

Dr Mohammed Ahsanul Hoda Ahsan, **Associate Professor.**

M.Sc(Physics), Specialization: High Energy Physics, Gravitation and General Relativity.

PhD(Physics), Thesis: Configuration Interaction studies on model Hamiltonians.

Post-Doctorate: Quantum many-body Physics, Strongly correlated systems, Bose-Einstein Condensation.

Courses taught

B.Sc: Statistical Mechanics, Electricity and Magnetism, Electromagnetic Theory, Classical Mechanics.

M.Sc: Condensed Matter Physics II, Quantum Field Theory, Classical Electrodynamics, Statistical Mechanics, Atomic and Molecular Physics, Numerical Analysis and Programming.

Pre-PhD: Advanced Condensed Matter Physics, Advanced Classical Electrodynamics, Research Methodology.

PhD Thesis supervision

Supervised—5; Co-supervised—2; On-going—4.

Research Publications (Last five years, 2012-2017)

- 1. Vortex patterns in moderately rotating Bose-condensed gas**, Mohd Imran and M A H Ahsan, Journal of Physics B: Atomic Molecular & Optical Physics **50**, 045301 (2017); ISSN: 0022-3700(Print).
- 2. Ground and Low-Lying Collective States of Rotating Three-Boson System**, Mohd. Imran and M A H Ahsan, Communications in Theoretical Physics, Vol. 65, pp. 473-482 (2016); Print ISSN: 0253-6102.
- 3. $\text{Sr}_2\text{Cu}(\text{PO}_4)_2$ and $\text{Ba}_2\text{Cu}(\text{PO}_4)_2$ as quasi-one-dimensional spin-1/2 Heisenberg antiferromagnet**, Md. Mahfoozul Haque and M.A.H. Ahsan, Journal of Magnetism and Magnetic Materials 402, 143149 (2016); ISSN 0304-8853(print), 1873-4766(web).
- 4. Finite Temperature Exact Results on $\text{La}_4\text{Ni}_3\text{O}_8$ Like Antiferromagnetic**, Md Mahfoozul Haque and M A H Ahsan, Advanced Science Letters, Vol. 21, No. 9, pp.2713-2716 (2015); ISSN: 1936-6612 (Print): EISSN: 1936-7317 (Online).
- 5. Exact Diagonalization Study of Bose-Condensed Gas with Finite-Range Gaussian Interaction**, Mohd. Imran and M A H Ahsan, Advanced Science Letters, Vol. 21, No.9, pp. 2764-2767 (2015); ISSN: 1936-6612 (Print): EISSN: 1936-7317 (Online).
- 6. Exact Diagonalization Study of Double Quantum Dot System in Zero-bandwidth Limit**, Haroon and M A H Ahsan, Journal of Atomic, Molecular, Condensate and Nano Physics, Vol. 6, No. 3, pp. 187-193 (2015); ISSN 2349-2716 (online); 2349-6088 (print).
- 7. Breathing Modes in Rotating Bose-Condensed Gas: An Exact Diagonalization**

Study, Mohd. Imran and M A H Ahsan, Journal of Atomic, Molecular, Condensate and Nano Physics, Vol. 2, No. 2, pp.133-139 (2015); ISSN 2349-2716 (online); 2349-6088 (print).

8. Organization of Hilbert space for exact diagonalization of Hubbard model, Medha Sharma and M A H Ahsan, Computer Physics Communications 193, pp.19-29 (2015), ISSN 0010-4655.

9. Electron Transport in T-shaped Double Quantum Dot System using Non-Equilibrium Green's Function, Haroon and M A H Ahsan, Advanced Science Letters **20**, 1281-1286 (2014); ISSN: 1936-6612 (Print): EISSN: 1936-7317 (Online).

10. Simulation of Pauli Spin Blockade Readout in Zero-Dimesnion Nanostructures, Medha Sharma, M A H Ahsan, Advanced Science Letters **20**, 1601-1604 (2014); ISSN: 1936-6612 (Print): EISSN: 1936-7317 (Online).

Conference Presentation

1. Effect of electronic correlation and role of van Hove singularity in the SWCNT leads on the transport through T-shaped double quantum dot system, Haroon and M A H Ahsan, at International JNU-ICTP Workshop on Current Trends in Frustrated Magnetism (smr2699), 9-13 February, 2015, Jawaharlal Nehru University, New Delhi.

2. An iterative method for solving the dynamical mean-field theory using exact diagonalization, Medha Sharma and M A H Ahsan at Internantional JNU-ICTP Workshop on Current Trends in Frustrated Magnetism (smr2699), 9-13 February 2015, Jawaharlal Nehru University, New Delhi.

Research Grant

Understanding the role of correlation in high temperature cuprate superconductors: An extended dynamical mean field study on model Hamiltonians, Rupees 12.58 lakhs, University Grants Commission, New Delhi, India, (2012-2015).