



THE UNIVERSITY  
of NORTH CAROLINA  
at CHAPEL HILL

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## Analysis and PDE Seminar

February 22, 2023

3:00 - 4:00 p.m.

PH 328

### On co-dimension one stability of the soliton for the 1D focusing cubic Klein-Gordon equation

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**Abstract.** Solitons are particle-like solutions to dispersive evolution equations whose shapes persist as time goes by. In some situations, these solitons appear due to the balance between nonlinear effects and dispersion, in other situations their existence is related to topological properties of the model. Broadly speaking, they form the building blocks for the long-time dynamics of dispersive equations.

In this talk I will present joint work with W. Schlag on long-time decay estimates for co-dimension one type perturbations of the soliton for the 1D focusing cubic Klein-Gordon equation (up to exponential time scales), and I will discuss our previous work on the asymptotic stability of the sine-Gordon kink under odd perturbations. While these two problems are quite similar at first sight, we will see that they differ by a subtle cancellation property, which has significant consequences for the long-time dynamics of the perturbations of the respective solitons.