

# Lecture on condensed matter magnetism

Virginie Simonet<sup>1,\*</sup>

<sup>1</sup>*Institut Néel, CNRS/Univ. Grenoble Alpes, Grenoble, France*

**Abstract.** The aim of this lecture is to recall the basis of magnetism. The lecture will start with the isolated atom and the definition of the atomic magnetic moment. The Hund's rules, spin-orbit coupling and crystal field theory will be presented. Then the thermodynamics of an assembly of such isolated magnetic moments will be considered. The different types of interactions between magnetic moments will be described as well as the resulting collective behaviors (static and dynamics). From this microscopic description, the macroscopic behavior of magnetic materials adapted to micromagnetic studies will be succinctly described. Finally an emphasis will be given to the tools devoted to the study of magnetic materials and to the modern trends of research in this field of magnetism.

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\*e-mail: [virginie.simonet@neel.cnrs.fr](mailto:virginie.simonet@neel.cnrs.fr)