

UNIVERSITY OF CRETE
DEPARTMENTS OF MATHEMATICS AND APPLIED MATHEMATICS

ANALYSIS SEMINAR

10:00am, Wednesday, 11 March 2020
Room A-303

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A generalization of Young measures for the hydrodynamic limit of condensing zero range processes

Zero range processes (ZRP) are stochastic interacting particle systems with zero range interaction. For particular choices of their parameters they exhibit phase separation with the emergence of a condensate. Such ZRPs are referred to as condensing and their hydrodynamic limit is not known, but is expected to be a degenerate non-linear diffusion equation where the diffusivity vanishes above a critical density ρ_c . In this talk we propose a generalization of the notion of Young-measures which allows to obtain a closed equation as the hydrodynamic limit of condensing ZRPs. We focus on symmetric ZRPs in the discrete torus and prove that the laws of the empirical density of the ZRP in terms of generalized Young-measures are concentrated on generalized Young measure-valued weak solutions $\pi = (\pi_t)_{t \geq 0}$ to the equation $\partial_t \pi = \Delta \Phi(\pi)$ where $\Phi(\rho)$ is the local mean jump rate of particles under a grand canonical equilibrium state of mean density $\rho \geq 0$.