

Théorie conforme des champs et systèmes quantiques à plusieurs corps
21 août – 9 septembre 2022

Conformal field theory and quantum many-body physics
August 21 – September 9, 2022

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**Topological Quantum Matter, Entanglement, and the
Second Quantum Revolution**

While the laws of quantum mechanics have remained unchanged and have passed all tests for the last eighty-five years, new discoveries about the exotic states that they allow, “entanglement”, and ideas from quantum information theory, have greatly changed our perspective, and some believe that a “second quantum revolution” is currently underway. The discovery of unexpected “topological states of matter”, and their possible use for “topologically-protected quantum information processing” is one of the important themes of these developments, and will be described.