

## CHAPTER OVERVIEW

### 8: Applications of Nuclear Science

We have now a clearer picture of the nuclear structure and of the radioactive decays, as well as the formalism –based on quantum mechanics and quantum field theory– that describes their dynamics. We can turn to the study of some applications of these ideas.

First, we will study how radiation interacts with matter. This is fundamental both in order to know what are the effects of radiation emitted during nuclear processes on the materials around (and the people) and in order to devise detectors that can measure these radiations. At the same time the knowledge of how radiation interacts with matter leads to many important applications in e.g. nuclear medicine, for imaging and therapy, in materials science, for imaging and diagnostic, in agriculture, archeology etc. Most of you might have already studied these applications in 22.01 and also analyzed the processes that give rise to the interactions. Thus we will be here only have a quick review, focusing mostly on the physical processes.

Then we will study two nuclear reactions (fission and fusion) that can be used as sources of energy (or in the case of fusion, that holds that promise).

#### 8.1: Interaction of Radiation with Matter

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