

PH2930 Nuclear Physics Laboratory

Professor: Guillaume Trap

Language of instruction: French – **Number of hours:** 36 – **ECTS:** 3

Prerequisites: PH1100 or equivalent. Due to site visit restrictions, the students registered in this lab series must have a French passport

Period: S8 Elective 13, One-week module 2 16-20 May IN28IS2, SEP8IS2

Course Objectives

This module provides an experimental introduction to the physics of nuclei and nuclear technologies. It aims at educating engineers/researchers with clear and sound ideas about this field.

On completion of the course, students should be able to

- ◇ understand the basics of nuclear physics (structures of nuclei, radiations, natural and artificial radioactivity, fusion-fission-transmutation, nuclear astrophysics, etc)
- ◇ deal with radiation hygiene
- ◇ master nuclear detection and diagnostic techniques
- ◇ exploit the potentials of nuclear technologies

Course Contents

- ◇ One-day introductory courses (1-nuclei, 2-radiations, 3-energy, 4-cosmos)
- ◇ One-day introductory demonstrations at the science museum "Palais de la découverte" (cloud and spark chambers, radioactive sources, alpha-beta-gamma-cosmic rays detectors, deuteron accelerator and neutron beam, etc)
- ◇ Three half-days labworks (driving ISIS reactor, measurements of radioactive lifetimes, study of alpha emission, gamma-ray spectroscopy)
- ◇ One-day visit at CEA labs in Bruyères (TERA supercomputer, linear accelerator, etc)

Lunches with the speakers and former centralians.

Course Organization

Lectures, labwork and visits: 36hr

Week booked 2 + two Tuesdays

Teaching Material and Textbooks

- ◇ Lecture notes about radiations
- ◇ Slides of the presentations

Evaluation

Written reports.