

Speaker: Mario Ayala Valenzuela

Title: Higher-order fluctuation fields and orthogonal duality polynomials

Abstract: In the study of scaling limits of reversible particle systems with the property of self-duality, many quantities of interest become easier to manipulate and simplify. For the particular case of fluctuation limits, and in the additional presence of orthogonality, these simplifications have interesting consequences. In this talk, we will briefly discuss some of those consequences and introduce what we call the k -th order fluctuation field. We will then explain how these fields can be interpreted as some type of discrete analogue of powers of the well-known density fluctuation field, and show how their scaling limits correspond to the SPDE associated with the k -th power of a generalized Ornstein-Uhlenbeck process.

This work takes inspiration from [1] and [2], and it is a joint effort with Gioia Carinci (Università di Modena e Reggio Emilia) and Frank Redig (TU Delft).

[1]- Sigurd Assing, A limit theorem for quadratic fluctuations in symmetric simple exclusion, *Stochastic Process. Appl.* 117 (2007), no. 6, 766–790.

[2]- Patricia Gonçalves and Milton Jara, Quadratic fluctuations of the symmetric simple exclusion, *ALEA Lat. Am. J. Probab. Math. Stat.* 16 (2019), no. 1, 605–632.