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Barcelona Analysis Seminar	2021–2022
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Date. July 18, 2022	
Time. 16:00 CET	
Room. CRM A1 (Universitat Autònoma de Barcelona)	
Online streaming (Zoom). Click here to join.	

Mean field limit of non-exchangeable multi-agent systems

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In this talk I will discuss on a recent derivation of the mean-field limit for multiagent systems on a large class of sparse graphs. More specifically, the case of nonexchangeable multi-agent systems consisting of non-identical agents is addressed, where the heterogeneous distribution of connectivities in the network is known to have critical effects on the collective dynamics. Our method of proof does not only involve PDEs and stochastic analysis, but also graph theory through a novel concept of limits of sparse graphs (extended graphons) for the structure of the network, which can be regarded as a new non-trivial extension of the seminal works by L. Lovasz and B. Szegedy for dense graph limits. Our proof allows removing some of the main restrictive hypotheses in the previous literature on the connectivities between agents (dense graphs) and the cooperation between them (symmetric interactions). This is a joint work with Pierre-Emmanuel Jabin (Penn State University) and Juan Soler (University of Granada).