Contribution ID: **124**   Type: **Parallel Talk**

Q-monopole-ball: a topological and nontopological soliton

Monday 8 August 2022 15:00 (20 minutes)

Magnetic monopoles and Q-balls are examples of topological and nontopological solitons, respectively. A new soliton state with both topological and nontopological charges is shown to also exist, given a monopole sector with a portal coupling to an additional scalar field S with a global U(1) symmetry. This new state, the Q-monopole-ball, is more stable than an isolated Q-ball made of only S particles, and it could be stable against fissioning into monopoles and free S particles. Stable Q-monopole-balls can contain large magnetic charges, providing a novel nongravitational mechanism for binding like-charged monopoles together. They could be produced from a phase transition in the early universe and account for all dark matter.

Collaboration name

Author: Dr ORLOFSKY, Nicholas (Carleton University)

Co-authors: BAI, Yang (University of Wisconsin, Madison); LU, Sida (Tel Aviv University)

Presenter: Dr ORLOFSKY, Nicholas (Carleton University)

Session Classification: Dark Matter

Track Classification: Dark Matter