**WENLU - Workshop on Nonlinear Partial Differential Equations and Geometric Analysis**
**UFPB - Universidade Federal da Paraíba**
**João Pessoa - Brazil, February 20-24, 2018**

# On two equations modeling bridges oscillations

Ederson Moreira dos Santos *

In the first model we consider the deck of the bridge as a beam and we present sharp results about the finite space blow up of the solutions of a fourth order ODE. In the second model we see the deck of the bridge as a plate where the two short edges are hinged whereas the two long edges are free. We study a nonlocal fourth order evolution equation and we present some theorems on the stability/instability of *simple modes* motivated by a phenomenon which is visible in actual bridges and we complement these theorems with some numerical experiments.

This talk is based on joint works with Denis Bonheure (Universit libre de Bruxelles), Filippo Gazzola (Politecnico di Milano), and Vanderley Ferreira Jr (Universidade Estadual de Campinas).

*ICMC,USP email: ederson@icmc.usp.br