

FLACAM 2019

French Latin - American Conference on New Trends in Applied Mathematics
5 - 8 November, Santiago – Chile

<http://eventos.cmm.uchile.cl/flacam2019/>

Diffusion and competition in population and gender dynamics

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Reaction-diffusion models have been widely used to study fundamental questions in population dynamics. This type of partial differential equations provide a way to translate local assumptions regarding the movement, growth and interactions for the individuals of a species, into global features of the population. Thus, reaction-diffusion models provide a theoretical framework for questions such as the persistence of a species, invasions, and coexistence of populations. Mathematical tools from non-linear analysis and dynamical systems can be used to study the consequences of population characteristics have in the long term dynamics. We will discuss how the relationship between population dispersal strategies, environmental factors and competition affects the persistence and coexistence of two species.

In this talk we will also explore issues related to the persistence and dispersal of women in a STEM environment, in which they account for less than 30% of the population. We will discuss the strategies which have been key for persistence, allowing women in STEM to grow and thrive through the formation and strengthening of networks and alliances. In particular, we will discuss the process that led to the creation of the Direction for Diversity and Gender, the first of this kind in a Faculty of Sciences, Math, and Engineering in Chile, and some research projects that the direction is pursuing.