Tel Aviv University , Physics Colloquium — Yossef Dothan Memorial Lecture

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Cambridge

Melamed

Solitons and Skyrmions

Is a particle point-like? If not, how can we describe a particle of finite size? A point electron has an infinite electric field at its centre, and this leads to severe difficulties in classical electromagnetism. Solitons are particle-like objects that are smooth and of finite size. They occur in many nonlinear field theories. A Skyrmion is a good example. It appears in a physically sensible approximation to strong interaction physics, involving interacting pion fields. In this talk I will show how Skyrmions provide a model for protons and neutrons, and larger atomic nuclei.