

# Promit Ghosal

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## Worked on the following topics:

1. Tail probabilities and fractal properties of the KPZ equation.
2. Interacting particle systems and their stochastic PDE limits.
3. Conformal field theory using probabilistic tools.
4. Spectral properties (e.g., rigidity, localization) of random Schrodinger operators.
5. Theory of Optimal Transport.

# Current Topics of Interests:

1. Fractal properties of the models in the KPZ universality class: (Sayan Das, Yier Lin and others)

Provide **law of iterated logarithms** for the models in the KPZ universality class. Study **fractal nature** of the large peaks and valleys of those models as we zoom out in the macroscopic scale.

2. Detailed study of tail probabilities of the KPZ and other models: (Alexandre Krajenbrink, Guilherme de Silva)

Understand the connection between the KPZ tail probabilities and other integrable systems (e.g., **Zakharov-Sabat system**). Tail probabilities of other models like **stochastic 6V model**, **ASEP** etc. Formulate and study **discrete integro-differential Painlevé equation**.

3. Application of ‘Probabilistic’ conformal blocks: (Harini Desiraju, Andrei Prokhorov and others)

Rigorously connecting ‘**probabilistic conformal blocks**’ (introduced in G.-Remy-Sun-Sun’ 20) with the solution of **quantum Painlevé equation** and  **$\beta$ -ensemble** and proving a variety of problems from conformal field theory.