

Emergent Research:

The PIMS Postdoctoral Fellow Seminar



Pacific Institute *for the*
Mathematical Sciences

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Discrete Gaussian Free Field and Invariant Measures for the Non-Linear Schrödinger Equation



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SPEAKER BIO:

Kesav is a PIMS postdoctoral fellow at the University of Victoria who works with Gourab Ray. Kesav's academic trajectory began as an undergraduate student in physics at the University of Delhi. After realizing that mathematical methods (specifically probability) excited him more, Kesav switched track and completed his masters in mathematics at the Indian Statistical Institute, Bangalore. As a PhD student at the University of Illinois, Urbana-Champaign, Kesav focused on problems in probability that have origins in statistical and mathematical physics. He continues to work in this field, specifically on phase transitions in lattice field theories and disordered models in statistical mechanics. He is thrilled to have gotten the opportunity to spend two years in the Pacific Northwest and explore its spectacular natural beauty.

ABSTRACT:

In this talk, I will describe how certain non-linear exponential tilts of the Discrete Gaussian Free Field yield invariant measures for a discretized PDE, the focusing Non Linear Schrödinger equation. I will briefly talk about how this tilted measure relates to self-intersections of the random walk on \mathbb{Z}^d . I will then describe joint work with Partha Dey and Kay Kirkpatrick on how this measure undergoes a phase transition in the thermodynamic limit with general $d \geq 3$ and non-linearity p . I will conclude with some new results with Gourab Ray, on the weak convergence of the random field sampled with respect to this measure to the massive discrete Gaussian Free Field.

For more information and registration:

<https://www.pims.math.ca/seminars/PIMSPDF>

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