



European  
Commission

# Euratom Research and Training Programme 2021-2025

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*"The newly adopted Euratom Programme will complement Horizon Europe. It will support research and innovation in areas such as cancer treatment and diagnostics, nuclear safety and fusion. Thanks to Euratom, Europe will maintain world leadership in fusion, nuclear safety, radiation protection, waste management and decommissioning, safeguards and security with the highest level of standards."*

**Mariya Gabriel** *Commissioner for Innovation, Research, Culture, Education and Youth*

The **Euratom Research and Training Programme (2021-2025)** is a nuclear research and training programme with an emphasis on the continuous improvement of nuclear safety, security and radiation protection. It complements the achievement of Horizon Europe's objectives including in the context of the energy transition as well as contributing to the implementation of the European fusion roadmap.

It has a budget of €1.38 billion distributed as follows:

- **€583 million** for actions in fusion research and development
- **€266 million** for actions in nuclear fission, safety and radiation protection
- **€532 million** for actions undertaken by the Joint Research Centre (JRC)

## THE NEW PROGRAMME CONTAINS FIVE MAIN NOVELTIES:

Fusion, nuclear safety, radioactive waste management and decommissioning, and radiation protection remain at the core of the Euratom research. The new Programme has five new features:

- 1. Simplification.** The structure of specific objectives has been streamlined and the number of objectives have been reduced.
- 2. Education and Training.** These activities have been strengthened to maintain and develop further nuclear expertise and knowledge in Europe. Nuclear researchers will be eligible to the Postdoctoral Fellowships of the Marie Skłodowska Curie actions to enhance the mobility of nuclear scientists.

3. **Synergies with Horizon Europe.** A clearer legal base for synergies with Horizon Europe has been provided. The Euratom Research and Training Programme uses mainly the same instruments and rules for participation as Horizon Europe.
4. **Synergies between actions.** Closer coordination and co-design of Work Programmes will allow nuclear researchers to better access to JRC expertise and its research infrastructure. Where relevant, the JRC will complement activities of the consortia receiving Euratom grants.
5. **Focus on health issues.** The new Euratom Work Programme addresses research on cross-sectorial fertilisation and non-power applications. An emblematic example is the use of ionising radiation to support safe and optimised medical procedures, contributing to Europe's Beating Cancer action plan. This will be implemented through a new Partnership initiative and topic in the Euratom work programme for 2021-22.

**Nuclear researchers** are constantly challenging the scientific state-of-the-art and creating conditions for innovation. Much of this innovation can be exploited in other science and industrial sectors, for the benefit of society. To reward and highlight outstanding researchers or industries, the Euratom Programme is awarding **the SOFT Prize (in the field of fusion) and the Nuclear Innovation Prizes (one in the field of safety of reactor systems and one for radioactive waste management).**

## ONGOING EURATOM PROJECTS



What are the long-term health consequences of radiological and radio therapeutic procedures for children and adolescents? **This is the investigation led by 24 partners from 11 Member States, Ukraine and Switzerland in the [HARMONIC project](#) ('Health Effects of Cardiac Fluoroscopy and Modern Radiotherapy in Paediatrics')** launched in 2019 with Euratom support of €7 million. The increasing use of radiation-associated diagnostic and therapeutic procedures have contributed to the improvements of early diagnosis and survival of paediatric patients. While benefits to the patient outweigh the radiation associated risk, the late effects of exposure of children are particularly important to understand in populations undergoing radiological and radio therapeutic procedures. HARMONIC focuses on two distinct and complementary populations: **Paediatric patients undergoing modern radiotherapy (including proton therapy) and paediatric patients undergoing interventional cardiology.** The research uses an integrated approach of conventional epidemiology, based on state-of-the art dosimetry, complemented by non-invasive imaging and molecular epidemiology. **HARMONIC will develop tools and guidelines for treatments reducing patients' doses in paediatric cardiology and oncology.**



**Small modular reactors (SMRs) have a great potential to provide safe and flexible nuclear power generation options.** They are currently considered in various countries as an alternative to large nuclear power plants and as part of the future energy-mix to achieve the low-carbon power generation goals with low risk and cost in a competitive energy market. **The Euratom-funded [McSAFER project](#) (2020-2023) aims to advance the safety research for SMRs by combining dedicated experimental investigations and numerical simulations.** It will carry out experiments on European thermal hydraulic test facilities in order to investigate SMR-specific safety-relevant phenomena. Additionally, the project will use advanced computational tools to conduct neutron-physical, thermal hydraulic and thermo-mechanic analyses of the reactor core of different SMR designs. Various numerical tools will demonstrate the safety features of an SMR core. **The project will play a role in promoting the safety of future nuclear power generation systems.**



The Euratom Programme supports innovations that improve decommissioning of Nuclear Power Plants. Particular attention is paid to the development of technologies for dismantling, risk characterisation and assessment, on-site radioactive waste management and environmental remediation. Existing conventional cutting techniques result in limited effectiveness. During the last decade, laser cutting technology emerged as a promising alternative for the segmentation of the reactor pressure vessel and internals. The Euratom-funded [LD-SAFE project \(2020-2024\)](#) will confirm the laser cutting technology for the dismantling of the most critical components of nuclear reactors. It will demonstrate the capabilities of a flexible laser cutting solution that meets the key technical challenges in dismantling, assessing its environmental and safety impacts and proving the economic advantages of its use.

## MOST OF THE EURATOM PROGRAMME WILL BE IMPLEMENTED THROUGH 3 EUROPEAN PARTNERSHIPS:

### ● EUROfusion

Fusion has the potential to provide a safe, cost-efficient and sustainable carbon-free solution to European and global energy needs. The EU is part of a **unique energy project called ITER**, which aims to build the world's biggest fusion machine. European fusion laboratories collaborate through a consortium called **EUROfusion - the European Consortium for Development of Fusion Energy** - in line with the long-term strategy set out in the European research roadmap to realise fusion energy. By fostering innovation and international collaborations, **the Partnership creates economic growth and job opportunities** while putting the EU in the lead of global fusion research.

### ● European Partnership in radioactive waste management

The European Partnership in radioactive waste management will build on the successful ongoing **European Joint Programme in radioactive waste management, EURAD**. The Partnership is a step change in the European collaboration towards safe radioactive waste management (RWM), including the geological disposal repositories. Through the development of a robust and sustained science and technology, the Partnership will support timely implementation of RWM activities. The Partnership will be aligned with the Radioactive Waste and Spent Fuel Management Directive. **It will ensure responsible and safe management of spent fuel and radioactive waste to avoid imposing undue burdens on future generations.**

### ● European Partnership in radiation protection and detection of ionising radiation

The European Partnership for research in radiation protection and detection of ionising radiation will build on and further develop the research priorities identified in **the roadmap prepared by the 2015-2020 European Joint Programme for the integration of radiation protection research, CONCERT**. The Partnership will provide solutions and recommendations for protecting people and the environment from the potentially harmful effects of ionising radiation in all exposure situations. The Partnership will be aligned with the Basic Safety Standards Directive. **It will improve the quality of life and health of European patients through the development of new and optimised diagnostic and cancer therapies involving radiation sources.**



For more information visit:

[https://ec.europa.eu/info/horizon-europe/euratom-research-and-training-programme\\_en](https://ec.europa.eu/info/horizon-europe/euratom-research-and-training-programme_en)