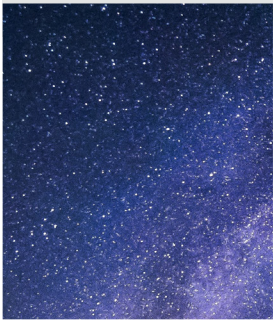
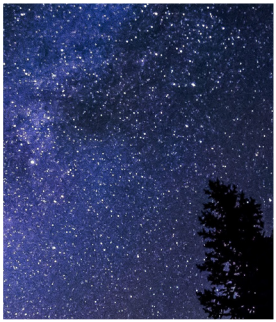
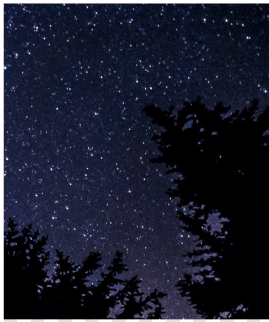
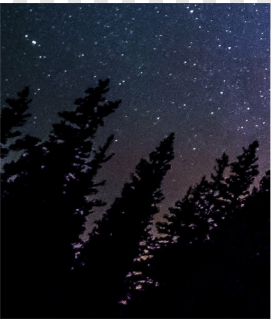
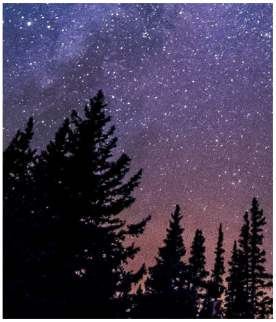
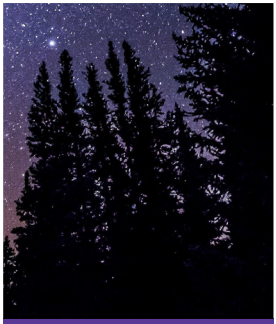
we research innovation

nuclear

Nuclear Department

The Department designs and develops components and experimental facilities for fusion and next-generation fission reactors, as well as new applications in areas such as diagnostics and the preservation of cultural heritage, technologies for security, and the prevention of terrorist acts.

At the Frascati Research Centre, the Divertor Tokamak Test (DTT) is currently under construction an experimental facility aimed at addressing unresolved issues along the path toward fusion, in particular the analysis of the most suitable configuration of the divertor, capable of dissipating plasma exhaust and excess heat from future fusion reactors.

In this regard, ENEA represents Italy within EUROfusion, the European Consortium that manages the funds allocated by the European Union for research and development in the European fusion programme. ENEA also acts as the Industrial Liaison Officer for Fusion for Energy, the European agency responsible for managing EU resources for the construction of ITER (International Thermonuclear Experimental Reactor), currently under development in Cadarache, France, the largest scientific experiment promoted by the European Union to demonstrate the feasibility of a fusion reactor.

In the fission sector, it plays the role of Integrated Service Manager for the management of radioactive waste originating from scientific research, industries and nuclear medicine; furthermore, the department is the national point of reference for institutions and industries in the field of research and development of new generation reactors.

Organisational Structure

Director: Eng. Alessandro Dodaro

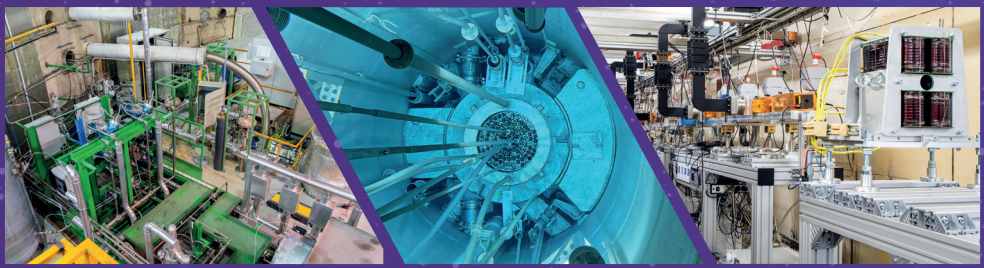
500 researchers, technologists, technicians and administrative staff organised into six Divisions and four technical-scientific Sections.

19 Research Laboratories across the national territory.

ricercanucleare.enea.it - direzione.nuc@enea.it

Strategic Areas

- Plasma physics
- Fusion energy development
- Experimental engineering
- Radiation facilities and applications
- Nuclear systems for energy
- Physical technologies



Plasma Studies and DTT

This Division contributes to DTT and EUROfusion, develops plasma diagnostics and technologies, studies fusion scenarios and plasma-material interactions, collaborates on experimental devices, and promotes research in space propulsion and hybrid reactors.

- DTT facility construction
- Theory, simulation and validation
- Inertial fusion, plasmas and interdisciplinary experiments

Fusion Energy Development

The Division develops advanced technologies, processes, and systems for fusion. It manages research facilities and creates prototypes. It participates in DTT, EUROfusion and ITER, collaborates with industry and promotes technology transfer and training.

- Special technologies
- Diagnostics
- Nuclear technologies
- Superconductivity

Experimental Engineering

This Division develops and tests technologies for fusion, liquid metals and advanced nuclear systems. It manages plants and laboratories, provides engineering services, and engages in national and international collaborations.

- Thermomechanical design and materials development
- Thermal-hydraulic design and experimentation
- Liquid metal systems and technologies

Nuclear Methods and Techniques for Security, Monitoring and Traceability

This Section applies nuclear methods for security and CBRN risk monitoring, operates laboratories for radioecological analyses and provides traceability services. It participates in international nuclear safety and nuclear forensics initiatives.

Radiation Facilities and Applications

This Division manages research reactors and irradiation facilities. It focuses on material characterisation, radioactive waste management and research on advanced nuclear systems.

- Radiological characterisation and radioactive waste management
- Nuclear research reactors
- Gamma irradiation facilities

Nuclear Systems for Energy

The Division develops nuclear technologies for both fusion and fission, supports institutions and industry on safety and sustainability, takes part in international projects and coordinates the development of modular and fourth-generation reactors.

- Nuclear plant safety
- Design and analysis of nuclear systems
- Development of new nuclear technologies

Physical Technologies and Security

This Division develops advanced technologies in photonics, optoelectronics, and laser spectroscopy for applications in security, energy, medicine, and environmental monitoring. It participates in international projects and transfers innovations to industry.

- Diagnostics and metrology
- Micro and nanostructures for photonics
- Particle accelerators

National Institute for Ionising Radiation Metrology

At the national level, the Institute ensures the function assigned to ENEA by Law no. 273 of 11 August 1991 "Establishment of the National Calibration System", as the Primary Metrology Institute in the field of ionising radiation.

ITALIAN NATIONAL AGENCY FOR
NEW TECHNOLOGIES, ENERGY AND
SUSTAINABLE ECONOMIC DEVELOPMENT

"ENEA is a public body dedicated to research and technological innovation, as well as the provision of advanced services to businesses, public administrations and citizens in the fields of energy, the environment and sustainable economic development."
Law 28th December 2015, no. 22

ENEA's mission is to contribute to the competitiveness and sustainable development of Italy through research, technological development, and agency activities supporting public administration, businesses – with particular focus on SMEs – and citizens.

60
years of research and innovation

14
research centres

8
technical and administrative directorates

17
local offices

2250
researchers, technologists, and administrative staff

4
departments

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