



AccelApp'24

2024 International Topical Meeting on Nuclear
Applications of Accelerators

March 17-21, 2024
Hosted by Jefferson Lab

Norfolk, Virginia

IAEA activities to support development of radiation treatment of polymers

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IAEA



IAEA

International Atomic Energy Agency

Atoms for Peace and Development

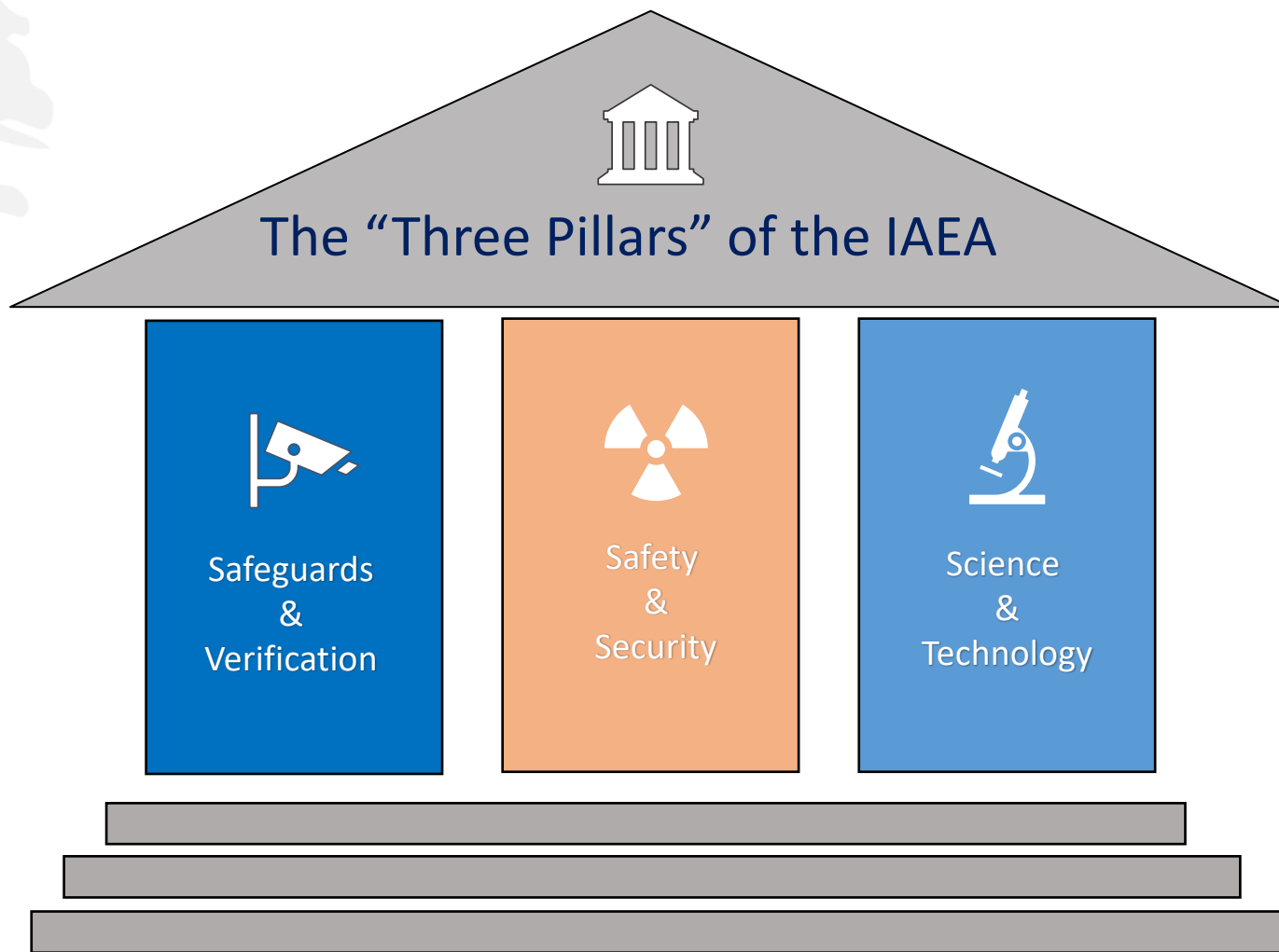
IAEA



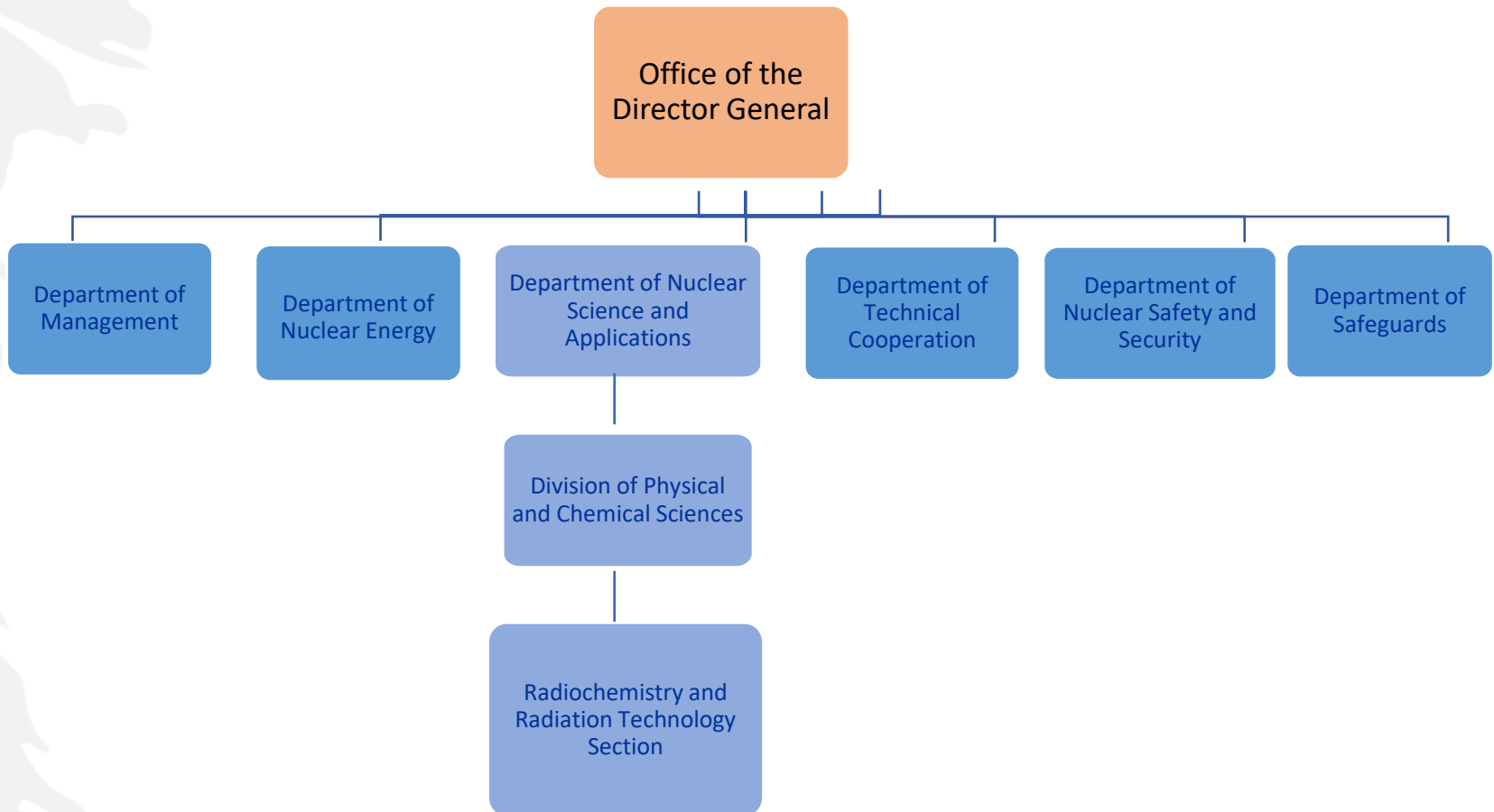
- Set up in 1957 to promote safe, secure and peaceful nuclear technologies
- Currently includes 178 Member States
- Over 2500 professional and support staff
- Headquarters in Vienna
- Two scientific laboratories and research centres
- Liaison offices in New York and Geneva



IAEA



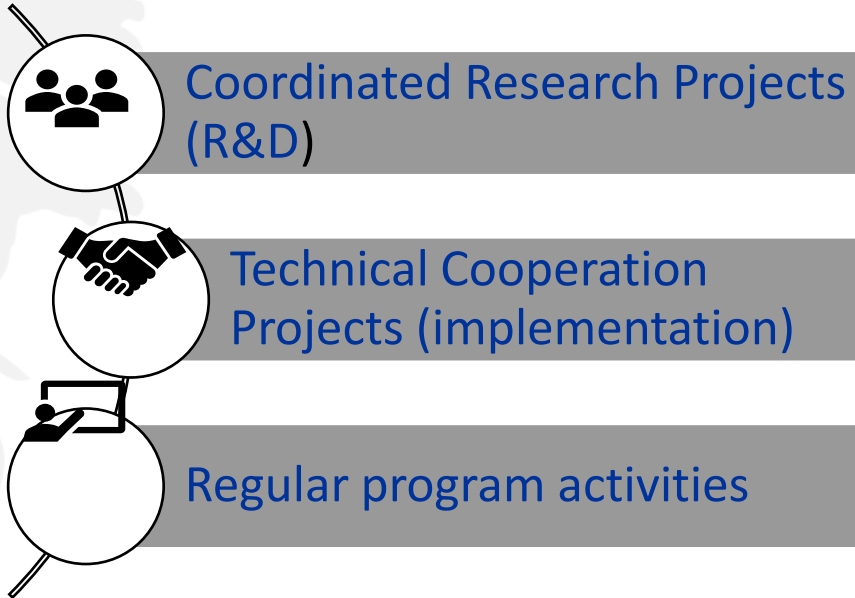
Organizational Chart



RCRTS

- Production of radioisotopes and radiopharmaceuticals
- Radiation technologies for industry, environment and cultural heritage
- Non-destructive testing and other uses of sealed sources
- Research and development
- Implementation of technologies
- Education and training

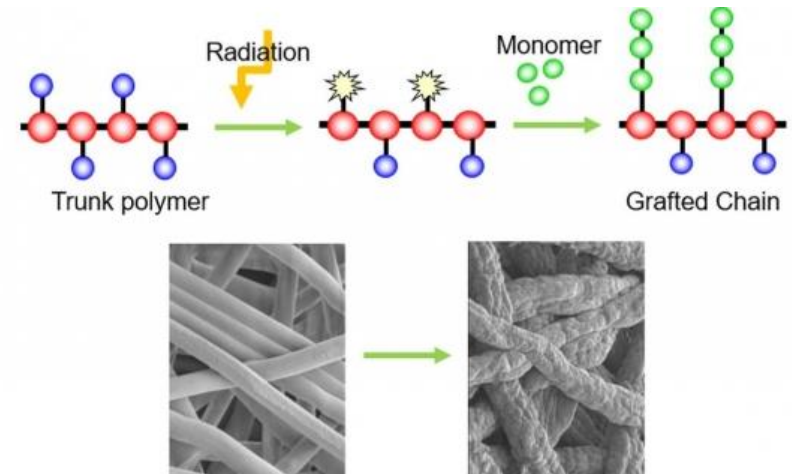
RCRTS



Development of functional membranes

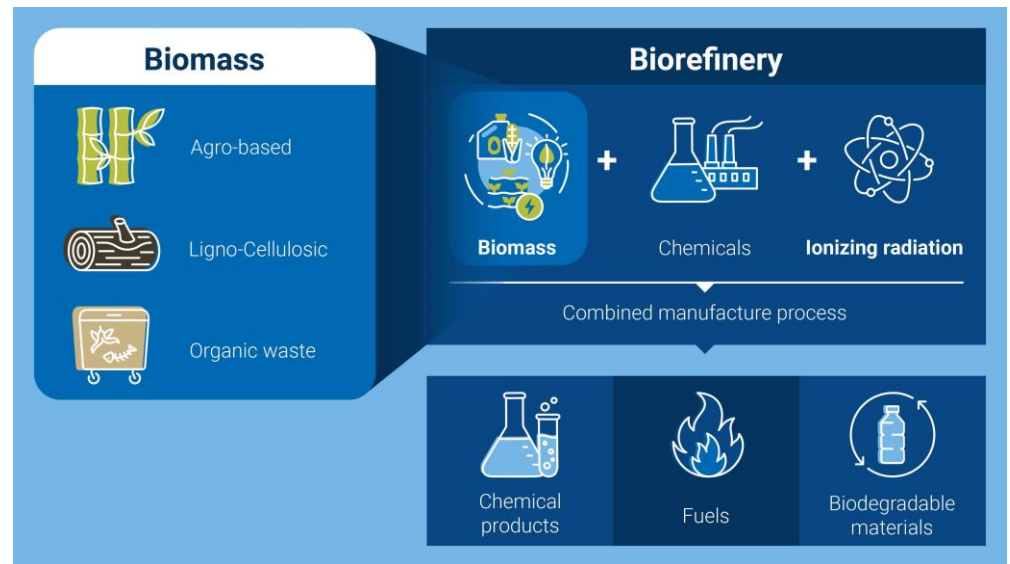
Development of functional membrane for their uses in:

- Electrochemical devices in the energy sector
- Separation of CO₂ from natural or renewal gas
- Catalysts for biodiesel production



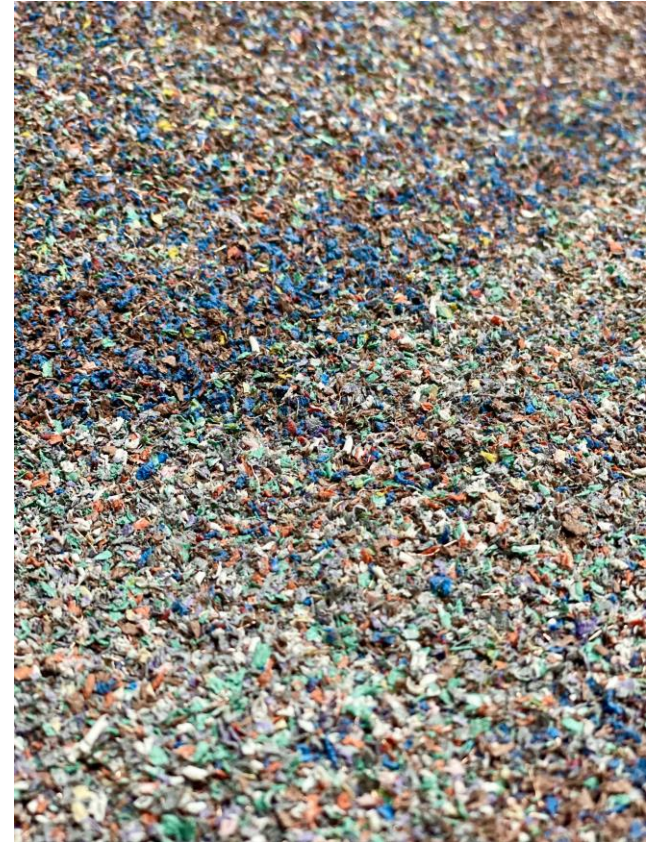
Development of biopolymers

- Functionalizing natural and biodegradable polymers with emphasis in replacing single use plastic and petrol-based packaging materials.
- Integrating radiation technologies into biorefineries to improve the yield, quality, or variety of consumer products



Recycling of polymer waste

- To develop processes, techniques, protocols for radiation recycling of plastic wastes for structural and non-structural applications
- To optimize the radiation process parameters to achieve efficient degradation or repurposing effects on the plastic wastes



Irradiation of PPE

- A study in 2020 (France, Israel, Republic of Korea, Poland, and the United States) investigated whether radiation is an effective and established tool to sterilize personal protective equipment that is in high demand during the COVID-19 pandemic



Radiation effects on single use medical devices

- Understanding of radiation effects on polymer materials common for medical devices by comparing gamma, e-beam, and x-ray irradiation.
 - Physical and chemical analysis
 - Biocompatibility studies
 - Ageing studies of samples



PUFFIn Workshop 2023

- PUFFIn - Simulations and Validation of Dose Distribution in Polymers Commonly Used in Medical Devices
- Five-day course (modelling and simulations as well as experimental work)
- Aerial-CRT, Strasbourg, France
 - Electron beam and x-rays
 - Dosimetry lab



PUFFIn Workshop 2024

- Two-day course on modelling and simulations
- Norfolk, USA (pre-AccelApp)



ICARST-2025

Third in the series, abstract submission is open:

<https://www.iaea.org/events/icarst-2025>

3rd International Conference on

Applications of Radiation Science and Technology

IAEA
#ICARST2025
7 – 11 April 2025
Vienna, Austria

BACKGROUND

The International Atomic Energy Agency (IAEA) is organizing the Third International Conference on Applications of Radiation Science and Technology (ICARST-2025), following the success of the first ICARST in 2017 and second ICARST in 2022.

Innovations in the field of radiation sciences have contributed significantly to industrial growth and economic development by providing versatile tools and processes to produce high quality products in a clean and efficient manner. These advances have resulted in economic growth and have significantly improved the quality of life in many Member States. With the focus now shifting to the development of sustainable technologies to help achieve the United Nations Sustainable Development Goals (UN SDGs), it is now time to revisit the current status of radiation technology programmes in academia and industry to prepare for meeting future challenges.

PURPOSE AND OBJECTIVES

The purpose of ICARST-2025 is to provide a comprehensive review of significant developments in applications of radiation science and technology, as well as the state of the art in the field; assess national, regional, and global initiatives for implementing proven industrial applications of radiation science and technology; provide a composite platform where representatives from industry and academia can develop new initiatives; and chart a clear-cut pathway for the adoption of radiation technologies to achieve specific SDGs.

It will aim to provide a unique opportunity to achieve the following objectives:

- Review key developments;
- Assessing Initiatives;
- Fostering New Initiatives;
- Identifying implementation strategies;

AUDIENCE

This conference will focus on the applications of radiation science and technology, which is a multidisciplinary area covering many branches including radiation-related physics, chemistry, materials science, biology, engineering, and industrial applications. The target audience for this conference comprises, but is not limited to:

- Radiation technologists in areas of chemistry, physics, microbiology, material science;
- Food technologists;
- Cultural heritage conservators and preservers;
- High dose radiation dosimetry experts;
- Environment engineers and scientists;
- Radiation facility operators;
- Quality assurance specialists for radiation facilities;
- Radiation safety experts;
- Process engineers;
- Entrepreneurs involved in applications of radiation technologies;
- Manufacturers of radiation sources and equipment suppliers;
- Research scientists and students engaged in radiation technologies;
- Policy makers and regulators; and
- Other stakeholders.



Accelerators for Research and Sustainable Development

- IAEA conference series: first in May 2022, next in Spring 2026 – keep an eye!



International Conference on Accelerators for Research and Sustainable Development: From Good Practices Towards Socioeconomic Impact

23–27 May 2022, Vienna, Austria

Conclusions

- IAEA RCRTS initiates, implements and manages a number of projects focused on applications of radiation technologies
- We also organize training events, such as PUFFIn workshops
- If you have questions, would like to participate in R&D projects, get trained, or host an IAEA event – please contact us: v.starovoitova@iaea.org

Thank you!

