

## Skymions and rho mesons, a numerically demanding relationship for nuclei

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The Skyrme model is a low energy effective field theory of strong interactions where nuclei and baryons appear as topological solitons, more concretely as collective excitations of pionic degrees of freedom. Proposed by Tony Skyrme in the sixties, his ideas received further support when it was discovered that in the limit of the large number of colours of QCD, an effective theory of mesons arises. In the last years, there has been a revival of Skyrme's ideas and new related models have been proposed to overcome two of the main drawbacks of the theory, namely, the too large binding energies and the lack of cluster structures. The aim of this talk is to successfully address both issues at the same time, something that has not been done before, by extending the standard Skyrme model with the inclusion of the rho meson, via dimensional deconstruction of pure Yang-Mills theory in one higher dimension. The complexity of the resulting energy functional makes the use of HPC resources mandatory to successfully deliver this task.

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