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Geant4 for medical physics applications

Page currently under revision

These web pages provide information about the use of Geant4 in medical physics. They are maintained by the Geant4 Collaboration. Please contact Sebastien Incerti and Susanna Guatelli if you would like to include information and to provide feedback.

Where to start from

Users should refer to the [Geant4 Installation Guide](#) . It is also possible to download a Geant4 virtual machine ([link](#)).

Once Geant4 is installed, beginners are recommended to get practice with Geant4 by means of the *basic examples* to understand the fundamental functionality of Geant4 (e.g. geometry, physics, scoring, UI, analysis, visualisation). Users can refer to many *extended* and *advanced examples* to use Geant4 in medical physics applications.

Physics, geometry and tracking

- Navigation
- Physics
- Biasing
- CPU performance
- Reverse Monte Carlo
- Interfaces (phase spaces, anatomy/dose rendering)

Radiobiology: Geant4-DNA extensions

Geant4 Physics electromagnetic processes are available for the simulation of particle interactions down to the electronVolt and molecular scale in liquid water, the main component of biological medium. Developments are on-going in the framework of the **Geant4-DNA project**, initiated by P. Nieminen ([European Space Agency/ESTEC](#)) in order to model Physics, Chemistry and Biology processes for the simulation of biological effects of ionizing radiation.

A description of the **Geant4-DNA project** and its status is accessible directly from [this link](#).

It is **part of a larger development activity**, the development of **Physics Models for Biological Effects of Radiation and Shielding** , as detailed [here](#).

Selected references can be found [here](#).

Geant4 Extended examples for medical physics applications

* DICOM

Geant4 Advanced examples for medical physics applications

Geant4 short courses and workshops

General links

- Geant4 User Forum for medical applications
- Past and future events
- European Network for Light Ion Therapy (ENLIGHT) - [link](#)
- Radiation Damage in Biomolecular Systems (RADAM) - [link](#)
- Computational Medical Physics working group - [link](#)
- The UK forum for users of Monte Carlo Neutron, Electron and Gamma radiation transport codes (MCNEG) - [link](#)
- Computational medical physics working group home page - [link](#)
- Computational physics group - [link](#)
- The European Radiation Dosimetry Group - [link](#)

The medical physics pages are maintained by Sebastien Incerti and Susanna Guatelli

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This topic: Geant4 > Geant4MedicalPhysics

Topic revision: r36 - 2019-09-10 - SusannaGuatelli



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