# LA PROTECCIÓN RADIOLÓGICA EN 2006

## Hitos en Dosimetría e Instrumentación

A.Delgado. CIEMAT

**Dos aspectos destacables:**

Ámbito nacional:
Necesidad inaplazable de completar el desarrollo de la **dosimetría interna**

Ámbito internacional:
Nuevos detectores **superconductores** para espectrometría gamma

## Dosimetría Interna en España

**Métodos "in vivo"** (emisores gamma):
razonablemente cubierto: CIEMAT, TECNATOM, CCNN

**Métodos "in vitro"** (emisores alfa y beta)
desarrollo insuficiente: solamente CIEMAT

**Evaluaciones de Dosis:**
CIEMAT (todos emisores),
Tecnatom, CCNN (productos fisión y activación)

*Resaltar complejidad evaluaciones para Actínidos*

## Necesidades futuras en dosimetría interna:

derivadas de actividades de D+D instalaciones nucleares:
**exposición a ACTINIDOS, emisores alfa**

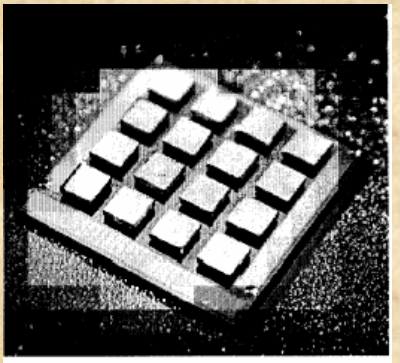
Sectores con riesgos de contaminación interna insuficientemente atendidos: Medicina Nuclear

**Asunto Po:**
necesidad desarrollar **métodos rápidos** para evaluar niveles de contaminación interna que pudieran requerir tratamientos de decorporación: Emergencias, terrorismo nuclear, tráfico ilegal fuentes….

**NIST PRESS RELEASE**
**Record-breaking Detector May Aid Nuclear Inspections**
**FOR IMMEDIATE RELEASE:**
March 14, 2006
**CONTACT**: Laura Ost(301) 975-4034

Boulder, Colo.—Scientists at the Commerce Department's National Institute of Standards and Technology (NIST) have designed and demonstrated the world's most accurate gamma ray detector, which is expected to be useful eventually in verifying inventories of nuclear materials and detecting radioactive contamination in the environment.

An array of the new **superconducting sensors** might give inspectors new capabilities such as enabling them to determine the Pu content of spent reactor fuel without handling the fuel.
Plutonium content can indicate whether a reactor is being used to produce weapons or electrical power.



Silicon chip built by NIST researchers with 16 tiny gamma ray detectors that may help nuclear inspectors improve analysis of plutonium and other radioactive materials. Each detector is one millimeter square.

View a high resolution version of this image.

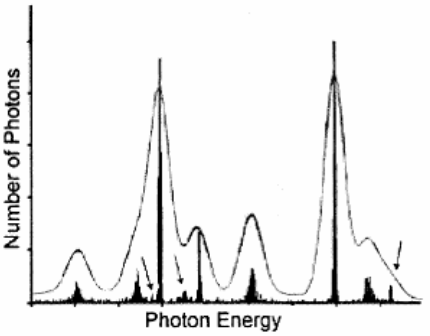
Image credit: NIST

**Desing of a Multi-Channel Ultra-High Resolution Superconducting Gamma-Ray Spectrometer**

S. Friedrich et.al. (Advanced Detector Group, LL National Laboratory, USA)

Superconducting Gamma-ray microcalorimeters , operated at temperatures around **100mK** offer an order of magnitude improvements in energy resolution over conventional high-purity Germanium spectrometers .

The calorimeters consist of a 1mm3 superconducting absorber and a sensitive thermistor weakly coupled to a cold bath.




The data plots above show detection of gamma rays with specific energies. Arrows point to energies identified with the new detector that are difficult to detect in the red plot made with a conventional detector.

View a high resolution version of this image.

Image credit: NIST, National Nuclear Security Agency, Los Alamos National Laboratory