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# Romania's Experience in Developing and Implementing National Capabilities for Response

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Date: June 2024  
Place: Vienna, Austria





# IFIN-HH

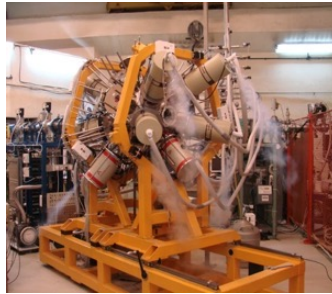
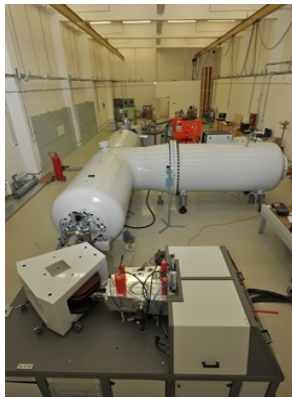




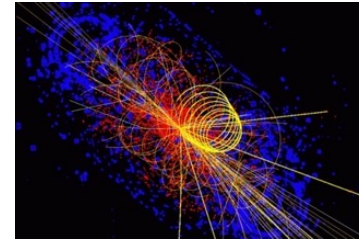
# Horia Hulubei National Institute for Research and Development in Physics and Nuclear Engineering

## International laboratory of IFIN-HH

**TANDEM Accelerators** 9 MV  
3 MV  
1 MV



## Present in the large experiments at CERN

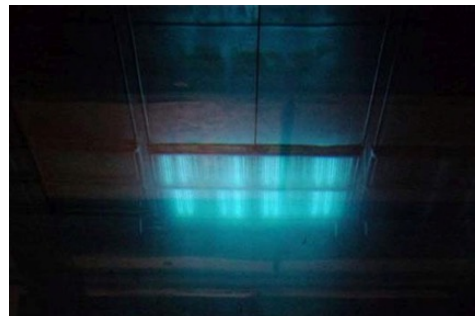


Developing and  
constructing  
experimental  
equipment  
Computing  
Data analysis

## Radiopharmaceuticals



## Technological irradiation



## Radioactive waste management



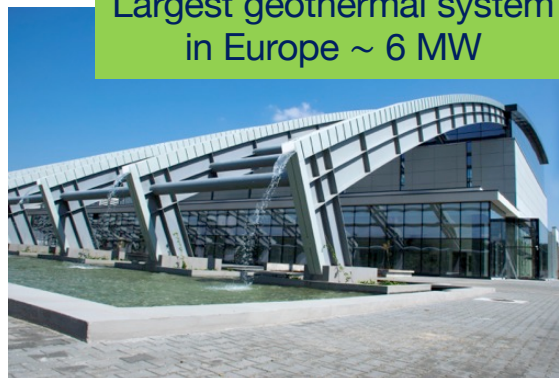
# ELI-NP Infrastructure



Project co-financed by the European Regional Development Fund through the Competitiveness Operational Programme "Investing in Sustainable Development"

Extreme Light Infrastructure-Nuclear Physics (ELI-NP) - Phase II

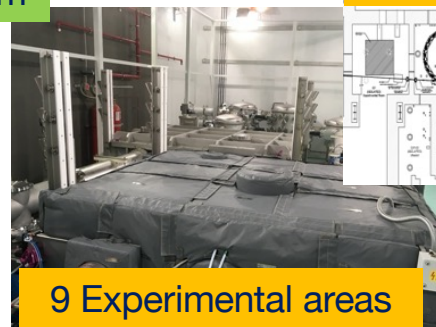
Largest geothermal system in Europe ~ 6 MW



2 x 10 PW High-Power Laser System



120,000 tons antivibration platform



9 Experimental areas

Variable Energy Gamma System



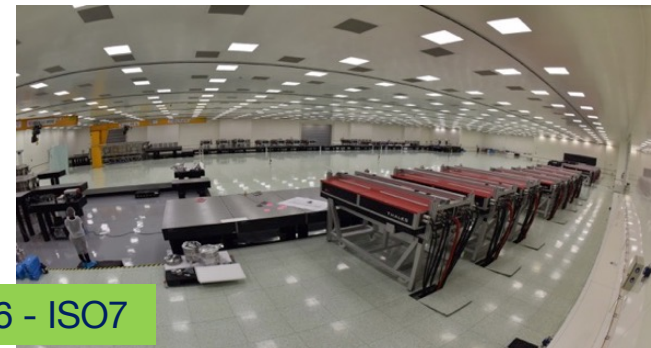
2 x 10 PW + 1 x 1 PW Laser Beam Transport System



Laboratories and workshops



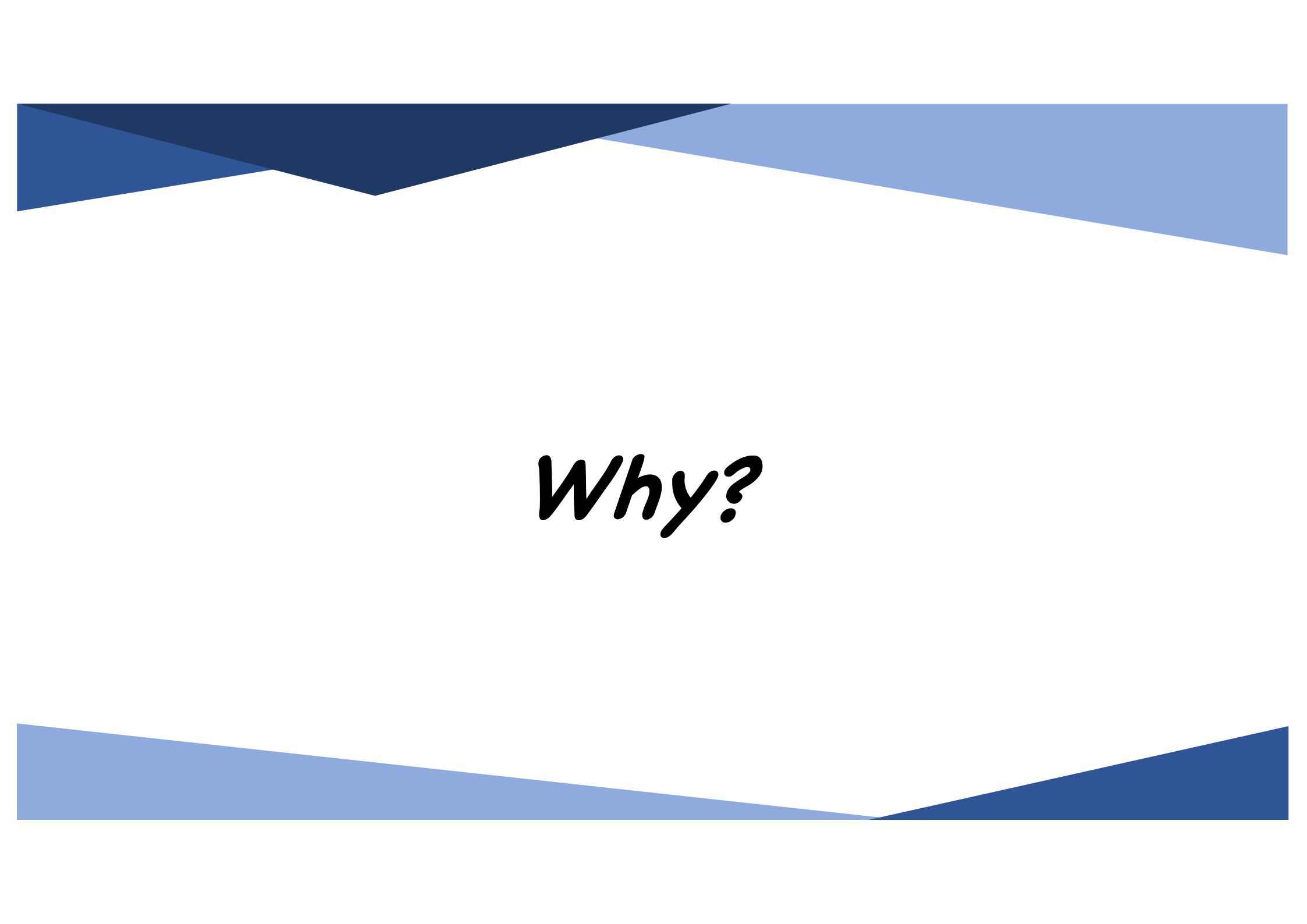
Clean rooms ISO6 - ISO7



# Strengthening Nuclear Security Response Capabilities

*Why? How? So What?*



The image features a white background with decorative blue geometric shapes at the top and bottom. The top shape is a dark blue triangle pointing downwards, overlapping a light blue trapezoidal shape that tapers towards the right. The bottom shape is a light blue trapezoidal shape that tapers towards the left, overlapping a dark blue triangle pointing upwards.

*Why?*

# Nuclear Security Events



More than 720 incidents reported to the ITDB account for the Black Sea Region

## Criminal RN cases around Romania

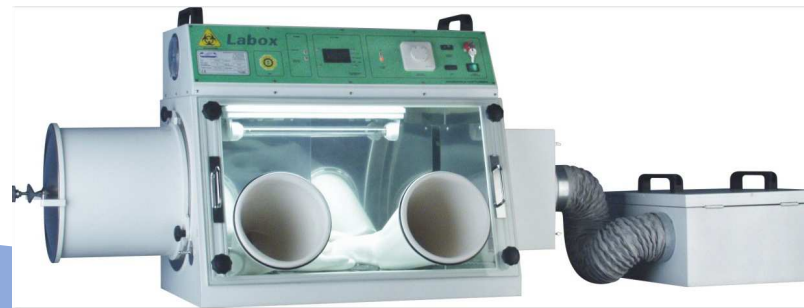




The image features a white background with decorative blue geometric shapes at the top and bottom. The top shape is a dark blue triangle pointing downwards, with a lighter blue trapezoidal shape extending to the right. The bottom shape is a light blue trapezoidal shape on the left, with a dark blue triangle pointing upwards on the right. The word "How?" is centered in the middle of the page in a bold, italicized, black font.

***How?***

# Nuclear Security at IFIN-HH: Detection and Prevention Capabilities



# Nuclear Security at IFIN-HH: RSCM



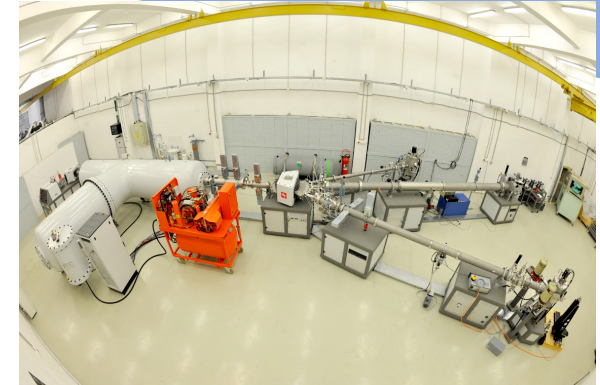
# Nuclear Security at IFIN-HH: Nuclear Forensics

## Already existing infrastructure:

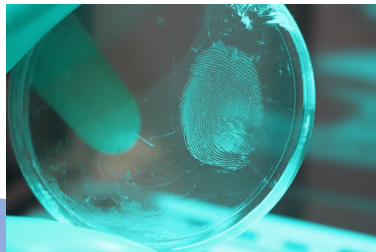
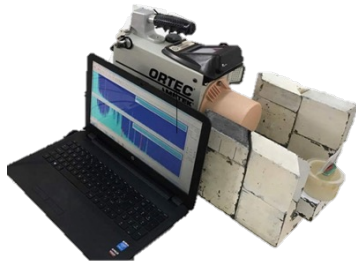
- Three particle accelerators:
  - Accelerator Mass Spectrometry
  - Ion Beam Analysis
  - Nuclear Structure Research
- Spectrometric systems



[https://www.nipne.ro/1-MV\\_TANDETRON.php](https://www.nipne.ro/1-MV_TANDETRON.php)



[https://www.nipne.ro/3-MV\\_TANDETRON.php](https://www.nipne.ro/3-MV_TANDETRON.php)



## Additional procurement:

- Multiple HPGe Gamma Spectrometry systems
- Scanning Electron Microscopy
- ICP-MS Element XR
- Traditional Forensics equipment
- Advanced Optical Microscopy
- 3D Scanner
- X-ray Fluorescence

## Nuclear Security at IFIN-HH: Nuclear Forensics



- Established in 2017
- First investigated criminal case in 2018 => around 2kg of depleted uranium
- **More than 14 criminal** cases since, which involved different kinds of nuclear and other radioactive material

# Training and Outreach

## Events in Romania



# National Authorities

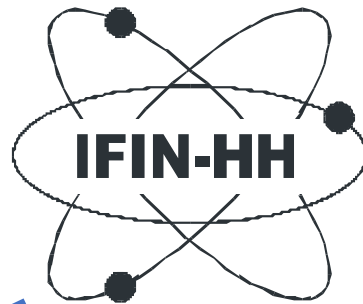


DIRECTORATE FOR INVESTIGATING  
ORGANIZED CRIME AND TERRORISM

ROMANIA



# *International Cooperation*





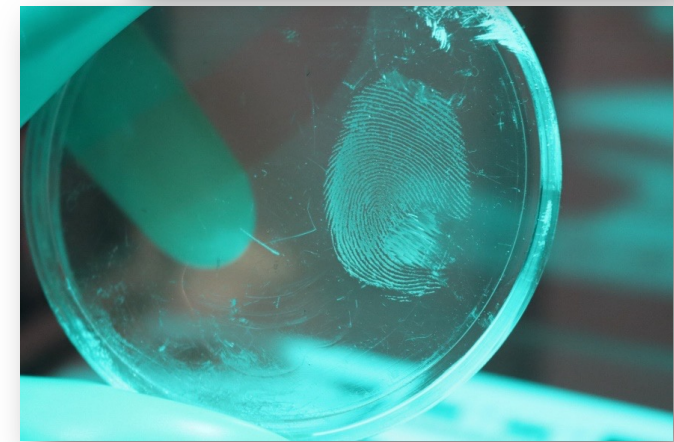
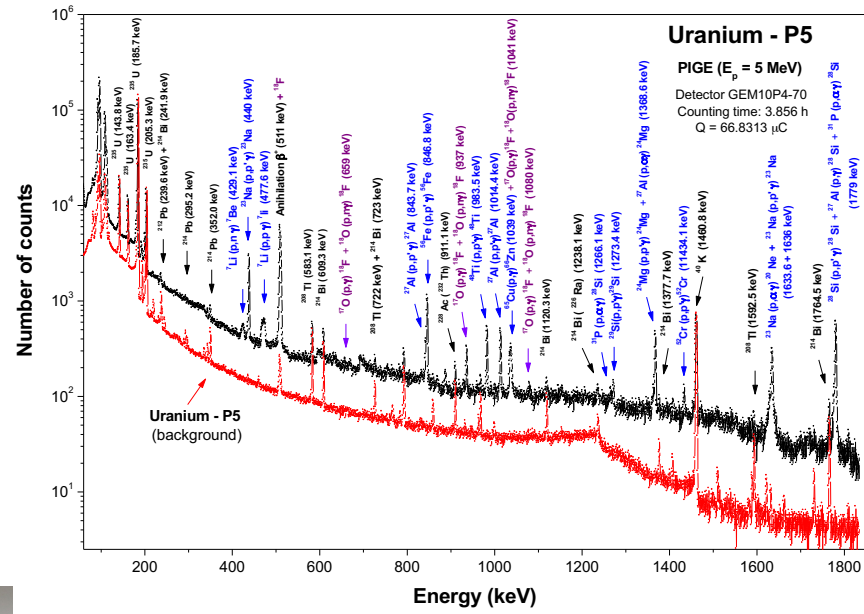
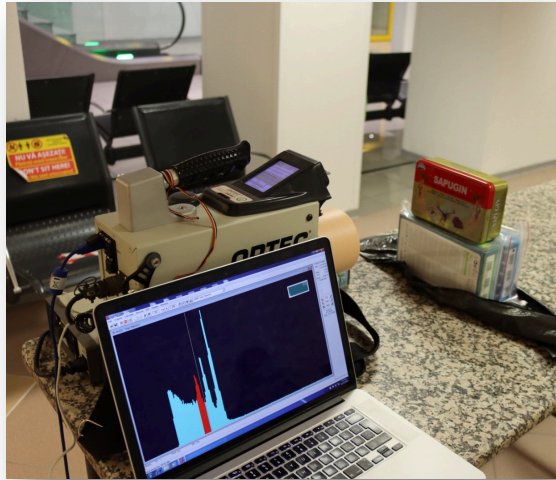
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***So what?***

# Criminal RN cases in and around Romania



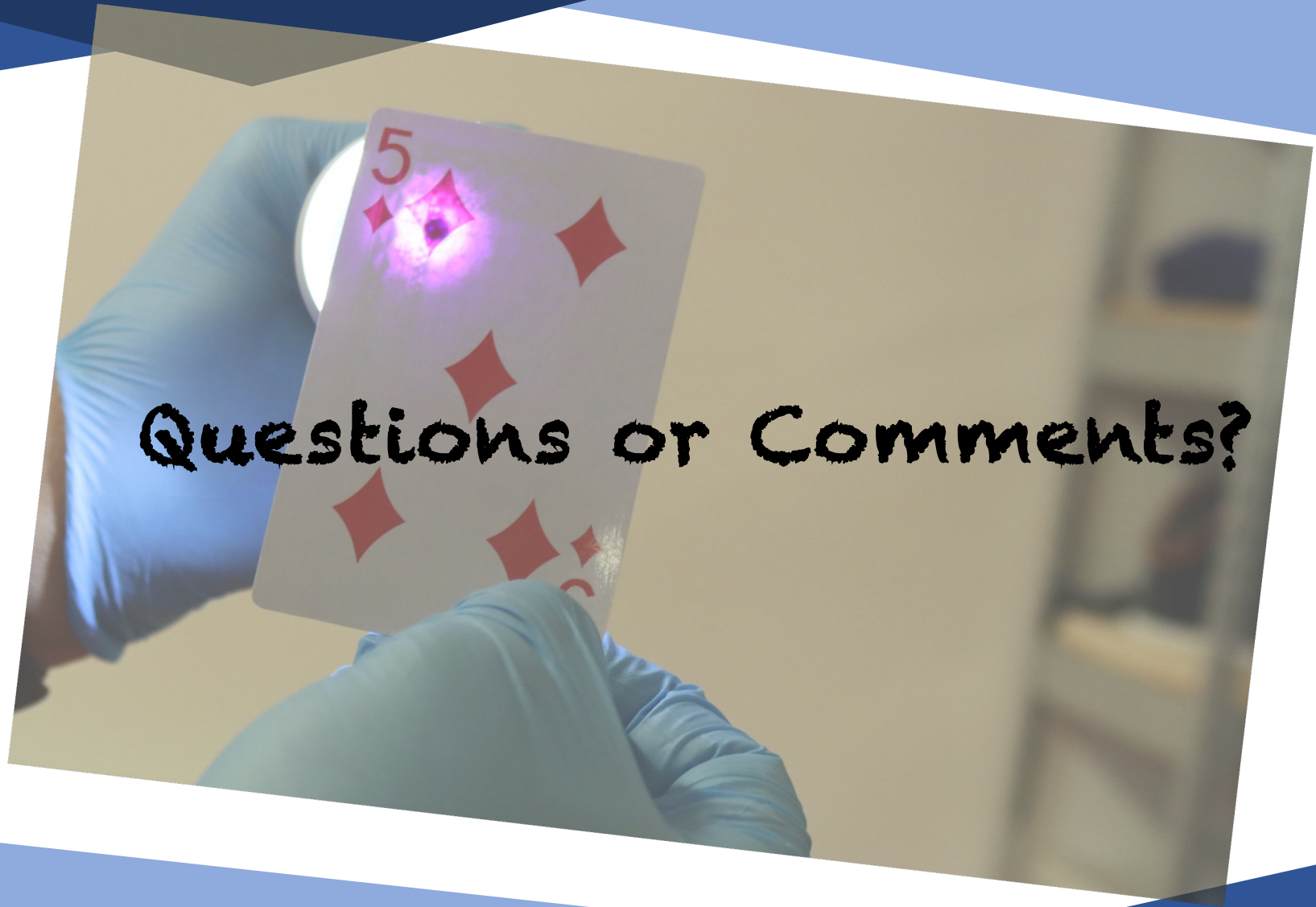
# Nuclear Security: A full-time job



# ROMANIA as IAEA NSSC member (2023)



- *Regional and International Coordination and Collaboration*
- *Exchange of Good Practices*
- *Information Exchange, Training and Outreach*



Questions or Comments?