PIège de PEnning pour des ions RAdioactifs à DEsir

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Context

Exotic nuclei
- more knowledge on the structure of the atomic nucleus
- evidence for the limits of the "standard" nuclear models

Fundamental interactions
- nuclear physics experiments to test the limits of the Standard Model

DESIR@SPIRAL2
- experiments with nuclei currently inaccessible

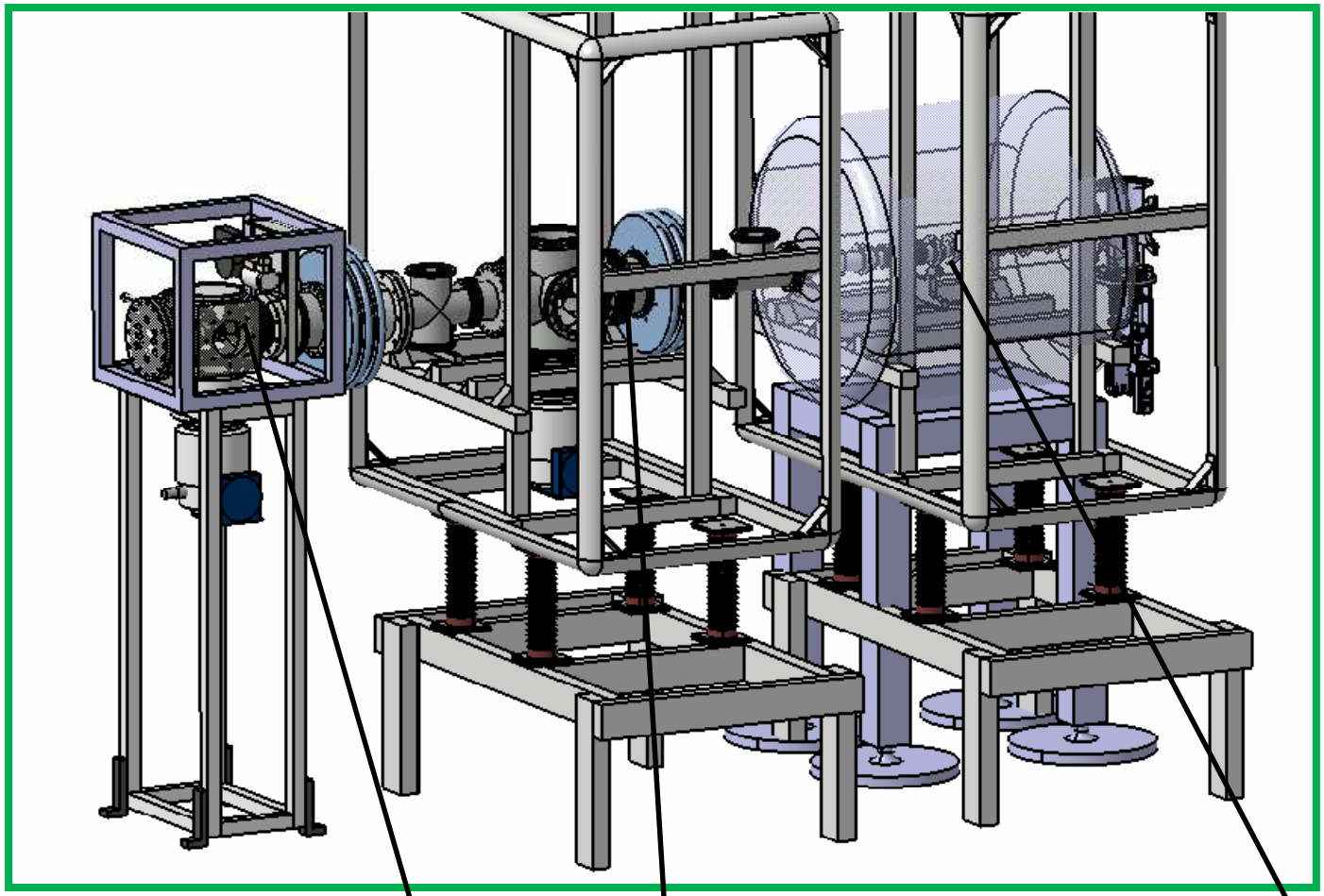
For many experiments, very **large** and **pure** samples of exotic nuclei are needed

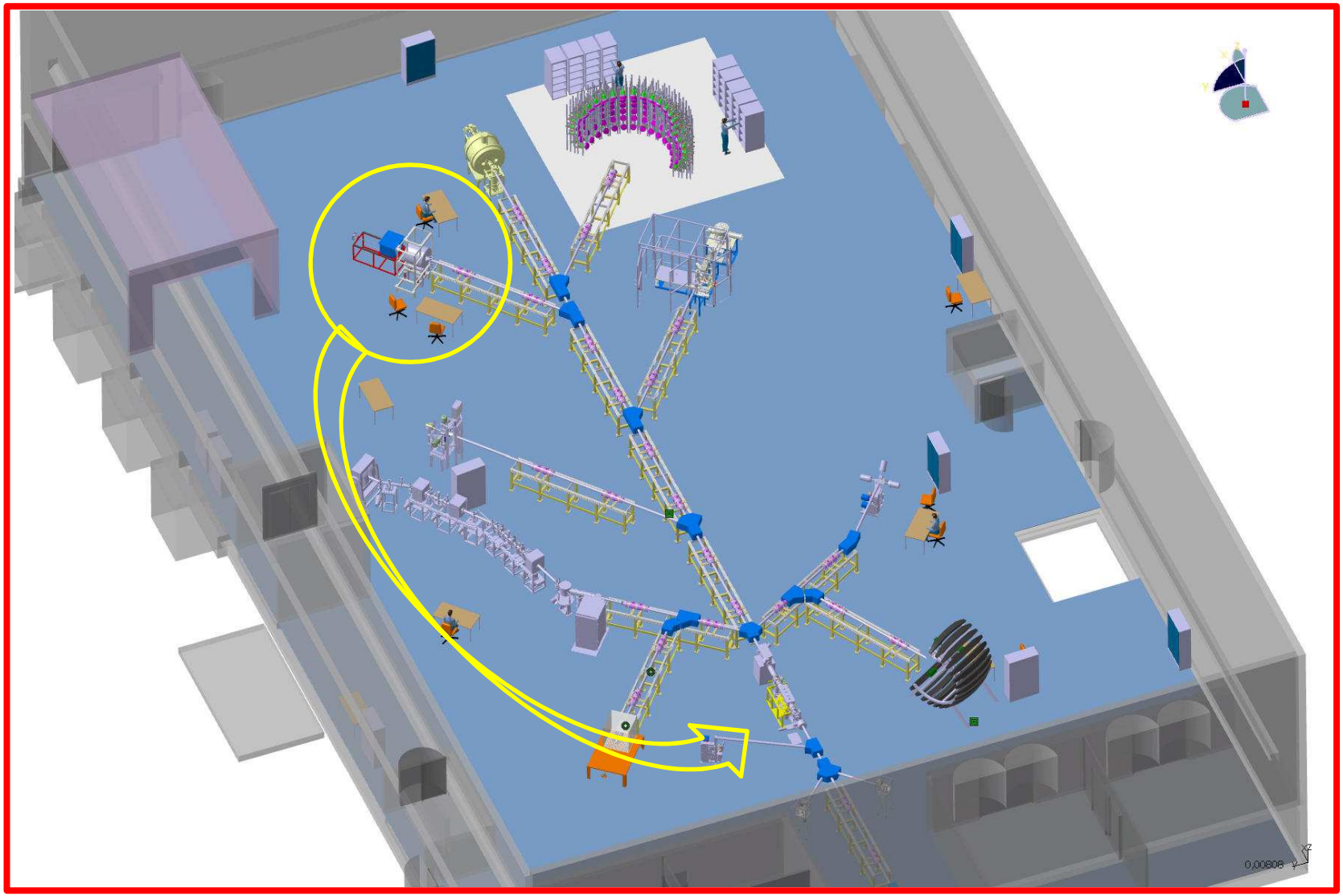
→**Double Penning** trap system

first trap : high capacity, mass separation using a buffer gas
second trap : accumulation before sending large samples to experiments

Trapping capacity
- up to 10^6 ions

Mass resolution
- $m/\Delta m > 10^5$


Ion Source
RFQ
Penning Traps



University Bordeaux 1

13 k€ detection

50 k€ Ion Source

Conseil Régional Aquitaine

168 k€ RFQ

50% PhD Student (with IN2P3)

IN2P3/CNRS

50% PhD Student (with CRA)

Agence Nationale de la Recherche

620 k€ Penning Trap

40 k€ Travels

2 years PostDoc or 3 years Engineer

50% PhD Student (with MPIK)

MPIK

50% PhD Student (with ANR)

total : 1 200 k€

850 k€ investment

40 k€ travels

310 k€ manpower

In charge of the Ion Source, the RFQ, the Magnet, the infrastructure (vacuum, cooling…), the Control Command, the Acquisition

In charge of the Penning Trap

In charge of the Tests

In charge of the Safety (contact with authorities…) and of the final installation at DESIR

2012 ----------> ----------

Ion Source : from ISOLDE (Mistral) ?
RFQ : Test of the Shiracq 1 to "learn"
Start to think about "GPIB" solution : ISCOOL type ?
Start of the PhD Thesis of Hugo Guerin : november 2, 2011
Collaboration with LPC Caen

Start simulation of "double" Penning trap concept

Test the mass separation with "large" samples with an existing trap
Start of the PhD Thesis of Sunil Kumar : november 1, 2011