

Abstract for an Invited Paper
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Interferometric schemes for the detection of non-abelian statistics¹

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States of matter are conventionally classified according to broken symmetries. Topologically ordered phases fall outside of this paradigm: with no local order parameter, they nevertheless have many peculiar properties setting them apart from disordered phases. In 2D, such phases may support anyons - quasiparticles that are neither bosons nor fermions. Moreover, anyons with *non-Abelian* statistics can occur, particularly in the fractional quantum Hall regime.

In this talk, I will focus on solid state interferometers designed to detect such exotic statistics. I will discuss recent experiments in the $\nu = 5/2$ quantum Hall state where the evidence for the existence of non-Abelian quasiparticles may have in fact been observed for the first time [1]. Potential applications of such interferometric schemes for topological quantum computation will also be addressed.

[1] R. L. Willett, L. N. Pfeiffer and K. W. West, PNAS **106**, 8853 (2009).

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