Enrico VALDINOCI
University of Western Australia

***Title*:** *A mathematical model for civil wars: a new Lotka-Volterra competitive system.*

***Abstract*:** We introduce a new model in population dynamics that describes two species sharing the same environmental resources in a situation of open hostility. The interaction among these populations is described not in terms of random encounters but via the strategic decisions of one population that can attack the other according to different levels of aggressiveness.
This leads to a non-variational model for the two populations at war, taking into account structural parameters such as the relative fit of the two populations with respect to the available resources and the effectiveness of the attack strikes of the aggressive population.
The analysis that we perform is rigorous and focuses on the dynamical properties of the system, by detecting and describing all the possible equilibria and their basins of attraction.
Moreover, we will analyze the strategies that may lead to the victory of the aggressive population, i.e. the choices of the aggressiveness parameter, in dependence of the structural constants of the system and possibly varying in time in order to optimize the efficacy of the attacks, which take to the extinction in finite time of the defensive population.
The model that we present is flexible enough to also include technological competition models of aggressive companies releasing computer viruses to set rival companies out of the market.
This is a joint work with E. Affili, S. Dipierro and L. Rossi.