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

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INFRAESTRUCTURAS CIENTÍFICAS Y TÉCNICAS SINGULARES

Universidad de Sevilla

Junta de Andalucía

CSIC

Consejo Superior de Investigaciones Científicas

What is CNA?













- 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}Co Irradiator
  - PET/CT Scanner



Conventional IBA techniques for material analysis

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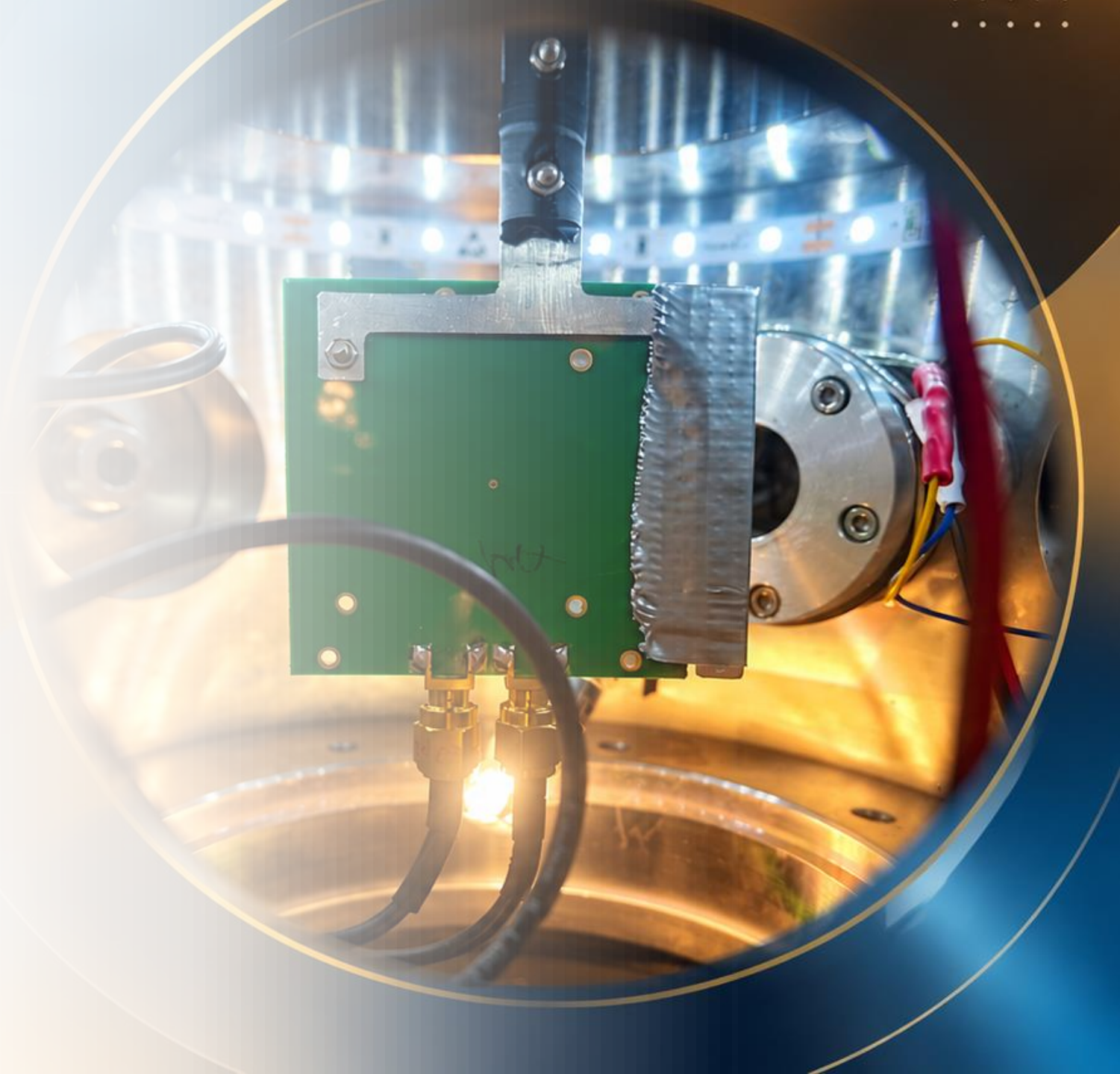
Caracterization of detectors



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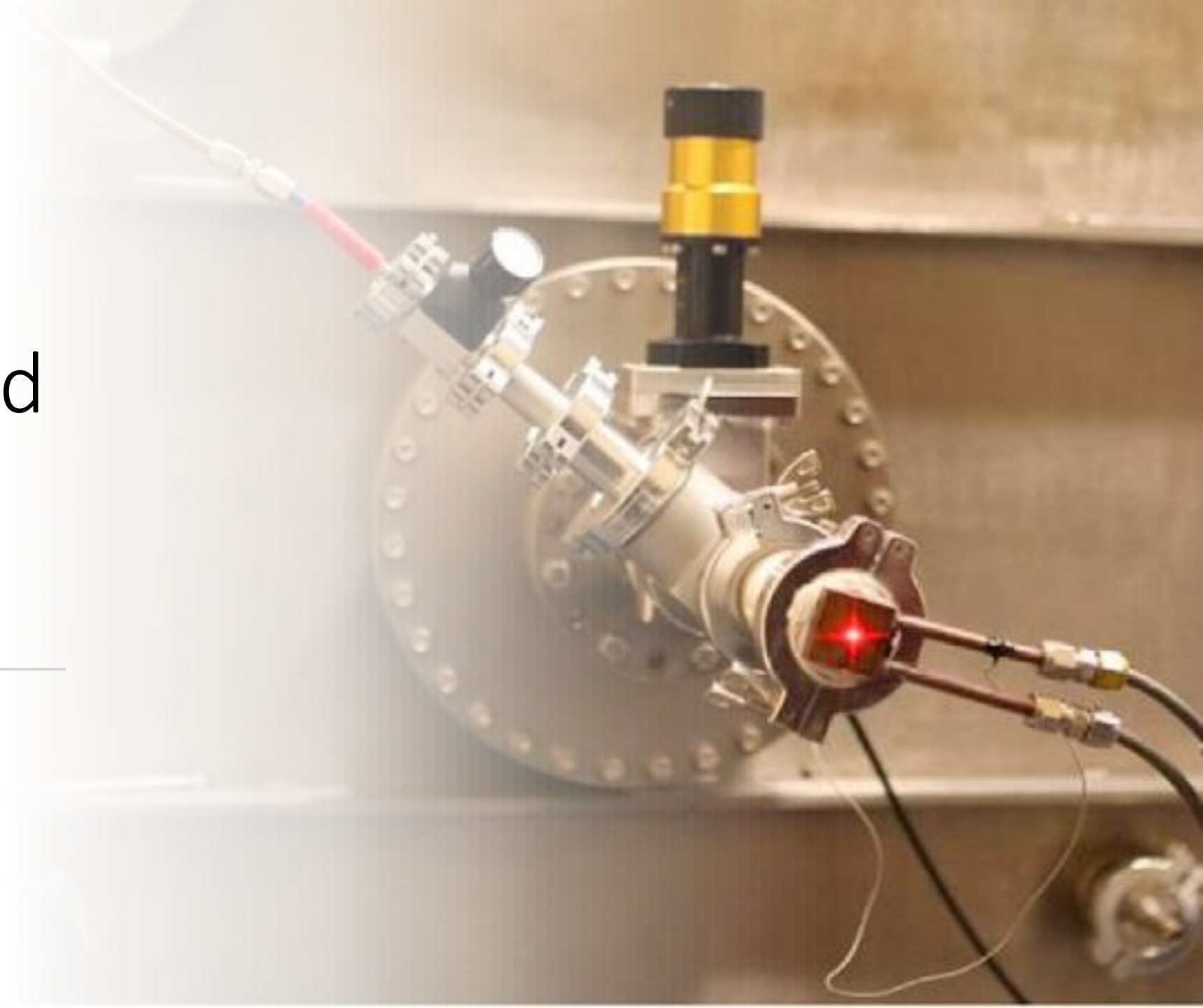
Production and use of Neutrons



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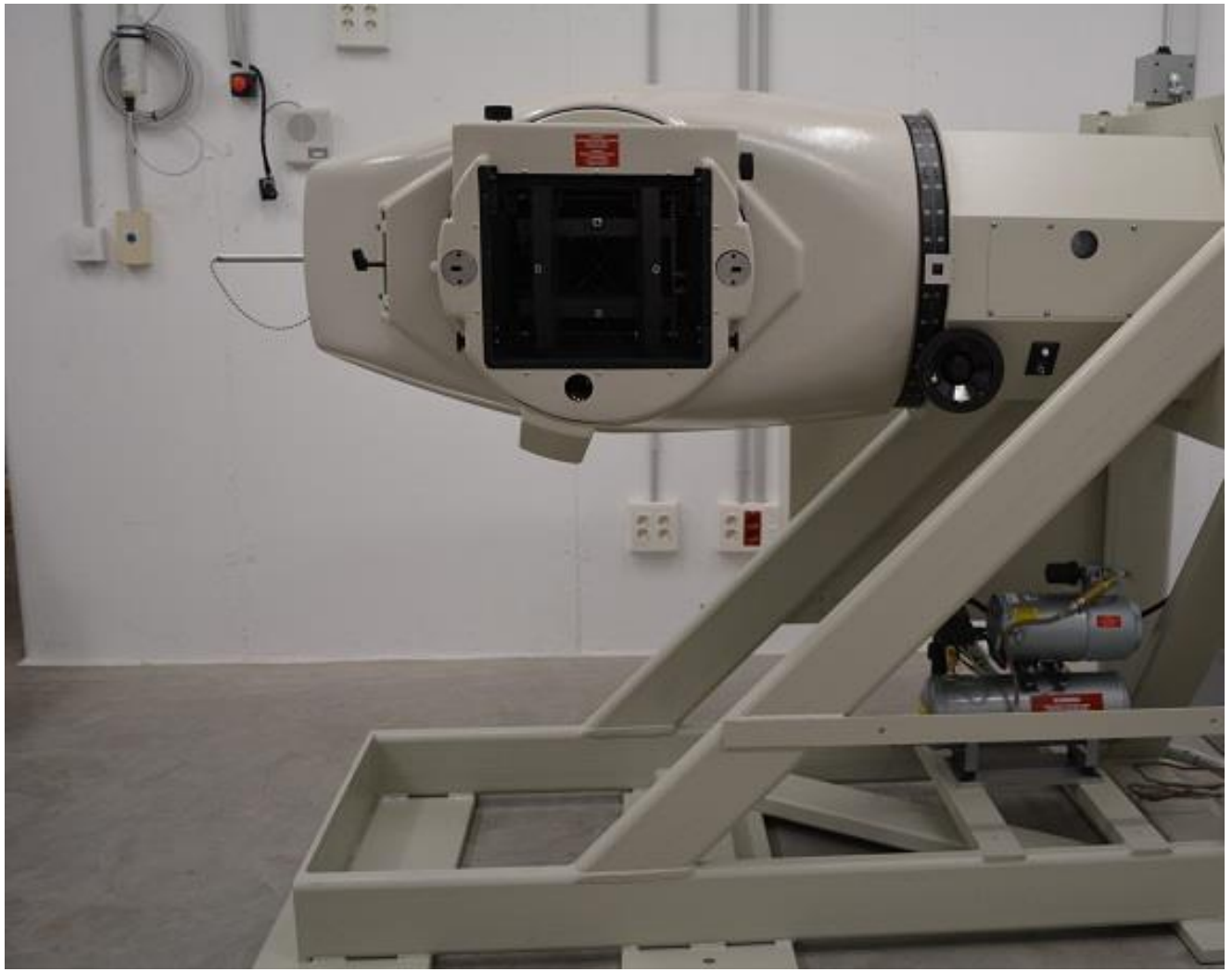
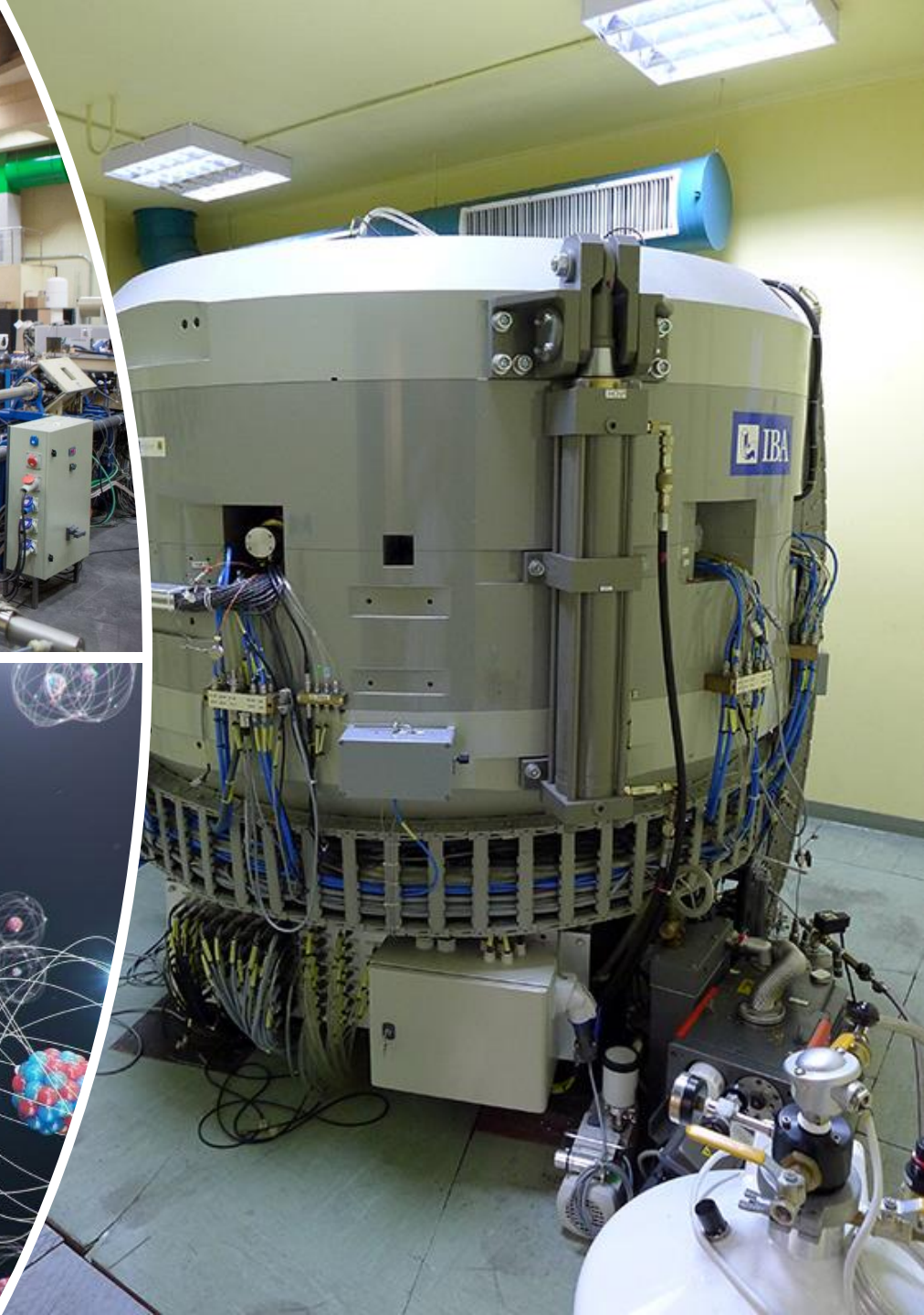
Irradiation essays (protons, deuterons, gamma…)



Nuclear reaction studies







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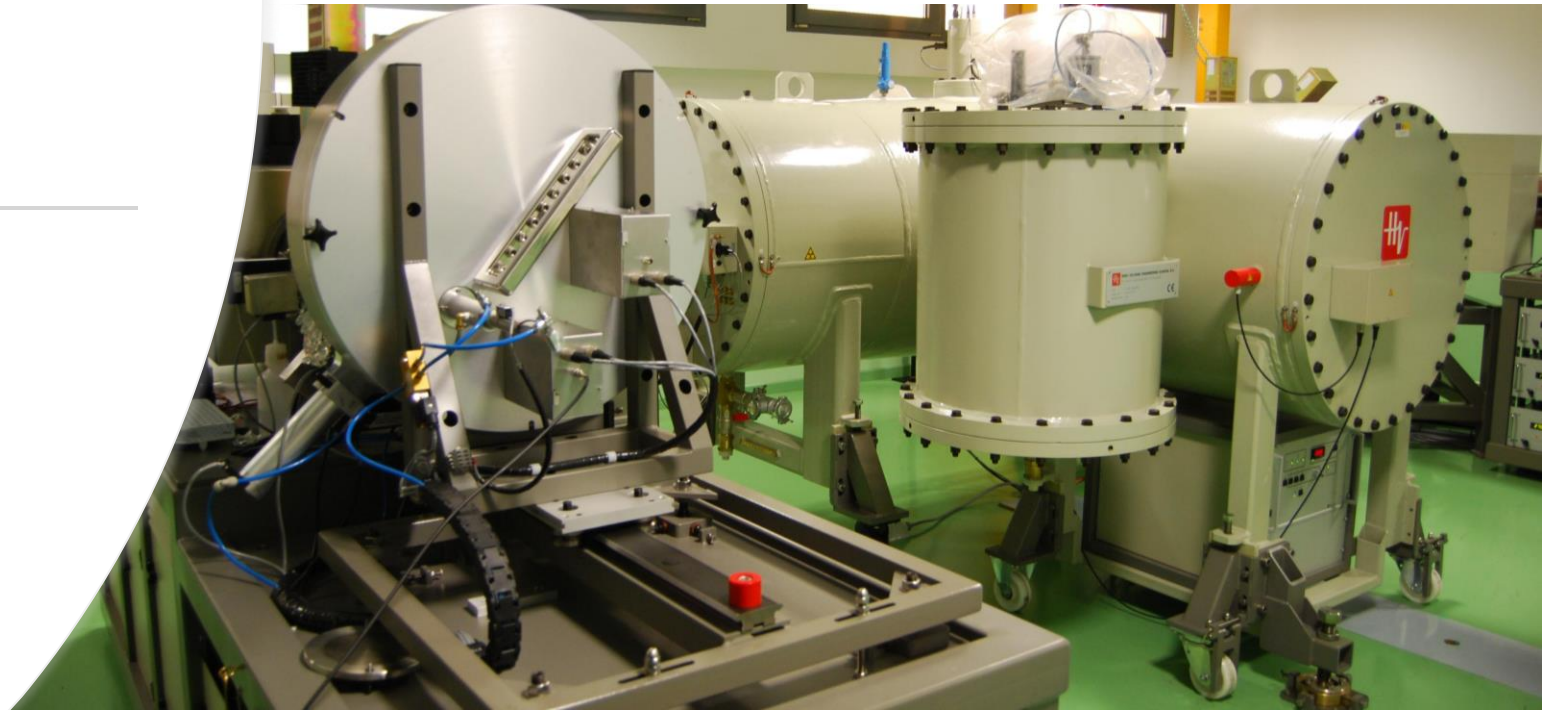
Determination of radionuclides by Accelerator Mass Spectrometry





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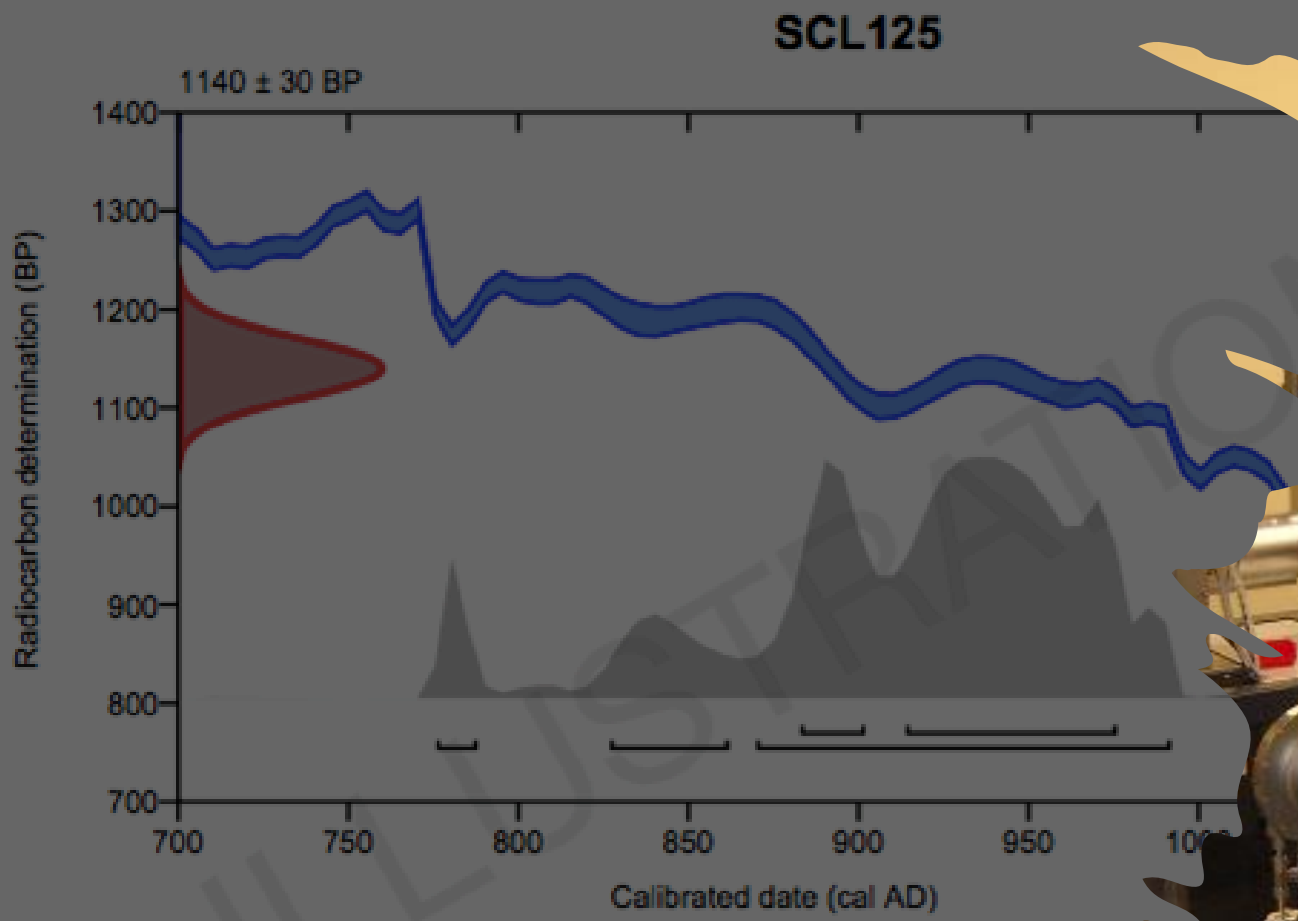

^{14}C Dating



Database used

INTCAL20

References

References to Probability Method

Bronk Ramsey, C. (2009). Bayesian analysis of radiocarbon dates. Radiocarbon, 51(1), 33

References to Database INTCAL20

Heaton, et.al.,2009, Radiocarbon 51(4):1151-1164, Reimer,et.al, 2009, Radiocarbon 51(4):1
Radiocarbon 35(1):137-189, Oeschger, et.al., 1975, Tellus 27:168-192.

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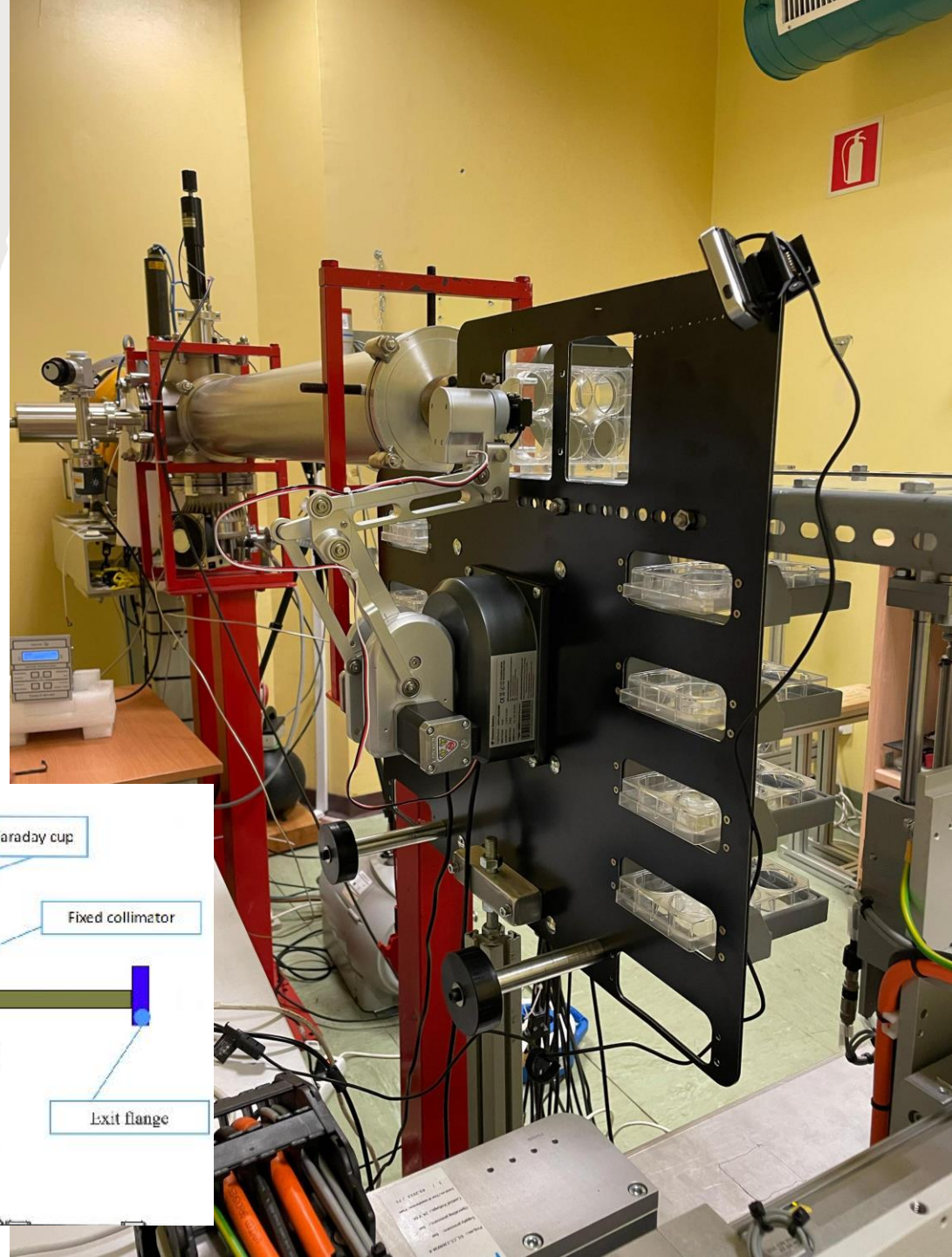
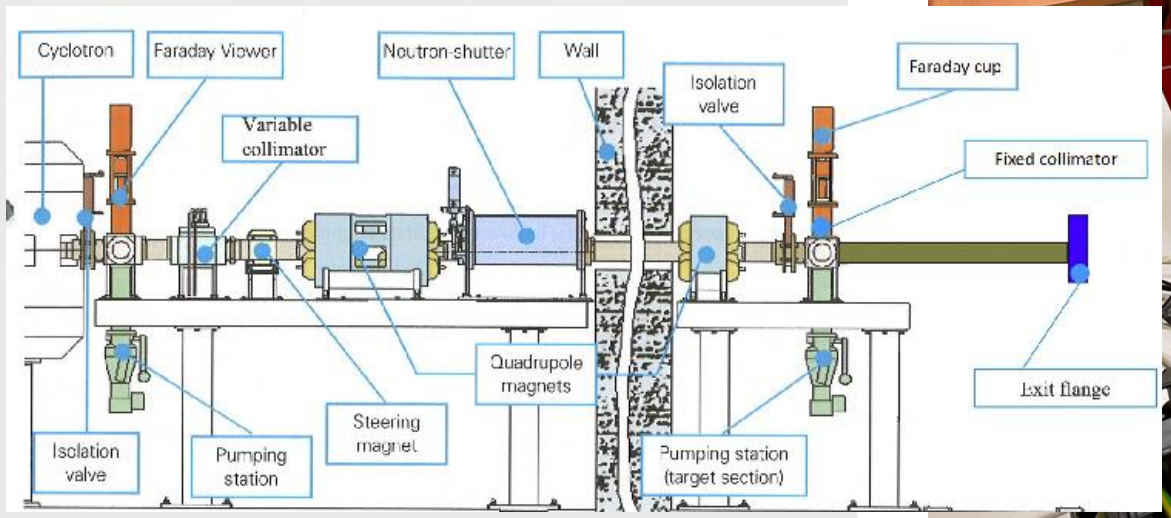
Radiobiology and Proton-therapy





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Archaeometry and Heritage Science



Development of semiconductor detectors for High Temperature applications

Centro Nacional de Aceleradores

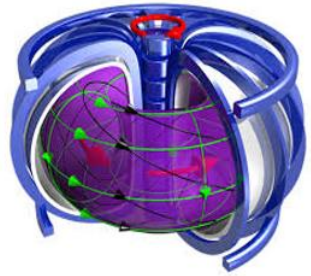
COLLABORATION: CNA & IMB-CNM

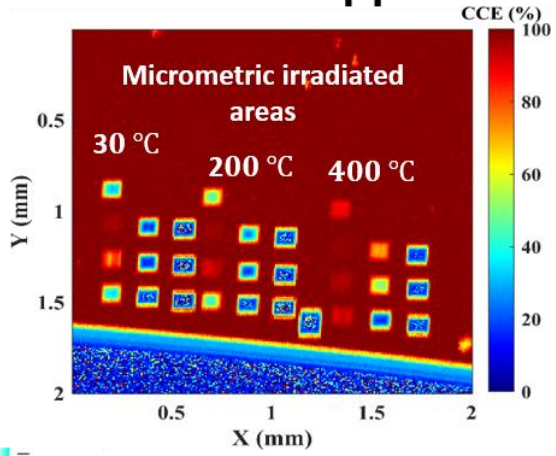
CNA team: Mª Carmen Jiménez-Ramos, Javier García López, Carmen Torres, Mauricio Rodríguez

Centro Nacional de Aceleradores · ICTS Infraestructuras Científicas y Técnicas Singulares · Centro Nacional de Microelectrónica · CSIC

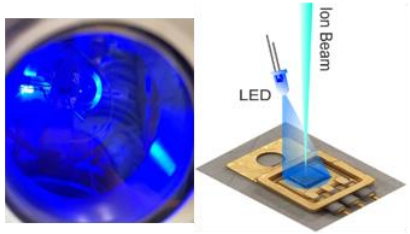
Actividades del CNA para los "upgrades" de alta luminosidad de CMS y DRDs del ECFA (**PID2023-148418NB-C44**)
R&D on Solid-state Detector Technologies (DRD3) **CERN collaboration**

- **4H-SiC diodes fabricated by IMB-CNM → targeted to be used up to 500 °C. Aim to be applied as Alpha particles diagnostic in experimental nuclear fusion devices.**





- **Highlights:**
  - **New sample holder for the nuclear microprobe for experiments up to 1200 °C**
  - **Damage study up to 400 °C in SiC prototype detectors**
  - **Use of blue LED for partial mitigation of radiation effects. Spectrometric response improves 3 times.**

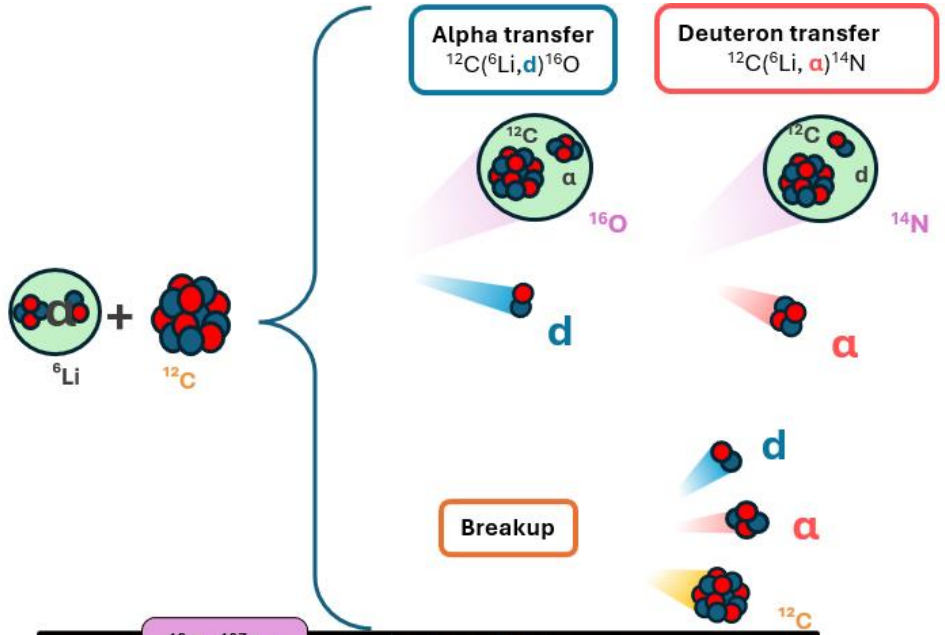


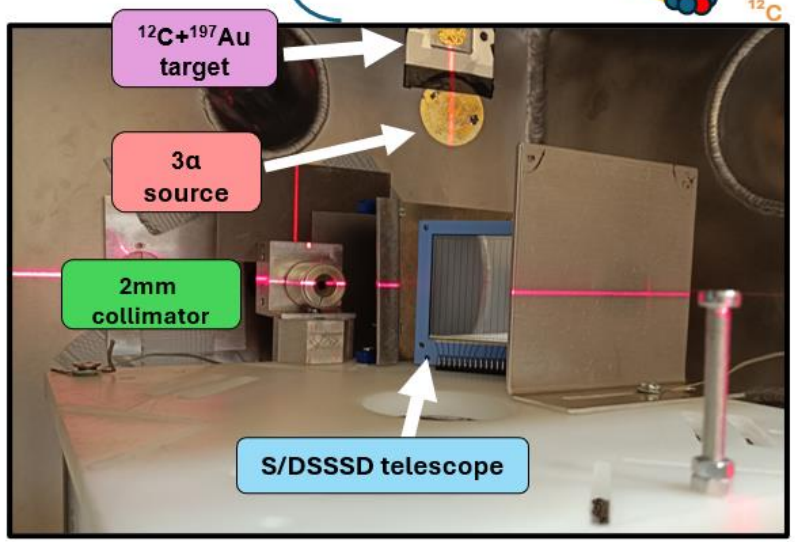
A blue LED was used to illuminate the detector during the characterization.

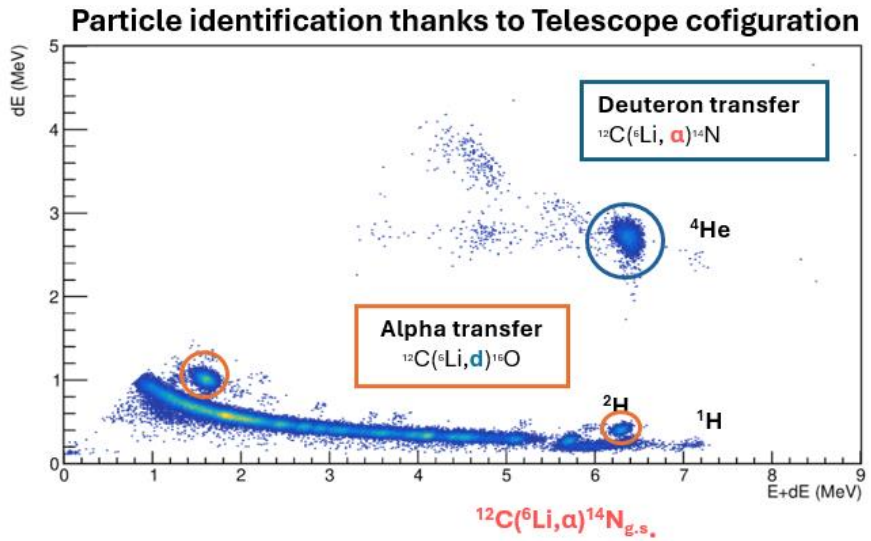
C. Torres-Muñoz *et al.* Effect of dynamic annealing on 4H-SiC detectors irradiated at different temperatures. *IEEE Trans. Instrum. Meas.* (under review).

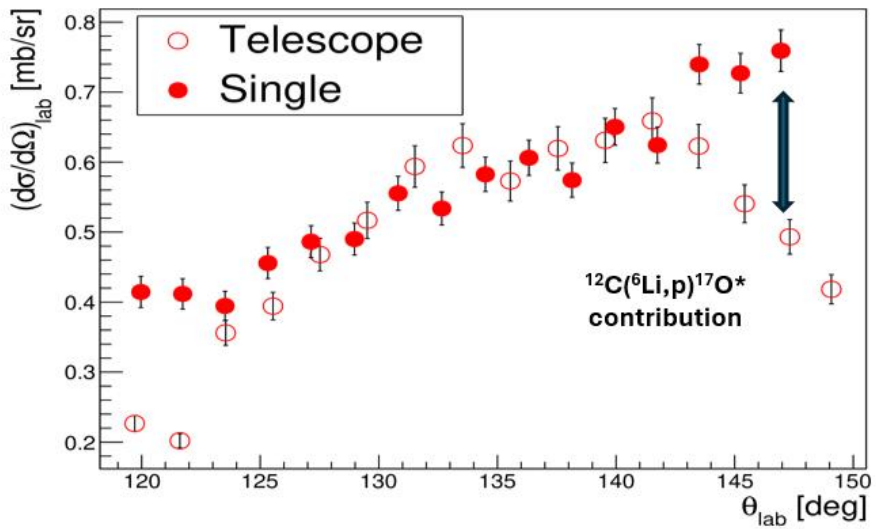
M. Rodríguez-Ramos *et al.* Enhancing charge collection efficiency in radiation-damaged unmetallized 4H-SiC detectors via LED illumination. *Rad. Phys. Chem.* (under review).

Medida de reacciones nucleares de interés astrofísico en FNB: 6Li+12C







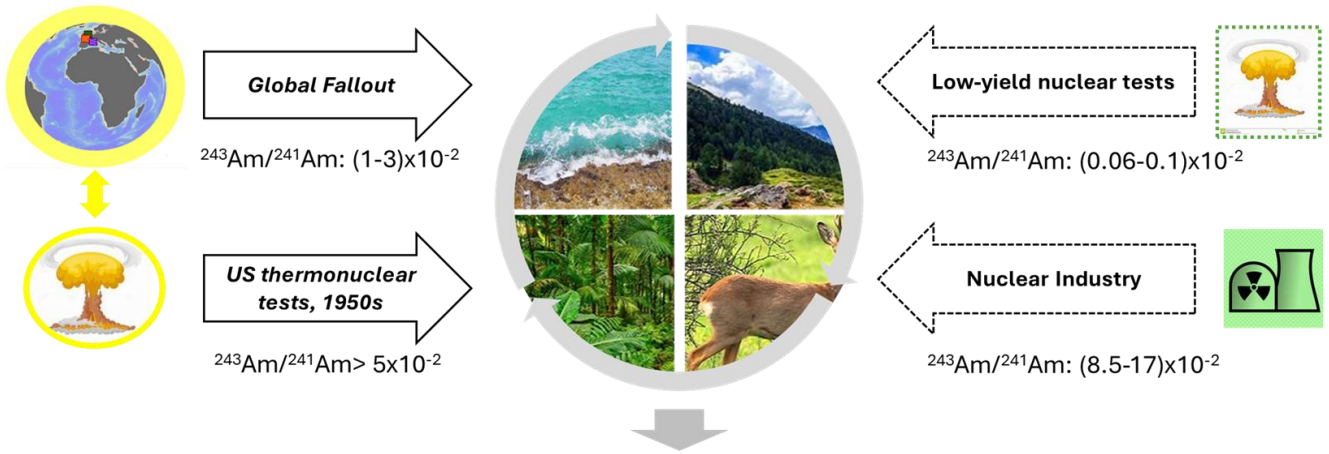


PhD A. Vegas

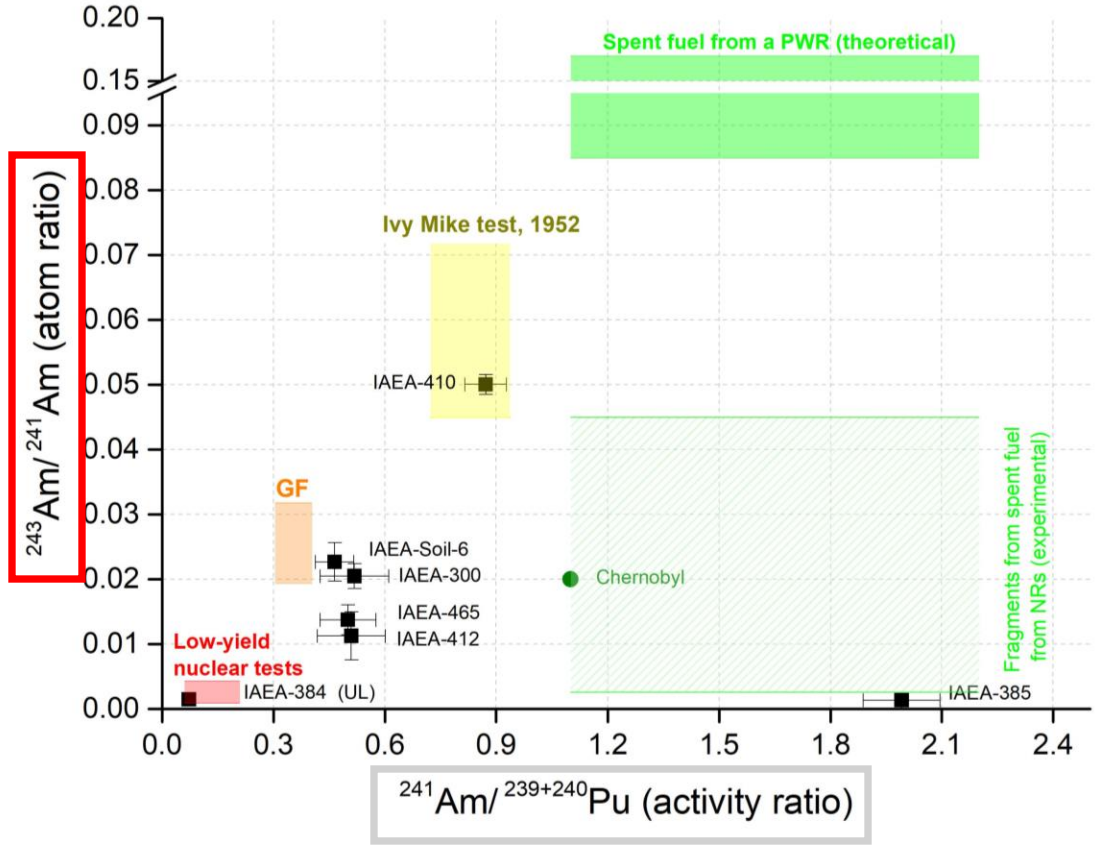
$^{243}Am/^{241}Am$: a new tracer of Am origin

Elena Chamizo, Mercedes López-Lora, Antonio J. López-Fuentes

- Primera determinación de ^{243}Am en cantidades ultra traza mediante AMS.
- La relación isotópica $^{243}Am/^{241}Am$ discrimina el origen de la contaminación.
- Validación en materiales de referencia de la IAEA.



Fingerprinting Am sources using $^{243}Am/^{241}Am$



communications earth & environment

Chamizo, E., López-Lora, M. & López-Fuentes, A.J. Trace americium contamination sources in the environment can be detected using $^{243}Am/^{241}Am$. Commun Earth Environ 7, 92 (2026). https://doi.org/10.1038/s43247-025-03095-2

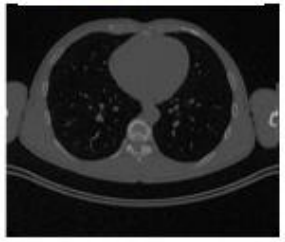
ESTUDIO MORFOLÓGICO DEL ALTO RENDIMIENTO DEPORTIVO Y SU RELACIÓN CON HOMO SAPIENS Y NEANDERTAL

Centro Nacional de Aceleradores

Departamento de Antropología y Genética Humana de la Facultad de Ciencias de la Universidad Carolina de Praga
Museo de Ciencias del CSIC en Madrid







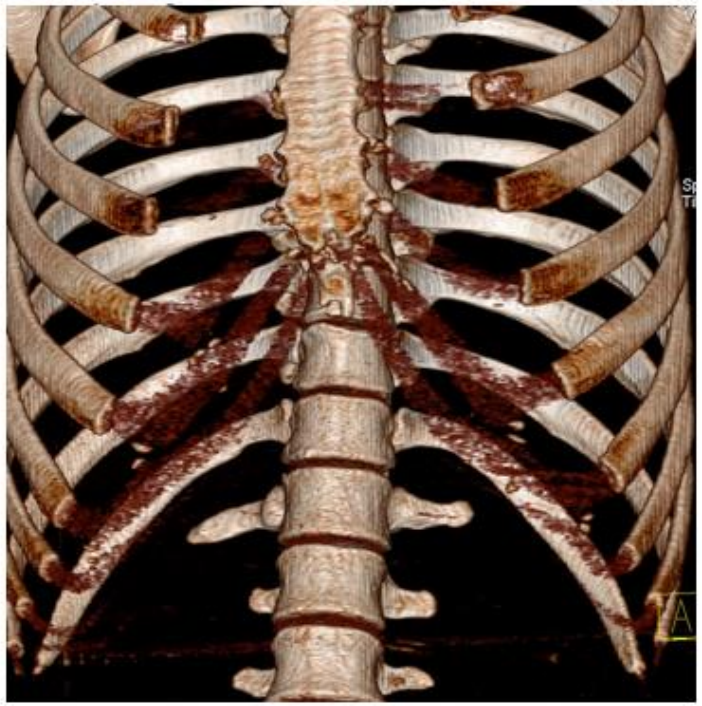


RESEARCH ARTICLE | Open Access

Lower Limb Entheseal Variation in Modern Athletes and an Early Medieval Population: Implications for Activity Reconstruction

Elena García-Vargas, Jiří Macháček, Ángel Luis Parrado-Gallego, Enrique Alcalá, Víctor Manuel Encinas-Tobajas, Markus Bastir, Vladimír Sládek

First published: 18 August 2026 | https://doi.org/10.1002/ajpa.70335 | VIEW METRICS





For your career

- 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

Thanks for your attention

José María López Gutiérrez

LGUTI@US.ES

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