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# KMI Theory Seminar

Monday, December 12, 2011

3:00 pm, KMI Science Symposia (ES635)

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“Hidden local symmetry and color confinement”

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Abstract:

The hidden local symmetry is a successful model to describe the properties of the vector mesons in QCD. We point out that if we identify this hidden gauge theory as the magnetic picture of QCD, a linearized version of the model simultaneously describes color confinement and chiral symmetry breaking. We demonstrate that such a structure can be seen in the Seiberg dual picture of a softly broken supersymmetric QCD. The model possesses exact chiral symmetry and reduces to QCD when mass parameters are taken to be large. Working in the regime of the small mass parameters, we show that there is a vacuum where chiral symmetry is spontaneously broken and simultaneously the magnetic gauge group is Higgsed. If the vacuum we find persists in the limit of large mass parameters, one can identify the rho meson as the massive magnetic gauge boson, that is an essential ingredient for color confinement.