

Stanford University
Departments of Mathematics and Statistics

PROBABILITY SEMINAR

*** Special Event ***

2pm, Friday, January 18, 2019
Sloan Mathematics Center Room 383N

Speaker: Hugo Duminil-Copin, *Institut des Hautes Études Scientifiques*

Title: **Emergent planarity in two-dimensional Ising models
with finite-range interactions**

Abstract:

The known Pfaffian structure of the boundary spin correlations, and more generally order-disorder correlation functions, is given a new explanation through simple topological considerations within the model's random current representation. This perspective is then employed in the proof that the Pfaffian structure of boundary correlations emerges asymptotically at criticality in Ising models on \mathbb{Z}^2 with finite-range interactions. The analysis is enabled by new results on the stochastic geometry of the corresponding random currents. The proven statement establishes an aspect of universality, seen here in the emergence of fermionic structures in two dimensions beyond the solvable cases.

This is joint work with M. Aizenman, V. Tassion, and S. Warzel.