



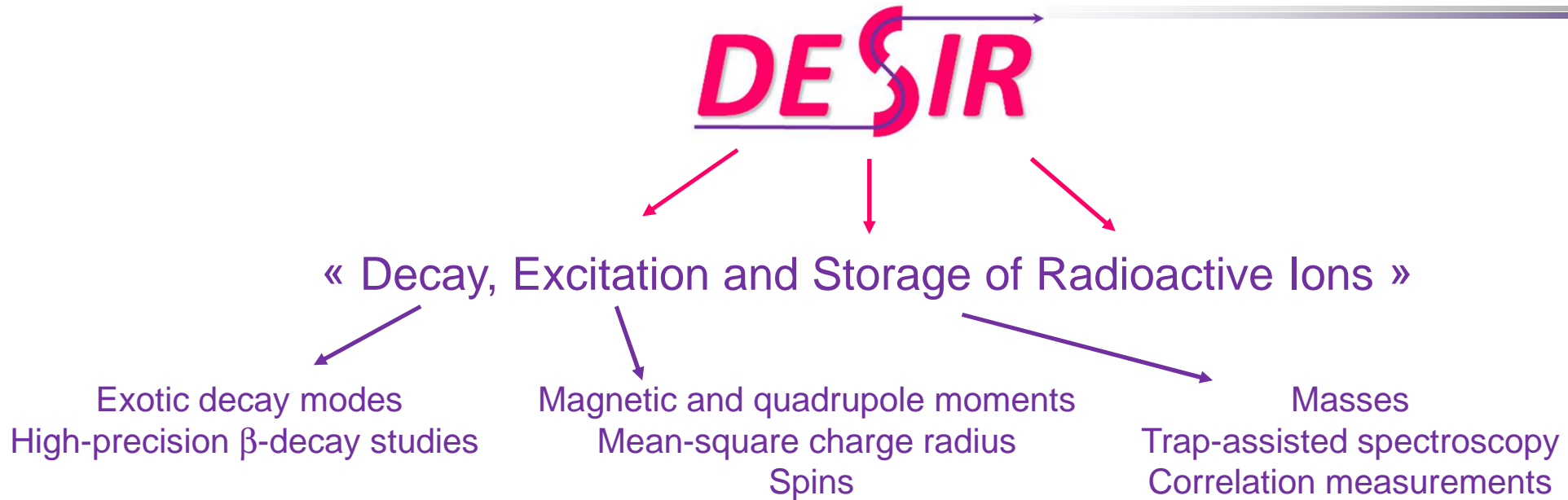
Status of the SPIRAL2-DESIR project

B. Blank, LP2iB-CENBG

On behalf of the SPIRAL2-DESIR project management and the DESIR collaboration

<http://www.cenbg.in2p3.fr/desir>

DESIR scientific objectives



- Fundamental properties of nuclei in their ground and long-lived isomeric states
- Ultra-pure samples for high-precision measurements
- Ion manipulation using traps and laser manipulation
- Complementarity with S³-LEB and other GANIL facilities

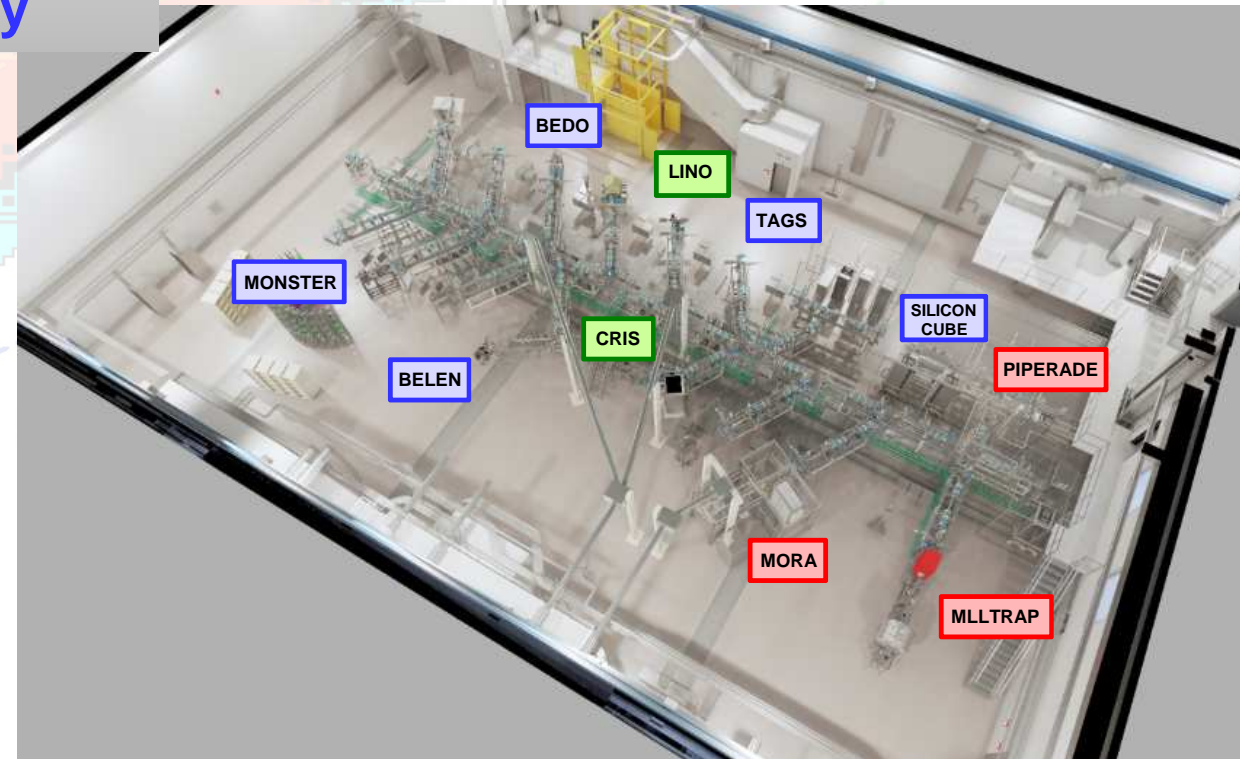
DESIR experimental equipment

- **Collinear laser-spectroscopy** LUMIERE
- **Laser polarisation (LINO)**
- **Paul trap (MORA)** DETRAP
- **Penning traps (PIPERADE, MLLTrap)** BESTIOL
- **(Trap-assisted) decay spectroscopy**

Dedicated workshops in 2024/25

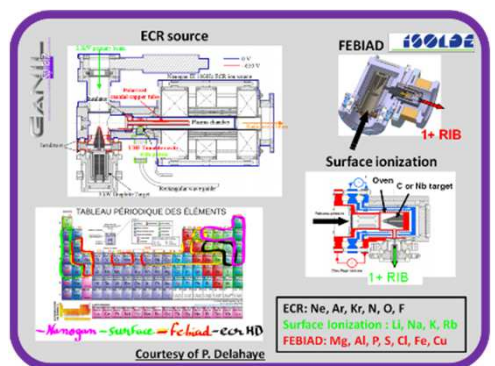
→ LOI

→ Day 1 proposals



DESIR Radioactive Ion Beams

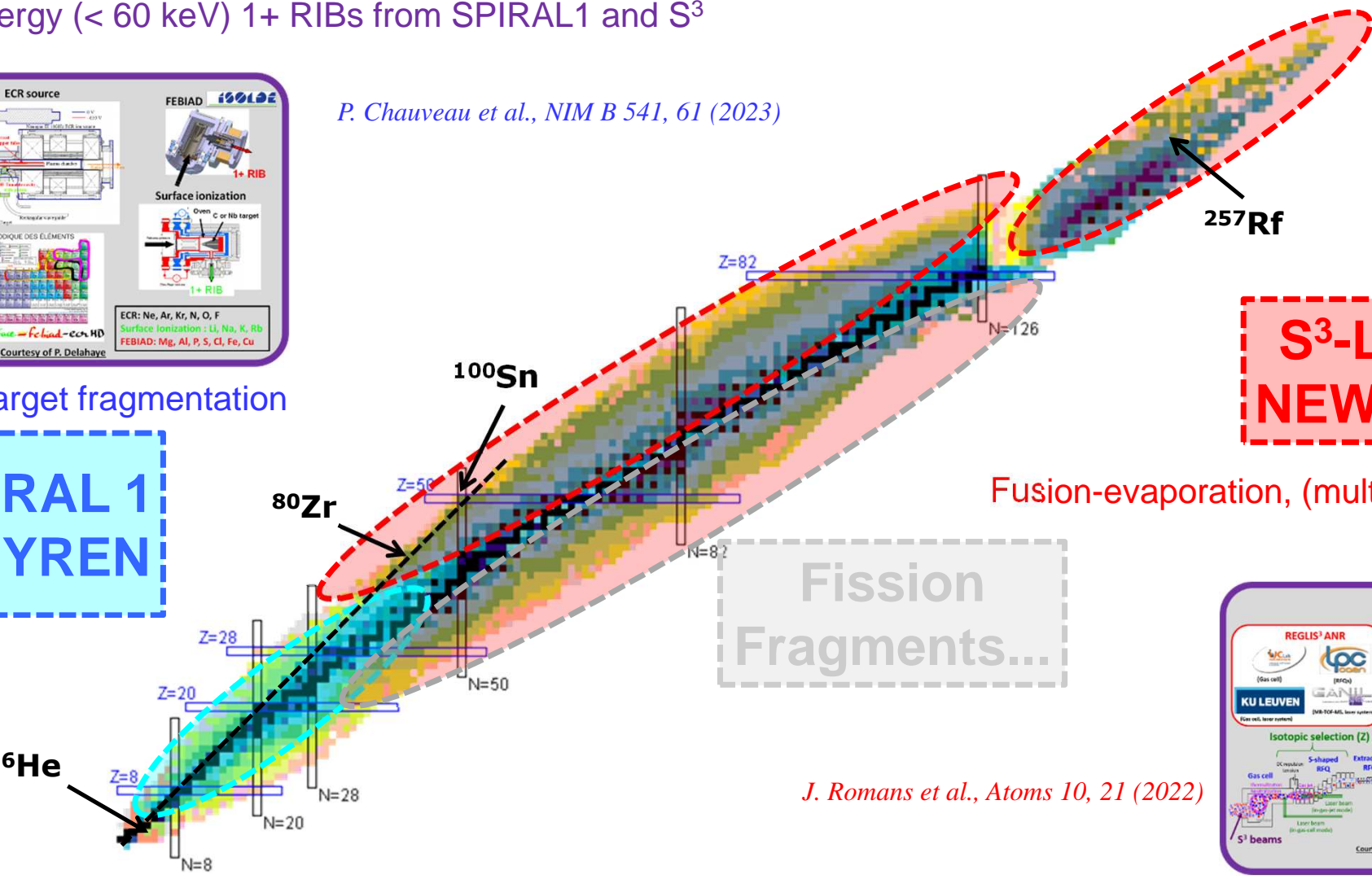
Low energy (< 60 keV) 1+ RIBs from SPIRAL1 and S³



P. Chauveau et al., NIM B 541, 61 (2023)

beam/target fragmentation

SPIRAL 1 + CYREN

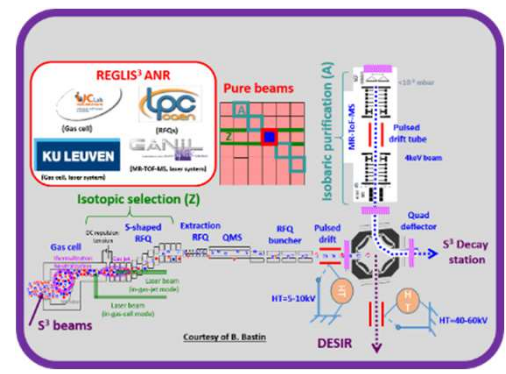


S³-LEB + NEWGAIN

Fusion-evaporation, (multi-nucleon) transfer

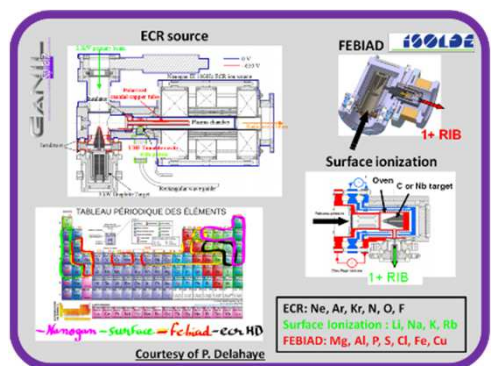
Fission Fragments...

J. Romans et al., Atoms 10, 21 (2022)



DESIR Radioactive Ion Beams

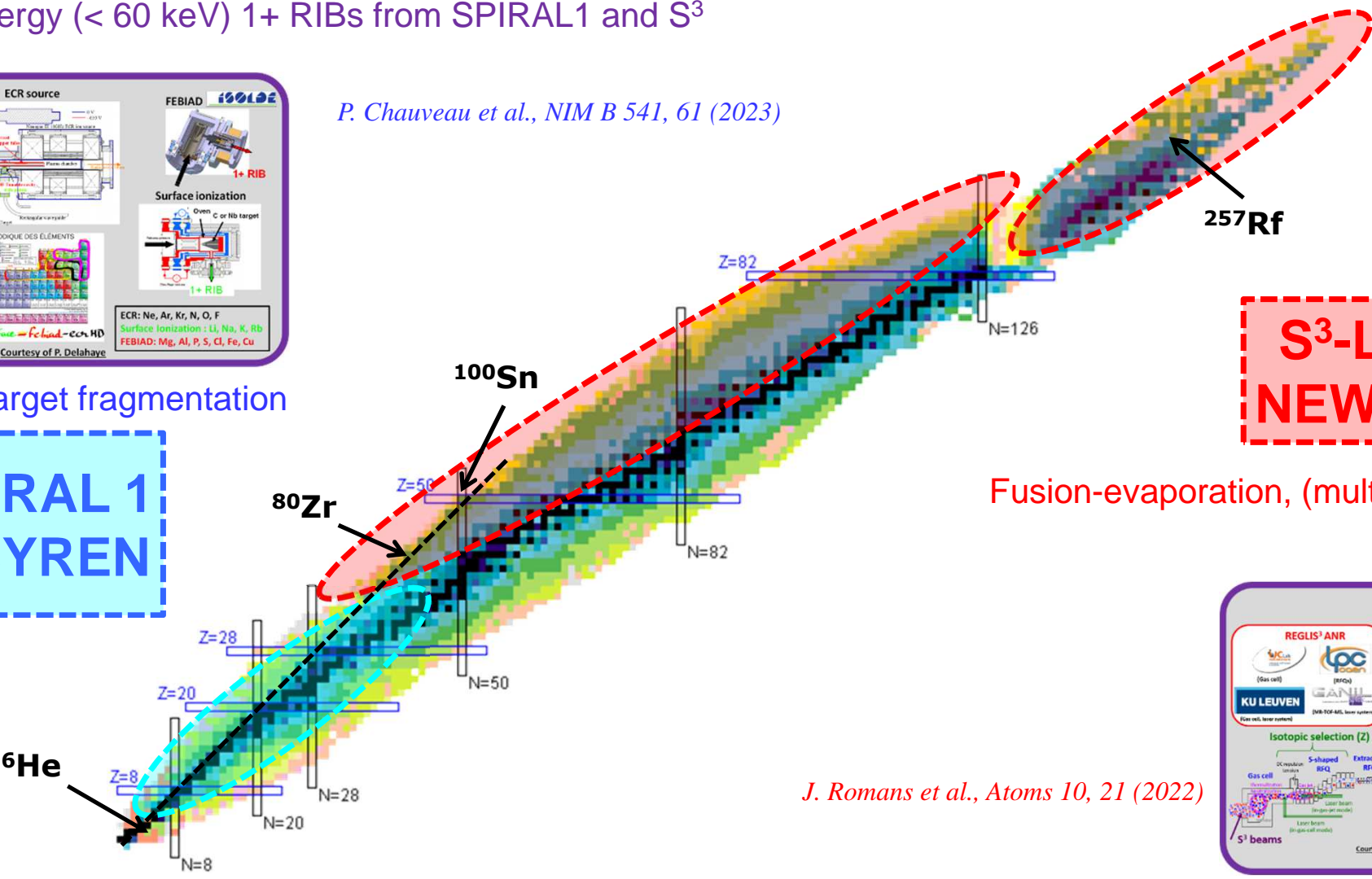
Low energy (< 60 keV) 1+ RIBs from SPIRAL1 and S³



P. Chauveau et al., NIM B 541, 61 (2023)

beam/target fragmentation

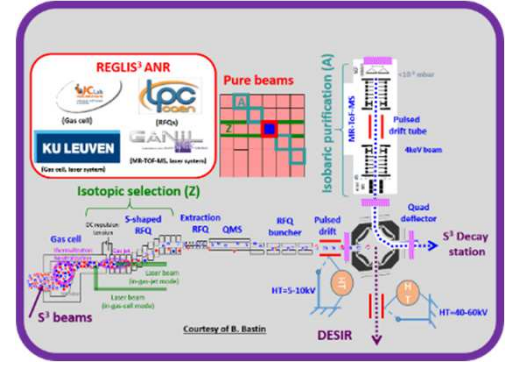
SPIRAL 1 + CYREN



S³-LEB + NEWGAIN

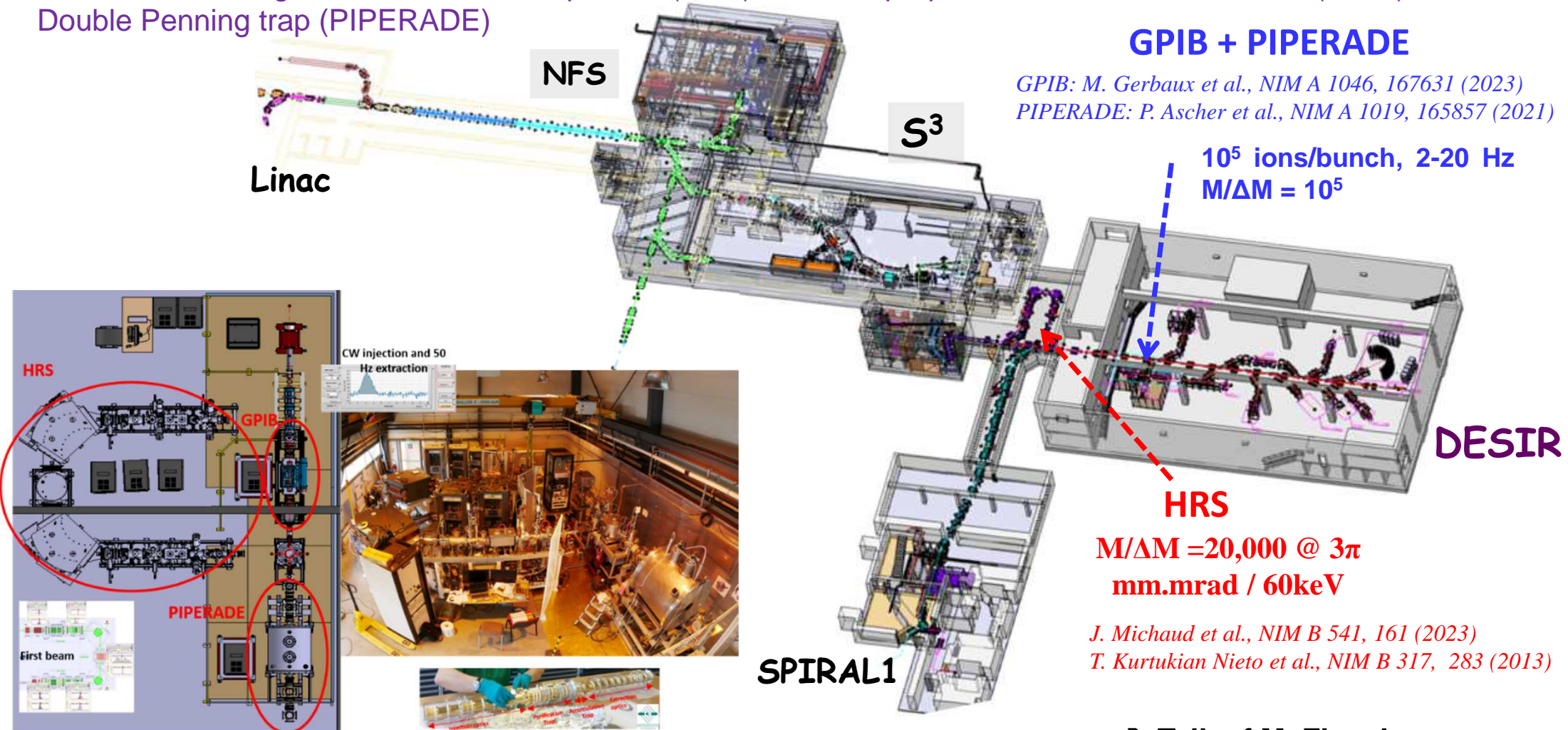
Fusion-evaporation, (multi-nucleon) transfer

J. Romans et al., Atoms 10, 21 (2022)



RIBs purification and handling

→ Beam Cooler + High-resolution mass separator (HRS); General purpose ion buncher and cooler (GPIB);
Double Penning trap (PIPERADE)



GPIB: M. Gerbaux et al., NIM A 1046, 167631 (2023)
PIPERADE: P. Ascher et al., NIM A 1019, 165857 (2021)

M/ΔM = 20,000 @ 3π mm.mrad / 60keV

J. Michaud et al., NIM B 541, 161 (2023)
T. Kurtukian Nieto et al., NIM B 317, 283 (2013)

→ Talk of M. Flayol

DESIR @ GANIL-SPIRAL2

Projet figures

Estimated cost: 33M€

Human resources: 250 FTE / 8y

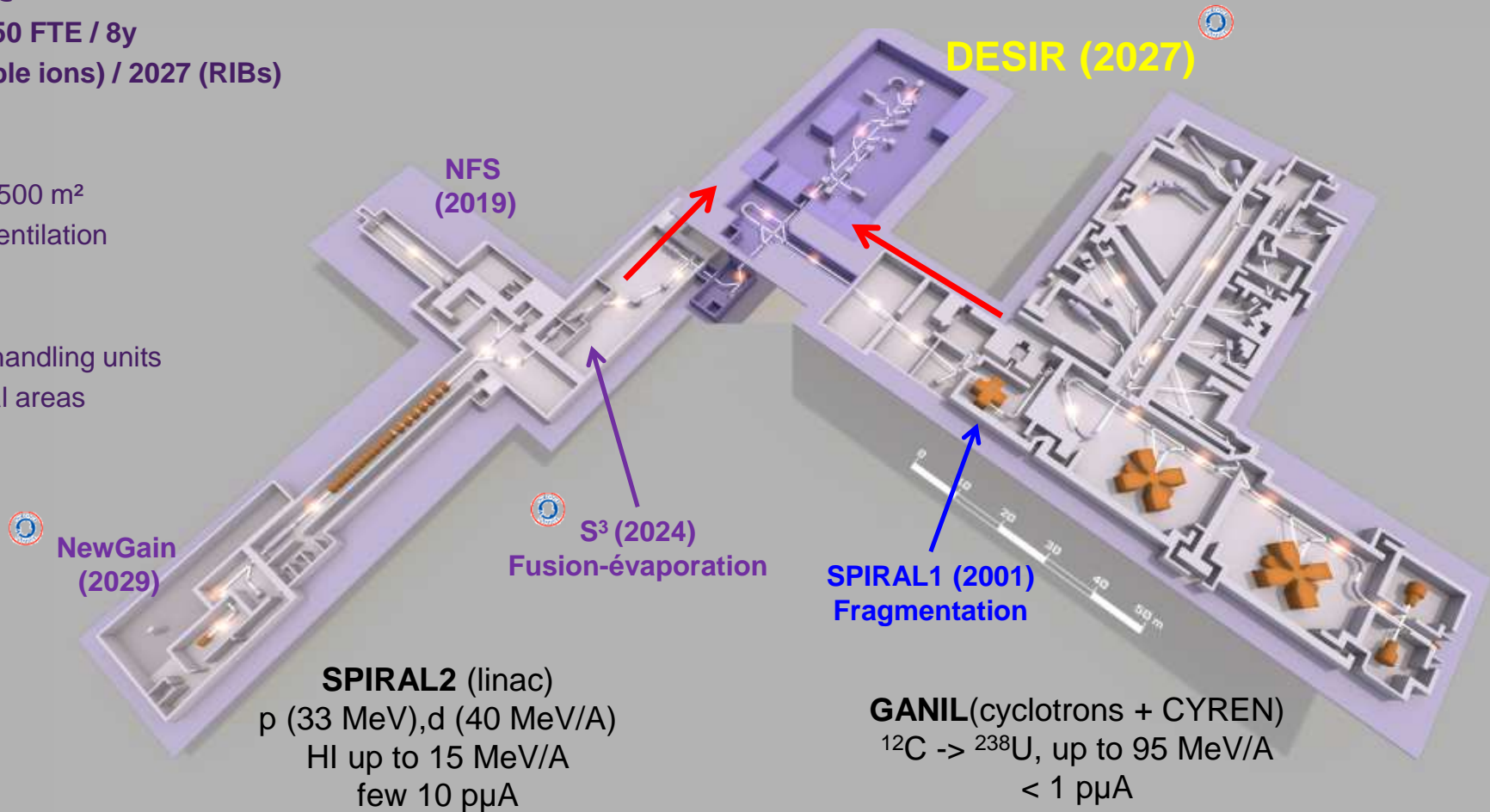
Operation: 2026 (stable ions) / 2027 (RIBs)

Building:

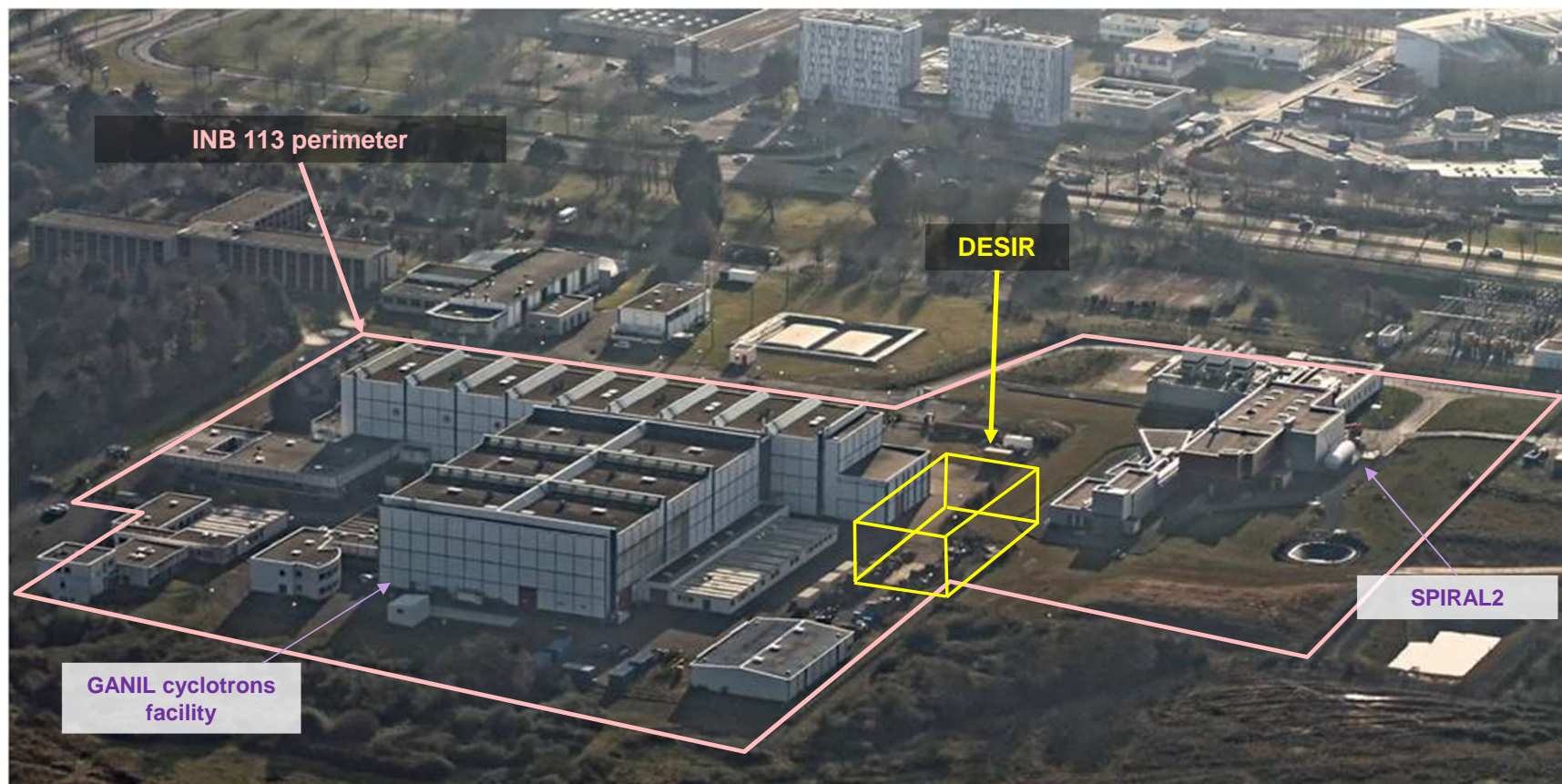
- 4500 m³ concrete / 2500 m²
- 95% under nuclear ventilation

Process:

- 180 m beam lines
- 5 beam preparation/handling units
- up to 15 experimental areas



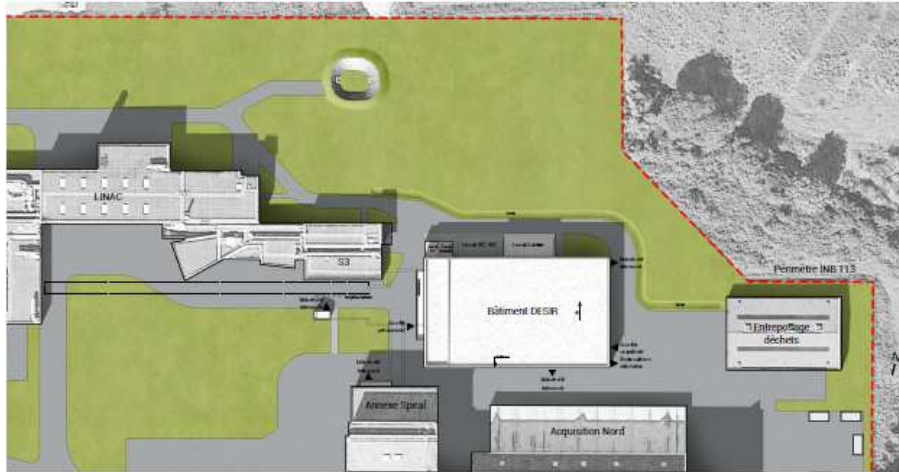
DESIR construction site



DESIR buildings

F.-X. Carel, GANIL

Building and infrastructure

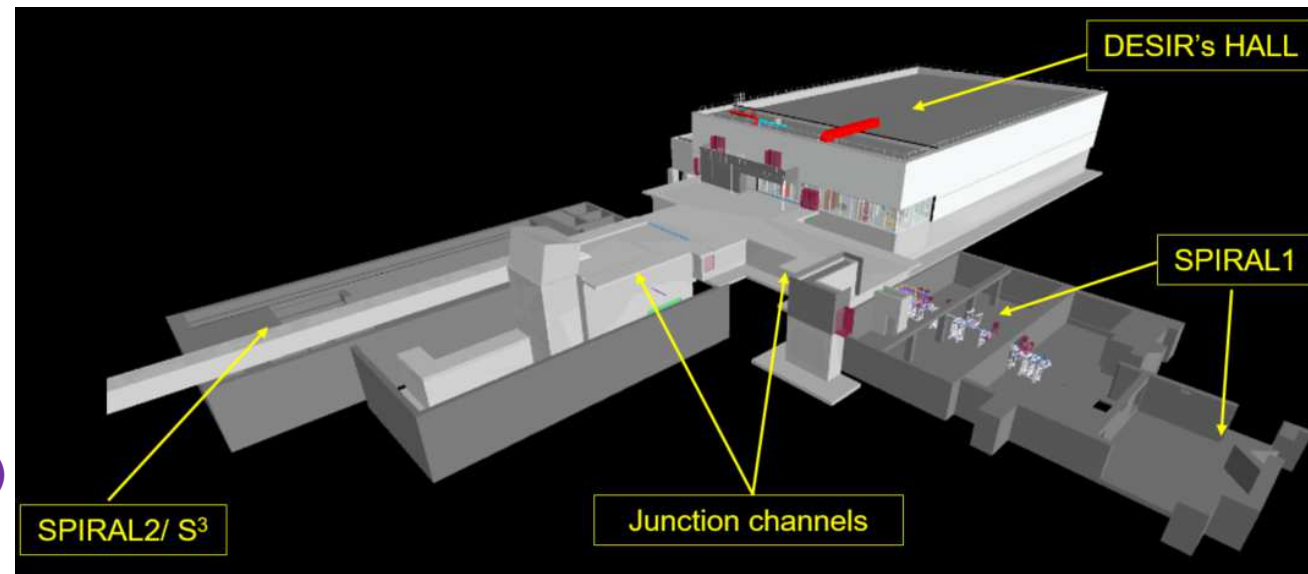


Aerial view

Current status

- Detailed studies performed
- Execution studies ongoing
- Construction permit (23/06/2023)
- Building construction started (July)

3D view



Main figures

- From -9.5 m (S³ exit) to +8.3 m (roof)
- 4500 m³ of concrete
- Junction channels: 1200 m²
- Experimental hall: 1300 m², 11000 m³
- Nuclear ventilation (95% of the buildings)

DESIR construction

Beginning of the construction



October 2022: Site preparation



March-April 2023: Site preparation



May 2023



June 2023



September 2023: Building construction preparation

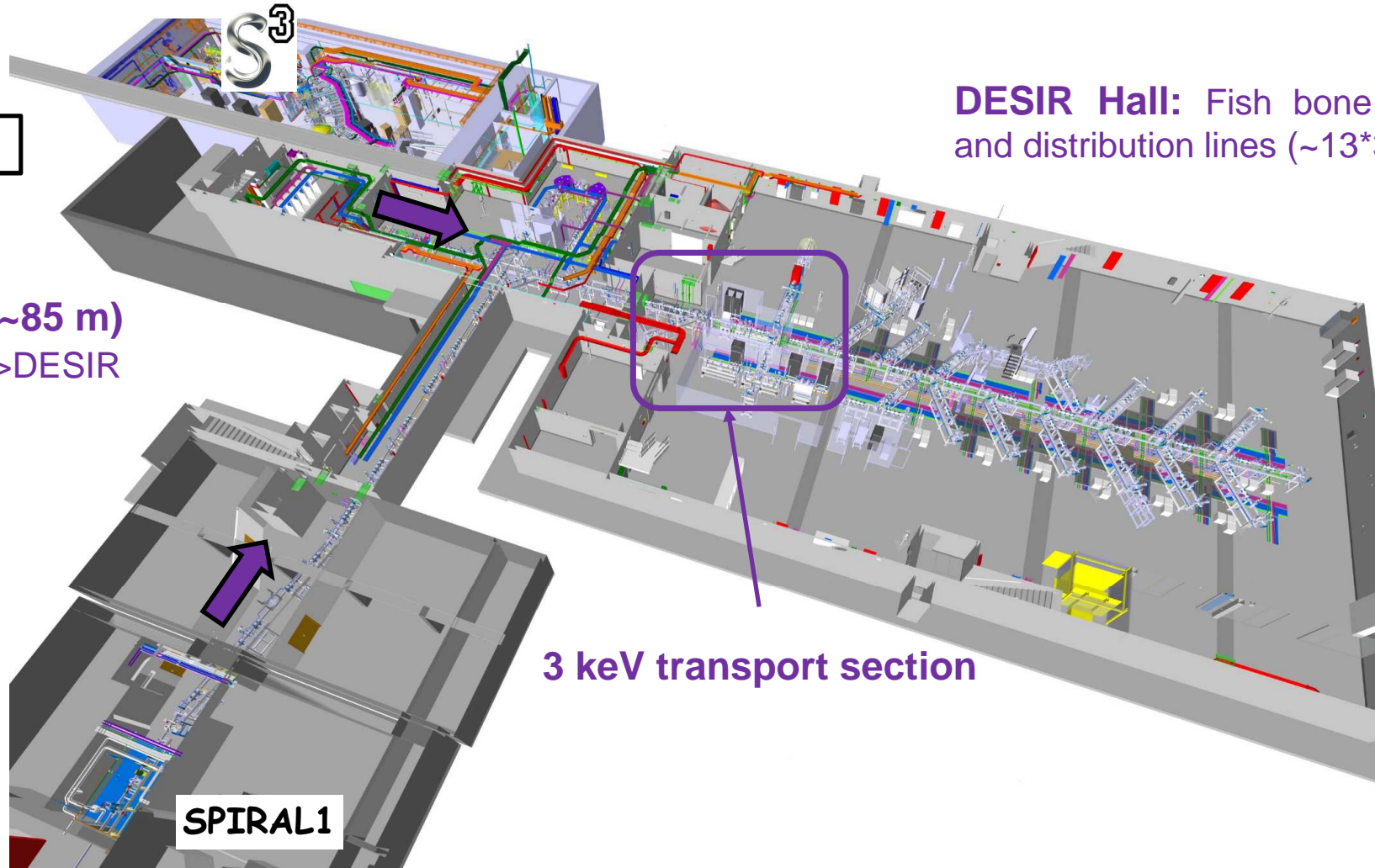


July 2023: Digging



DESIR beam lines

DESIR beam lines



L. Perrot, IJCLab

DESIR Hall: Fish bone (~40 m) and distribution lines (~13*3 m)

Transport lines (~85 m)
S³-LEB; SPIRAL1 ->DESIR

3 keV transport section

SPIRAL1

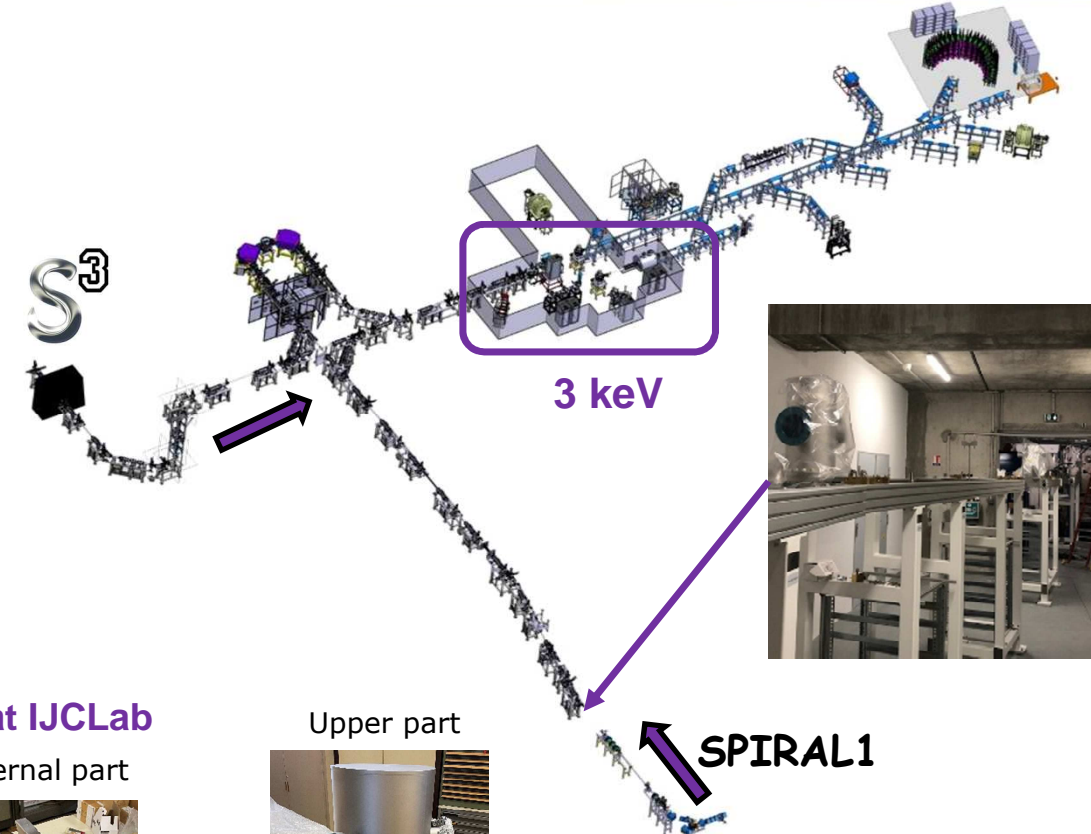
DESIR beam lines

Transport lines

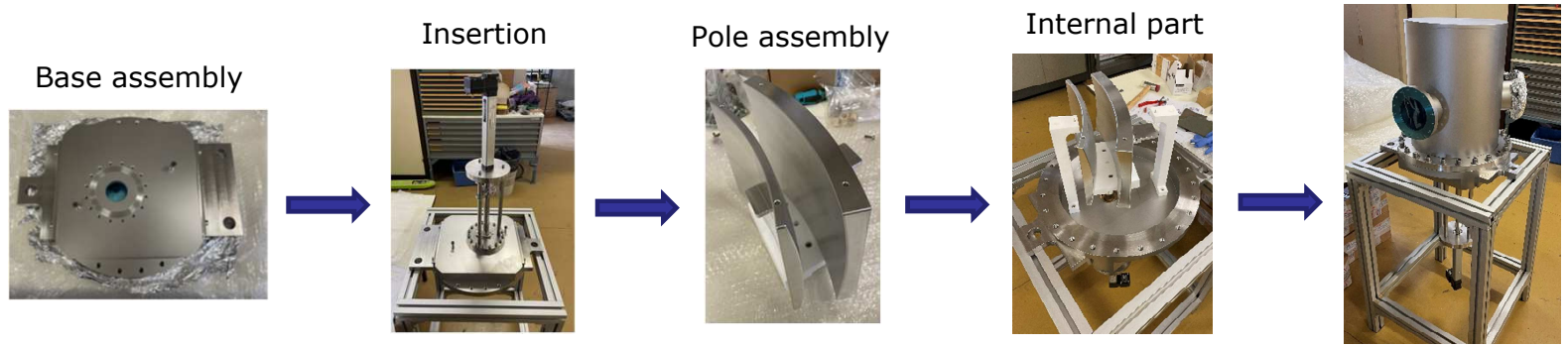
- 1+ ions, 3-60 keV, 3-80 π .mm.mrad
- Fully electrostatic
- Standardization
- Final specifications: 2018
- Manufacturing and delivery: -> 2021 (SPIRAL2-GSI/FAIR agreement)
- > availability of ~80 % of the beam-line equipment

Prototype sections

- At LP2iB: integration and remote control system
- At GANIL: mechanics, alignment, assembly tests



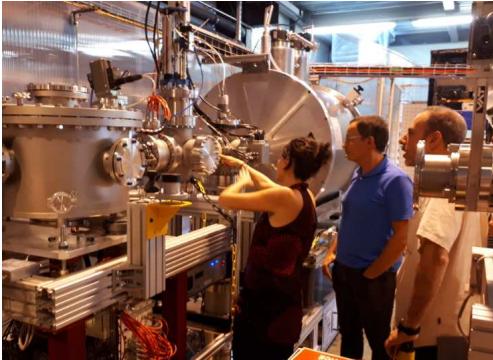
Example: 45° deflector assembly at IJCLab



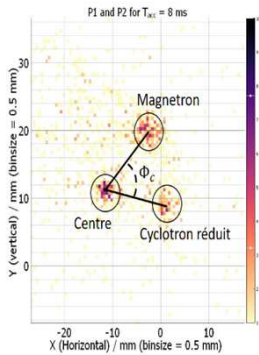
DESIR experimental equipment

Experimental equipment: commissioning, tests, projects,...

GPIB - PIPERADE (LP2iB)

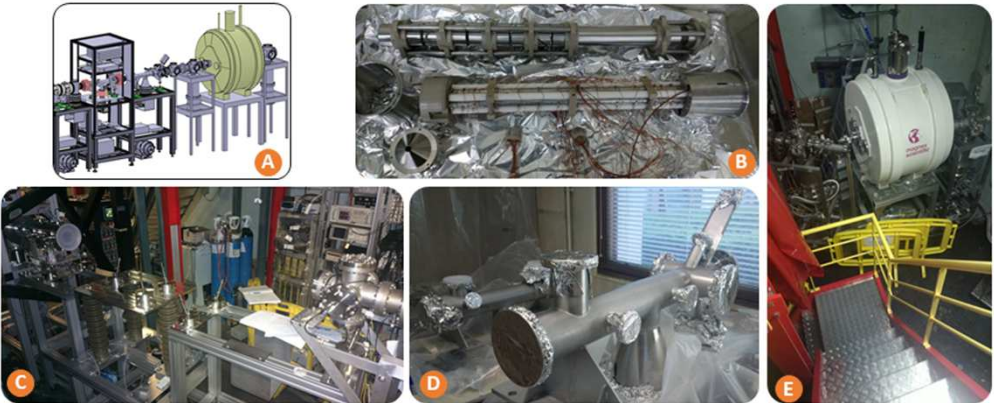


→ Talk of M. Flayol



MLLTrap

Towards first online tests (IJCLab)



→ Talk of Luis Miguel Motilla Martinez

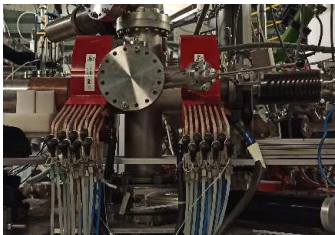
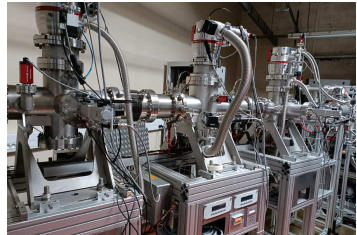


→ Talk of Guillem Tocabens

BEDO / COeCO (IJCLab)

MR-TOF-MS

To be developed

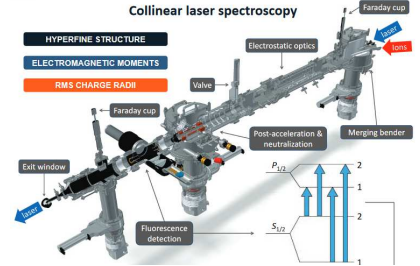


MORA

Operation at JYFL (LPCC/GANIL)

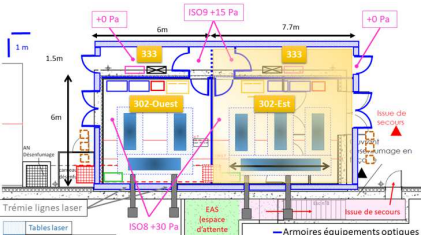
LINO

1st phase commissioned (IJCLab)



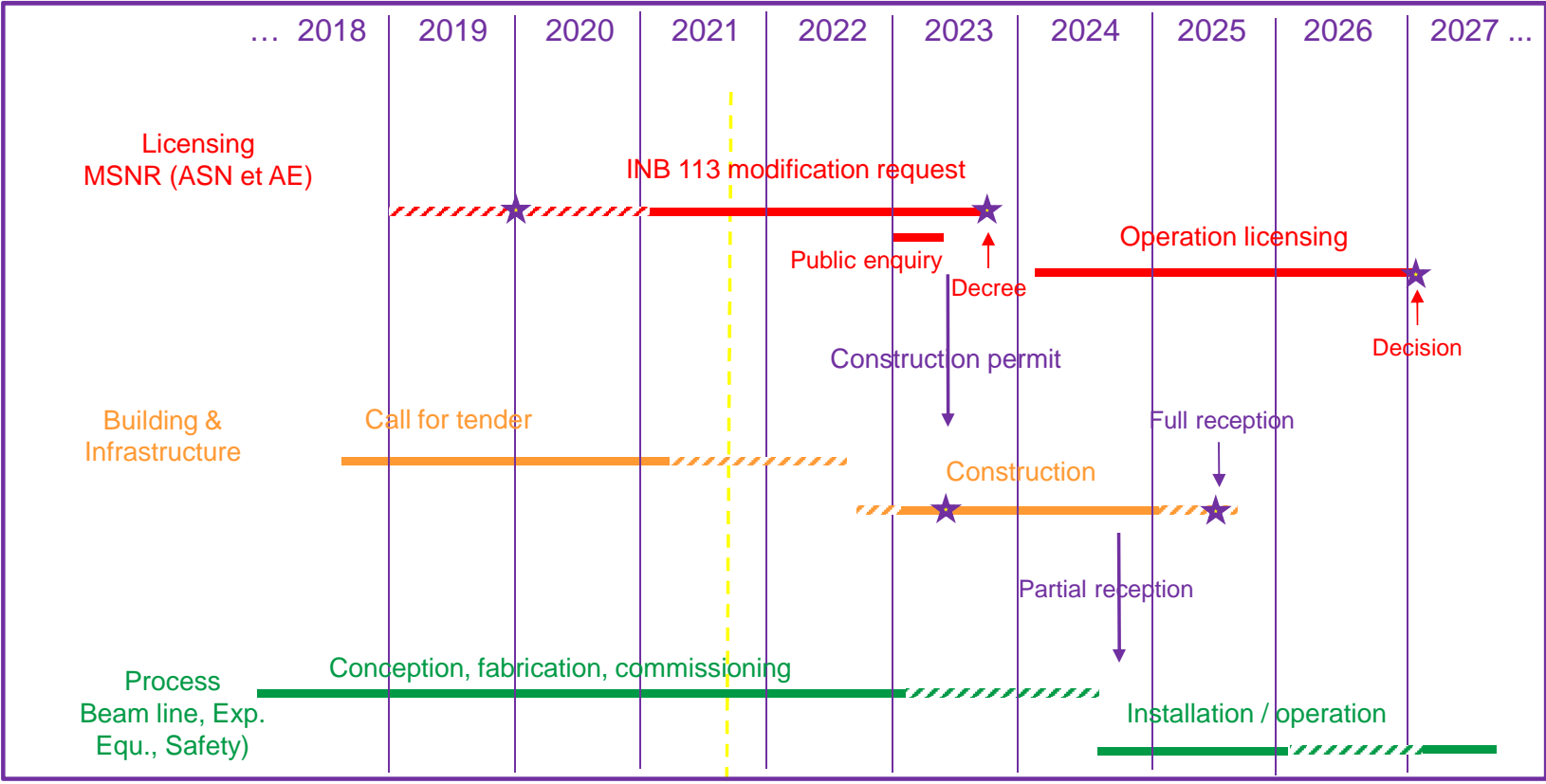
Laser room

Equipment to be purchased

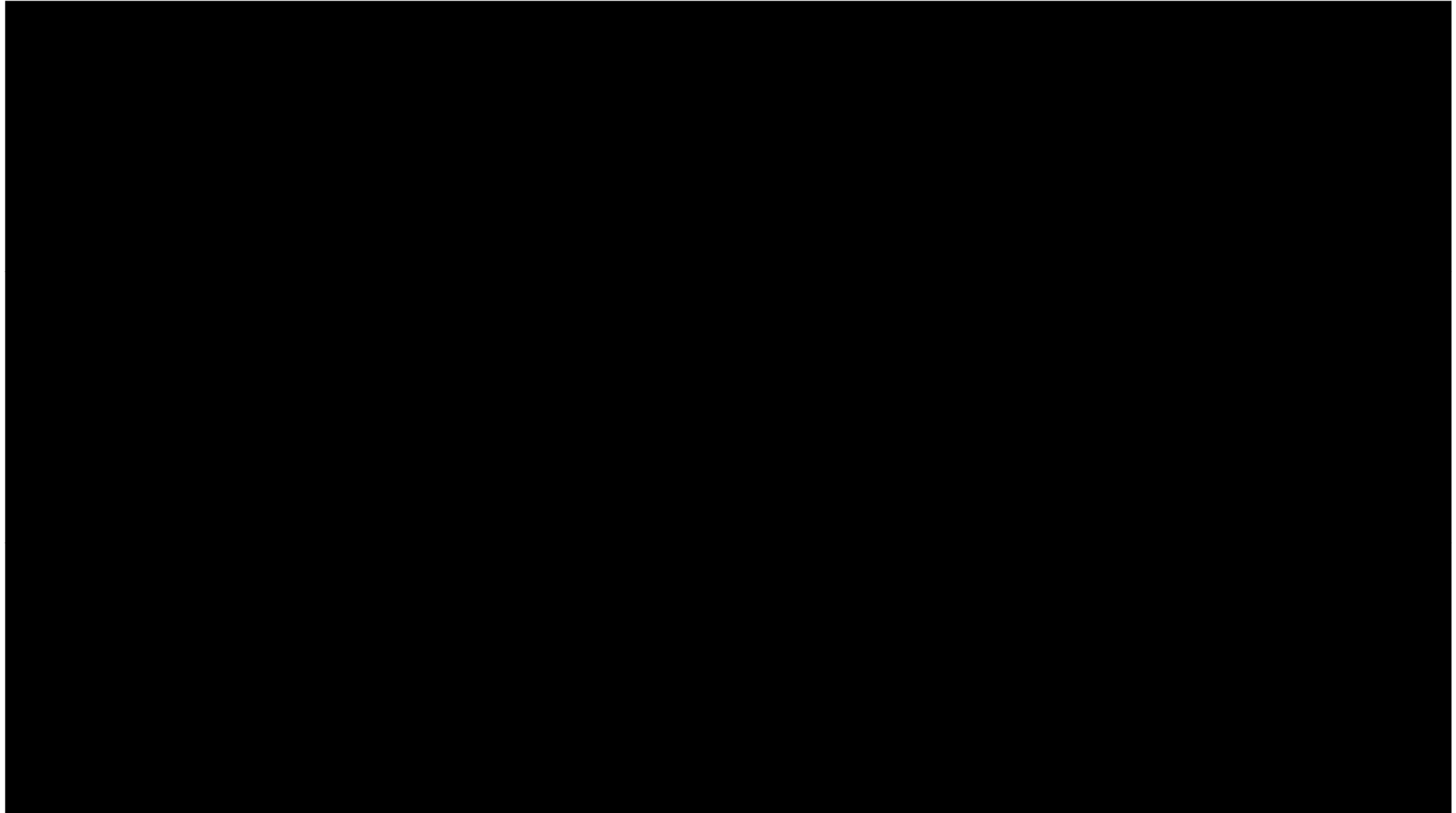


DESIR project timeline

SPIRAL2-DESIR project: timeline



Time laps of DESIR construction préparation



Thanks for your attention