CURRICULUM VITAE

1. Name : **SUDHANSU SEKHAR MANDAL**

2. Nationality : **Indian**

3. Address for Correspondence : **Department of Physics**,
Indian Institute of Technology
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4. Academic Qualifications :

- **M.Sc. in Physics, Indian Institute of Technology, Kharagpur, year: 1990.**
- **Ph.D in Theoretical Condensed Matter Physics, Indian Institute of Technology, Kanpur, year: 1997.**
  Title of Thesis: *Theory of arbitrarily polarized quantum Hall states, and integer quantum Hall effect at finite temperatures.*
  Thesis Supervisor: Prof. V. Ravishankar.

5. Present Position and Institution :
Professor, IIT Kharagpur, since December, 2015.

6. Previous Positions & Institutions :

- **Research Associate (from August, 1996 to August, 1999) jointly at the Indian Institute of Science, Bangalore and the Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore.**
- **Post-Doctoral Fellow (from November 1999 to July 2002) at the Pennsylvania State University, USA**
- **Senior Lecturer (since August, 2002 to December 2005) at IACS, Kolkata, India**
- **Assistant Professor (since December, 2005 to August, 2006) at IACS, Kolkata, India**
- **Associate Professor (since August, 2006 to August, 2011) at IACS, Kolkata, India**
- **Professor (since August, 2011 to November, 2015) at IACS, Kolkata, India**

7. Present Research Interest :

- Fractional Quantum Hall Effect
- Disordered BCS Superconductors
- Topological Structures and Dynamics in Ferromagnets and Ferroelectric Materials.
- Atomic and Molecular Wavefunctions

8. M. Sc Thesis Supervised :

- Abhik Debnath, Sougata Ganguly, and Sudipto Das (2016-2017)
- Subhodip Saha and Jyotijwal Debnath (2017-2018)
- Soumen Podder and A. Arabindh Swaminathan (2018-2019)
- Saurav Suman, Sounak Hazra and Manisha (2019-2020)
- Ranajit Jana and Yogesh Vyas (2020-2021)
- Tania Patra, Rajesh Mondal and Saurabh Prasad (2021-2022)

9. PhD Thesis Supervised :

- *Study of Unconventional Superconductivity* by Soumya Prasad Mukherjee registered at Jadavpur University, Kolkata, India.
- *Collective Excitations in Fractional Quantum Hall Effect* by Dwipesh Majumder registered at University of Calcutta, Kolkata, India.
- *Transport Properties of Spin-Orbit Coupled Electronic Systems* by Ankur Sensharma rigistered at Jadavpur University, Kolkata, India.
- *Unconventional fractional quantum Hall states in the lowest Landau level* by Sutirtha Mukherjee registered at Jadavpur University, Kolkata, India
- *Theoretical and Computational Study of Magnetic Skyrmions in Ferromagnetic Materials* by Sandip Bera at IIT Kharagpur.

10. Number of PhD students and Post-Docs presently working in my group :

- No. of PhD students: 4
- No. of Post-Docs: 1

11. Courses Taught (at IIT Kharagpur) :

- *Physics (1st year)* (PH11001)

- *Classical Mechanics-II* (PH31007/PH40027)
- *Mathematical Methods-I* (PH31013/PH41013)
- *Mathematical Methods-II* (PH41008)
- *Condensed Matter Physics-II* (PH41017)
- *Advanced Computational Physics* (PH60033)
- *A View of Condensed Matter Physics: Modern Aspects* (PH58006/PH61008)
- *Advanced Quantum Theory* (TS70005)
- Condensed Matter Physics Lab-I (PH49001/PH49009)
- Condensed Matter Physics Lab-II (PH49014/PH59010)
- Modern Physics (PH59008)
- Physics Lab (1st year) (PH19001/PH19003)
- Computational Physics Lab (PH49012)

12. List of Publications Since 2017 :

[1] J. A. Hutasoit, A. C. Balram, S. Mukherjee, Y. H. Wu, **S. S. Mandal**, A. Wojs, V. Cheianov, and J. K. Jain, *The Enigma of the $\nu = 2+3/8$ fractional quantum Hall effect*, **Phys. Rev. B 95**, 125302 (2017).

[2] **S. S. Mandal**, S. Mukherjee, and K. Ray, *Determination of many-electron basis functions for a quantum Hall ground state using Schur polynomials*, **Annals of Physics 390**, 236 (2018).

[3] **S. S. Mandal**, *Generalization of Laughlin's theory for the fractional quantum Hall effect*, **J. Phys.: Condensed Matter 30**, 405605 (2018).

[4] S. Bera and **S. S. Mandal**, *Theory of the skyrmion, meron, antiskyrmion, and antimeron in chiral magnets*, **Phys. Rev. Research 1**, 033109 (2019).

[5] G. Sinha and **S. S. Mandal**, *A Theoretical Model for Designing Superconducting Magnets*, **IEEE Transactions on Applied Superconductivity 30**, 2963402 (2020).

[6] **S. S. Mandal** and T. V. Ramakrishnan, *Microscopic free energy functional of superconductive amplitude and phase: Superfluid density in disordered superconductors*, **Phys. Rev. B 102**, 024514 (2020).

[7] S. Bera and **S. S. Mandal**, *Skyrmions at vanishingly small Dzyaloshinskii Moriya interaction or zero magnetic field*, **J. Phys.: Condensed Matter 33**, 255801 (2021).

[8] S. Das, S. Das, and **S. S. Mandal**, *Unconventional filling factor of 4/11: A closed-form ground-state wave function*, **Phys. Rev. B 103**, 075304 (2021).

[9] S. Bera and **S. S. Mandal**, *Length-scale independent skyrmion and meron Hall angles*, **Journal of Physics: Condensed Matter 33**, 115801 (2021).

[10] S. Das, S. Das, S. Mukherjee, and **S. S. Mandal**, *From the Gaffnian critical point to the incompressible 2/5 quantum Hall state*, **Phys. Rev. B (Lett.) 105**, L041305 (2022).

[11] S. Dutta, P. Raychaudhuri, **S. S. Mandal**, and T. V. Ramakrishnan, *Superfluid Density in Conventional Superconductors: From Clean to Strongly Disordered*, (Communicated for publication), 2022

[12] S. Das, S. Das, and **S. S. Mandal**, *An Anomalous Reentrant 5/2 Quantum Hall Phase at Higher Landau-Level-Mixing Strength*, (Communicated for publication), 2022.

12. Selected List of Invited Talks Delivered :

- *APS March Meeting*, Portland, USA, March, 2010.
- *International Conference on Quantum Effects in Solids Today*, New Delhi, India, December, 2010.
- *4th International Workshop on Emergent Phenomena in Quantum Hall Systems*, Beijing, China, June, 2011.
- *International Conference on Strongly Correlated and Disordered Systems*, Bengaluru, India, December, 2011.
- *Chandrasekhar Lecture: ICTS Meeting*, Bangalore, India, December, 2012.
- *International Workshop on Strongly Disordered Superconductors and the Superconductor Insulator Transition*, Villard-de-Lans, France, February, 2014.
- *6th International Workshop on Emergent Phenomena in Quantum Hall Systems*, Mumbai, India, January, 2016.
- *School on Current Frontiers in Condensed Matter Research*, ICTS, Bangalore, India, June, 2016.