

# Measurement of $^{229m}\text{Th}$ decay energy for nuclear clock application

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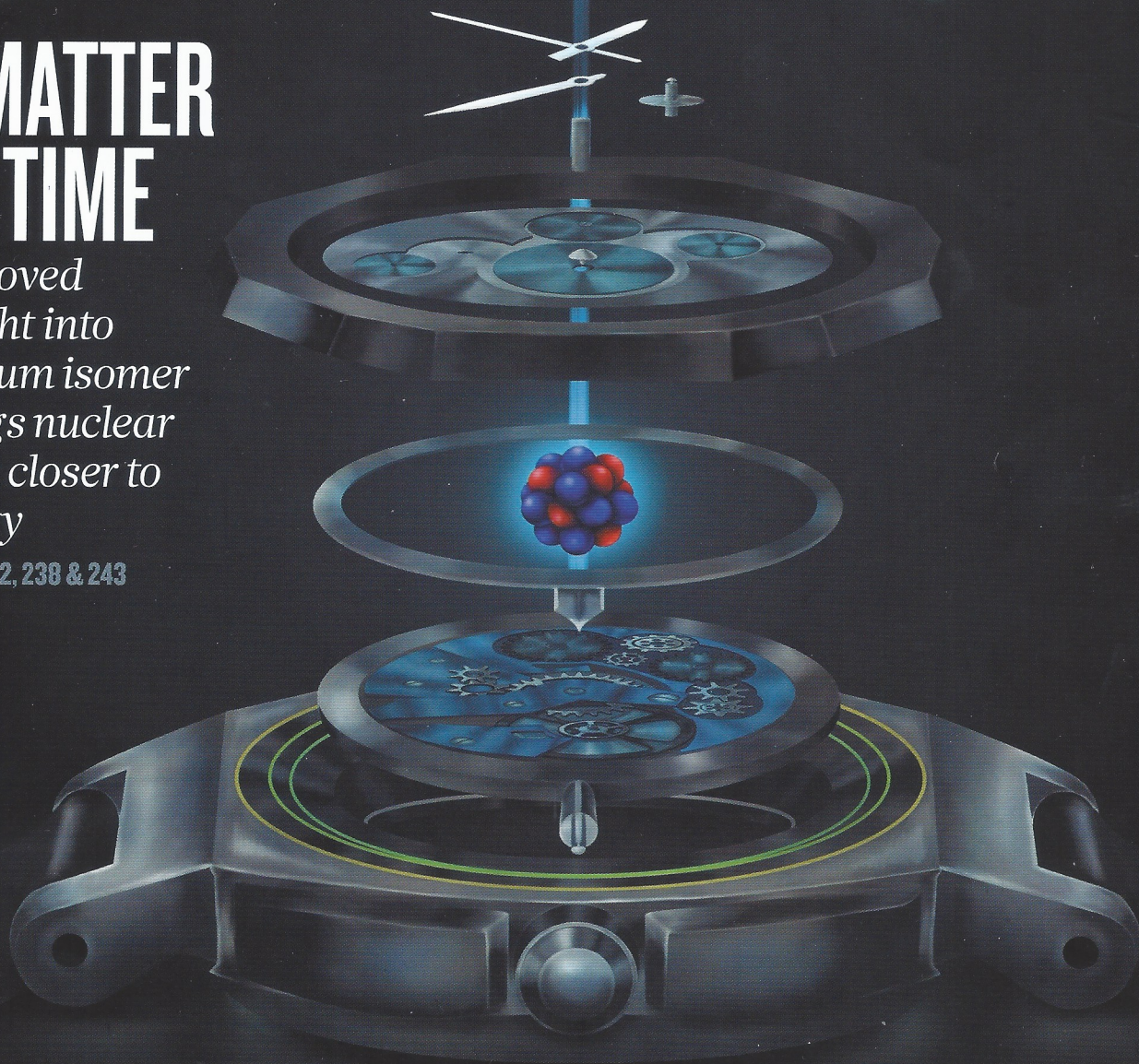
# nature

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## A MATTER OF TIME

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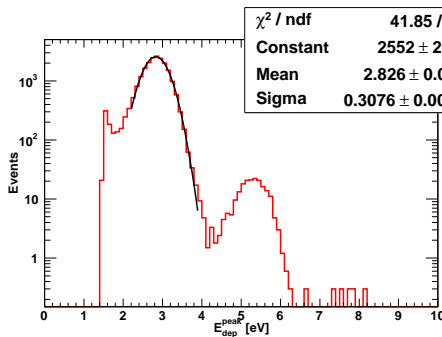
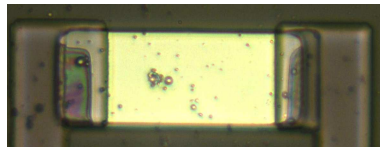
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# Detector development and characterization

- 1 development of TES satisfying experimental requirements:  
signal fall time  $\tau < 10 \mu\text{s}$ ,  
resolution  $\Delta E < 1 \text{ eV}$ ,
- 2 production of TES array with total area  $200 \times 200 \mu\text{m}^2$ ,
- 3 laser calibrations and Poissonian fit,
- 4 growth of  $^{233}\text{U}$  film on Si detector,
- 5 final measurement with  $^{233}\text{U}$  film.



F. Gatti, M. Osipenko, R. Caciuffo.

# Kelvinox 100 instrumentation



- 1 dilution refrigerator Kelvinox 100: temperature 20 mK, cooling power 100  $\mu$ W at 100 mK;
- 2 new cool head (in progress in OM),
- 3 new SQUID (in delivery),
- 4 cables, fibers, supports (OM),
- 5 LabView remote control (Adriano Bevilacqua),
- 6 operation tests (Luigi Parodi).

## Measurements of the band gap of ThF<sub>4</sub> by electron spectroscopy techniques

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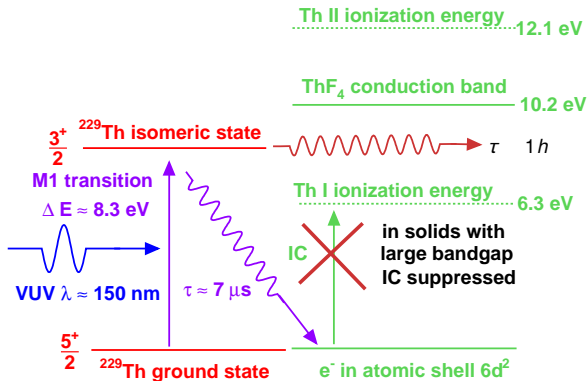
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We present an experimental determination of the band gap of ThF<sub>4</sub> performed by two different techniques.

- 1 VUV photo-luminescence measurements of ThF<sub>4</sub> (II-VI),
- 2  $\alpha$  scintillation measurements of ThF<sub>4</sub> (II-VI),
- 3 preparation for <sup>229</sup>ThF<sub>4</sub> measurements at JRC (Karlsruhe).



# Manpower/Richieste 2021

Person	Participation (FTE)
Mikhail Osipenko	0.7
Mauro Taiuti <sup>†</sup>	0.4 <sup>†</sup> associato INFN.
Mauro Giovannini <sup>†</sup>	0.3
Marco Ripani	0.2
Flavio Gatti <sup>†</sup>	0.1
Beatrice Siri <sup>†</sup>	0.1
Lorenzo Ferrari Barusso <sup>†</sup>	0.1
Total	1.9

Richieste finanziarie: consumo - 11 (LHe), missioni - 1 + 2 s.j.

Servizio	Richieste (m.u.)	Obiettivi
Progettazione	1	criostato/camera
Officina	1	criostato/camera
Supporto tecnico	1	montaggio, cavi, test
Utilizzo criostati		test Si e TES, misure

# Schedule of experiment

