

## Raka Dasgupta

Assistant Professor

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### Academic Qualifications

Ph.D, S. N. Bose National Centre for Basic Sciences, Kolkata, India, 2013

**Thesis Title:** Pairing and Condensation in Ultracold Quantum Gases

**Thesis Supervisor:** Prof. Jayanta K. Bhattacharjee

(Degree awarded by Jadavpur University)

M.Sc, Jadavpur University, Kolkata, India , 2006

B.Sc, Jadavpur University, Kolkata, India , 2004

### Appointments

Post Doctoral Fellow, Asia Pacific Center for Theoretical Physics, Pohang, South Korea (2012-2015)

DST-INSPIRE Faculty, Dept. of Physics, University of Calcutta (2015-2016 )

Assistant Professor, Dept. of Physics, University of Calcutta (2016-till present )

### Research Interests

Condensed Matter Theory and Statistical Physics: Ultracold Fermi and Bose gases, Exotic pairing and novel superfluidity in cold atom systems, Natural and driven dynamics of quantum gases , Quantum simulation.

### Publications and Preprints

- *Stability of the breached pair state for a two-species fermionic system in the presence of Feshbach resonance.*  
**Raka Dasgupta**, Phys. Rev. A, Volume-**80**, 063623, December 2009
- *Stability of a gapless state for population-imbalanced fermionic systems.*  
**Raka Dasgupta**, Physics Teacher (Quarterly Journal of Indian Physical Society), Volume-**51**, numbers 3 & 4, July-December 2009
- *Effects of three-body scattering processes on BCS-BEC crossover.*  
**Raka Dasgupta**, Phys. Rev. A, Volume-**82**, 063607, December 2010

- *Dynamics as a probe for population-imbalanced fermionic systems*, **Raka Dasgupta** and J. K. Bhattacharjee, **arXiv:1110.4092v1**
- *Periodic dynamics of fermionic superfluids in the BCS regime*. A. Roy, **R. Dasgupta**, S. Modak, A. Das, K. Sengupta, J. Phys.: Condens. Matter Volume-**25**, 205703, April 2013
- *Nonlinear phenomena of ultracold atomic gases in optical lattices*, G. Watanabe, B.P. Venkatesh and **R. Dasgupta**, Entropy, Volume-**18**, no. 4, 118, March 2016
- *Attraction-induced dynamical stability of a Bose-Einstein condensate in a nonlinear lattice*, **R. Dasgupta**, B. P. Venkatesh, G. Watanabe, Phys. Rev. A, Volume-**93**, 063618, June 2016
- Cold Atom Quantum Simulator for String and Hadron Dynamics in Non-Abelian Lattice Gauge Theory, **R. Dasgupta** and I. Raychowdhury, arXiv:2009.13969

## Presentations in Conferences/ Workshops

**7<sup>th</sup> Indian Statistical Community Meeting, February 19-21 2020**, International Centre for Theoretical Sciences, Bangalore (TALK : Dynamics of a Feshbach-Coupled Ultracold Fermionic System in an Optical Lattice)

**APCTP 3rd Alumni Symposium**, October 17-18 2019, Busan, South Korea (TALK : Exotic Pairing Phases in Ultracold Fermionic Systems )

Pressing for Progress 2019, University of Hyderabad, September 19-21 2019, (TALK: Period-Doubled State of a Bose-Einstein Condensate in a Nonlinear Lattice)

**APCTP 2014 Workshop on Frontiers of Physics** Dec. 20-23, 2014, Muju, South Korea (TALK : *Controlling the Effective Range in Feshbach Resonances in Ultracold Atomic Gases*)

**Workshop on Intersection of Cold-atomic and Nuclear physics**, 12-13 May 2014, APCTP, South Korea (TALK : *Controlling the Effective Range in Feshbach Resonances in Ultracold Atomic Gases*)

**Boulder School for Condensed Matter and Material Physics**, 8 July-2 August 2013, University of Colorado Boulder, USA (POSTER: *Detecting momentum-space structures in population imbalanced fermionic systems*)

**"Quo Vadis Bose Einstein Condensation? IV"**, 21-25 August 2012, Bad Honnef, Germany (POSTER: *Dynamics as a probe for population-imbalanced fermionic systems*)

**Summer School on Low Dimensional Quantum Many-body Systems** 16-21 August 2012, Trier, Germany (SHORT TALK and POSTER: *Emergence of alternative crossover routes in BCS-BEC crossover* )

**Condensed Matter Days-2011**, 24-26 August 2011 Gauhati University, Gauhati, India  
(*TALK: Effects of Three-body Scattering Processes on the BCS-BEC Crossover*)

**Workshop on Frontiers in Ultracold Fermi Gases**, 6- 10 June 2011 , ICTP - The Abdus Salam International Centre for Theoretical Physics Trieste, Italy (*POSTER : Effects of Three-body Scattering Processes on the BCS-BEC Crossover*)

**STATPHYS-Kolkata VII**, November 26 – 30 2010, SINP, Kolkata, India(*POSTER : Effects of Three-body Scattering Processes on the BCS-BEC Crossover*)

**"Quo Vadis Bose Einstein Condensation? III"**, 2-20 August, 2010, Max Planck Institute for the Physics of Complex Systems Dresden, Germany (*POSTER: Stability of the Breached Pair State in the BEC Side of BCS-BEC Crossover*)

**International School and Conference on Cold Ions and Atoms** , 6-21 January 2010, International Centre for Theoretical Sciences, TIFR held at Kolkata-Shankarpur, India (*POSTER: Stability of the Breached Pair State for a Population-imbalanced Fermionic System*)

**Young Physicists' Colloquium**, 20-21 August 2009, Indian Physical Society, Kolkata, India (*TALK: Stability of a Gapless State for Population-imbalanced Fermionic Systems*)

**International Conference on Cold Atoms (ICCA) 2008**, December 2008, Indian Institute of Science Education and Research (IISER) Kolkata, India (*POSTER: Asymmetric Pairing in a Two-Species Fermionic System*)