

Math/Physics Seminar

Tuesday, October 1, 2024

1:30-2:20 pm SCHM 303

Speaker: Vu Trung, University of Illinois Urbana-Champaign**Title:** Arctic Curves of T-system with Slanted Initial Data

Abstract: We study the T -system of type A_∞ , also known as the octahedron recurrence/equation, viewed as a $2 + 1$ -dimensional discrete evolution equation. Generalizing earlier work on arctic curves for the Aztec Diamond obtained from solutions of the octahedron recurrence with “flat” initial data, we consider initial data along parallel “slanted” planes perpendicular to an arbitrary admissible direction $(r, s, t) \in \mathbb{Z}_+^3$. The corresponding solutions of the T -system are interpreted as partition functions of dimer models on some suitable “pinecone” graphs introduced by Bousquet-Melou, Propp, and West in 2009. The T -system formulation and some exact solutions in uniform and periodic cases allow us to explore the scaling limit of the corresponding dimer models and to derive exact arctic curves separating the various phases of the system. This approach bypasses the standard general theory of dimers using the Kasteleyn matrix and uses instead the theory of Analytic Combinatorics in Several Variables.