PNU-IBS workshop on Axion Physics : Search for axions



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Cosmological Solitons

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The study of localised stable solitons in 3+1 dimensional field theory often hinges on a loophole to Derrick's theorem that states that stable localised solutions may exist if they are periodic in time, such as in the case of a time dependent complex phase. The possible presence and influence of such dynamic solitons may have important consequences for the evolution of the early universe in structure formation or in the present universe as dark matter candidates. This talk will discuss a number of examples in soliton theory. Firstly, on large Q-balls and the simulation of their collisions including gravitational effects and secondly, on possible solitons in axion electrodynamics in the presence of a time dependent axion field.

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