

# Research at the National Accelerator Center (CNA): opportunities for students

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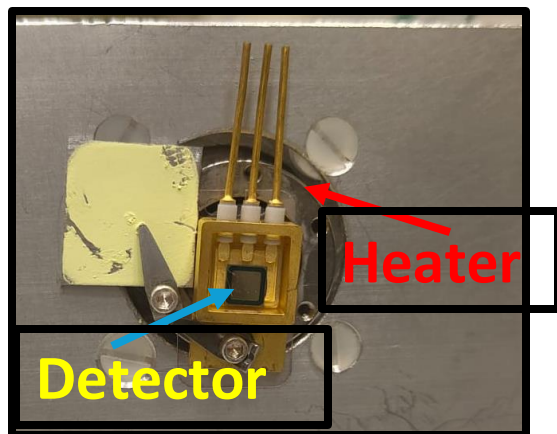
- The National Accelerator Center in Seville is a user-oriented particle accelerator research center.
- It is a joint centre belonging to the University of Seville, the Regional Government of Andalusia and the Spanish National Research Council (CSIC).



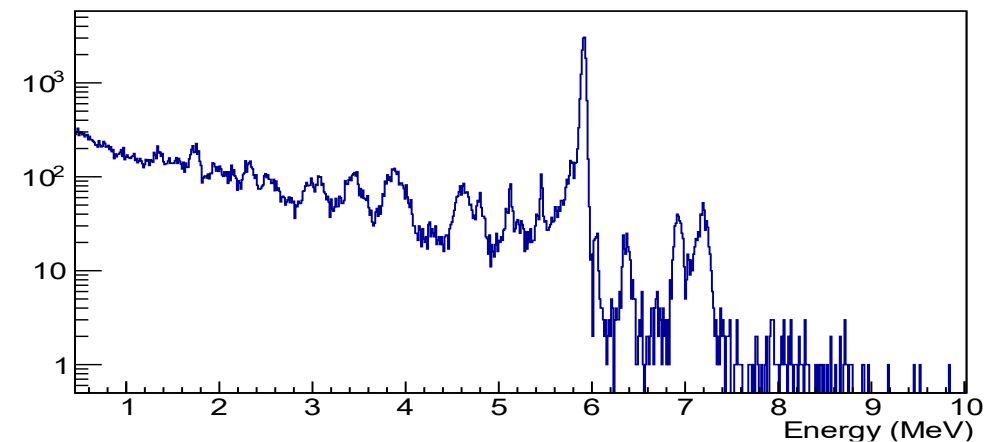
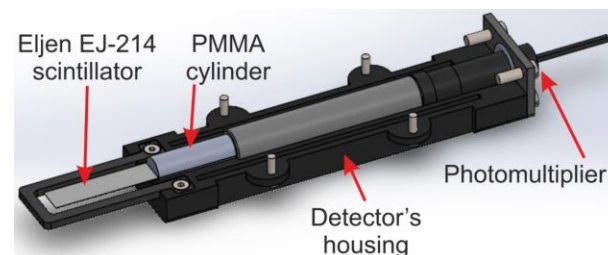
- Six main facilities:
  - 3MV Tandem Accelerator
  - 18 MeV proton cyclotron
  - 1 MV Tandetron AMS
  - Compact accelerator for radiocarbon
  - $^{60}\text{Co}$  Irradiator
  - PET/CT Scanner



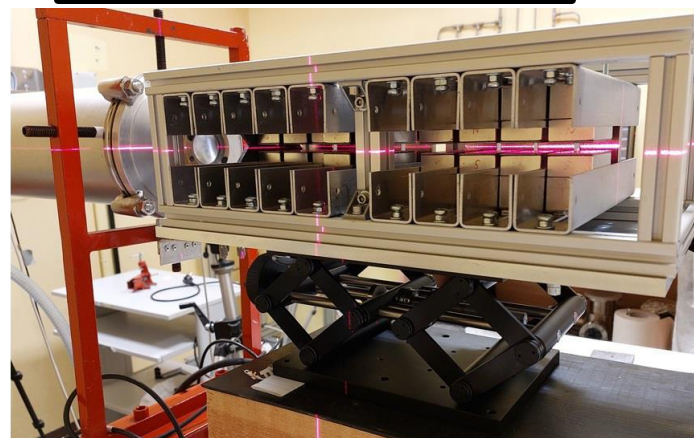




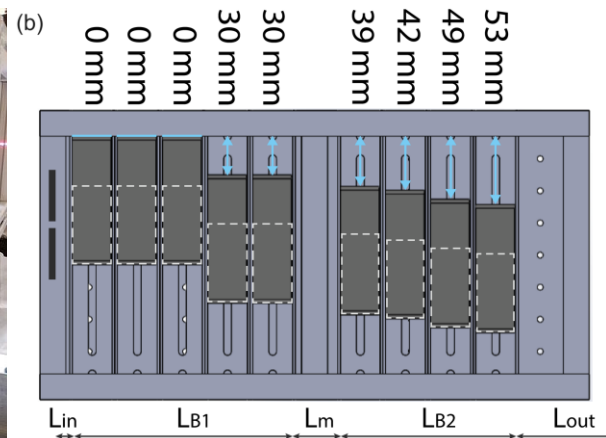
## Design and development of nuclear detectors



## Nuclear Reaction Measurements



## Development of nuclear instrumentation



## Irradiation of materials for different applications

Combined Irradiation Study on Electronic Devices with Potential Use in Space and Other Harsh Environments, at the 'Centro Nacional de Aceleradores'

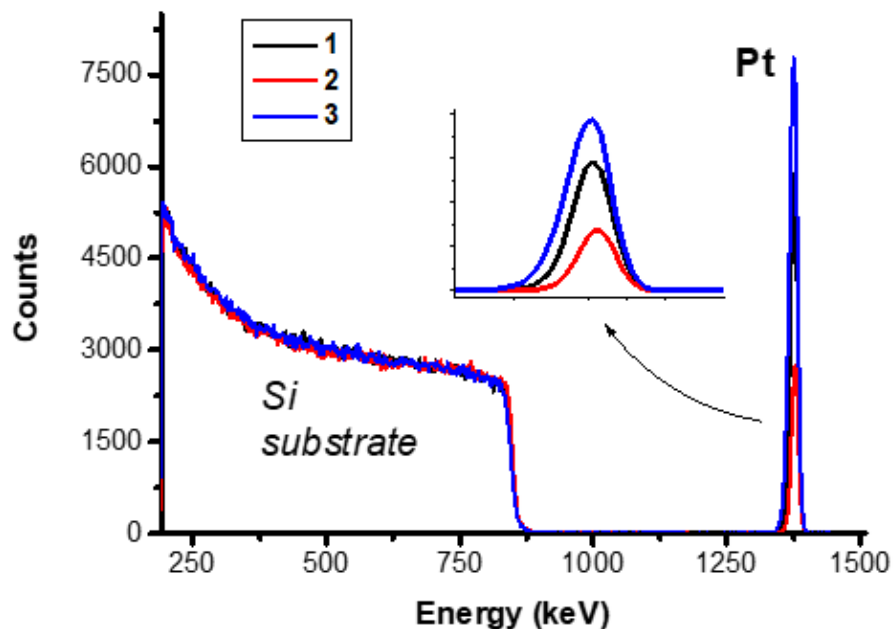



PhD Dissertation  
PEDRO MARTÍN HOLGADO  
CNA - Sevilla - 25-04-2025

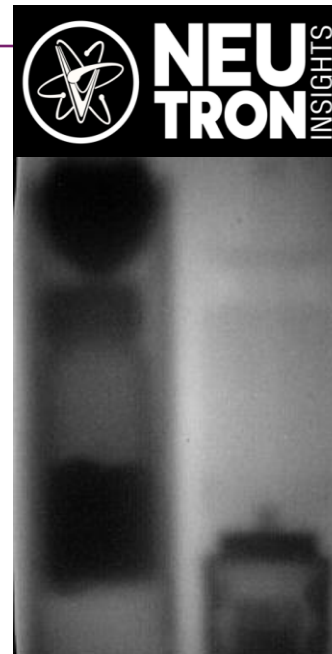


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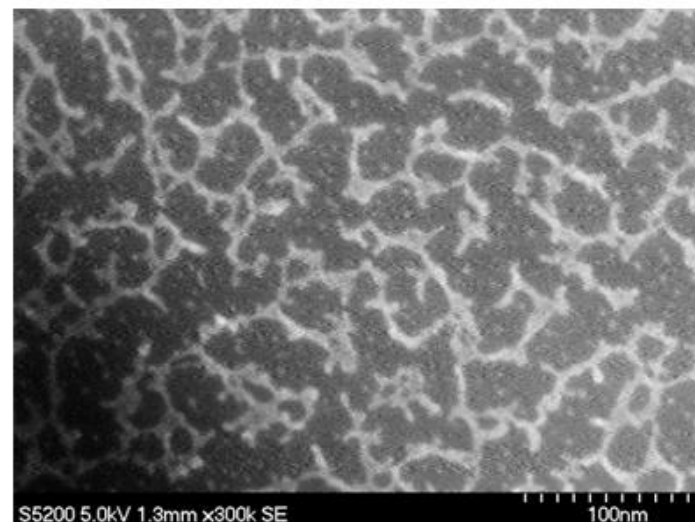
**CNA**  
Centro Nacional de Aceleradores



Characterization  
of materials with  
ion beams



Neutron generation  
studies



Nuclear reactors

Nuclear weapons

$^{239}\text{Pu}(n,\gamma)^{240}\text{Pu}(n,\gamma)^{241}\text{Pu}(n,\gamma)^{242}\text{Pu}(n,\gamma)^{243}\text{Pu}(n,\gamma)^{244}\text{Pu}$   
 24 ky,  $\alpha$     6.5 ky,  $\alpha$     14.4 y,  $\beta^-$     0.37 My,  $\alpha$     4.95 h,  $\beta^-$     80 My,  $\alpha$   
 Fissile



Global Fallout

Thermonuclear tests  
(1952-1962)

Environmental  
radioactivity  
studies with  
accelerators

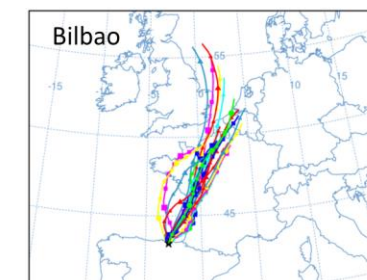


Maximum:  $(1.18 \pm 0.07) \times 10^{-3}$   
 Debris from Ivy-Mike test in  
 1952 (10 Mt),  
 [Diamond et al., 1960]

$(5.7 \pm 1.0) \times 10^{-5}$   
 GF Northern Hemisphere  
 (1945-1980)  
 [Steier et al., 2013]

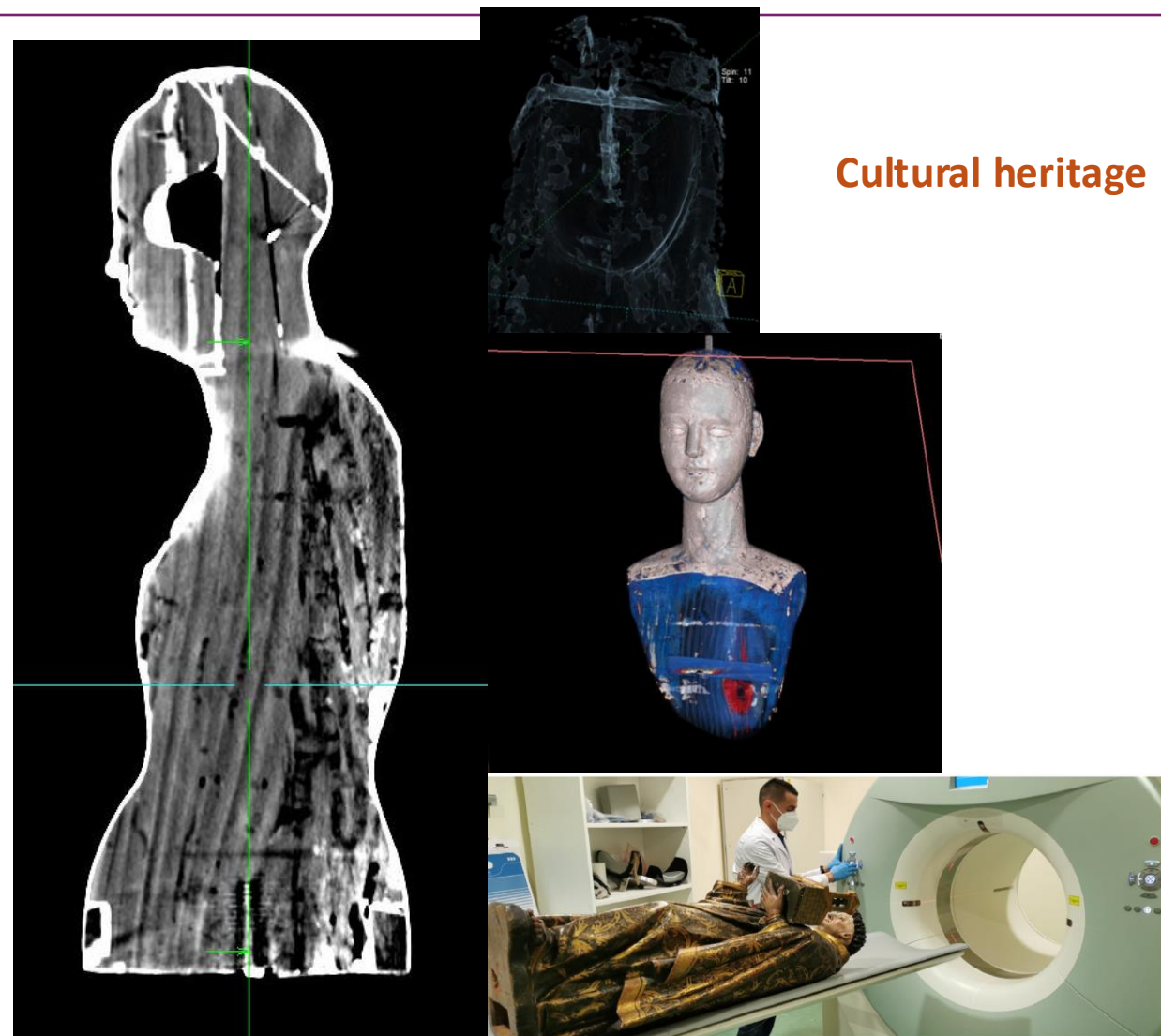
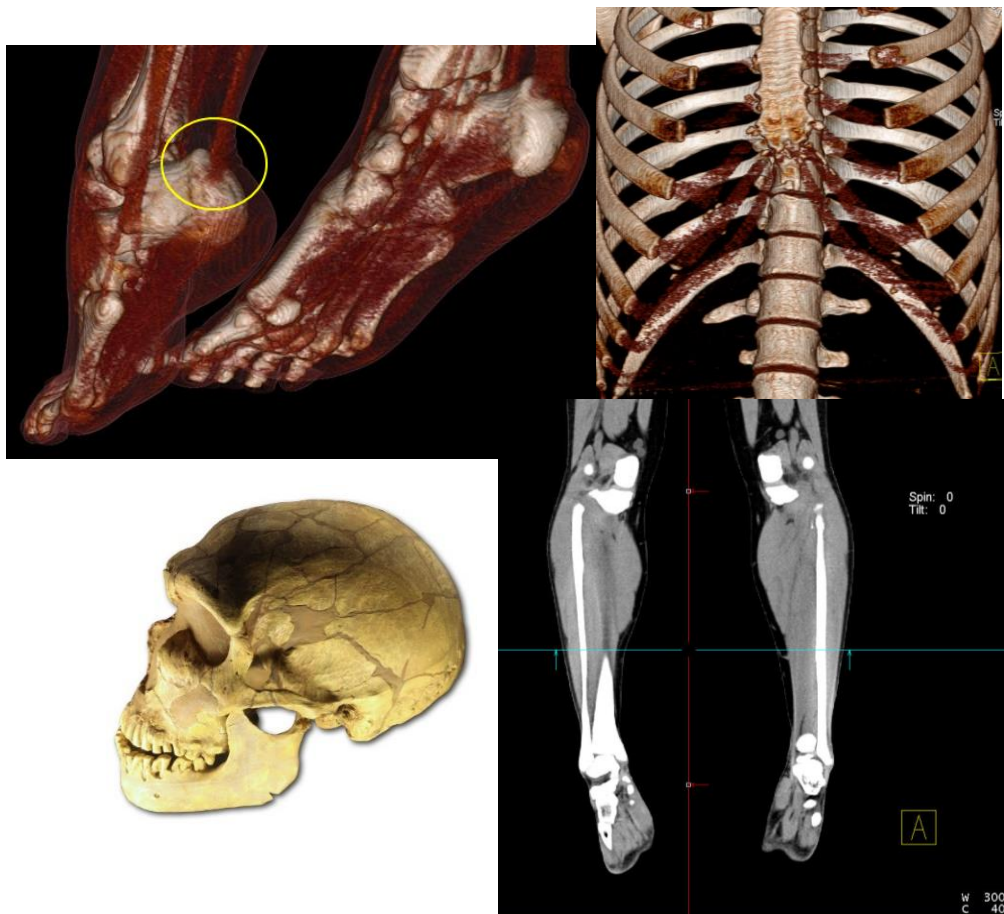
$< 3.5 \times 10^{-6}$   
 Sediments from Sellafield  
 [Steier et al., 2013]

$^{244}\text{Pu}/^{239}\text{Pu}$



## Bio-morphology studies

## Cultural heritage





- CNA is open for students who are interested in doing their Master thesis, PhD, Post-doc, etc.
- Funding opportunities may come from different sources:
  - Public calls: Spanish government, regional government, US...
  - Research projects at US
  - Contracts with companies at CNA
  - Private funding

**If you are interested in participating as a  
researcher at CNA, please send me an email to  
LGUTI@US.ES**



Infraestructuras  
Científicas y  
Técnicas  
Singulares

# Thanks for your attention

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