

# SEMINÁRIO

## ANÁLISE E EQUAÇÕES DIFERENCIAIS

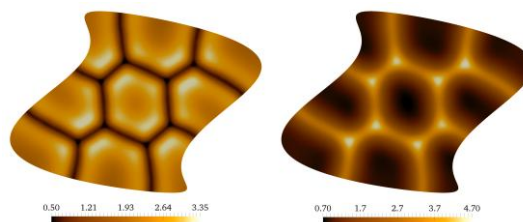
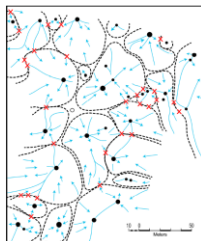
**2 de Maio | 13h30 | sala 6.2.33**

### **Predator-prey model with competition, the emergence of territoriality**

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#### **Abstract:**

I will present a series of joint works in collaboration with Henri Berestyki (EHESS-PSL). We study systems of reaction-diffusion equations modelling predators that compete with each other and interact with a single prey. These systems are related to models arising in multi-phase Bose-Einstein condensates particle annihilations and also spatially distributed chemical reactions. We analyze the situation of predators, like wolves or coyotes, that can divide up into several hostile packs. The motivation comes from understanding the conditions under which predators segregate into packs, whether there is an advantage to have such hostile packs, and to compare the various territory configurations that arise in this highly competitive environment. Mathematically, we focus on the analysis of stationary states, stability issues, and the asymptotic of the system when the competition parameter or the number of packs become unbounded. These questions lead us to show new a priori estimates and qualitative properties for the solutions of systems of reaction-diffusion equations.



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