Special Issue

Boundaries in Quantum Field Theories

Message from the Guest Editor

The role of boundaries is crucial in many aspects of quantum field theories. The first example which comes to mind might be the Casimir effect, which motivated Symanzik in 1981 to formulate a systematic way to introduce boundaries in QFTs. He translated the presence of a boundary by means of a condition on the propagators, which vanish if calculated for points lying on opposite sides of the boundary. A lot has changed since then. Think, for instance, of topological field theories, which do not have local degrees of freedom, the only observables being geometrical, global holes of the manifolds, knots, etc. These are theories linked to vanishing Hamiltonian, where fields have no particle interpretation. Nonetheless, when a boundary is introduced, topological field theories acquire a physical life: Quantum spin Hall states appear on the edge of three-dimensional topological Chern–Simons theory.

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Message from the Editor-in-Chief

Symmetry is ultimately the most important concept in natural sciences. It is not surprising then that very basic and fundamental research achievements are related to symmetry. For instance, the Nobel Prize in Physics 1979 (Glashow, Salam, Weinberg) was received for a unified symmetry description of electromagnetic and weak interactions, while the Nobel Prize in Physics 2008 (Nambu, Kobayashi, Maskawa) was received for the discovery of the mechanism of spontaneous breaking of symmetry, including CP symmetry. Our journal is named *Symmetry* and it manifests its fundamental role in nature.

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