Convergence of a microscopic dynamics to the porous medium equation

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In this talk I will present a microscopic model in the family of kinetically constrained lattice gases. Particles are situated on the discrete lattice and perform random jumps under some restrictions depending on the local configuration around them. We prove that the macroscopic behavior of this microscopic dynamics, under periodic boundary conditions and diffusive time scaling, is ruled by the porous medium equation. The proof makes use of the relative entropy at the discrete level, and generalizes a method developed by Yau (1991), by involving approximations of solutions to the porous medium equation (instead of exact solutions). Based on a joint work with O. Blondel, C. Cancès, and M. Sasada [1].

References

[1] O. Blondel, C. Cancès, M. Sasada and M. Simon: *Convergence of a degenerate microscopic dynamics to the porous medium equation*, Preprint: https://arxiv.org/abs/1802.05912, ArXiv: 1802.05912, to appear in Annales de l'Institut Fourier (2019+).