



# Lectures in Quantum Information

*“The physics of topological quantum computing:  
selected topics”*

Anthony Leggett

Thursday, June 4th

Tuesday, June 9th

Tuesday, June 16th

Thursday, June 18th

Tuesday, June 23rd

Thursday, June 25th

Tuesday, June 29th

Thursday, July 2nd

2:00 - 3:00pm

RAC 2009

Everyone  
Welcome

## Abstract

Building on last year's course (which will be recapped in the first one or two lectures) as a base, I address various questions related to the physical (as distinct from the algorithmic) aspects of the effort to build a topologically protected quantum computer.

Possible topics include:

- The meaning of "two-dimensional": how meaningful is it in real life, and what are the consequences of its partial failure?
- The current evidence for and against the "Pfaffian" identification of the  $\nu=5/2$  FQHE state.
- Possible ansätze for the many-body wave function of a  $(p+ip)$  Fermi superfluid, and their consequences for the viability of TQC in this system.
- The nature of Majorana fermions and their relation to ground state entanglement.

Various other topics may be included by popular demand.

## About the speaker

Anthony J. Leggett, the John D. and Catherine T. MacArthur Professor and Center for Advanced Study Professor of Physics, has been a faculty member at Illinois since 1983. He is an Associate Member and a member of the Scientific Advisory Committee at the Institute for Quantum Computing, University of Waterloo. He is widely recognized as a world leader in the theory of low-temperature physics, and his pioneering work on superfluidity was recognized by the 2003 Nobel Prize in Physics.

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