Title: Computer-Powered Chaos in Lattice Models

Abstract: The study of combinatoric properties of tilings on lattice models has a long history of interactions with both computability (*e.g.* the undecidability of the domino problem) and statistical physics (*e.g.* the Peierls argument), but the joining of those two interfaces is relatively recent. Notably, the question "chaotic temperature dependence" originates from the spin-glass literature, and has been active for the last two decades.

In this context, chaoticity can be summarised as the fact that no converging behaviour can occur in a given model as its temperature goes to 0. First formally established for an infinite spin alphabet, this property was later refined using a finite alphabet with long-range 1D interactions, and then finite-range interactions in higher dimensions.

In this talk, I will notably focus on how the simulation of Turing machines within tilings has played a key role in this evolution, up to and including a realisation result on the zero-temperature limit accumulation sets of chaotic models.