



UNIVERSITÀ
DEGLI STUDI
DI TRIESTE



Dipartimento di

Fisica

Dipartimento d'Eccellenza 2023-2027

Trieste Quantum Seminar Series

Wednesday October 29th 2025, at 11:00
Stasi room, ICTP

Dr. Chiara Paletta

Department of Physics,
University of Ljubljana, Slovenia

On the integrability of the deformed Rule 54 model



Abstract: I will discuss the integrability property of a stochastic and quantum deformation of the Rule 54 cellular automaton: the simplest microscopic (deterministic) reversible model in 1+1 discrete space and time dimensions with strong local interactions. First, I will introduce the Rule 54 model and its two deformations: In the stochastic case, I couple the system to stochastic boundary reservoirs and show that the resulting non-equilibrium steady states can be constructed explicitly in matrix product form. In the quantum case, I explain how the model can be embedded into the Yang-Baxter integrability framework. It turns out that Yang-Baxter integrability is more common than previously thought! Based on ongoing work with T. Prosen.

Contact: trieste.quantum@units.it - www.triestequantum.it



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