

Special Day and Location
Condensed Matter Seminar

Professor Mike Peterson
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Topologically ordered phases in realistic models

Friday, April 21, 4:00 p.m.

1004 Pamplin Hall

In strongly correlated systems in two-dimensions, new quantum topologically ordered phases of matter can emerge—the fractional quantum Hall effect is the paradigmatic example. These phases support (quasi-)particle excitations with fractional charge and fractional (braiding) statistics, i.e., anyons. A special variety of anyons called non-abelian anyons have potential applications in the construction of fault-tolerant topological quantum computers. I will discuss numerical studies of exotic topological phases in the second Landau level of the fractional quantum Hall effect. In particular, I will include the realistic effect of Landau level and sub-band mixing and discuss particle-hole symmetry breaking. In addition, I will discuss the possibility of topologically ordered phases in realistic spin models.