# Practical on Units

Olivier Fruchart
SPINTEC, Grenoble, France
*olivier.fruchart@cea.fr

This hands-on practical on units of physical quantities follows and extands the lecture "Fields, Moments, Units". In this tutorial we derive the dimensions for physical quantities of use in magnetism, and their conversions between cgs-Gauss and SI.

**Topics:**

1. Notations
    a. Physical quantity, dimension
    b. 4 fundamental dimensions, MKSA system
2. Finding dimensions of physical quantities based on physical laws
    a. Mechanics
    b. Magnetism
3. Conversions (SI – cgs)
    a. Force, energy
    b. Magnetic induction, flux, magnetic moment, magnetization
    c. Vacuum permeability
    d. Magnetic susceptibility, demagnetizing coefficients

**Recommended reading:**

[1] Bureau International des Poids et Mesures: http://www.bipm.org/
[2] siunitx LaTeX package: https://ctan.org/pkg/siunitx
[3] F. Cardarelli, Encyclopedia of Scientific Units, weights and measures, Springer, London, 2003.