

Titulo:

"Quantum computing with the chiral anomaly"

Abstract:

One of the cornerstones of quantum field theory is the concept of anomaly: a classical symmetry is broken by quantum effects. While anomalies have been discovered in particle physics (the decay of the neutral pion into two photons) in recent years they have played a major role in condensed matter physics. In particular topological quantum matter is intimately related to anomalies. One example of topological quantum matter are the so-called Weyl semimetals. The electronics of these materials realizes effectively the axial anomaly. Via the chiral magnetic effect the axial anomaly generates dissipationless currents. A recent proposal in the literature suggests to use this effect as basis for a new qubit architecture. The TFM shall explore the underlying theoretical principles of this new qubit architecture.