Contribution ID: **141** Type: **Parallel**

Implication of Chiral Symmetry on the Heavy-Light Spectroscopy

Tuesday, 29 May 2018 16:30 (30 minutes)

For a long time, the quark model has served as an ordering scheme and brought systematics into the hadron zoo. However, many new hadrons that were observed since 2003, including the lowest-lying positive-parity charm-strange mesons $D^{\star}_{s0}$(2317) and D_{s1}(2460), do not conform with quark model expectations. Various modifications to the quark model and alternative approaches have been proposed ever since to explain their low masses and decay properties. We demonstrate that if the lightest scalar (axial vector) states are assumed to owe their existence to non-perturbative $\pi/\eta/K - D^{(\star)}/D_s^{(\star)}$ scattering, various puzzles in the D-meson spectrum get resolved. Most importantly the ordering of the lightest strange and non-strange scalars becomes natural. We show the well constrained amplitudes for Goldstone-Boson$-D/D^{\star}$ scattering are fully consistent with recent high quality data on $B^- \to \pi^-\pi^-D^+$ final states. This implies that the lowest quark-model positive-parity charm mesons, together with their bottom cousins, if realized in nature, do not form the ground-state multiplet. This is similar to the pattern that has been established for the scalar mesons made from light up, down and strange quarks, where the lowest multiplet is considered to be made of states not described by the quark model. In a broader view, the hadron spectrum must be viewed as more than a collection of quark model states.

E-mail

du@hiskp.uni-bonn.de

Primary author: Dr DU, Meng-Lin (Helmholtz-Institut f\"ur Strahlen- und Kernphysik and Bethe Center for Theoretical Physics, Universit\"at Bonn)

Presenter: Dr DU, Meng-Lin (Helmholtz-Institut f\"ur Strahlen- und Kernphysik and Bethe Center for Theoretical Physics, Universit\"at Bonn)

Session Classification: QCD, Hadron Spectroscopy, and Exotics

Track Classification: QCDHS