

List of publications

- **Publications** (*in descending order, year-wise*)

Publications in journals

- **87.** Nirnoy Basak, Sumathi Rao and Faruk Abdulla, *Magneto tunnel conductance across twisted Weyl semimetal junctions*, Phys. Rev. **B110**, 155155 (2024).
- **86.** Suman Jyoti De, Sumathi Rao and Ganpathy Murthy, *Magnon transmission across $\nu = 1| - |1$ mono-layer graphene junction as a probe of electronic structure*, Phys, Rev. **B110**, **085417** (2024).
- **85.** item Kishore Iyer, Amulya Ratnakar, Sumathi Rao and Sourin Das, *Multiple species of Majorana zero modes in reconstructed quantum Hall edges*, Phys. Rev. **B110**, L161302 (2024).
- **84.** Sourav Biswas, Allesandro de Martino, Sumathi Rao and Arjit Kundu , *Two channel Kondo problem in coupled interacting helical liquids*, Phys. Rev. **B109**, 155119 (2024).
- **83.** Suman Jyoti De, Ankur Das, Sumathi Rao, Ribhu Kaul and Ganpathy Murthy, *Global phase diagram of charge neutral graphene in the quantum Hall regime for generic interactions*, Phys, Rev. **B107**, 125422 (2023).
- **82.** Kishore Iyer, Amulya Ratnakar, Aabir Mukhopadhyaya, Sumathi Rao and Sourin Das, *Spontaneous fractional Josephson current from parafermions*, Phys. Rev. **B107**, L121408 (2023).
- **81.** Ruchi Saxena, Nirnoy Basak, Pritam Chatterjee, Sumathi Rao and Arijit Saha, *Thermoelectric properties of inversion symmetry broken Weyl semimetal-Weyl superconductor hybrid junctions*, Phys. Rev.**B107**, 195426(2023).
- **80.** Faruk Abdulla, Ankur Das, Sumathi Rao and Ganpathy Murthy, *Time-reversal-broken Weyl semimetal in the Hofstadter regime*, SciPost, Phys. Core **5**, 014 (2022).

- **79.** Vivekananda Adak, Aabir Mukhopadhyay, Suman Jyoti De, Udit Khanna, Sumathi Rao and Sourin Das, *Chiral detection of Majorana bound states at the edge of a quantum spin Hall insulator*, cond-mat/2106.04596, Phys. Rev. **B106**, 045422 (2022).
- **78.** Ankur Das, Sumathi Rao, Yuval Gefen and Ganpathy Murthy, *DC electrical current generated by upstream neutral modes*, cond-mat/2103.06200, Phys. Rev. **B105**, 165154 (2022).
- **77.** Fermi arc reconstruction at the interface of twisted Weyl semimetals (with Faruk Abdulla and Ganpathy Murthy), cond-mat/2101.09907, Phys. Rev. **B 103**, 235308 (2021).
- **76.** Kohn-Sham density functional theory of abelian anyons (with Yayun Hu, Ganpathy Murthy and Jainendra Jain), cond-mat/2010.09872, Phys. Rev.**B103**,035124 (2021).
- **75.** Amartya Saha, Suman Jyoti De, Sumathi Rao, Yuval Gefen and Ganpathy Murthy, Emergence of spin-active channels at a quantum hall interface, with Amartya Saha, Suman Jyoti De, Yuval Gefen and Ganpathy Murthy), cond-mat/2009.10539, Phys. Rev.**B103** Letters, L081401 (2021).
- **74.** Curvature function renormalisation, topological phase transitions and multicriticality, (with Faruk Abdulla and Priyanka Mohan, cond-mat/2003.10190, Phys. Rev.**B102**, 235129 (2020).
- **73.** Chiral Luttinger liquids in graphene tuned by irradiation, (with Sourav Biswas, Tridev Mishra and Arijit Kundu), cond-mat/2003.09160, Phys. Rev.**B102**, 155428 (2020).
- **72.** Magnetic flux periodicity in second order topological superconductors, (with Suman Jyoti De and Udit Khanna), cond-mat/1912.06784, Phys. Rev. **B101**, 125429 (2020).
- **71.** Bulk-edge correspondence and new topological phases in periodically driven spin-orbit coupled materials in the low frequency limit, (with Ruchi Saxena and Arijit Kundu), cond-mat/1712.05916, J. Phys. Commun. **4**, 075019 (2020).
- **70.** Quantum charge pumping through Majorana bound states (with Krashna Mohan Tripathi and Sourin Das), cond-mat/1809.00784, Phys. Rev. **B99**, 085435 (2019).

- **69.** Interplay of Floquet Lifshitz transitions and topological transitions in bilayer Dirac materials (with Priyanka Mohan), 1805.04125, Phys. Rev. **B98**, 165406 (2018).
- **68.** Fabry-Perot interferometry in Weyl semi-metals (with Dibya Kanti Mukherjee and Sourin Das), cond-mat/1710.06873, accepted in Jnl of Physics (Condensed matter), and published online (2018).
- **67.** Spin mode-switching at the edge of a quantum Hall system (with Udit Khanna, Ganpathy Murthy and Yuval Gefen), cond-mat/1708.04252, Phys. Rev. Lett. **119**, 186804 (2017).
- **66.** Transport through Andreev bound states in a Weyl semi-metal quantum dot (with Dibya Kanti Mukherjee and Arijit Kundu), cond-mat/1708.0170, Phys. Rev.**B96**, 161408(R) (2017).
- **65.** Zero-pi Josephson current transitions in irradiated Weyl semi-metals (with Udit Khanna and Arijit Kundu), cond-mat/1703.01312, Phys. Rev. **B95**, 201115 (R) (2017).
- **64.** Brillouin-Wigner theory for Floquet topological phase transitions in spin-orbit coupled materials (with Priyanka Mohan, Ruchi Saxena and Arijit Kundu), cond-mat/1609.06504, Phys. Rev. **B94**, 235419 (2016).
- **63.** Slave fermion formalism for the tetrahedral spin chain (with Priyanka Mohan), cond-mat/1602.02005, Eur. Phys. J. **B 89**, 206 (2016).
- **62.** Fingerprints of Majorana bound states in Aharanov-Bohm geometry (with Krashna Mohan Tripathi and Sourin Das), cond-mat/1509.06684, Phys. Rev. Lett. **116**, 166401 (2016).
- **61.** Chiral nodes and oscillations in the Josephson effect in Weyl semimetals, (with Udit Khanna, Dibya Kanti Mukherjee and Arijit Kundu), cond-mat/1509.03166, Phys. Rev. **B93** (RC), 121409 (2016).
- **60.** Conductance, valley and spin polarization and tunneling magneto-resistance in ferromagnetic-normal- ferromagnetic junctions of silicene (with Ruchi Saxena and Arijit Saha), cond-mat/1507.04225, Phys. Rev. **B92**, 245412 (2015).

- **59.** Proximity induced superconductivity in Weyl semi-metals (with Udit Khanna, Arijit Kundu and Saurabh Pradhan), cond-mat/1407.7515, Phys. Rev. **B90**, 195430 (2014).
- **58.** Transport and STM studies of hyperbolic surface states of topological insulators (with Udit Khanna and Saurabh Pradhan), cond-mat/1303.3700, Phys. Rev. **B87**, 245411 (2013).
- **57.** Magnetic field induced Fabry-Perot resonances in helical edge states, (with Abhiram Soori and Sourin Das), cond-mat/1112.5400, Phys. Rev.**B 86**, 125312(2012).
- **56.** Quantum charge pumping through a superconducting double barrier structure in graphene, (with Arijit Kundu and Arijit Saha), cond-mat/1102.1447, Phys. Rev. **B83**, 165451 (2011).
- **55.** Spin polarised scanning tunneling probe for helical Luttinger liquids (with Sourin Das), cond-mat/1006.2239, Phys. Rev. Lett.**106**, 236403 (2011).
- **54.** Resonant tunneling through superconducting double barrier structures in graphene, (with Arijit Kundu and Arijit Saha), cond-mat/1007.3716, Phys. Rev. **B82**,155441 (2010).
- **53.** Resonant spin transport through a superconducting double barrier structure, (with Arijit Kundu and Arijit Saha), cond-mat/0906.3679, Europhys. Lett. **88**, 57003 (2009).
- **52.** Resonant transmission of pure spin current through a t-stub coupled to a superconductor (with Arijit Saha and Sourin Das), cond-mat/0811.0660, Eur. Phys. J. **B 72**, 139 (2009).
- **51.** Enhancement of tunneling density of states at a junction of three Luttinger liquid wires (with Amit Agarwal, Sourin Das and Diptiman Sen), cond-mat/0810.3513, Phys. Rev. Lett. **B72**, 139 (2009).
- **50.** Effect of inter-edge Coulomb interactions on transport through a point contact in a $\nu = 5/2$ quantum Hall state (with Sourin Das and Diptiman Sen), cond-mat/0808.2249, Europhys. Lett. **81**, 37010 (2009).
- **49.** A systematic stability analysis of the renormalisation group flow for the normal-superconductor-normal junction of

- Luttinger liquid wires (with Arijit Saha and Sourin Das), cond-mat/0901.0126, Phys. Rev. **B 79**, 155416 (2009).
- **48.** Duality between normal and superconducting junctions of multiple quantum wires (with Sourin Das), cond-mat/0807.0804, Phys. Rev. **B78**, 205421 (2008).
 - **47.** Renormalization group study of transport through a superconducting junction of multiple one-dimensional quantum wires, (with Sourin Das and Arijit Saha), cond-mat/0711.1324, Phys. Rev. **B77** 155418 (2008).
 - **46.** Spintronics with NSN Junction of one-dimensional quantum wires : A study of Pure Spin Current and Magnetoresistance (with Sourin Das and Arijit Saha), cond-mat/0710.5240, Europhys. Lett. **81**, 67001 (2008).
 - **45.** Adiabatic charge pumping through a dot at the junction of N quantum wires (with Shamik Banerjee, Anamitra Mukherji and Arijit Saha), Phys. Rev. **B75** 153407(2007).
 - **44.** Renormalisation group study of the Kondo problem at a junction of several quantum wires, (with Ravi Chandra and Diptiman Sen), Phys. Rev. **B75**, 045435 (2007).
 - **43.** Inter-edge interactions and fixed points at a junction of quantum Hall line junctions, (with Sourin Das and Diptiman Sen), Phys. Rev. **B74**, 045322 (2006).
 - **42.** A multi-channel fixed point for Kondo spin coupled to a junction of Luttinger liquids, (with Ravi Chandra and Diptiman Sen), Europhys. Lett. **75**, 797 (2006).
 - **41.** Effect of interactions on an adiabatic quantum electron pump, (with Sourin Das), Phys. Rev. **B71**, 165333 (2005).
 - **40.** Tunneling through two resonant levels: fixed points and conductances, (with Diptiman Sen), Phys. Rev. **B70**, 195115 (2004).
 - **39.** Renormalisation group study of the conductances of interacting quantum wire systems with different geometries (with Sourin Das and Diptiman Sen), Phys. Rev. **B70**, 085318 (2004).
 - **38.** Transport through multiply connected quantum wires,

- (with Sourin Das), Phys. Rev. **B70**, 155420 (2004).
- **37.** Effective action and interaction energy of coupled quantum dots (with Sourin Das), Phys. Rev. **B68**, 073301 (2003).
 - **36.** Junction of several weakly interacting quantum wires: a renormalization group study. (with Siddhartha Lal and Diptiman Sen), Phys. Rev. **B66**, 165327 (2002).
 - **35.** Conductance through contact barriers of a finite length quantum wire (with Siddhartha Lal and Diptiman Sen), Phys. Rev. **B 65**, 195304 (2002).
 - **34.** Transport through quasi-ballistic quantum wires : the role of contacts (with Siddhartha Lal and Diptiman Sen), Phys. Rev. Lett. **87**, 26801 (2001).
 - **33.** Transport in multi-chain models of interacting fermions (with P. K. Mohanty), Jnl. of Physics **A 33**, 7363 (2000).
 - **32.** Resonant Tunneling through a Quantum Dot in an Aharonov-Bohm Ring : Results from bosonization, (with P. Durganandini), Phys. Rev. **B61**, 4739 (2000).
 - **31.** Transport in Double-Crossed Luttinger Liquids, (with P. Durganandini), Phys. Rev. **B59**, 13122 (1999).
 - **30.** Exactly Solvable Fermionic N -band Models, (with P. K. Mohanty and R. K. Ghosh), Jnl. of Physics **A32**, 4343 (1999).
 - **29.** Exact Analytic results for Composite Fermions in a Rajaraman-Sondhi like formulation, Mod. Phys. Lett. **B12**, 1203 (1998).
 - **28.** Fractional quantum Hall effect states as Exact ground states, (with Ranjan K. Ghosh), Int. Jnl. of Modern Physics, **B12**, 1125 (1998).
 - **27** Exactly Solvable Models in Arbitrary Dimensions, (with Ranjan K. Ghosh), Phys. Lett. **A238**, 213 (1998).
 - **26.** Field Theories of Frustrated Heisenberg Antiferromagnets, (with Diptiman Sen), Journal of Condensed Matter **C9** 1881 (1997).
 - **25.** Few Anyon Spectra in a Harmonic Oscillator Potential, (with Ranjan K. Ghosh), Mod. Phys. Lett. **B10** 515 (1996).

- **24.** A Bosonic Mean Field Theory for Frustrated Heisenberg Models in two dimensions, (with R. Chitra, D. Sen and Suresh Rao), Phys. Rev. **B52** 1061 (1995).
- **23.** Quantum Hall Effect of Non-interacting Hard-core Bosons, (with J.K. Jain), Mod. Phys. Lett. **B9** 611 (1995).
- **22.** Bosonic Mean Field Theory of the Spiral Phases of Heisenberg Antiferromagnets on a Chain, (with D. Sen) , Phys. Rev.**B48** (RC) 12763 (1993).
- **21.** Non-linear Field Theory of a Frustrated Heisenberg Antiferromagnet, (with D. Sen), Nucl. Phys. **B424** 547 (1994).
- **20.** Chirality Ordering of Chiral Spin Liquids, (with D. P. Jatkar and D. M. Gai tonde), Phys. Rev. **B46** 12026 (1992).
- **19.** Exact Many Body Fermi-Bose Transmutation in 2+1 Dimensions, (with D. M. Gai tonde), Int. Jnl of Mod Phys. **B6** 3543 (1992).
- **18.** Charge-Flux Density Waves : Anyons in a periodic potential (with D. M. Gai tonde), Mod. Phys. Lett. **B5** 1431 (1991).
- **17.** Anyon Superconductors at Rational Statistics, (with D. M. Gai tonde), Phys. Rev. **B44** (RC) 929 (1991).
- **16.** Anyons and Gaussian conformal field theories (with D. P. Jatkar), Mod. Phys. Lett. **A6** 289 (1991).
- **15.** Lattice dynamics and anyon superconductors (with D. M. Gai tonde), Mod. Phys. Lett. **B4** 1143 (1990).
- **14.** Vortices in Higgs models with and without Chern-Simons term (with D. P. Jatkar), Phys. Lett. **229B** 67 (1989).
- **13.** Q-ball solutions in local gauge theories with Chern-Simons term (with A. Khare), Phys. Lett. **227B** 424 (1989).
- **12.** Two point function on a torus for the SU(3) W-Z-W theory (with S. Panda), Phys. Lett. **215B** 530 (1988).
- **11.** On baryogenesis from a Chern-Simons condensate (with K. Enqvist and D. V. Nanopoulos), Phys. Rev. **D38** 1797 (1988).
- **10.** Topological mass term for gravity induced by matter (with J. J. van der Bij and R. Pisarski), Phys. Lett. **179B**

- 87 (1986).
- **9.** Dynamical breakdown of symmetries in QED_3 (with R. Yahalom), Phys. Rev. **D34** 1196 (1986).
 - **8.** Parity anomalies in gauge theories in 2+1 dimensions (with R. Yahalom), Phys. Lett. **172B** 227 (1986).
 - **7.** Renormalisation group fixed points and the Higgs boson spectrum (with C. T. Hill and C. N. Leung), Nucl. Phys. **B262** 517 (1985).
 - **6.** Low energy manifestations of a new scale: operator analysis (with C. N. Leung and S. T. Love), Zeit. für Phys. **C31** 433 (1986).
 - **5.** Topologically massive chromodynamics in the perturbative regime (with R. Pisarski), Phys. Rev. **D32** 2081 (1985).
 - **4.** Fermions interacting with spherically symmetric monopoles: beyond the step function approximation, Phys. Rev. **D31** 2559 (1985).
 - **3.** Interaction of monopoles with fermions in higher representations, Phys. Rev. **D29** 2387 (1984).
 - **2.** Six fermion $|\Delta(B-L)| = 2$ operators of arbitrary generational structure (with R. E. Shrock), Nucl. Phys. **B232** 143 (1984).
 - **1.** $n - \bar{n}$ transition operators and their matrix elements in the MIT bag model (with R. E. Shrock), Phys. Lett. **116B** 238 (1982).

Conference Proceedings

- **C9.** ‘Non-linear sigma model approach to quantum spin chains’ Proceedings of CMDAYS05, Indian Journal of Physics, Vol **80**, No. 6, (June 2006).
- **C8.** ‘Effects of interactions and junctions on conductances of quantum wires’, (with S. Das and D. Sen), proceedings of the International Conference on Nanoscience and Technology, Kolkatta, December 2003, Int. Jnl of Nanoscience, **4**, 951 (2005).
- **C7.** ‘Transport through quantum dots’, presented at National

Seminar on ‘Recent Advances in Physics’, 19-20 September 2003, Gopalpur-on-sea, to be published (2003).

- **C6.** ‘Electron transport through ballistic quantum channels,’ (presented by Siddhartha Lal) at the ‘International Conference on Nanomaterials’, Saha Institute, Calcutta, India, January 2001, published in Applied Surface Science **182**, 377 (2001).
- **C5.** ‘Transport in Quantum wires’, presented at the ‘International Conference on Mesoscopic and Disordered Systems’, Indian Institute of Science, Bangalore, India, December, 2000, published in Pramana **58**, 205(2002).
- **C4.** ‘Transport in Luttinger liquids’, at the Conference on Quantum Many Body physics, Jawaharlal Nehru University, March 1999, published in Int. Jnl. of Modern Physics **B14**, 2157 (2000).
- **C3.** ‘The Fractional Quantum Hall effect’, K.S. Krishnan Birth Centenary Conference on Condensed Matter physics, Allahabad University, published in Condensed Matter Physics, edited by B. K. Agarwal and H. Prakash, Narosa Publications, 2000.
- **C2.** ‘Do Hard-core Bosons exhibit Quantum Hall Effect?’, published in the proceedings of ‘Colloquium on Modern Quantum Field Theory II,’ World Scientific Publications, January 1994.
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Books

- **B4** Weyl semi-metals : A short review, cond-mat 1603.02821, published in Jnl of Indian Institute of Science, **96(2)**, 145 (2016).
- **B3.** ‘Introduction to abelian and non-abelian anyons’, cond-mat/1610.09260, lectures given at the SERC school on ‘Topology and condensed matter physics’, held in Kolkata, Nov 23-Dec 12, 2015, edited by Somendra M. Bhattacharjee, Mahan,

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- **B2.** ‘An Introduction to Bosonisation and Some of its Applications’ (with Diptiman Sen), cond-mat/0005492, based on Lectures delivered at the SERC school on ‘Field Theories in Condensed Matter systems’ held at Harish-Chandra Research Institute, Allahabad, February, 2001, published in ‘Field Theories in Condensed Matter systems’ edited by me, (Hindustan Book Agency, 2001 and Institute of Physics publications, series in condensed matter physics), 2002.
- **B1.** ‘An Anyon Primer’, hep-th/9209066 based on Lectures delivered at the VIII SERC School in High Energy Physics, 30 Dec. ’91 - 18 Jan ’92, held at Physical Research Laboratory, Ahmedabad, and at the SERC School in Statistical Mechanics, Feb ’94, held at Puri, published in ‘Models and Techniques of Statistical Physics’, edited by S. M. Bhattacharjee (Narosa Publications), 1997.

General articles

- **G15.** ‘History of the working group of women in physics in India’, Physics News, Vol. **51**, 77 (2021).
- **G14.** ‘Learning to belong as an Indian physicist’, Review of Women’s studies, Economic and Political Weekly, India, Vol. **52**, Issue 17, 45, 2017.
- **G13.** P. Shastri, A. Kurup, L. Resmi, R. Ramaswamy, S. Ubale, S. Bagchi, Sumathi Rao and S. Narasimhan ‘Towards gender equity in physics in India: Initiatives, investigations and questions’, Proceedings of the International conference on Women in Physics, Waterloo, Canada, 2015.
- **G12.** P. Shastri, R. Ramaswamy, S. Narasimhan, S. Rao, S. Ubale and S. Kulkarni, ‘Gender diversity in physics in India: Interventions so far and recommendations for the future’, Proceedings of the 4th International IUPAP Conference on Women in Physics, 2012.
- **G11.** ‘Overcoming fear and forging ahead’, biographical essay in Lilavati’s daughters : Women scientists in India, edited by

Rohini Godbole and Ram Ramaswamy, Indian Academy of Sciences, 2008.

- **G10.** ‘Women in Physics in India : 2008’, poster at the International Conference on Women in Physics, (ICWIP3), Seoul, 2008, (with N. Chandra, R. M. Godbole, N. Gupte, P. Jolly, A. Mehta, S. Narasimhan, V. Sharma and S. Surya), AIP conference proceedings, **1119**, 120 2008.
- **G9.** ‘Personal professional development’, (presented by me at the International Conference on Women in Physics, (ICWIP3), Seoul, 2008) (with I. Gledhill, B. Hartline, Z. Ben Lakhdar, A. J. MacLachlan, K. Mack, A. Mehta, L. Wu and H. Zhang), AIP conference proceedings, **1119**, 7 2008.
- **G8.** ‘Women in Physics in India’, presented at Jamshedpur Women’s college, 10-11 October 2006, published in proceedings on the National Conference on ‘Convergence with Physics’, 2007.
- **G7.** ‘Science : A journey into new frontiers’, presented at Jamshedpur Womens’ college, 10-11 October 2006, published in proceedings on the National Conference on ‘Convergence with Physics’, 2007.
- **G6.** ‘Women in physics in India, 2005’, poster at the International Conference on Women in Physics, (ICWIP2), Rio de Janeiro, 2005, (with N. Gupte, R. M. Godbole, P. Jolly, S. Narasimhan), AIP conference proceedings, **795**, 129 2005.
- **G5.** ‘Launching a succesful physics career’, presented at the International Conference on Women in Physics, (ICWIP2), Rio de Janeiro, 2005, (with J. Corbett, R. Heyrovska, L. Meza-Montes), AIP conference proceedings, **795**, 11 2005.
- **G4.** ‘Women in Physics : An Indian perspective’, poster at the International Conference on Women in Physics, (ICWIP), Paris 2002, (with N. Gupte, J. Gyanchandani and S. Rao), AIP conference proceedings, **628**, 171 2002.
- **G3.** ‘Attracting girls into physics’, presented by me at the International Conference on Women in Physics, (ICWIP), Paris 2002, (with J. Adams, A. Andam, A. Frederiksen, N. Gupte,

- J. Gyanchandani, C. Hooijer, J. O'Brien and P. Saeta), AIP conference proceedings, **628**, 9 2002.
- **G2.** 'Report on first IUPAP meeting on women in physics, Paris, 2002', (with N. Gupte and R. M. Godbole), Current science, **83**, 359 2002.
 - **G1.** 'Women scientists: A contradiction in terms?', Current science, **76**, 24 (1999), based on talk presented at a Symposium on 'Science and Technology education: Concerns and perspectives, National Academy of Sciences, Allahabad, in Lucknow, 23-25 October 1998.