

# SEREN5 Pitch Presentation



*CEA for DRS-03, FCT-01, BM-03,  
INFRA-01 and CS-ECCCC-02*

Antonin Galtier  
EUROPEAN AFFAIRS  
CEA - French RTO

- XS-ABILITY
- TERRIFIC
- CLEANDEM
- STARLIGHT
- KINAITICS
- PERUN
- ARIEN
- CUSTOMAI
- ATLANTIS
- APPRAISE
- C-BORD
- ENSEMBLE
- MULTISCAN
- C-BORD
- CUSTOMAI
- GUARDIANS
- SPARTE
- TEAM-UP

# CEA LIST/RTO

*From Research to Industry*



## Contact Details

Email: *antonin.galtier@cea.fr*  
Telephone/Mobile: *+33 1 69 08 54 29*  
Country: *FRANCE*

## Experience

- *CBRN instrumentation and expertise for analysis,*
- *AI for Crisis Management,*
- *federated AI & cybersecurity,*
- *Non destructive testing and sensors for monitoring solid, liquids and gas (e.g. X-ray, neutronic, IR, FTIR, Fiber optics),*
- *Electronics for miniaturisation & AI algos*

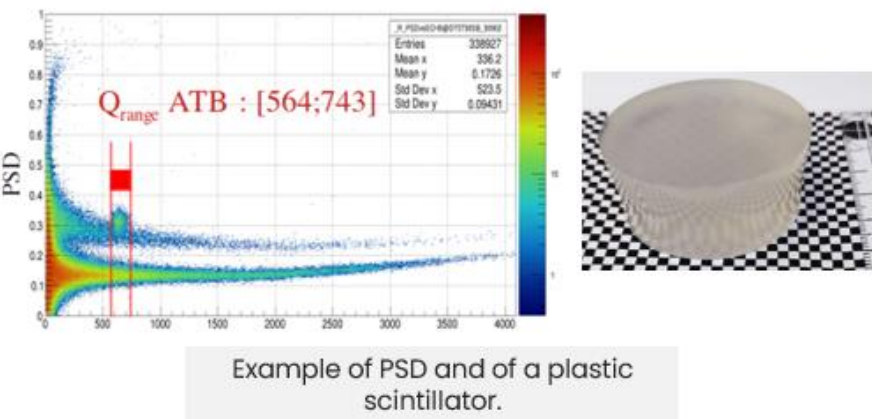


Funded by the  
European Union

- |              |             |            |            |             |             |
|--------------|-------------|------------|------------|-------------|-------------|
| • XS-ABILITY | • STARLIGHT | • ARIEN    | • APPRAISE | • MULTISCAN | • GUARDIANS |
| • TERRIFIC   | • KINAITICS | • CUSTOMAI | • C-BORD   | • C-BORD    | • SPARTE    |
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# Focus on DRS-03 option B : miniaturized CBRN sensors

## 1.Small- multi-radiation detector

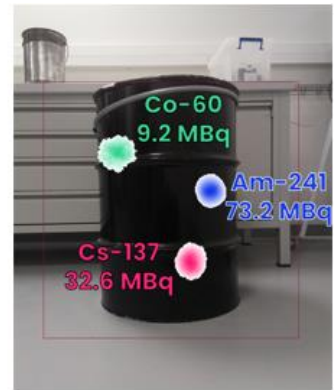
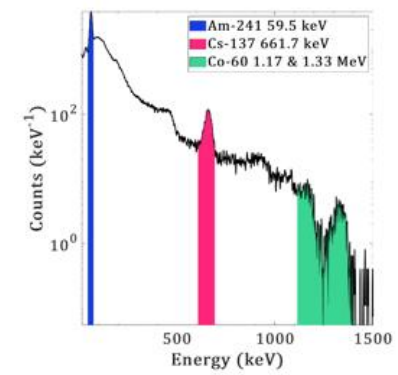
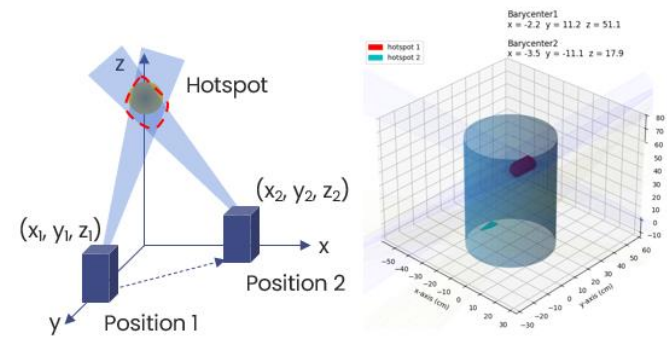


**Expertise in**

- **Scintillators**
- **Spectro-imaging**
- **Algorithms for Real-time synchronisation with the 3D reconstructed map**
- **Electronics for Lightweight version**

	CEA Background
Scintillator	Triple discriminating scintillators synthesis
Detection head	Scintillator + PMT
Electronic	Commercial electronic
PSD algorithms	Discrimination and dose rate determination

## 2.Nanopix embedded on UGV/UAV



Results from the H2020 Euratom **CLEANDM**.

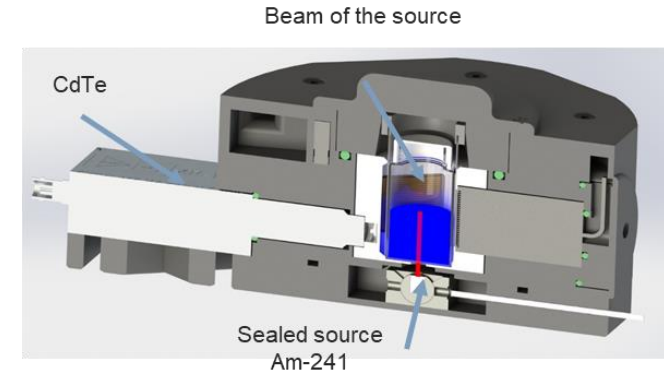
## Focus on DRS-03 option B : miniaturized CBRN sensors

### 3. Radioactive gases test-bench and associated measurements methods

Two materials were identified in the FET-OPEN SPARTE project:

- Metal Organic Frameworks (MOF): tested and found to have “memory” effect – inappropriate for direct online measurement
- Inorganic aerogel scintillators: best candidate with new gas separation capabilities

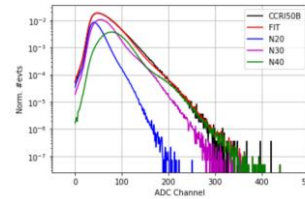
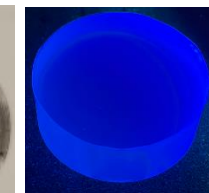
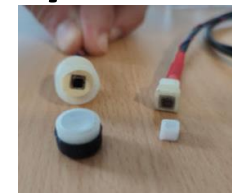
### 4. GN tracker for handheld detection of gamma-ray, fast and thermal neutrons



### 5. Single-head detection miniaturized active dosimeter from commercial plastic scintillator and SiPM based devices to measure the equivalent dose to the extremities.

Ultra-compact active dosimeter mounted on a ring:

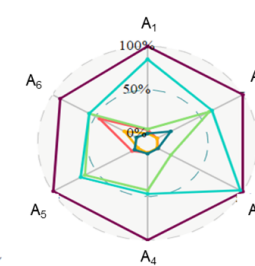
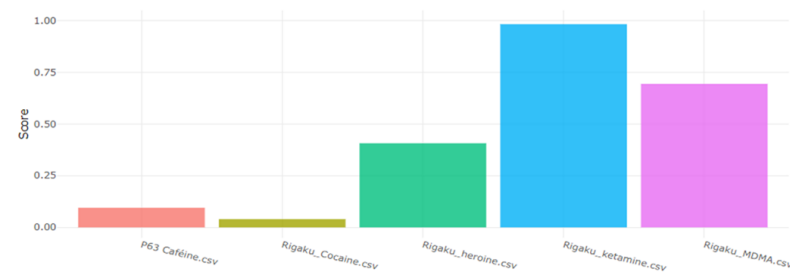
- **Online measurement** for gamma-rays for determining the individual equivalent dose to the extremities
- Miniaturized system based on **plastic scintillator**, **SiPM** and ultra-compact electronics
- **Homemade algorithm** for data analysis and dose measurement
- **Metrological calibration** made by the Henri Becquerel National Laboratory





*Focus on FCT-01 option C (and B) : modernisation of frontline policing  
(and forensic analysis using new and emerging technologies)*

## 1. CROSS-Methodology and AI-based solutions for CBRN multi-threats Detection and Evidence Collection



Ketamine + MDMA (+ close traces of Heroin)

Tusibi (2C-B)

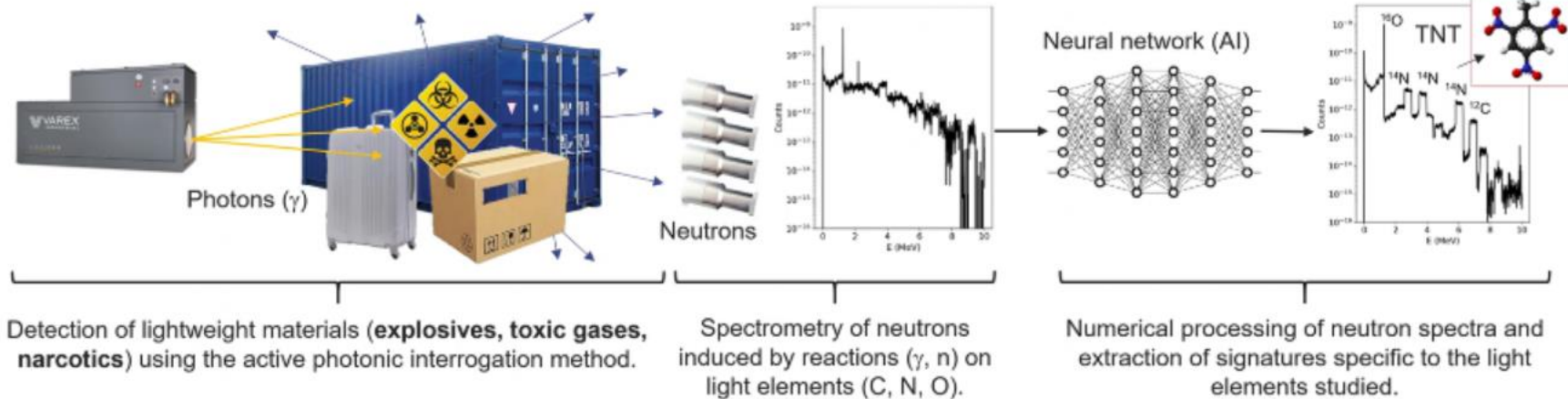
*Sensing methods (FTIR, RAMAN ✓OK NMR ✓testing (GC/LC)-MS ✓targeted other measures from innovative technologies ✓targeted)*

*Methodological points (Explainable and reliable AI-based detection by crossing sensing)*

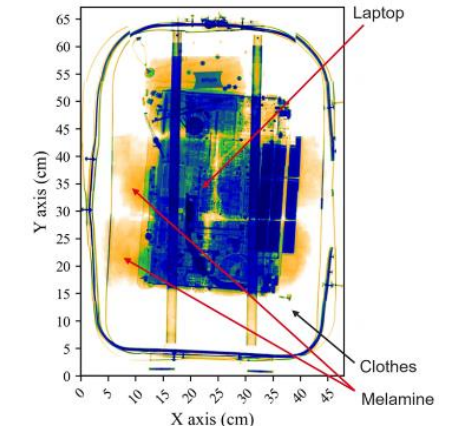
*Use cases in explosives, drugs, etc.*

## Focus on BM-03 : open topic on better customs and supply chain security

### 1. Innovative non –invasive system for detection of illicit materials



Suitcase with melamine, clothes and laptop:



Dual-energy image 80 kV – 140 kV

### 2. Advanced inspection system integrating cutting-Edge Technologies to improve Cargo Container Security MULTISCAN 3D Project

smiths  
detection

THALES  
Building a better world

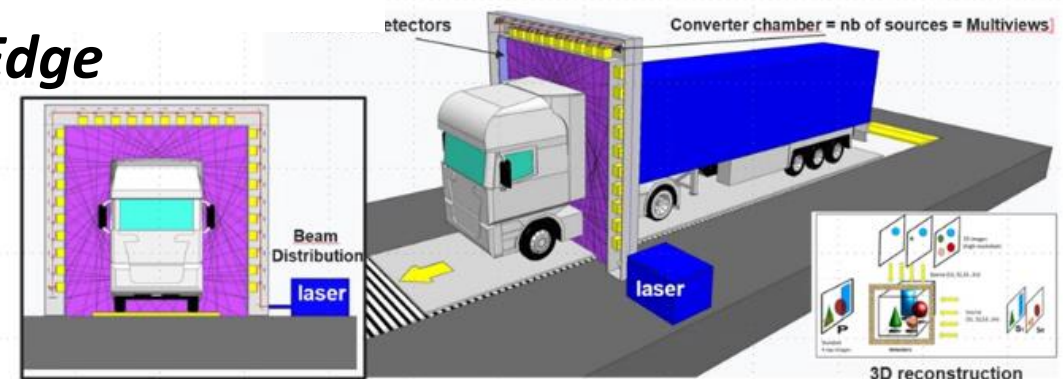
Border Force

INFN

European Commission

imec

ps-tech



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HORIZON-CL3-2025-01-BM-03

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