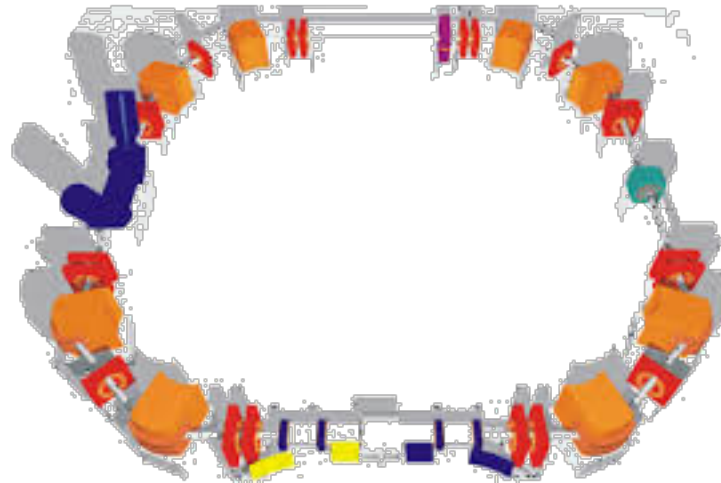
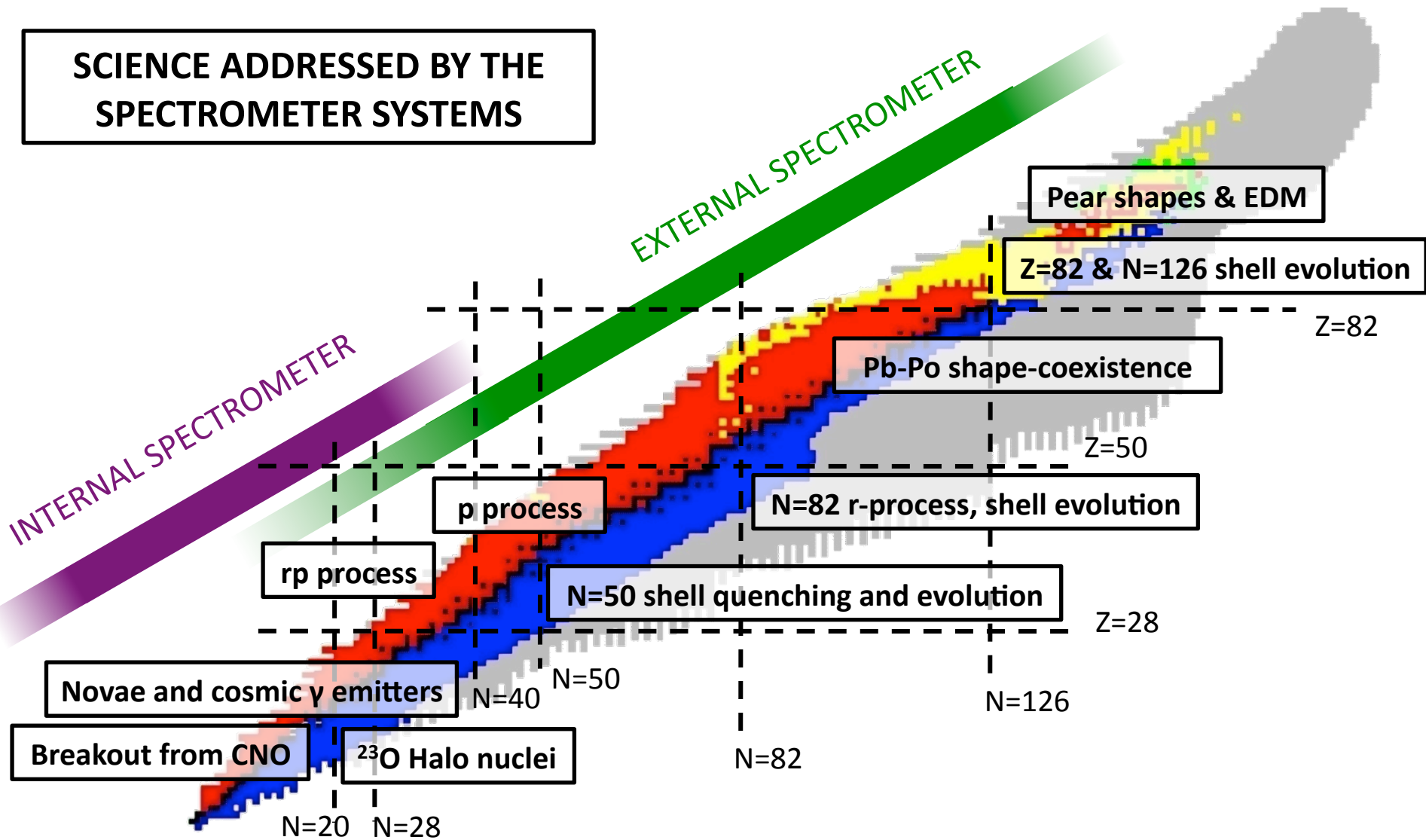


ISOL-SRS project



TSR  **OLDE**

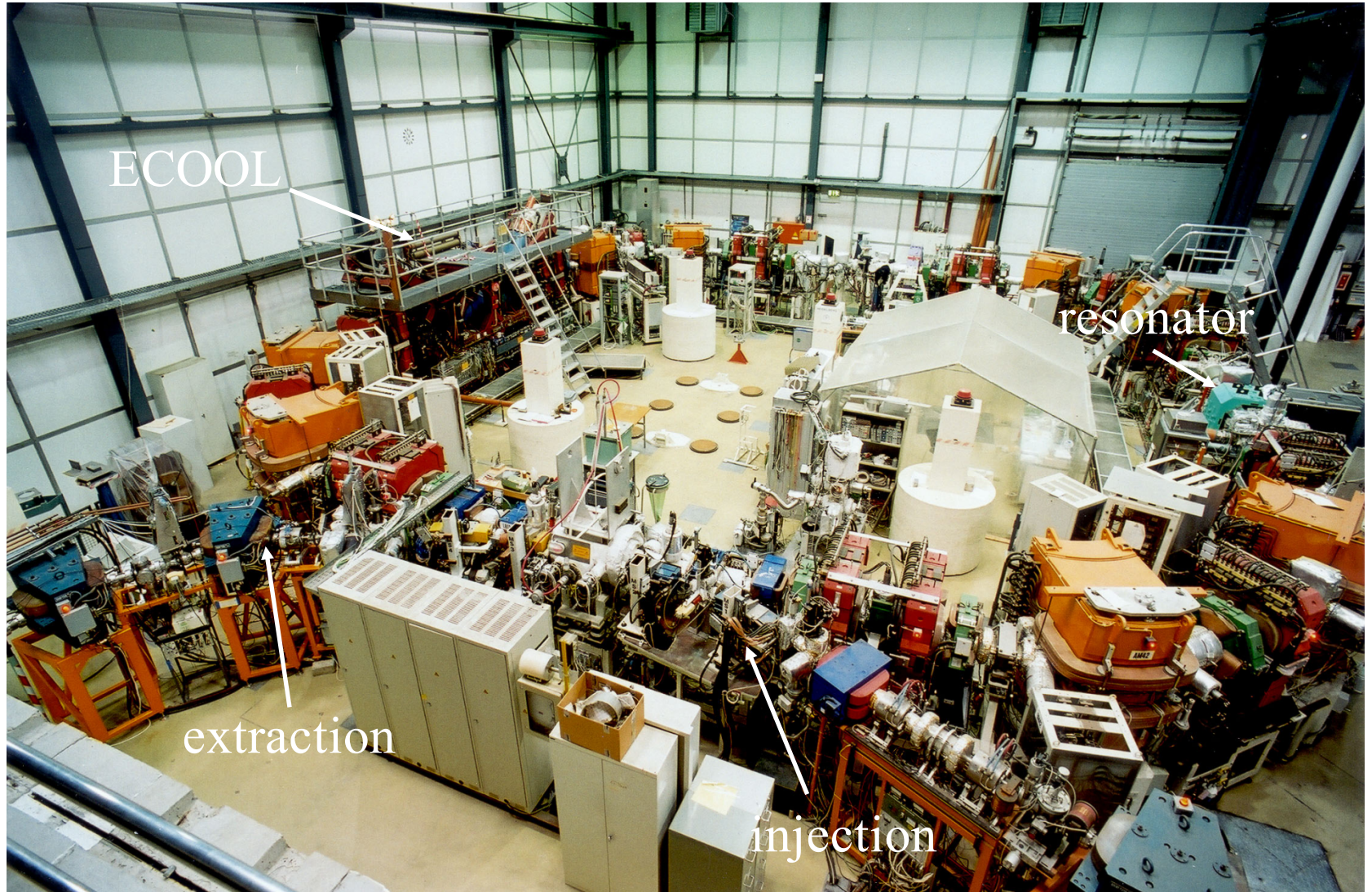
SCIENCE ADDRESSED BY THE SPECTROMETER SYSTEMS



KEY PRIORITY of ISOL-SRS is to develop spectrometer systems for the TSR storage ring to fully exploit the range of radioactive beams from HIE-ISOLDE.

The heavy ion storage ring (TSR)

Circumference: 55m



Deliverables (two work packages) of project January 1st 2015 – September 20th 2019

In-ring spectrometer

External spectrometer

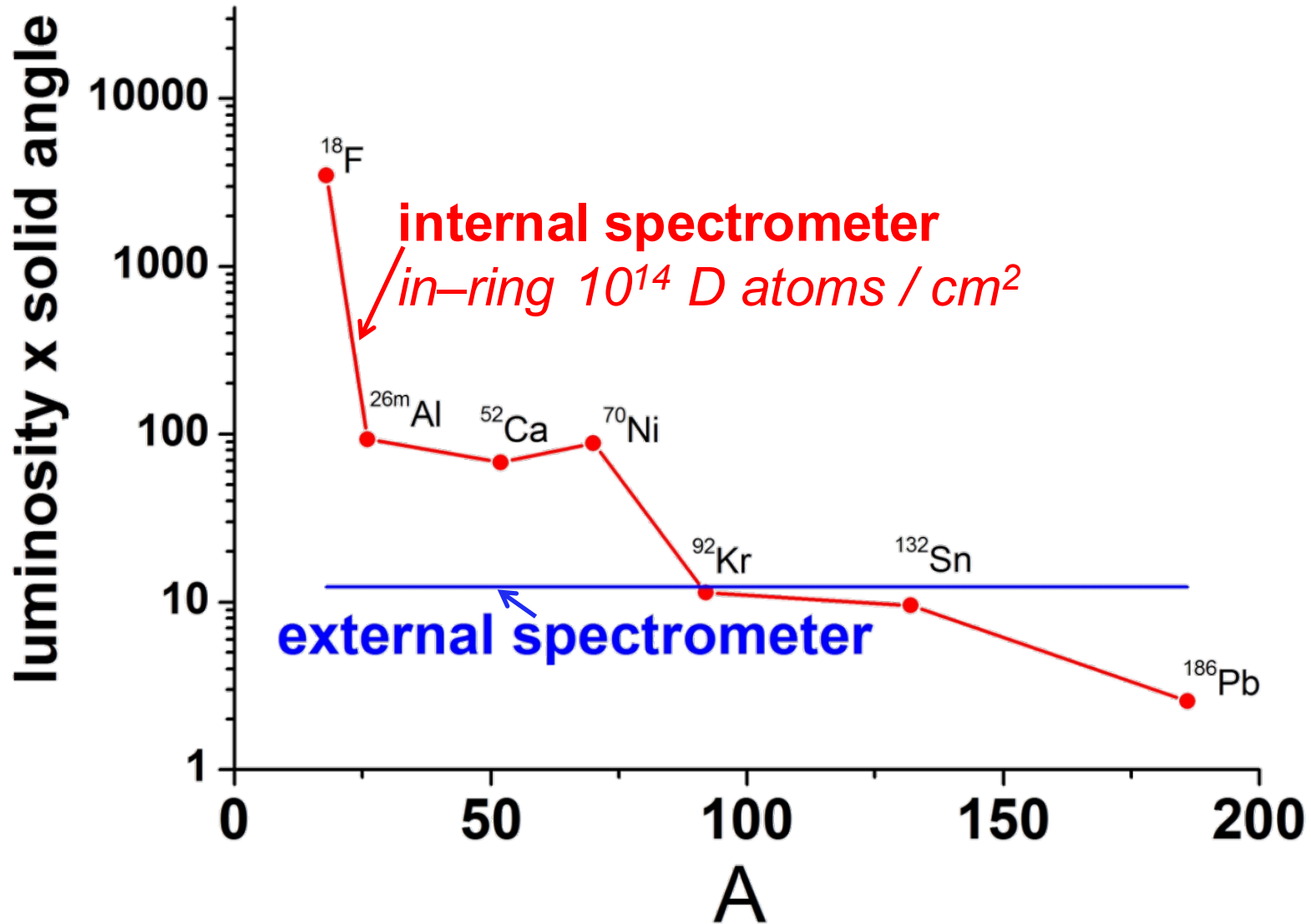
For each the project provides the mechanics (chambers and supports), the detectors, the readout electronics, and the software for data acquisition and control.

Funded project partners are Universities of Edinburgh, Liverpool and STFC Daresbury Laboratory.

T&S funding available to Manchester, Surrey and York.

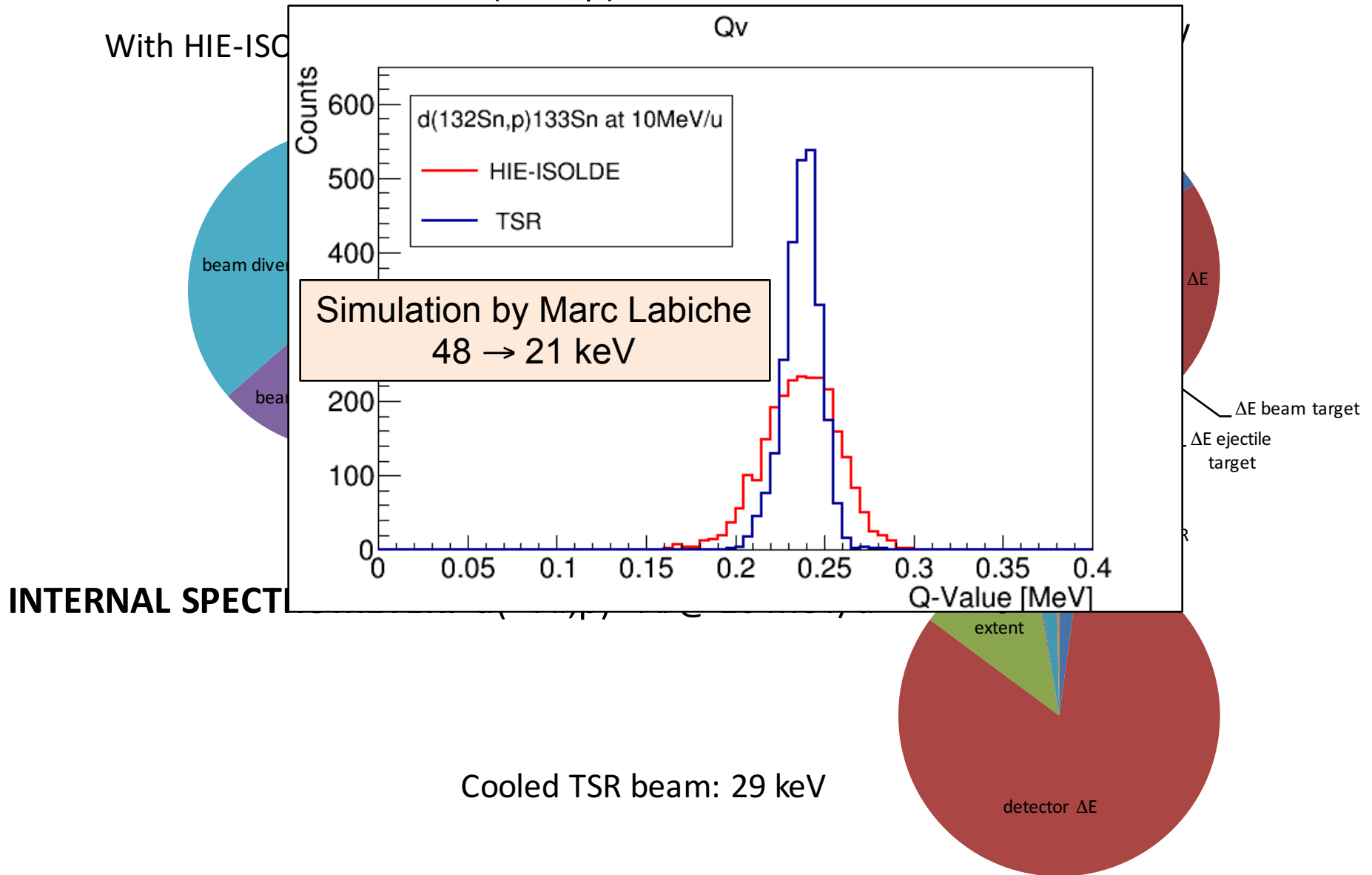
UK Management Board

Spokesperson:	Phil Woods (chair)
Deputy Spokespersons:	Peter Butler, Sean Freeman
PI's from institutions:	Robert Page , John Simpson
Technical co-ordinator:	Ian Lazarus
Deputy tech co-ordinator:	Alan Grant
Project Manager:	Mike Cordwell
WP leaders:	Ian Lazarus (WP1, management), Tom Davinson (WP2, internal spectrometer) Robert Page (WP4, external spectrometer)



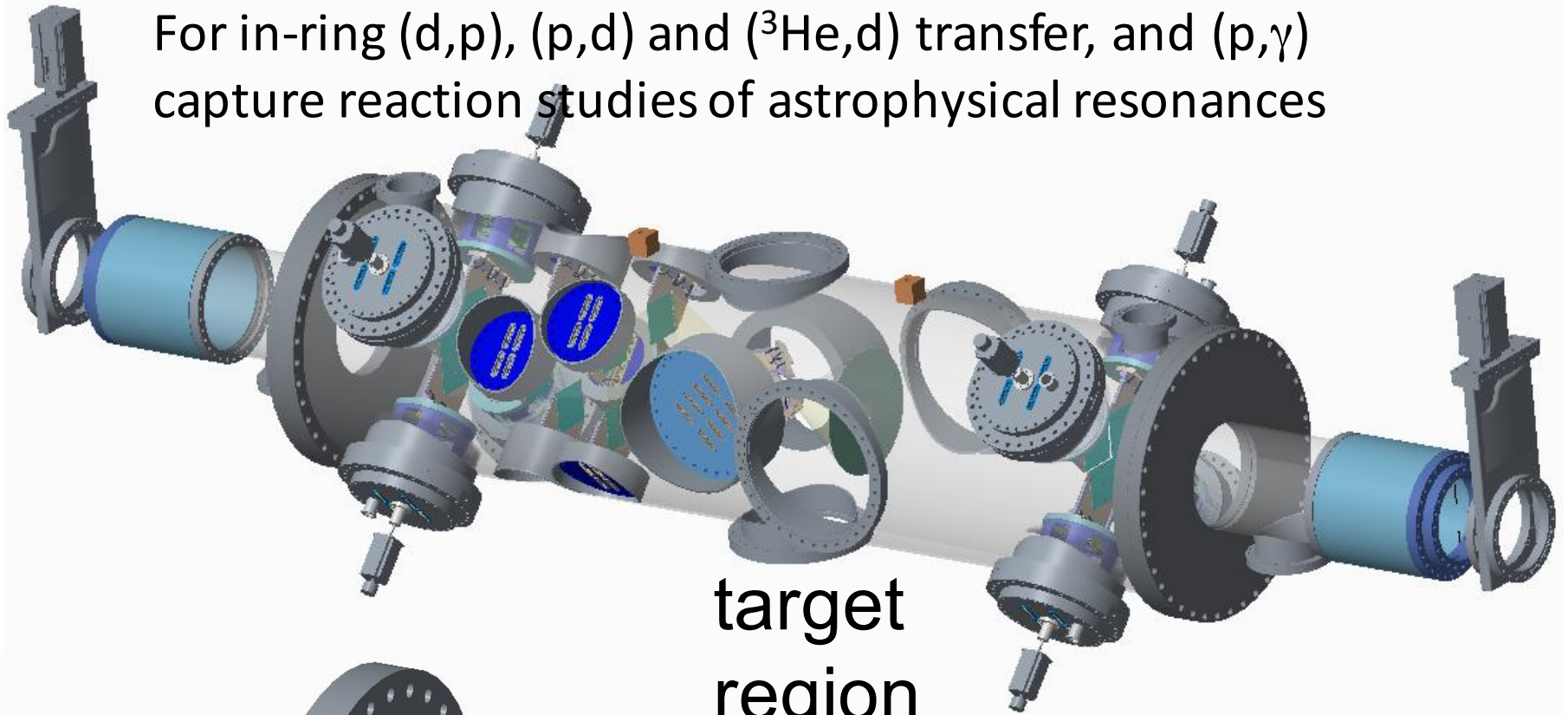
Q-VALUE RESOLUTION

EXTERNAL SPECTROMETER: $d(^{24}\text{Ne}, p)^{25}\text{Ne}$ @ 10 MeV/u

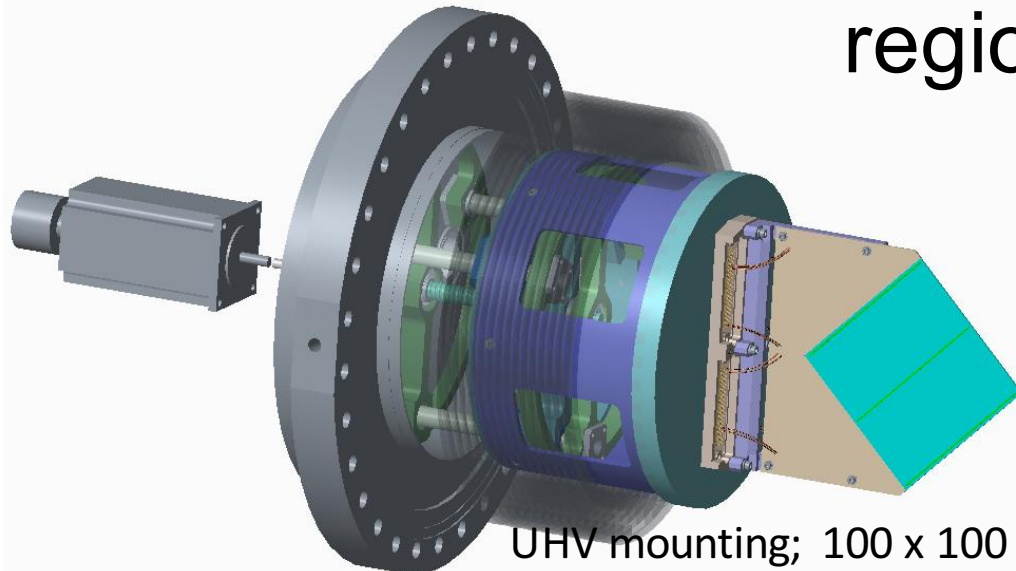


In-ring DSSD System

For in-ring (d,p), (p,d) and (^3He ,d) transfer, and (p, γ) capture reaction studies of astrophysical resonances



target
region



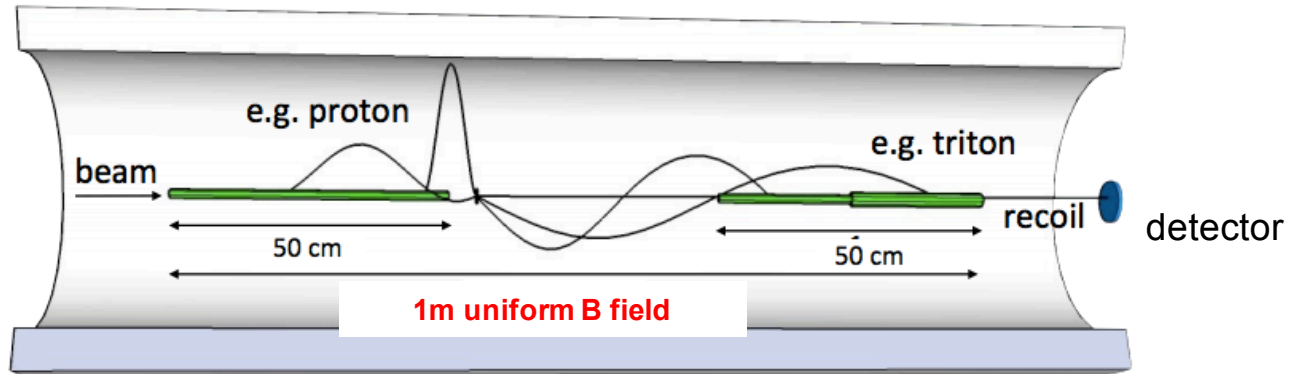
DSSDs nearest beam
axis move in/out

UHV mounting; 100 x 100 mm; 0.25 – 1mm strips; AIDA-type readout

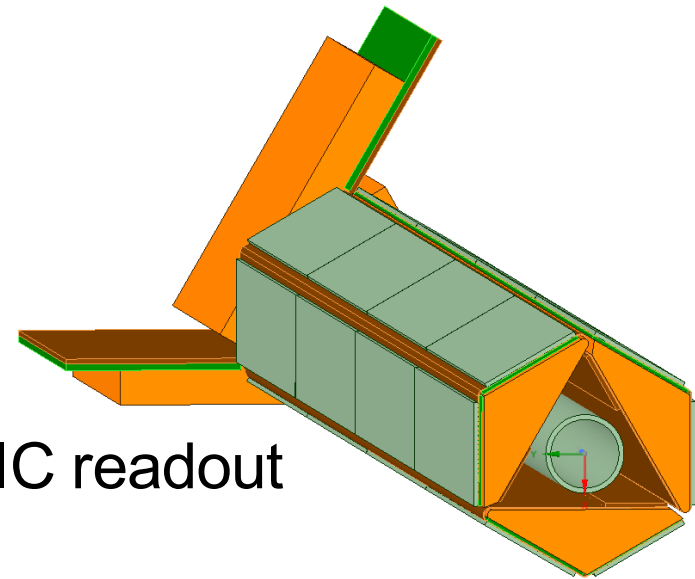
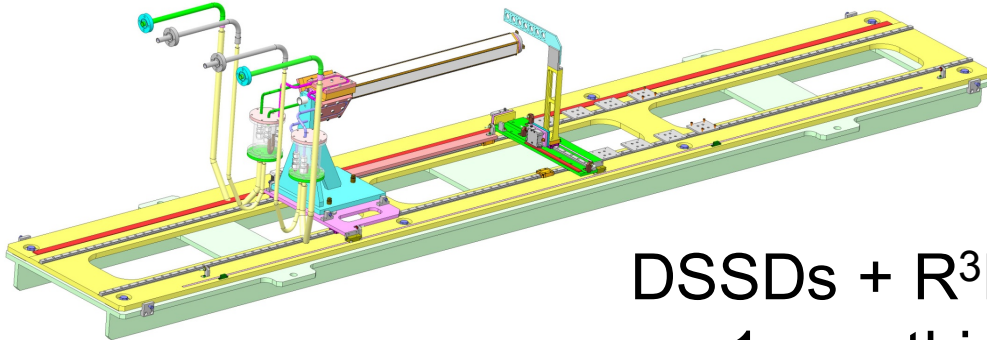
External spectrometer

for high resolution studies of nuclear reactions on heavier nuclei outside the ring

HELIOS concept



e.g. $Q\text{-value} = 1.01 E_{\text{lab}} (\text{MeV}) - 9.92 - 0.21 z (\text{cm})$
for $10 \text{ MeV/u } ^{132}\text{Sn}(d,p)$



DSSDs + R³B ASIC readout

1 mm thick

x: $128 \times 0.95 \text{ mm}$

y: $11 \times 2 \text{ mm}$

Status of magnet procurement

- Magnet funding awarded (STFC/UoL)
- Magnet available from Brisbane (UQ)
 - OR66 4T ex-MRI magnet
 - “Active shield” reduces stray field
 - Installed February 2003
 - Discharged then warmed ~2013
- Order for magnet has been placed!
- To be delivered & paid by 31/3/2016

Status of procurement



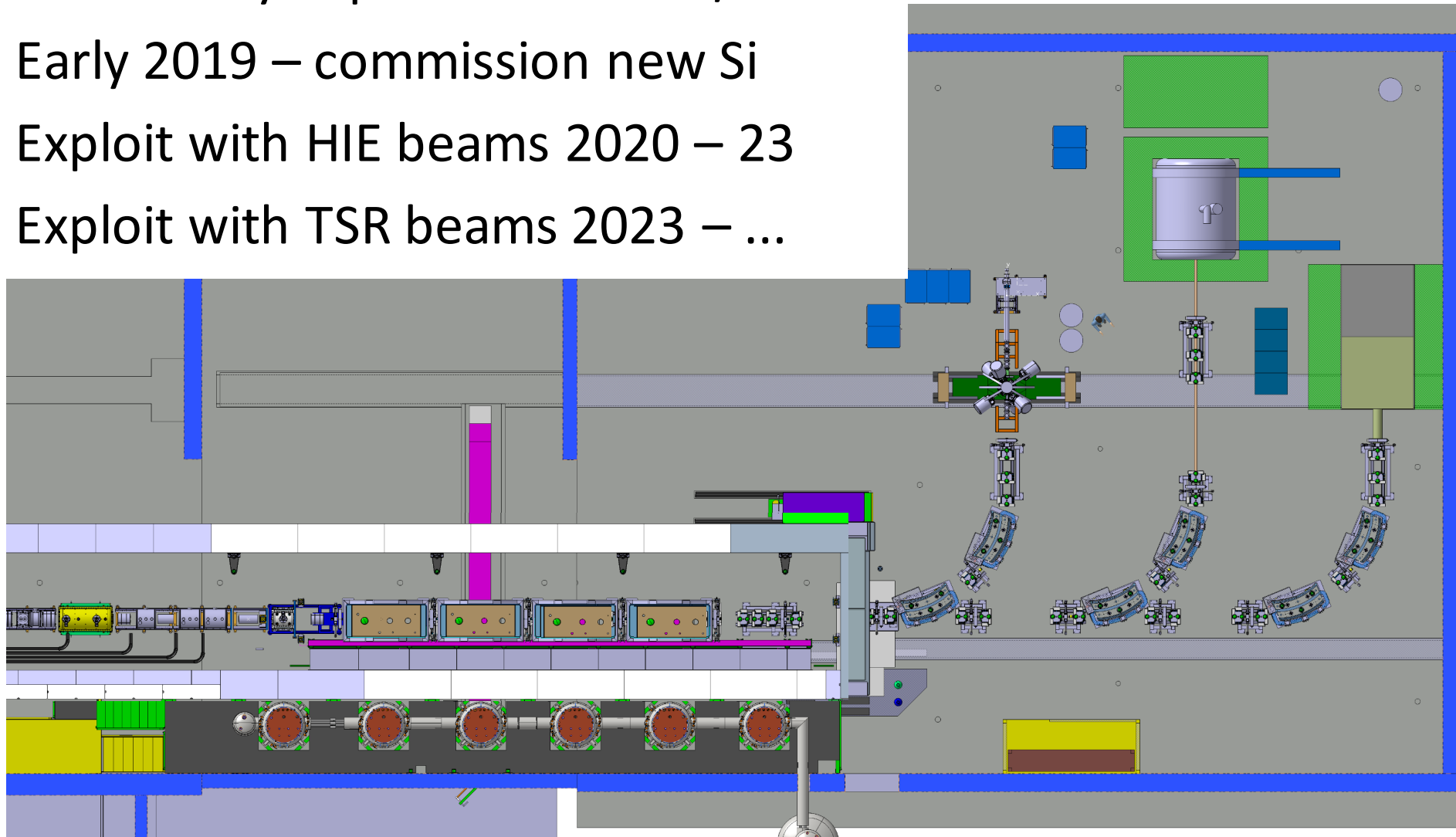
Installation in the ISOLDE Hall

Preliminary experiments 2017/18?

Early 2019 – commission new Si

Exploit with HIE beams 2020 – 23

Exploit with TSR beams 2023 – ...



International Collaboration



- **MPI-K Heidelberg:** TSR, technical input to install and commission, **and FTE.**
- **CERN:** New TSR building and infrastructure (15 MCHF and FTE). Research Board approved installation: **not yet included** in CERN-MTP.
- **UK:** Detector array for internal spectrometer. External (HELIOS-like) spectrometer **including magnet.** Development of in-ring laser spectroscopy
- **Universities of Aarhus and Lund:** In-ring gas-jet target **grant in preparation.**
- **University of Leuven:** **collaboration through active target ERC grant.**