

Welcome !



geant4-dna.org

Geant4-DNA tutorial
Princess Srisavangavadhana Faculty of Medicine,
Bangkok, Thailand
18-20/03/2026

Geant4 version 11.4.0
Released in December 2025

A big thank you!

■ Tutorial's organizers

- [Thiansin Liamsuwan](#)
Princess Srisavangavadhana Faculty of Medicine,
Chulabhorn Royal Academy, Thailand
- [Yeon Soo Yeom](#)
Yonsei U., Republic of Korea

■ And to lecturers

- [Konstantinos Chatzipapas](#), TU Delft, The Netherlands
- [Sebastien Incerti](#), CNRS, France
- [Anh Tuan Le](#), INST, Vietnam
- [Dousatsu Sakata](#), AIST, Japan
- [Hoang Tran](#), CNRS, France

This tutorial

- **Introduce users to Geant4 and Geant4-DNA**
 - **Introduction** to Geant4 and hands-on in medical physics
 - **Overview** of the Geant4-DNA project
 - Introduction **lectures** to **key components**
 - **Physics**: track structures
 - **Chemistry**: water radiolysis
 - (sub-)cellular scale **geometries**
 - **Biological damage** prediction
 - **Hands-ons** based on a selection of **user examples**
- All software is **already fully included in Geant4**
 - No other external software needed
- We also showcase our **Geant4 Virtual Machine** for easier access to Geant4(-DNA)

Today's schedule

<https://indico.in2p3.fr/event/36861/>

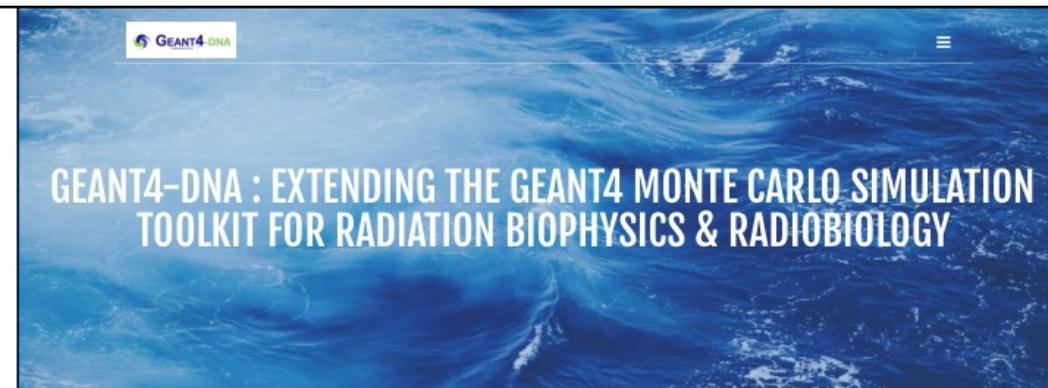
MER. 18 MARS			
13:00	→ 14:00	Introduction to Geant4 Orateur: D. Sakata	🕒 1h
14:00	→ 14:30	Geant4 Virtual Machine installation check Orateur: S. Incerti	🕒 30m
14:30	→ 16:00	Hands-on: dosimetry in a water phantom Orateur: D. Sakata	🕒 1h 30m

JEU. 19 MARS			
09:00	→ 09:05	Welcome Orateur: Organisers -	🕒 5m
09:05	→ 10:00	Overview of the Geant4-DNA Project Orateur: D. Sakata	🕒 55m
10:00	→ 11:00	Geant4-DNA Physics Orateur: S. Incerti	🕒 1h
11:00	→ 11:30	Break	🕒 30m
11:30	→ 12:30	Hands-on: Physics Orateur: S. Incerti	🕒 1h
12:30	→ 14:00	Lunch	🕒 1h 30m 📍 - (tbd)
14:00	→ 15:00	Geant4-DNA Chemistry Orateur: H. Tran	🕒 1h

VEN. 20 MARS			
09:00	→ 10:00	Hands-on: Chemistry Orateur: H. Tran	🕒 1h
10:00	→ 10:30	Break	🕒 30m
10:30	→ 11:30	Geant4-DNA Biology Orateur: K. Chatzipapas	🕒 1h
11:30	→ 13:00	Lunch	🕒 1h 30m 📍 - (tbd)
13:00	→ 14:00	Hands-on: Biology / dsbandrepair Orateur: A. T. Le	🕒 1h
14:00	→ 15:00	Hands-on: Biology / molecular dna Orateur: K. Chatzipapas	🕒 1h

The Geant4-DNA website

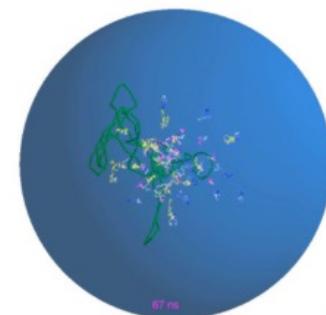
<https://geant4-dna.org/>



Welcome to the web page of the Geant4-DNA project !

The **Geant4** general purpose particle-matter Monte Carlo simulation toolkit is being extended with processes for the **modeling of biological damage induced by ionising radiation at the DNA scale**. Such developments are on-going in the framework of the Geant4-DNA project. This project was originally initiated by the **European Space Agency (ESA)**. Developments are undertaken by an international collaboration, coordinated since 2008 by the **National Institute of Nuclear and Particle Physics (IN2P3)** of the **National Centre for Scientific Research (CNRS)** in France, in collaboration with the **Geant4@IN2P3** activities.

Once published, all developments are freely accessible in **full open access** through the **Geant4 toolkit** or through our **Geant4 Virtual Machine**.



Irradiation of a pBR322 plasmid, including radiolysis
- movie courtesy of V. Stepan (NPI-ASCR/LP2IB-CENBG/CNRS/IN2P3/ESA) -

On-going **developments** include

- **Physics** processes in liquid water and other materials
- **Physico-chemistry and chemistry** processes for water radiolysis
- **Molecular geometries**
- Quantification of **biological damage** (such as single-strand, double-strand breaks, base oxidation...)

Dedicated **example applications** are provided as well.

Please refer to our list of **publications and theses** for more information.

Dedicated **documentation** is also provided in the Geant4 **Book For Application Developers**.

Our current **job listing** is available **here**.

You may follow us on **X** and **Bluesky**.

Last posts

Dec. 20, 2024: Geant4-DNA in the **winter 2024 issue of the EFOMP European Medical Physics News**.

Dec. 17, 2024: The **Geant4 11.3.0 LP2i Virtual Machine** with AlmaLinux 9 has been released, see **link**.

You may follow us on **X** and **Bluesky**

Geant4-DNA reference publications

Important notice:

Any communication, report or publication results obtained using the Geant4-DNA software shall cite at least the five following publications by the Geant4-DNA Collaboration

1. **Review of chemical models and applications in Geant4-DNA: Report from the ESA BioRad III Project**,
H. N. Tran et al.,
[Med. Phys. 51 \(2024\) 5873-5889 \(link\)](#)
2. **Geant4-DNA example applications for track structure simulations in liquid water: a report from the Geant4-DNA Project**,
S. Incerti et al.,
[Med. Phys. 45 \(2018\) e722-e739 \(link\)](#)
3. **Track structure modeling in liquid water: A review of the Geant4-DNA very low energy extension of the Geant4 Monte Carlo simulation toolkit**,
M. A. Bernal et al.,
[Phys. Med. 31 \(2015\) 861-874 \(link\)](#)
4. **Comparison of Geant4 very low energy cross section models with experimental data in water**,
S. Incerti et al.,
[Med. Phys. 37 \(2010\) 4692-4708 \(link\)](#)
5. **The Geant4-DNA project**,
S. Incerti et al.,
[Int. J. Model. Simul. Sci. Comput. 1 \(2010\) 157-178 \(link\)](#)

Thank you very much