



PhD School in Nano and Physical Sciences 2011

**"Advanced Solid State Physics"** (16 ore- 4 ECTS) Massimo Rontani (CNR-NANO S3)

Program:

Magnetism: Phenomenology  
Simple models of atomic behavior  
Second quantization  
Exchange interaction  
Hubbard Hamiltonian  
Model Hamiltonians  
Spin waves (Part I and II)