Construction and commissioning of the Cryogenic Stopping Cell for the Super-FRS

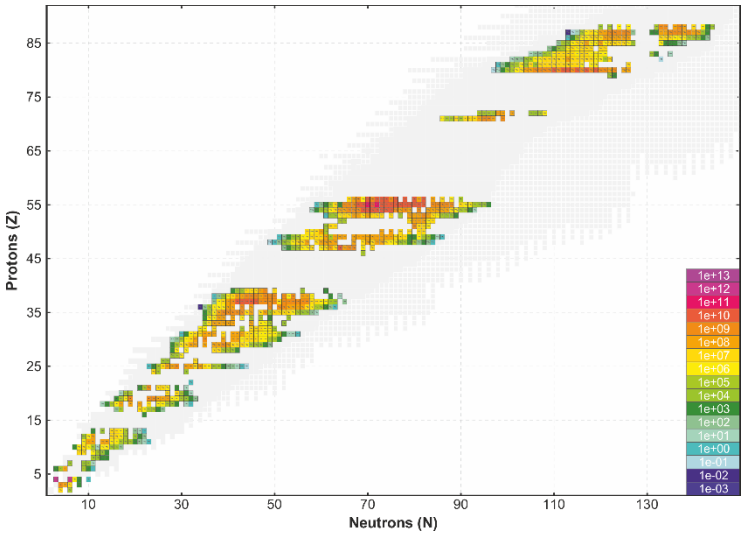
Daler Amanbayev

for the Super-FRS EC collaboration
and the FRS Ion Catcher collaboration

The Helmholtz program days Matter and the Universe 2026,
20.10.2026, GSI

Two towns

ISOL

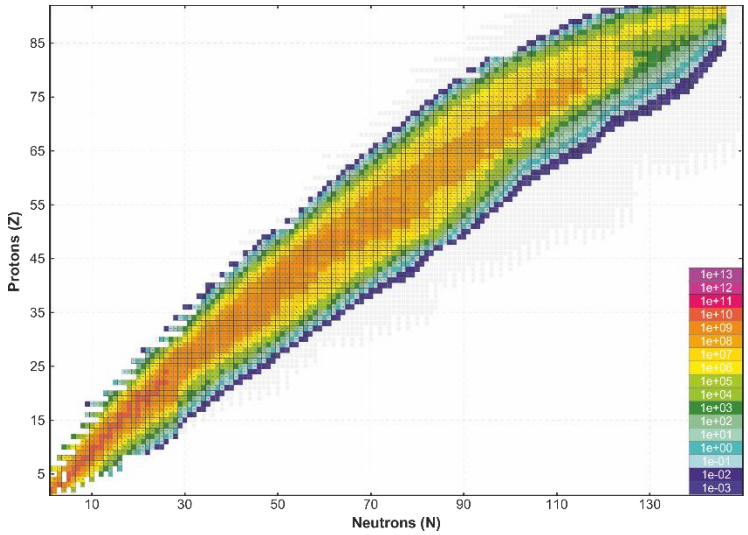


Low-energy beams

High-precision experiments:

- mass spectrometry
- laser spectroscopy
- in-trap decay spectroscopy
- β-NMR
- …

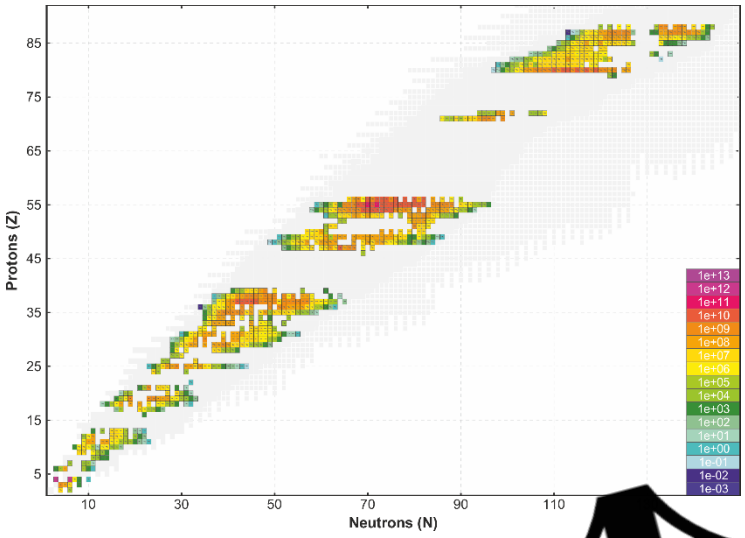
In-flight (Super-FRS)



Relativistic beams – no trap can hold it

Bridge the best of both towns

ISOL



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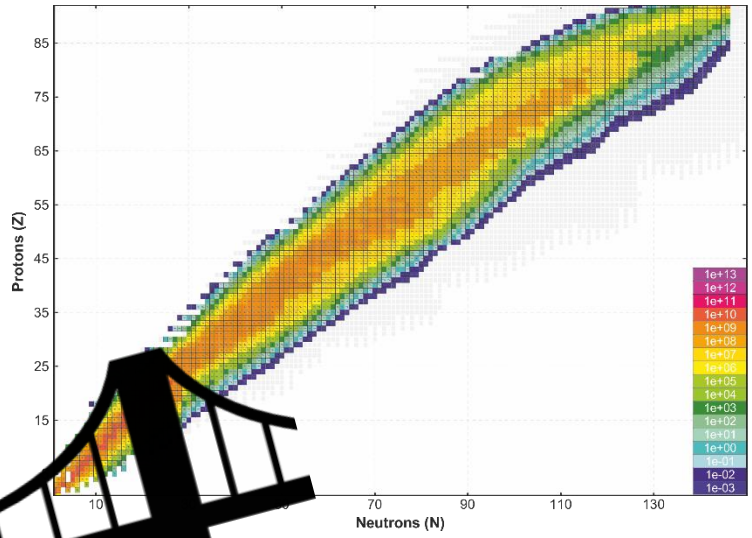
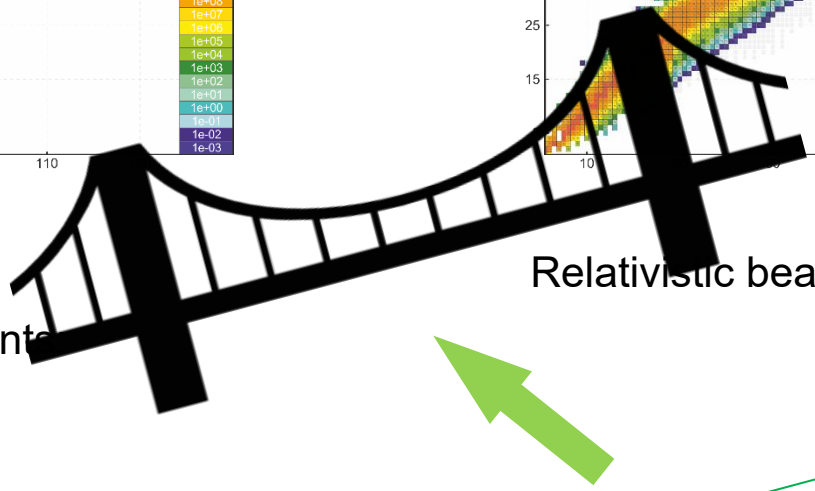
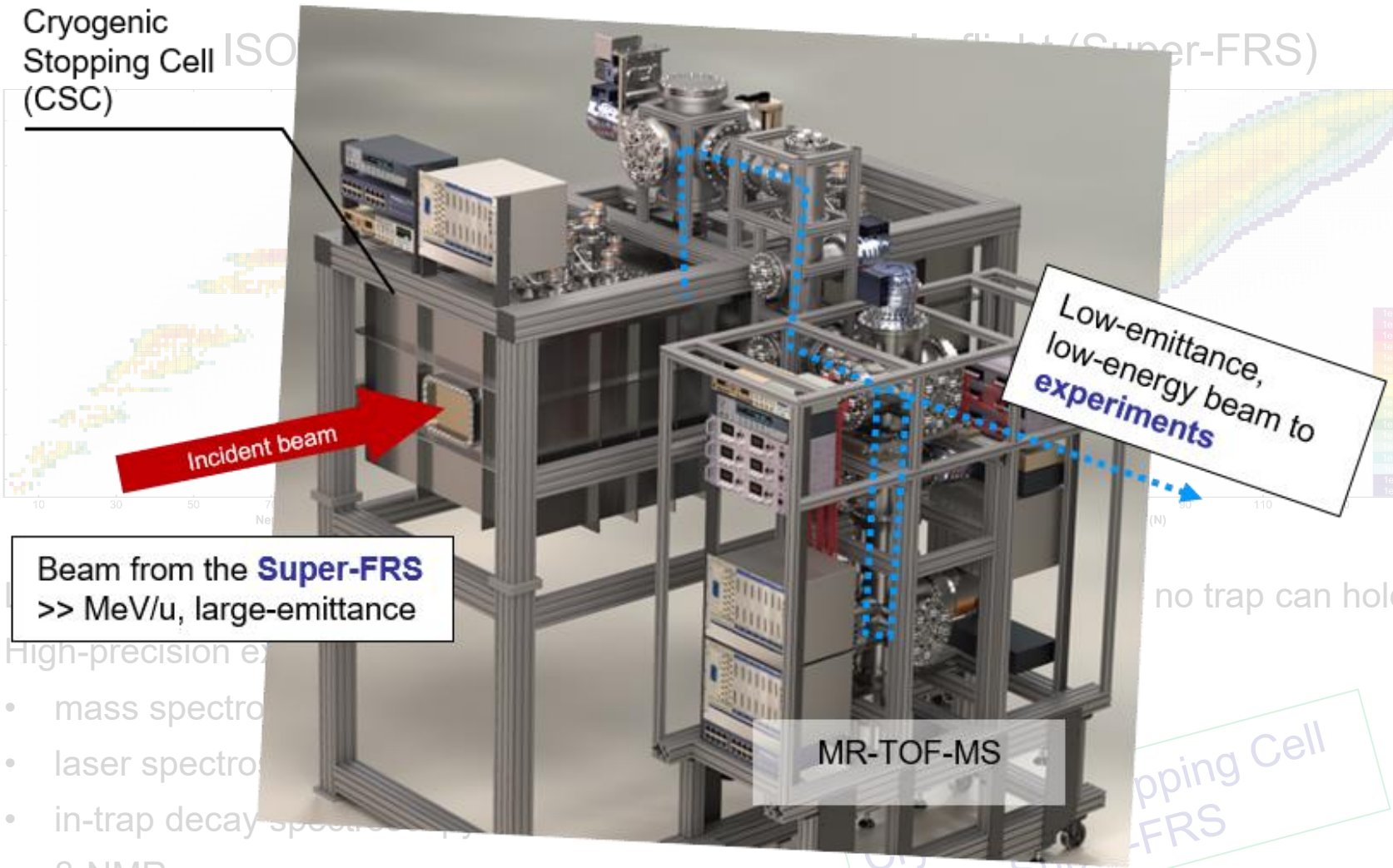


Relativistic beams – no trap can hold it

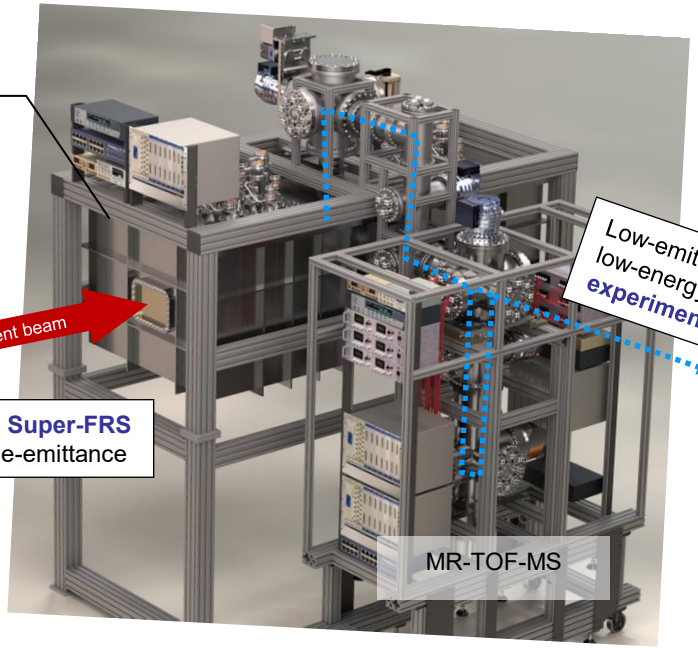


Cryogenic Stopping Cell for the Super-FRS

Bridge the best of both towns



Key device for experiments with thermalized exotic nuclei at FAIR

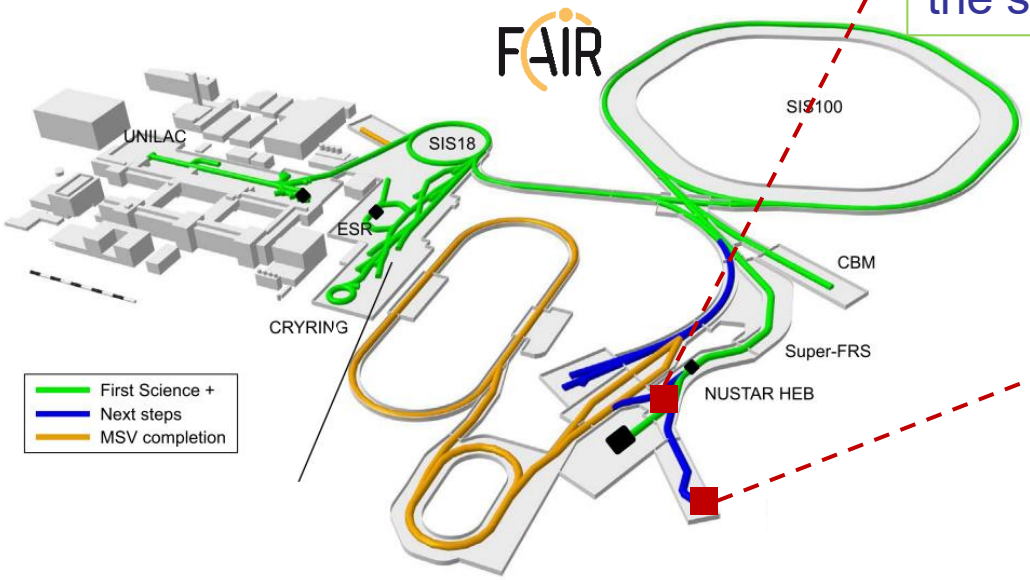


Early Science / First Science

- Mass, Pxn measurements, isomers, fission studies …
- High-rate experiments (e.g. MNT reaction studies)
- Laser spectroscopy
- Commissioning and PID

Super-FRS EC | LaSpec

CSC performance strongly impacts the scope and reach of these experiments

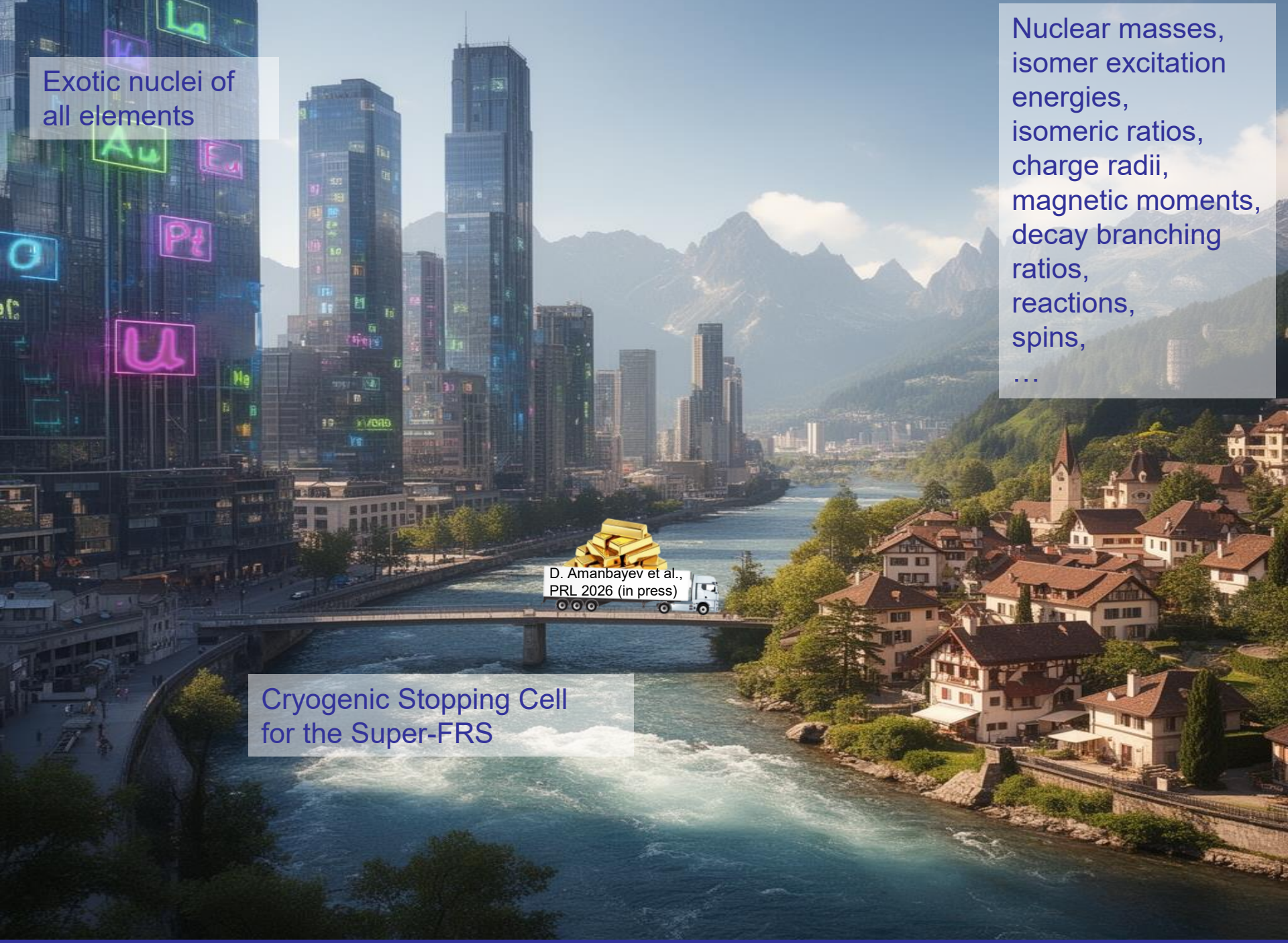


Low-Energy Branch (FLF6):

First Science++

- Mass measurements
- Laser spectroscopy experiments
- In-cell decays, …

MATS | LaSpec | Super-FRS EC


Exotic nuclei of all elements
Nuclear masses, isomer excitation energies, isomeric ratios, charge radii, magnetic moments, decay branching ratios, reactions, spins, …
D. Amanbayev et al., PRL 2026 (in press)
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