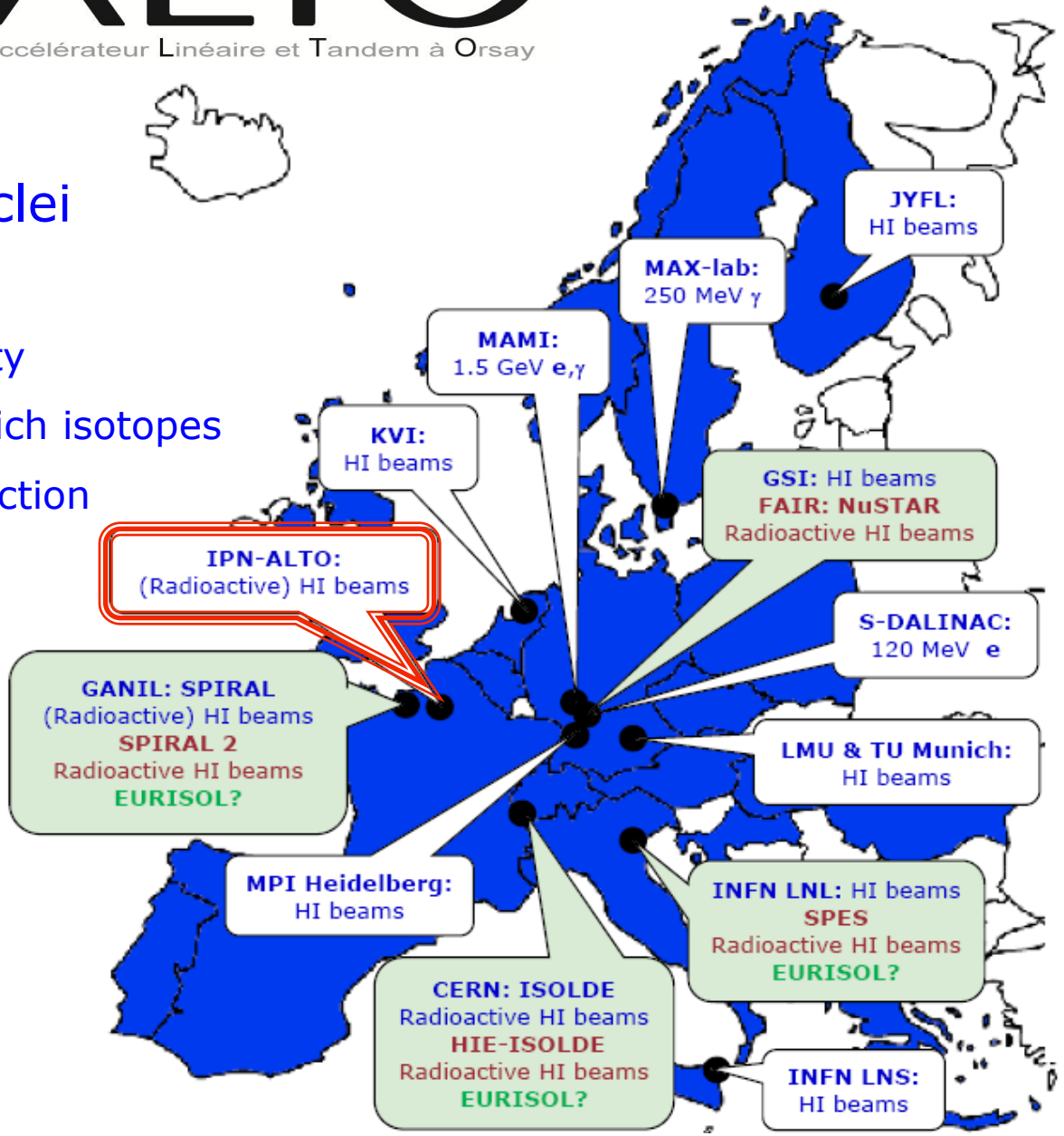
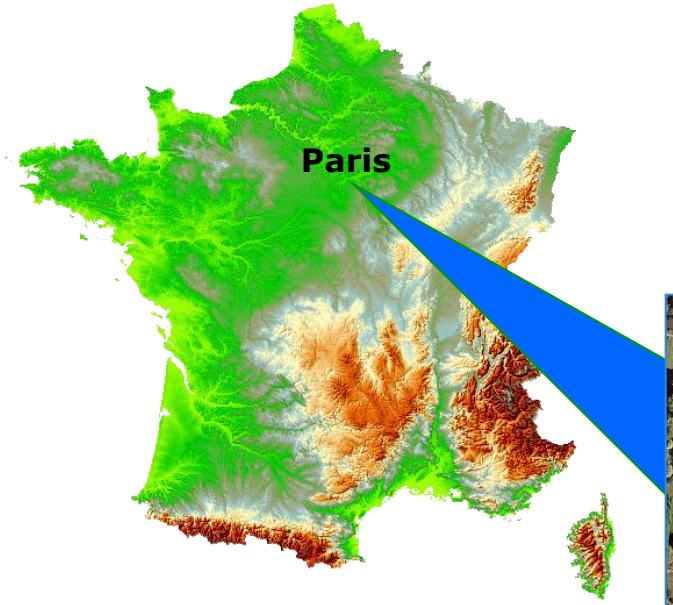
ALTO
Accélérateur Linéaire et Tandem à Orsay

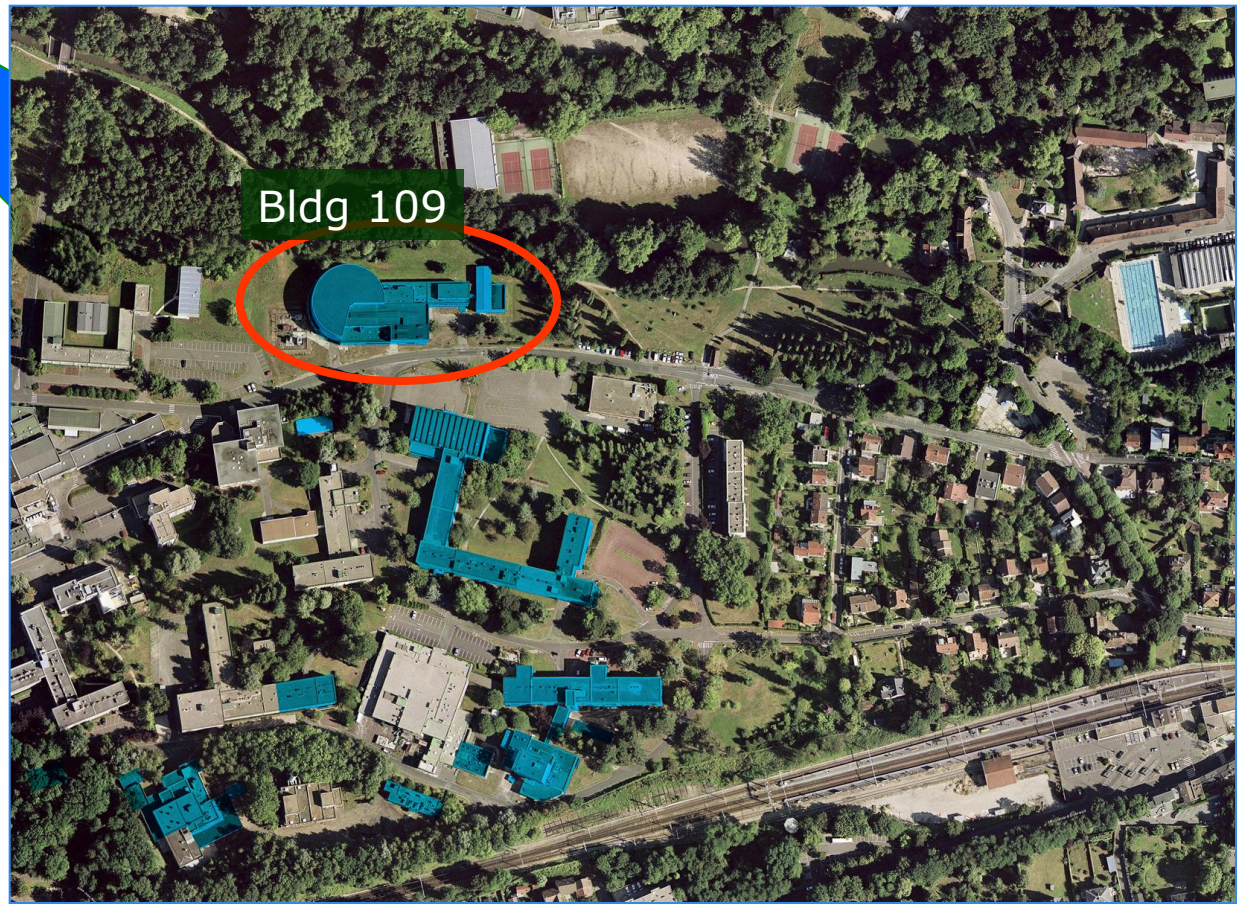
The ALTO facility to produce rare nuclei

- The overall TNA facility
- The production of n-rich isotopes
- R&D for such a production

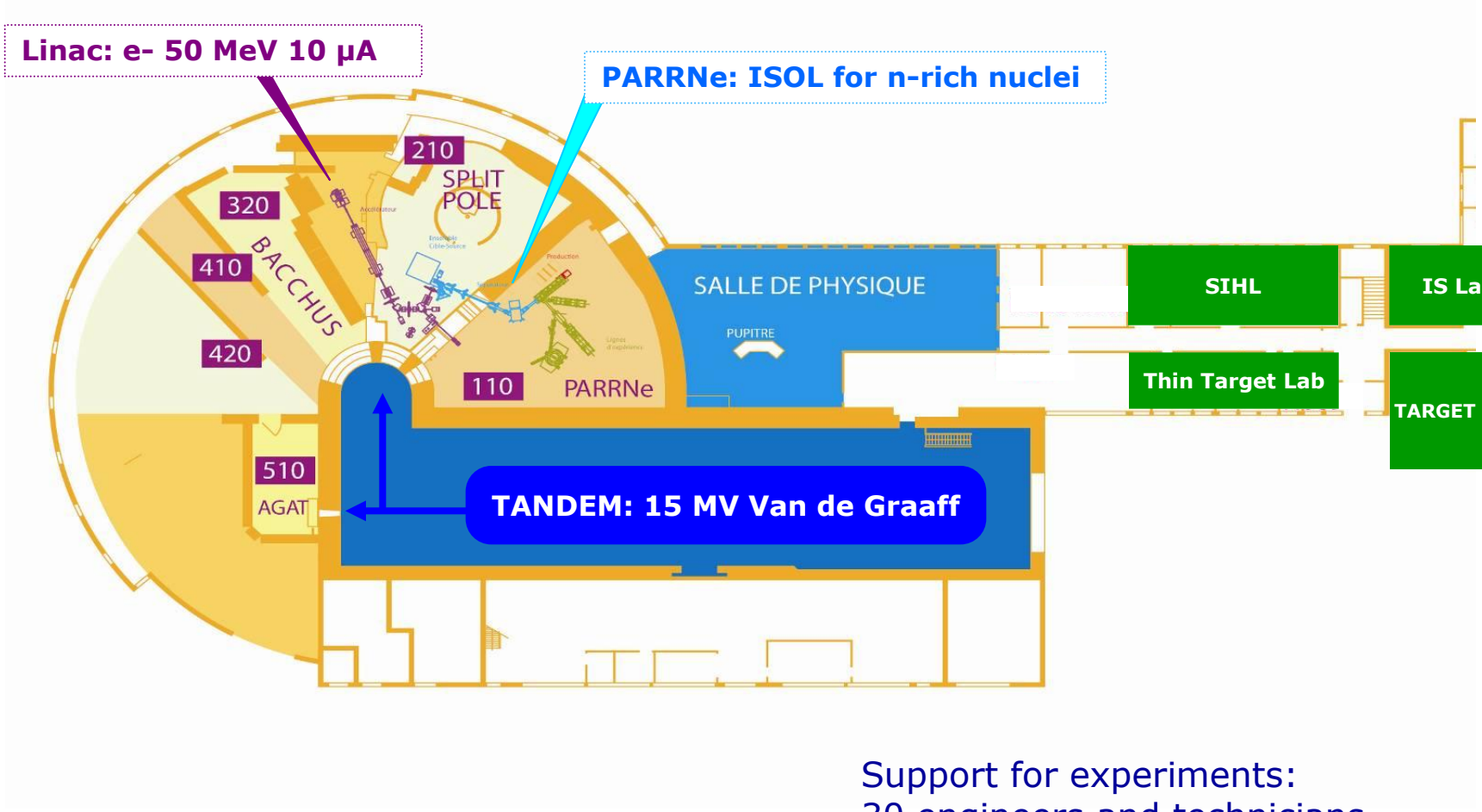


ALTO the TNA facility at Orsay





ALTO the TNA facility at Orsay



Support for experiments:
30 engineers and technicians,
5 physicists.

ALTO a hybrid facility

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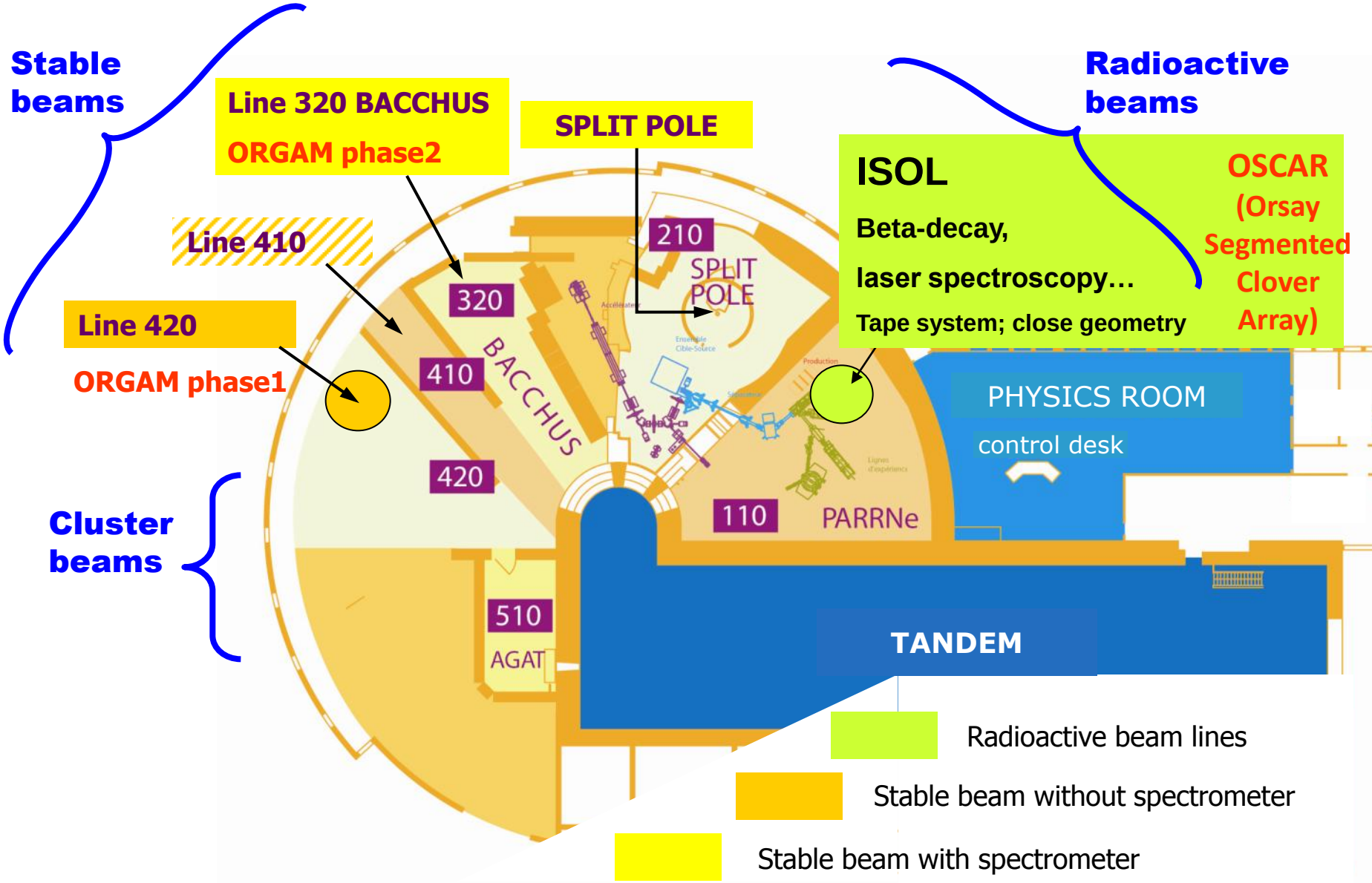
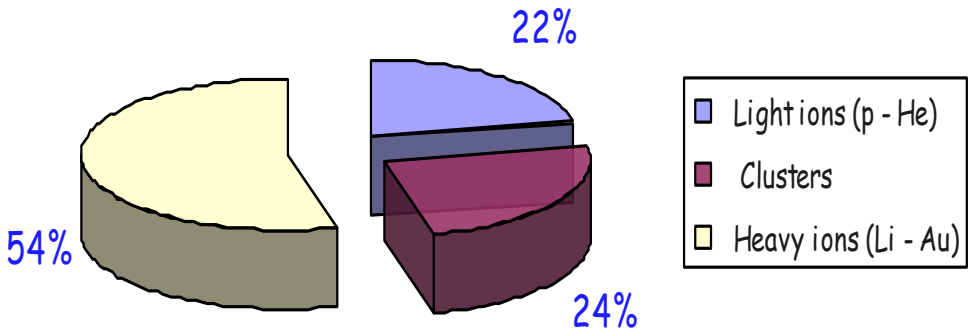


Experiments with the Tandem

The Tandem delivers

- ions ranging from p to Au,
- cluster beams and micro-droplets,
- rare ion beams: 14C, 48Ca etc.

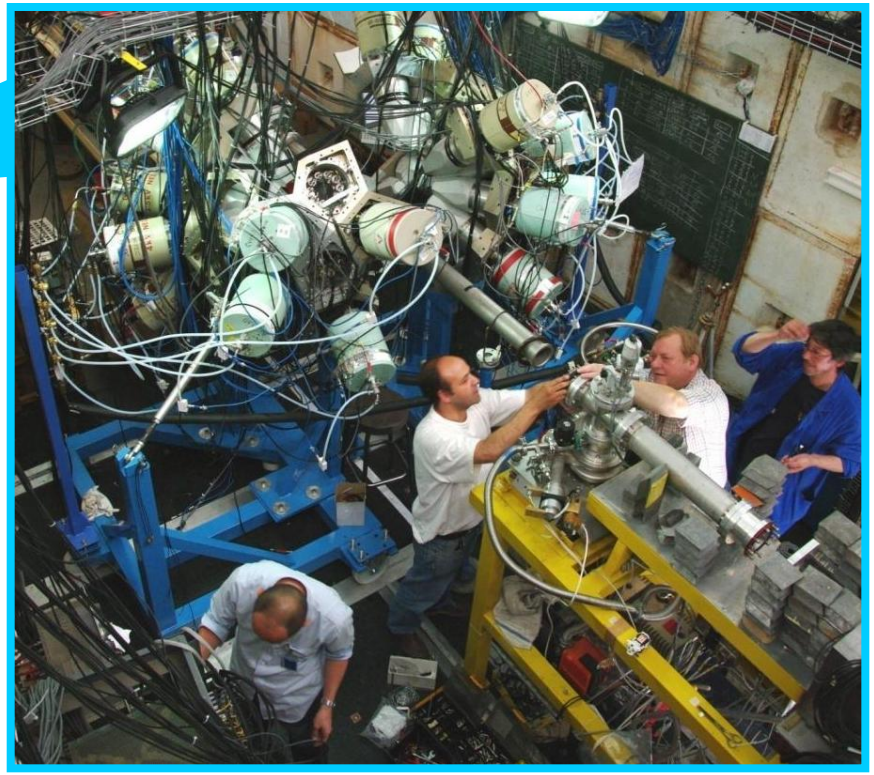


400 researchers from
26 foreign institutions and 15 national ones
for nuclear physics and applied physics.

ORGAM: ORsay GAMma array

Recent achievement related to stable beams:
installation and exploitation of ORGAM.

Construction achieved,
measurement campaign in progress
(1st phase ended).



ALTO for the production of n-rich nuclei

Facility using photofission process for the production of ISOL RNB.

Linac

Target – ion source

RILIS station

10^{11} fissions/s

$3\,10^{7}$ ^{132}Sn/s

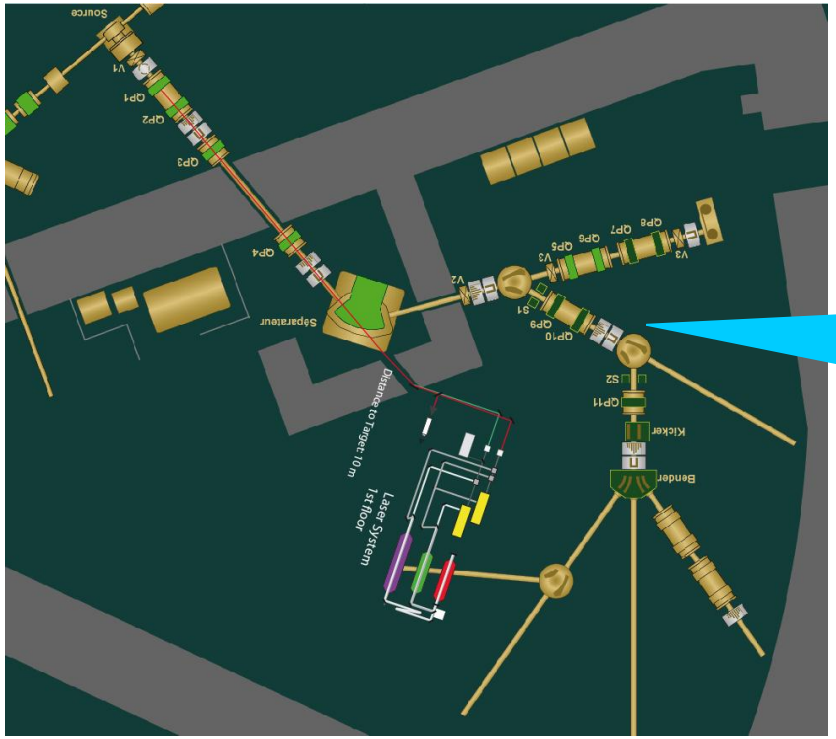
Experimental beamlines

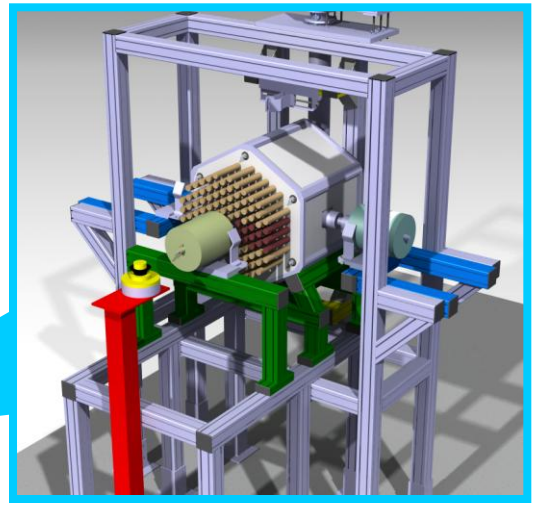
New experimental beam lines:

Phase 1 of DESIR for fission fragments…

Experimental beam lines

5 experimental beam lines for nuclear structure physics





Beam line equipments in coherence and synergy with DESIR at SPIRAL2:

- Collinear spectroscopy etc.
- β decay: an optimized detector in progress: **BEDO**

Status of the n-rich RNB at ALTO

ALTO workshop: 26 LoI for programs to operate at ALTO.

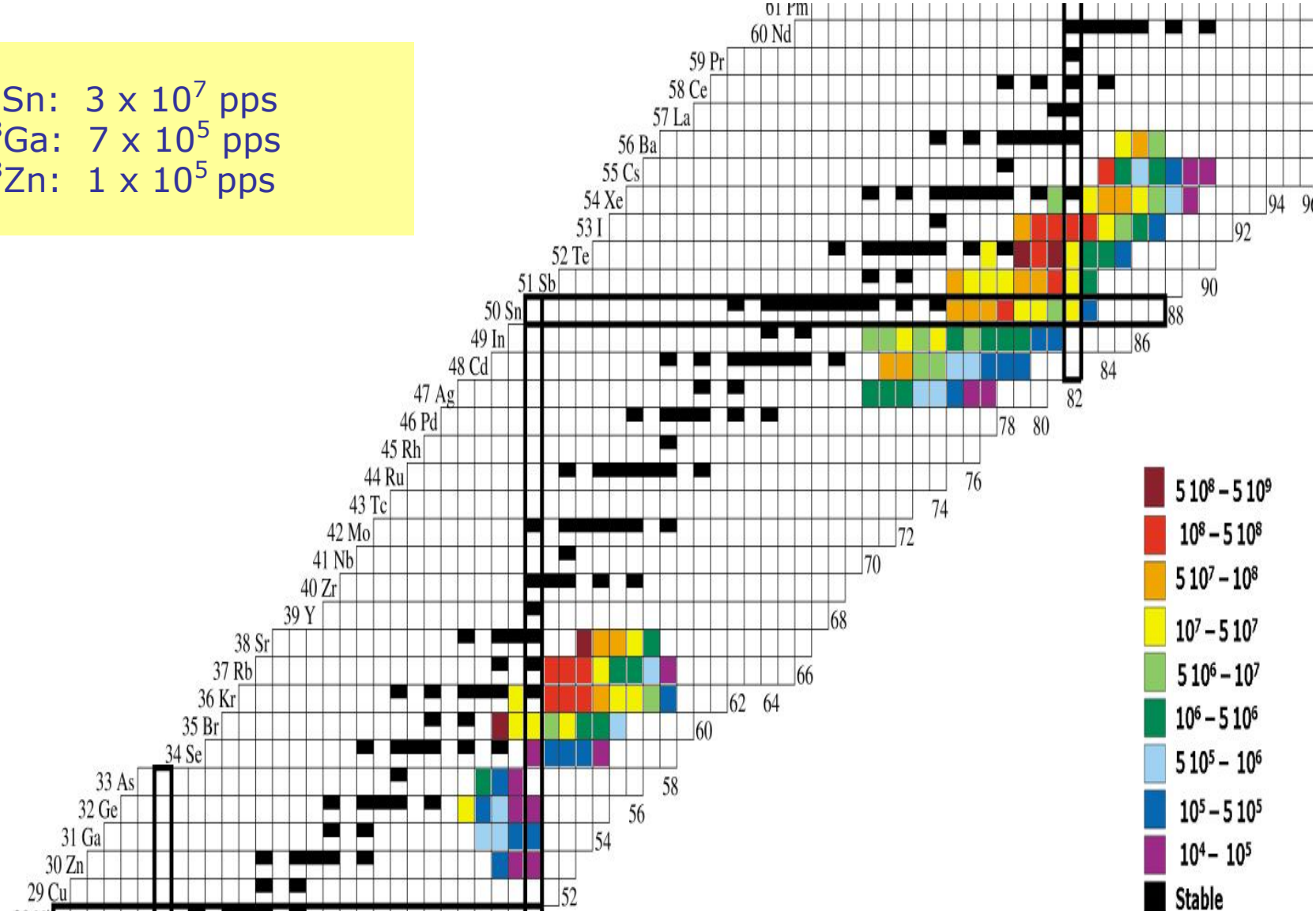
Commissioning step by step from 100 nA to 10 µA:

- Technical output:
  - Validation of the shielding
  - Validation of the radioactive gas storage system
  - Validation of the various safety system: fire, radiation, access, confinement etc.
- Physics output:
  - Confirmation of expected yield (M. Cheikh Mhamed *et al.*)
  - New data on 81-83-84Ga
  - Fast timing in the La-region (B. Roussière *et al.*)
  - β-n measurements on (e.g. Poster #23 by D.Testov *et al.*)

Commissioning and validation of all components of the facility achieved.
Final authorization in October, then full operation of the facility.

ALTO Production with 10 µA e-

^{132}Sn: 3 x 10^7 pps
^{78}Ga: 7 x 10^5 pps
^{78}Zn: 1 x 10^5 pps



Detailed data on: http://ipnweb.in2p3.fr/tandem-alto/alto/accelerateur/productions/productions_E.html

R&D Installations for SPIRAL2 at ALTO

- SIHL: the off-line separator for the development of new ion sources:

FEBIAD-type
IRENA,
RILIS etc.

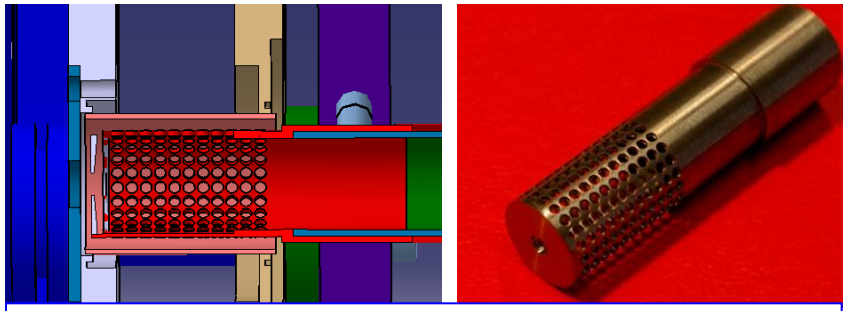
- Target lab to develop optimized UC_X targets:

X-ray diffractometer,
Hydrostatic weighing scale,
Helium pycnometer,
Mercury porosimeter,
BET,
Scanning electron microscope etc.

Lab extension for SPIRAL2 (100 m^2) under construction…

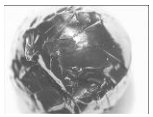
R&D at ALTO for SPIRAL2

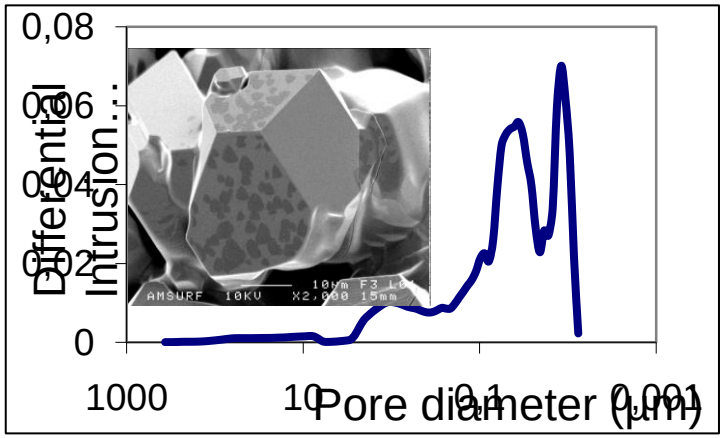
- Development of ion sources
  - IRENA SPIRAL2 - EURISOL
  - RILIS: contribution to GISELE (ANR)



IRENA designed with Lorentz 3D

- Development of UCX targets throughout European collaborations:
  - Collaboration with the SC material lab of UNIVERSITÉ DE RENNES 1
  - MoU SPIRAL2 - SPES
  - ActILab (ENSAR)





From synthesis
to waste reprocessing…

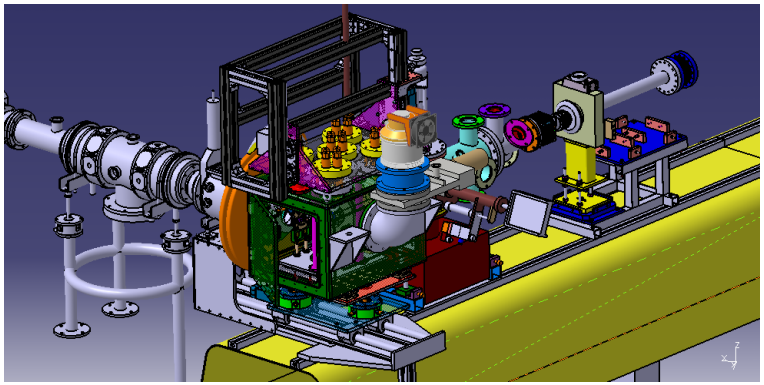
Tests at ALTO for SPIRAL2

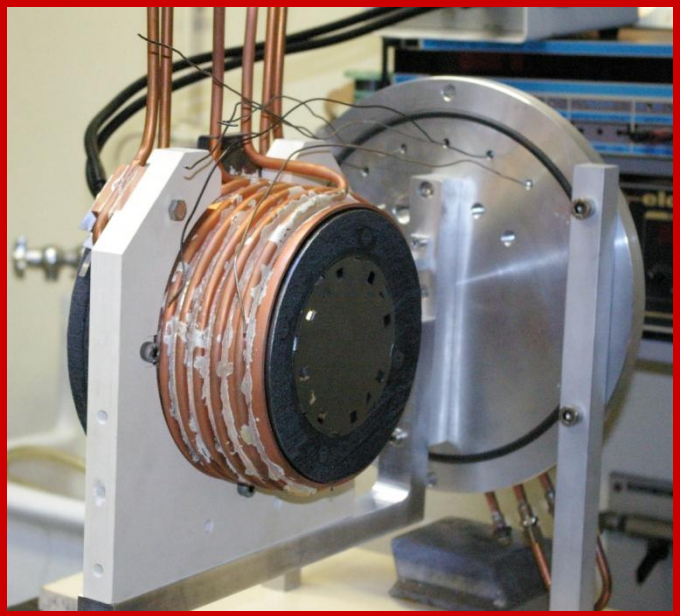
- Thermal modeling and tests of the target oven:

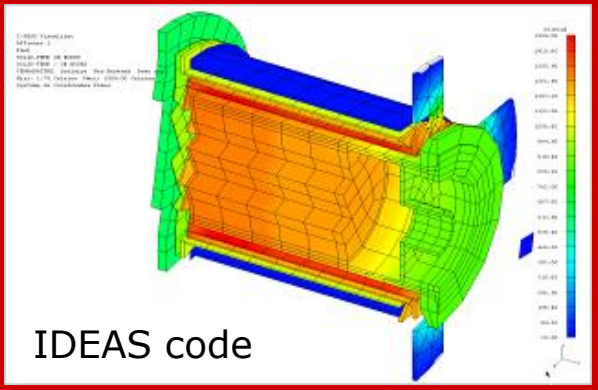
- On-line tests:
  - Material characterization:
    SC cavity, converter etc.
  - Diamond detector,
  - Release characterization of UC_X prototypes.

Already 5 weeks of beamtime in 2010…

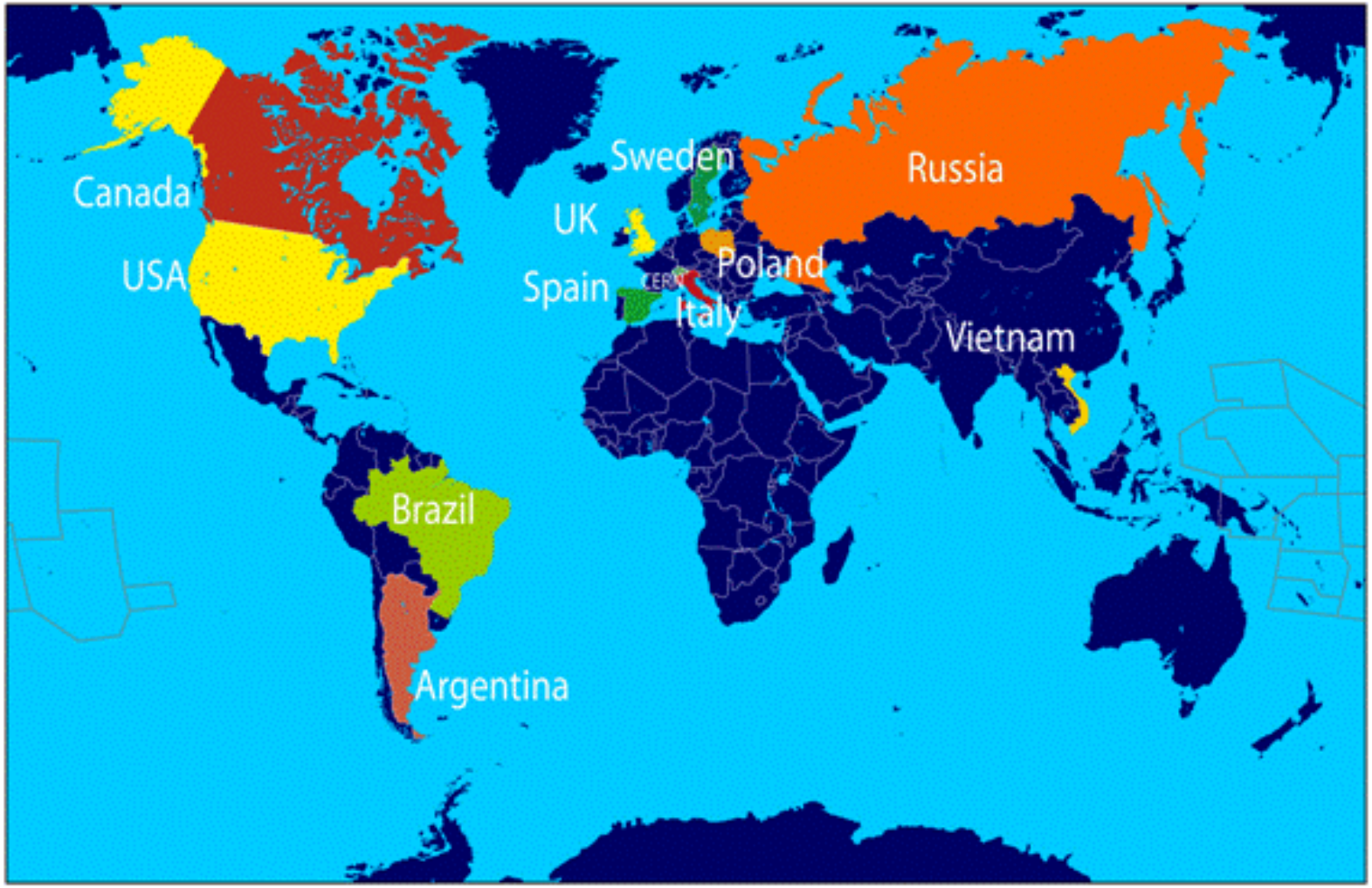
- Integration of TIS at ALTO







A facility open to other collaborations



The whole facility runs ~4000 h/year
+ R&D programs for nuclear beams

Web: http://sneap2010.in2p3.fr/

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