

First Joint Meeting Brazil Italy of Mathematics  
Special Session: Control and Asymptotics in Nonlinear  
PDE dynamics

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**Title:** Optimal control for some diffuse-interface models for binary fluids with nonlocal interaction

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**Abstract:** In the first part of the talk we shall recall the main results recently proven concerning well-posedness, regularity and long-time behavior for the nonlocal Cahn-Hilliard/Navier-Stokes system with different assumptions on the double-well potential, mobility and viscosity. Then, in the situation of regular potential and constant mobility and singular potential associated with a degenerate mobility we shall consider some related optimal control problems in 2D. For these cases, first order necessary conditions for the existence of the optimal control will be presented. Joint work with E. Rocca, M. Grasselli and J. Sprekels.