

# 12th Course - Challenges in Radiation Damage and Radiation Protection during Design and Operation of Accelerator Facilities and Space Missions

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## **Models and Tools - Introduction to Monte-Carlo Methods Part 1**

*Tuesday 24 October 2023 15:15 (1h 10m)*

The role of the Monte-Carlo method in radiation calculations is discussed, highlighting its advantages and limitations. Probability distributions and sampling techniques are introduced, and the behavior of statistical uncertainty is characterized. The framework adopted for the simulation of particle transport and interactions is described, distinguishing between continuous and discrete processes. While the first ones are dealt with by a condensed history approach, the latter ones are treated according to a scheme coupling integral cross section evaluations, used to determine when a given type of interaction occurs, and physics models returning its final products.

**Presenter:** CERUTTI, Francesco (CERN)