

# Boğaziçi MATH COLLOQUIUM

## Double Jump Phase Transition in a Soliton Cellular Automaton

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**Abstract:** I will discuss joint work with Lionel Levine and Hanbaek Lyu on the soliton cellular automaton with random initial conditions. This CA is a discrete-time dynamical system which models the behavior of certain traveling wave packets arising in various areas of math and physics. After explaining the basics of the model, I will describe connections with a variety of combinatorial objects like pattern-avoiding permutations, Young tableaux, and Motzkin paths. I will then turn to the random setting where one can frame things in terms of probabilistic constructs like renewal processes, birth-and-death chains, Brownian motions, and Galton-Watson forests. Using these perspectives, I will present some limit theorems which establish a 'double jump phase transition' for certain statistics of the system analogous to that found by Erdős-Rényi in their seminal study of random graphs.

**Date :** Wednesday, January 13, 2021

**Time:** 17:00

**Place:** <https://boun-edu-tr.zoom.us/j/97865078290>