

# Ian Affleck- Condensed Matter Theory

## Novel Quantum Effects in Low Dimensional Magnetism

- theory of electron spin resonance for quantum spin chains: solitons and breathers
- magnetization plateaux in spin-1/2 chains
- entanglement entropy in spin-1/2 chains
- Bose condensation in Haldane gap (integer spin) chains

# Quantum Impurity Problems

- Conformal field theory method for exact solutions of Kondo-type models
- Exotic phase of triple quantum dot system
  - possible realization in gated semi-conductor quantum dot structures or in STM experiments
- The Kondo screening cloud –proposals to observe it in quantum dot experiments
- Entanglement entropy and the Kondo screening cloud
- Y-junctions of quantum wires
  - a novel magnetic switching phenomena