Predators-prey model with competition, the emergence of packs and territoriality

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I will present a series of works in collaboration with Henri Berestycki, dealing with systems of predators interacting with a single prey. The system is linked to the Lotka-Volterra model of interaction with diffusion, but unlike more classic works, we are interested in studying the case where competition between predators is very strong: in this context, the original domain is partitioned in different sub-territories occupied by different predators. The question that we ask is under which conditions the predators segregate in packs and whether there is a benefit to the hostility between the packs. More specifically, we study the stationary states of the system, the stability of the solutions and the bifurcation diagram, and the asymptotic properties of the system when the intensity of the competition becomes infinite.