoms in FeMgSiO_4 and $\text{FeMg}(\text{SiO}_3)_2$ studied by density functional calculations* Phys. Rev. B **79**, 115103 (2009)
- [54] Tamoghna Das, Surajit Sengupta, and Subhasis Sinha, *Structural transitions in a crystalline bilayer: the case of Lennard-Jones and Gaussian core models* J. Phys.: Condens. Matter **21**, 195408 (2009)
- [55] Yu-Hang Chui, Surajit Sengupta, Ian K. Snook, and Kurt Binder, *The observation of formation and annihilation of solitons and standing strain wave superstructures in a two-dimensional colloidal crystal* J. Chem. Phys. **132**, 074701 (2010)
- [56] Yu-Hang Chui, Surajit Sengupta, Ian K. Snook, and Kurt Binder, *Effective interactions and melting of a one-dimensional defect lattice within a two-dimensional confined colloidal solid* Phys. Rev. E **81**, 020403(R) (2010)
- [57] Ankush Sengupta, Surajit Sengupta, and Gautam I. Menon, *Driven disordered polymorphic solids: Phases and phase transitions, dynamical coexistence and peak effect anomalies* Phys. Rev. B **81**, 144521 (2010)
- [58] K. Franzrahe, P. Nielaba, and S. Sengupta, *Coarse-graining microscopic strains in a harmonic, two-dimensional solid: Elasticity, nonlocal susceptibilities, and nonaffine noise*, Phys. Rev. E **82**, 016112 (2010)
- [59] Swastika Chatterjee, Sirshendu Bhattacharyya, Surajit Sengupta and Tanusri Saha-Dasgupta, *Crossover of cation partitioning in olivines: a combination of ab initio and Monte Carlo study*, Phys. Chem. Minerals **38**, 259 (2010)
- [60] Tamoghna Das, Surajit Sengupta, and Madan Rao, *Nonaffine heterogeneities and droplet fluctuations in an equilibrium crystalline solid*, Phys. Rev. E **82**, 041115 (2010)
- [61] Surajit Sengupta, Madan Rao, and Jayee Bhattacharya, *Early-time particle dynamics and non-affine deformations during microstructure selection in solids*, J. Phys.: Condens. Matter **23** 295402 (2011)

- [62] Chandana Mondal and Surajit Sengupta, *Polymorphism, thermodynamic anomalies, and network formation in an atomistic model with two internal states*, Phys. Rev. E **84**, 051503 (2011)
- [63] Chandana Mondal and Surajit Sengupta, *Single-file diffusion and kinetics of template-assisted assembly of colloids*, Phys. Rev. E **85**, 020402(R) (2012)
- [64] S. Chatterjee, T. Saha-Dasgupta and S. Sengupta, *Visualizing frozen point defect tracks in Fe-containing olivines*, Europhys. Lett., **98**, 29001 (2012).
- [65] D. Wilms, P. Virnau, S. Sengupta and K. Binder, *Langevin dynamics simulations of a two-dimensional colloidal crystal under confinement and shear*, Phys. Rev. E **85**, 061406 (2012).
- [66] U.Siems, C.Kreuter, A.Erbe, N.Schwierz, S.Sengupta, P.Leiderer, P.Nielaba *Non-monotonic crossover from single-file to regular diffusion in micro-channels*, Scientific Reports (Nature Publishing Group) **2**, 1015 (2012)
- [67] Chandana Mondal and Surajit Sengupta *Thermodynamic anomalies of a network former in a periodic field*. Eur. Phys. J. E **36**, 6 (2013)
- [68] Jayee Bhattacharya, Vijay Singh, Surajit Sengupta and Indra Dasgupta *Magneto-structural transitions: Molecular dynamics simulations of a united-atom mesoscopic model*, Mod. Phys. Lett. B **27**, 1350047 (2013)
- [69] Saswati Ganguly, Surajit Sengupta, Peter Sollich, Madan Rao, *Non-affine displacements in crystalline solids in the harmonic limit*, Phys. Rev. E, **87**, 042801 (2013).
- [70] Debabrata Sinha, Surajit Sengupta, Chandan Dasgupta, Oriol T. Valls, *Out of equilibrium plasticity dynamics and the annealing of super-solidity in solid ^4He* , J. Phys.: Condens. Matter **25**, 295601(2013).
- [71] Nirmalendu Ganai, Arnab Saha, and Surajit Sengupta, *Colloidal particles in a drying suspension: A phase field crystal approach*, Eur. Phys. J. E **36**:90, (2013).
- [72] Chandana Mondal, Ali Hossain Khan, Bidisa Das, Somobrata Acharya and Surajit Sengupta, *Origin of Chains of Au-PbS Nano-Dumbbells in Space*, Scientific Reports (Nature Publishing Group) **3**, 2612 (2013).
- [73] Arya Paul, Sengupta Surajit, Madan Rao, *Non-affine fields in solidsolid transformations: the structure and stability of a product droplet*, Journal of Physics: Condensed Matter **26**, 015007 (2013).
- [74] Nirmalendu Ganai, Surajit Sengupta and Gautam I. Menon, *Chromosome positioning from activity-based segregation*, Nucleic Acids Res. **42**, 4145 (2014). (Highlighted in the Journal Club of Condensed Matter Physics)

- [75] Sumanta Mukherjee, Arnab Saha, Pralay K. Santra, Surajit Sengupta and D. D. Sarma, *Beyond the coffee ring”: Re-entrant ordering in an evaporation driven self-assembly in colloidal suspension on a substrate*, J. Phys. Chem. B, **118**, 2559 (2014).
- [76] Chandana Mondal, Smarajit Karmakar, Surajit Sengupta *Glass-like Slow Dynamics in a Colloidal Solid with Multiple Ground States* , J. Phys. Chem. B, **119**, 10902 (2015).
- [77] Tamoghna Das, Saswati Ganguly, Surajit Sengupta and Madan Rao, *Pre-Yield Non-Affine Fluctuations and A Hidden Critical Point in Strained Crystals*, Scientific Reports (Nature Publishing Group), **5**, 10644, (2015).
- [78] Saswati Ganguly, Surajit Sengupta, Peter Sollich, *Statistics of non-affine defect precursors: tailoring defect densities in colloidal crystals using external fields*, Soft Matter, **11**, 4517 (2015).
- [79] Amartya Mitra, Saswati Ganguly, Surajit Sengupta, Peter Sollich, *Non-affine fluctuations and the statistics of defect precursors in the planar honeycomb lattice*, J. Stat. Mech. P06025 (2015).
- [80] Anirban Pal, Smita Gohil, Surajit Sengupta, H. K. Poswal, Surinder M Sharma, Shankar Ghosh and Pushan Ayyub, *Structural phase transitions in trigonal Selenium induce the formation of a disordered phase*, J. Phys.: Condens. Matter, **27**, 415404 (2015).
- [81] Jeetu S Babu, Chandana Mondal, Surajit Sengupta and Smarajit Karmakar *Excess Vibrational Density of States and the Brittle to Ductile Transition in Crystalline and Amorphous Solids*, Soft Matter, **12**, 1210 (2016).
- [82] Jörg Bewerunge, Ankush Sengupta, Ronja F. Capellmann, Florian Platten, Surajit Sengupta, and Stefan Egelhaaf, *Colloids Exposed to Random Potential Energy Landscapes: from Particle Number Density to Particle-Potential and Particle-Particle Interactions* , J. Chem. Phys. **145**, 044905 (2016). (Editor’s choice)
- [83] Ankit Agrawal, Nirmalendu Ganai, Surajit Sengupta and Gautam I Menon *Chromatin as active matter* J. Stat. Mech. P014001 (2017).
- [84] Saswati Ganguly, Parswa Nath, Jürgen Horbach, Peter Sollich, Smarajit Karmakar and Surajit Sengupta, *Equilibrium and dynamic pleating of a crystalline bonded network*, J. Chem. Phys. **146**, 124501 (2017).
- [85] Saswati Ganguly and Surajit Sengupta, *Excess vibrational modes of a crystal in an external non-affine field*, J. Chem. Sci. **129**, 891 (2017).

- [86] Saswati Ganguly, Priti S. Mohanty, Peter Schurtenberger, Surajit Sengupta, and Anand Yethiraj, *Contrasting the dynamics of elastic and non-elastic deformations across an experimental colloidal Martensitic transition*, Soft Matter, **13**, 4689, (2017).
- [87] Pankaj Popli, Saswati Ganguly and Surajit Sengupta, *Translationally invariant colloidal crystal templates*, Soft Matter, **14**, 104 (2018).
- [88] Parswa Nath, Saswati Ganguly, Jürgen Horbach, Peter Sollich, Smarajit Karmakar, and Surajit Sengupta, *On the existence of thermodynamically stable rigid solids*, Proc. Natl. Acad. Sci. USA **115**, E4322 (2018).
- [89] Saswati Ganguly, Debankur Das, Jürgen Horbach, Peter Sollich, Smarajit Karmakar, and Surajit Sengupta, *Plastic deformation of a permanently bonded network: Stress relaxation by pleats*, J. Chem. Phys. **149**, 184503 (2018).
- [90] Dheeraj Dube, Navjeet Ahalawat, Himanshu Khandelia, Jagannath Mondal and Surajit Sengupta, *On identifying collective displacements in apo- proteins that reveal eventual binding pathways*, PLoS Comput Biol 15(1): e1006665 (2019).