



Contribution ID: 39

Type: **not specified**

Symmetry Breaking by Topology and Energy Gap

Thursday, 19 May 2016 17:50 (20 minutes)

A symmetry breaking mechanism is discussed which exhibits radically different properties compared with the Goldstone and the Higgs mechanisms: the interplay between symmetries of a quantum system and the topology of the manifold of particle configurations can account for both the breaking of an internal symmetry and the presence of an energy gap. Such features are clearly displayed by the quantum particle on a circle and the Bloch electron, for instance.

In fact, the fundamental group of the manifold of the positions of the quantum system gives rise to elements of the center $\mathcal{Z}$ of the observable algebra: symmetries that do not commute with the topological invariants represented by elements of $\mathcal{Z}$ are then spontaneously broken in each irreducible representation of the observable algebra compatibly with an energy gap.

Primary authors: Dr HEISSENBERG, Carlo (SNS); STROCCHI, Franco (PI)

Presenter: Dr HEISSENBERG, Carlo (SNS)

Session Classification: Parallel Session 19 pm 2