

# Particle detection, data acquisition and analysis

## Lecturers

Gilles DE LENTDECKER (Coordinator), Ioana Codrina MARIS and Pascal VANLAER

## Course mnemonic

PHYS-F420

## ECTS credits

5 credits

## Language(s) of instruction

English

## Course period

First term

## References, bibliography and recommended reading

G. Knoll, "Radiation Detection and Measurement", 3ème édition (2000)

Review of Particle Physics, Physics Letters B vol 592, 15 Juillet 2004 (ainsi que le booklet) Particle Data Group Review Articles: <http://pdg.web.cern.ch/pdg/>

D. Green, "The Physics of Particle Detectors"

G.Cowan, "Statistical data analysis", Oxford Science Publications, 2002

FRUHWIRTH R. et al., "Data Analysis Techniques for High-Energy Physics. 2nd edition", Cambridge Monographs on Particle Physics, Nuclear Physics and Cosmology 11, 2000

## Other information

### Contact(s)

Catherine.Vander.Velde@ulb.ac.be Tel 02 629 3208 <http://uv.ulb.ac.be>

## Evaluation method(s)

Other

### Evaluation method(s) (additional information)

Average of marks obtained for the personal works and an oral examination.

## Programmes

### Programmes proposing this course at the faculty of Sciences

MA-PHYS | **Master in Physics** | finalité Research/unit 1 and finalité Teaching/unit 1

## Course content

Collider experiments : physics goals, general layout, tracking detectors (including silicon and gaseous detectors, track reconstruction and momentum resolution), calorimeters (including cristal calorimeters, energy reconstruction and resolution), signal processing, physics objects reconstruction and particle identification.

## Objectives (and/or specific learning outcomes)

Be able to understand and evaluate the published results of present large experiments.

## Teaching method and learning activities

The content is transmitted via notes, slides and video lectures presented on the virtual university and through the discussions of the assignments (travaux personnels) presentations, as well as through one week of laboratory courses. The assignments consist in problems to solve.