

CMM PDE Seminar

January 22th, at 12:10 pm

Speaker: **Claudio Muñoz**

"Error bounds for Physics Informed Neural Networks in Nonlinear Schrödinger equations placed on unbounded domains"

Abstract: We consider the subcritical nonlinear Schrödinger (NLS) in dimension one posed on the unbounded real line. Several previous works have considered the deep neural network approximation of NLS solutions from the numerical and theoretical point of view in the case of bounded domains. In this paper, we introduce a PINNs method to treat the case of unbounded domains and show rigorous bounds on the associated approximation error in terms of the energy and Strichartz norms, provided reasonable integration schemes are available. Applications to traveling waves, breathers and solitons, as well as numerical experiments confirming the validity of the approximation are also presented as well.

January 22th, at 04:10 pm

Speaker: **Jarosław Mederski**

"Multiple normalized solutions to a system of nonlinear Schrödinger equations"

Abstract: We present recent results concerning normalized solutions to a system of coupled nonlinear Schrödinger equations. The problem appears in different areas of mathematical physics, e.g. in the analysis of Bose-Einstein condensation or in nonlinear optics. By means of spectral results, the Cwikel-Lieb-Rozenblum theorem, the Morse index and new Liouville-type results we show the existence of multiple normalized solutions for sufficiently large coupling. The talk is based on joint work with Andrzej Szulkin.

For both talks

Venue: DIM seminar room, Beauchef 851, 5th floor.

Zoom:

<https://uchile.zoom.us/j/96642349167?pwd=MkRVbWxzOFBUUXICTWFicW0reWZ6cz09>