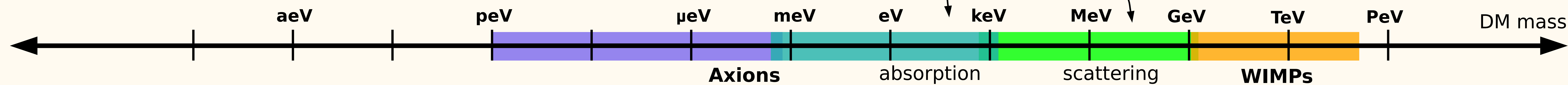


The New Cryolab at Kamioka

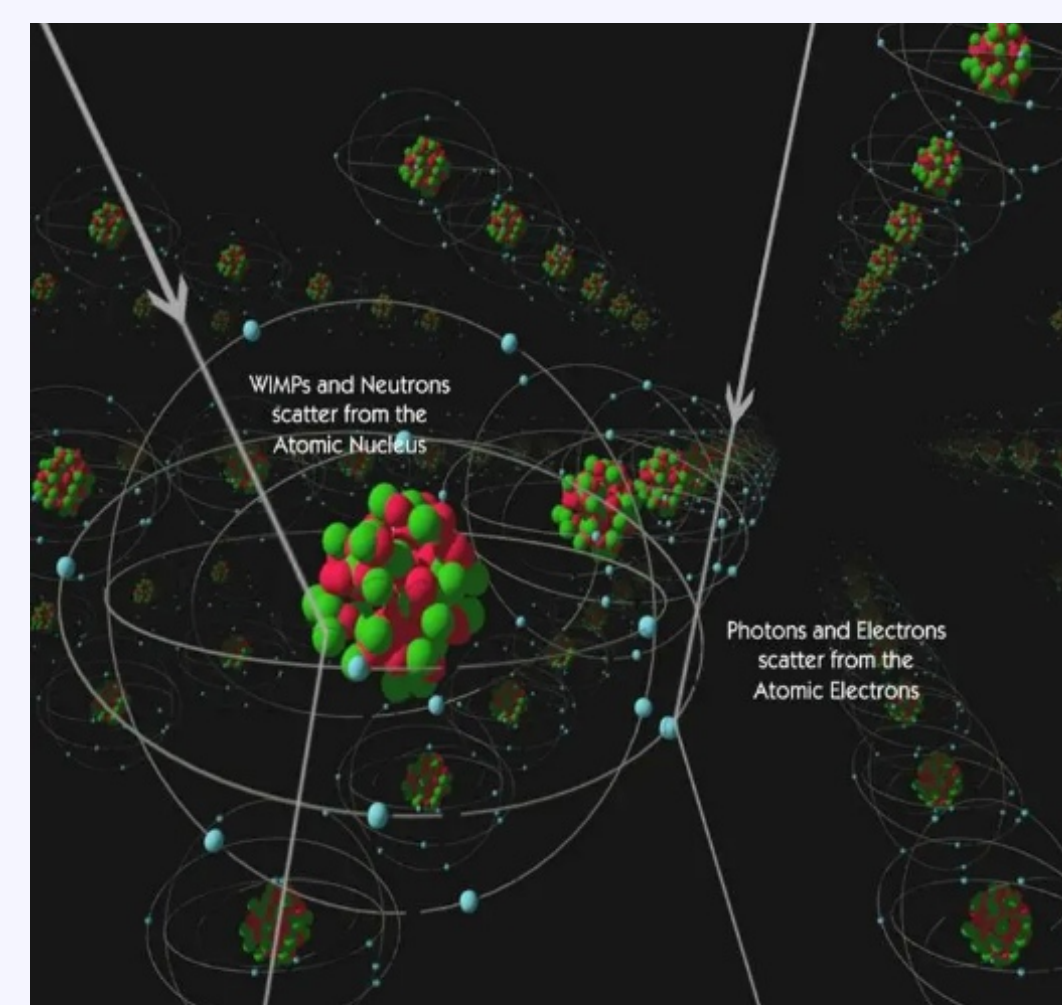
¹LBNL, ²UC Berkeley, ³QUP (KEK), ⁴Tohoku RCNS, ⁵MIT

H. Akamatsu³, K. Bui³, D. Chernyak⁴, M. Garcia-Sciveres^{1,3}, K. Hattori³, K. Hosokawa⁴, K. Ichimura⁴, K. Ishidoshiro⁴, R. Kriboos³, K. Kawanami⁴, X. Li¹, J. Lin², M. Reed², B. Russell³, B. Suerfu³, A. Suzuki¹, V. Takhistov³

SCIENCE MOTIVATION: LOW MASS PARTICLE DARK MATTER

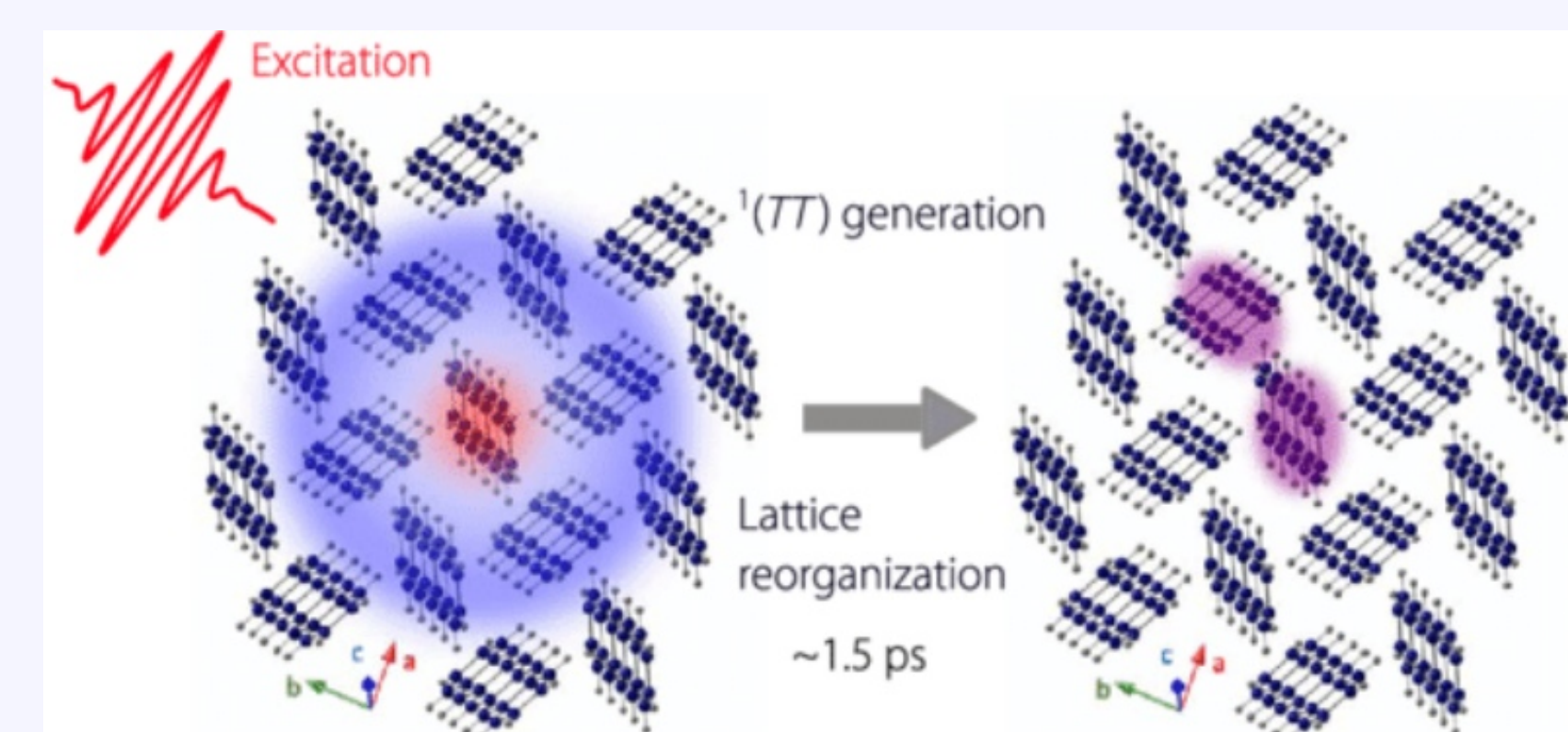


WIMP interaction picture (heavy particles)
Looks like particle physics



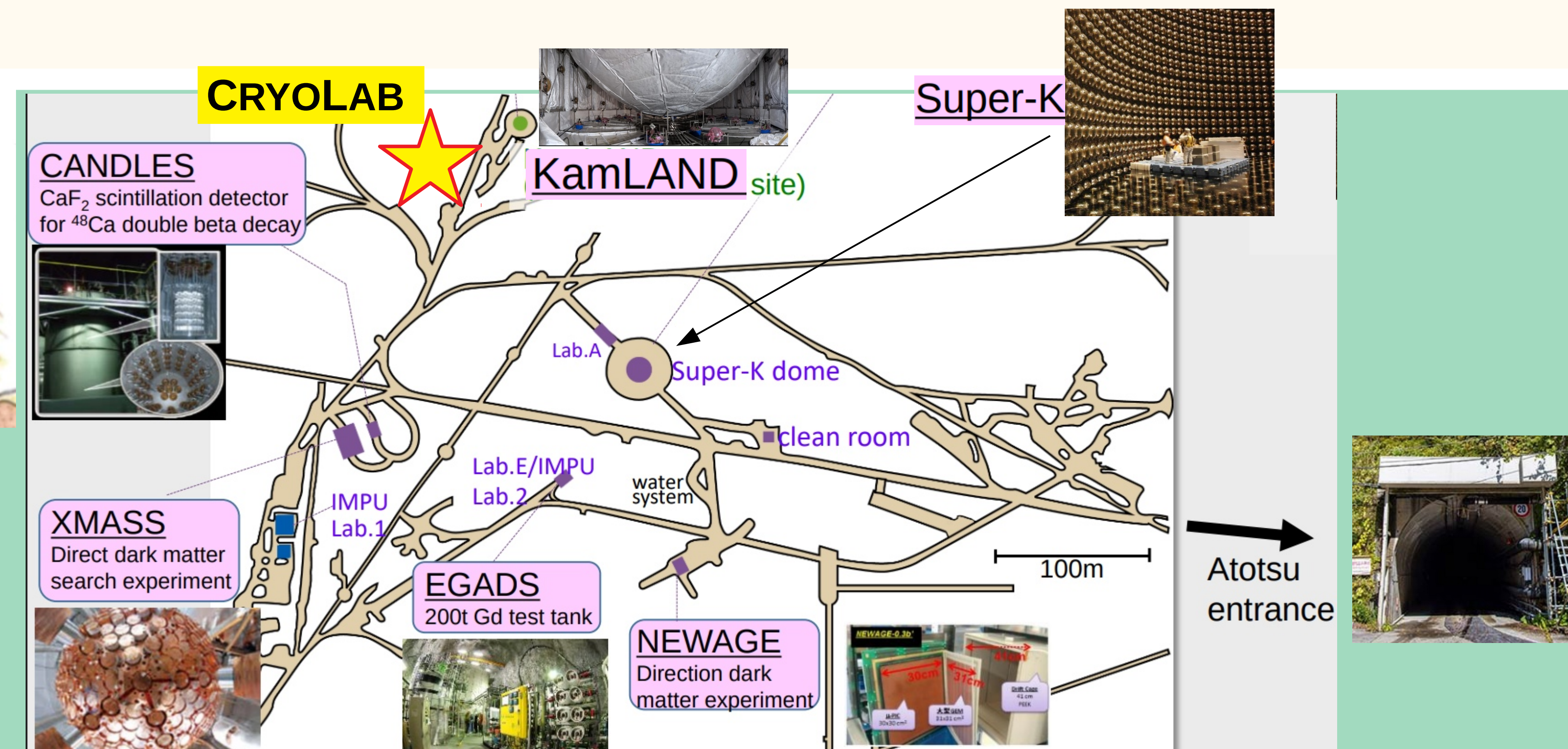
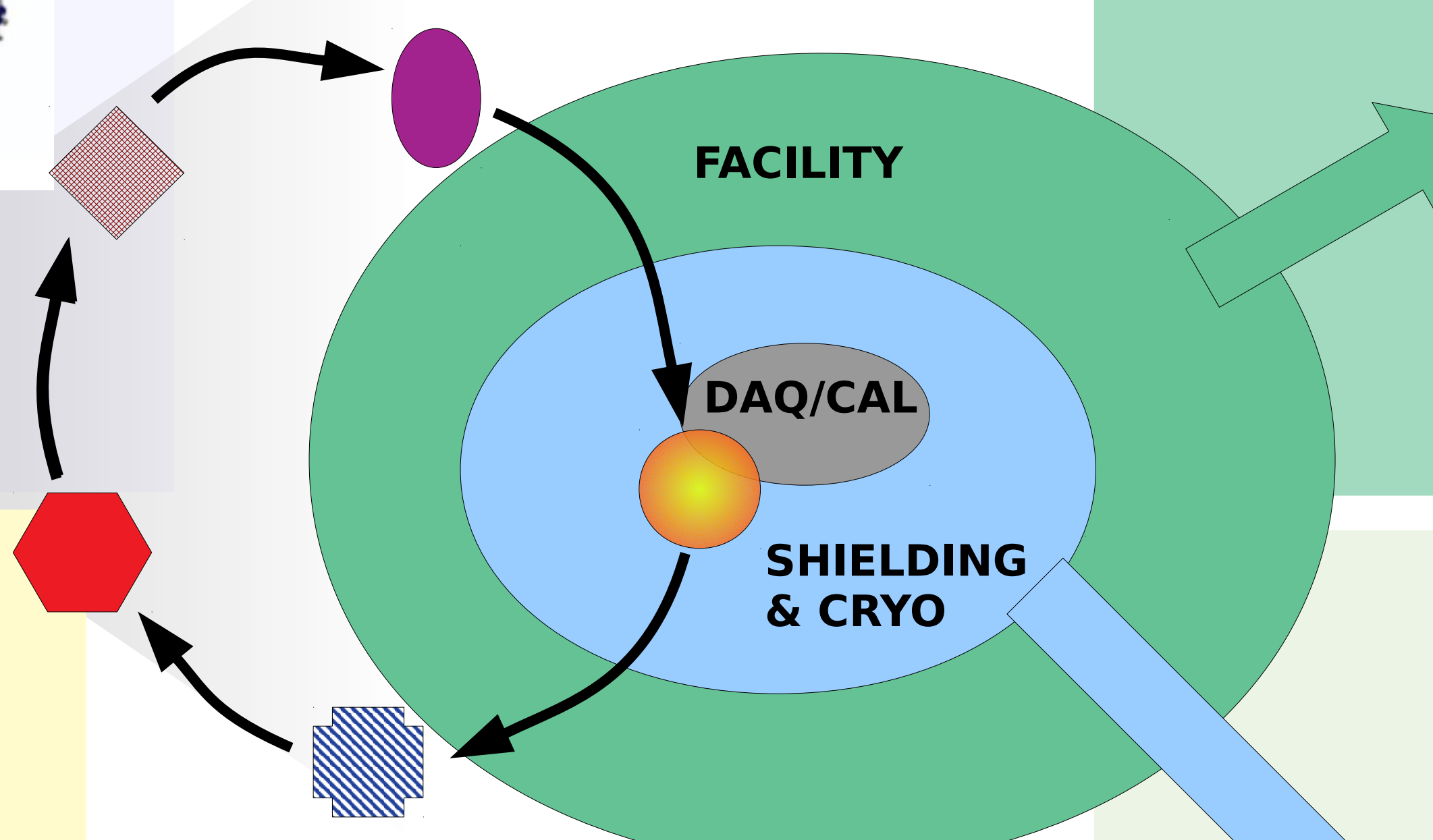
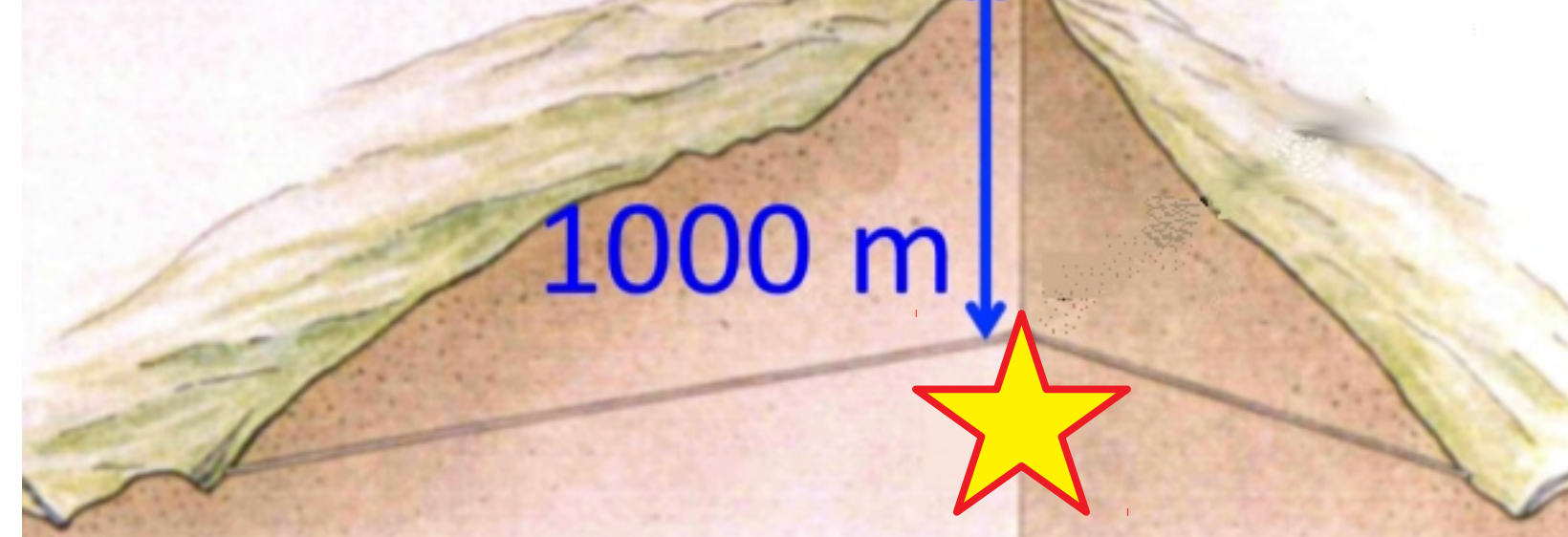
One single target material can probe all models (eg LXe)

Light particle interaction picture
Looks like Materials Science

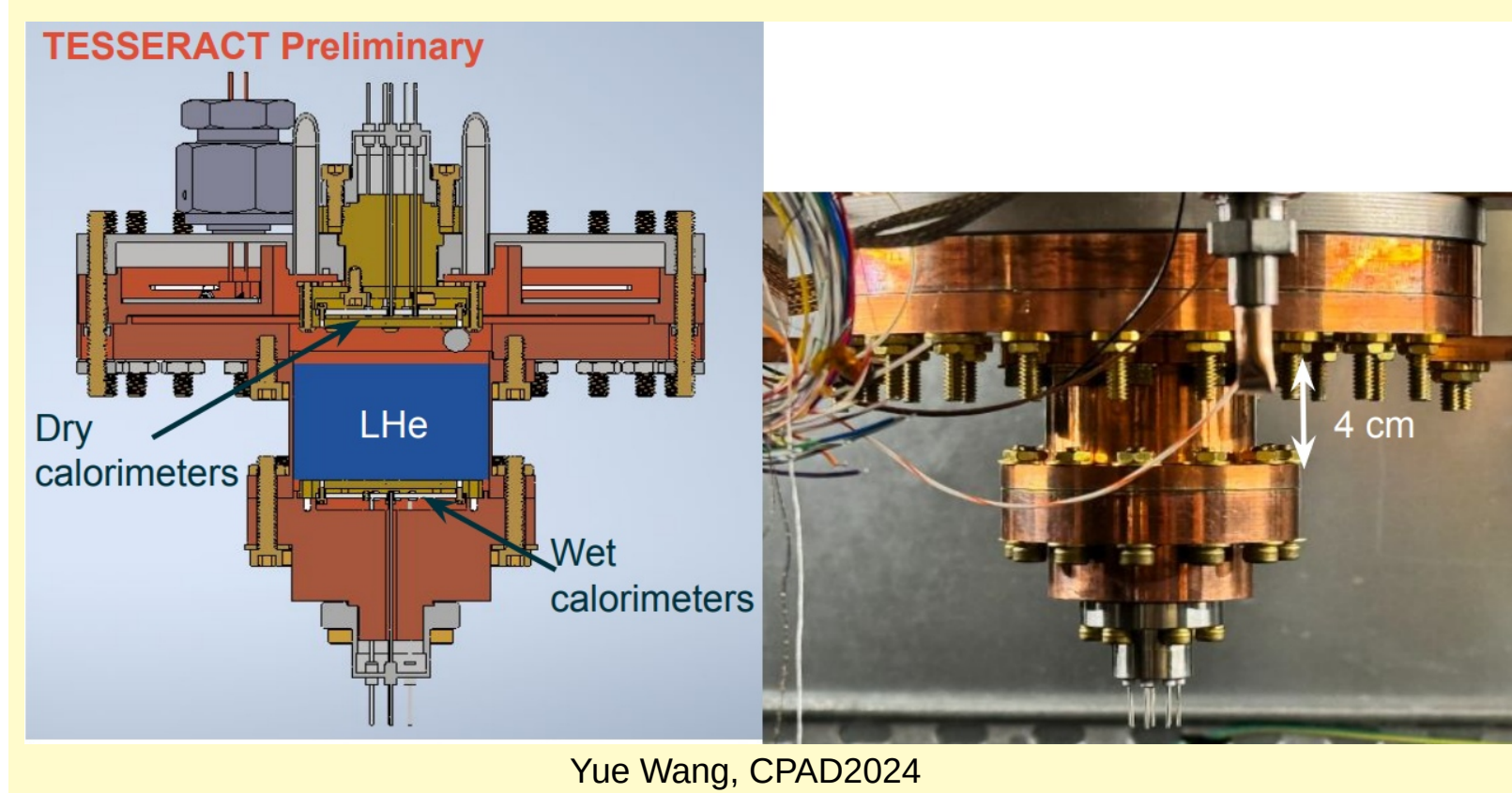
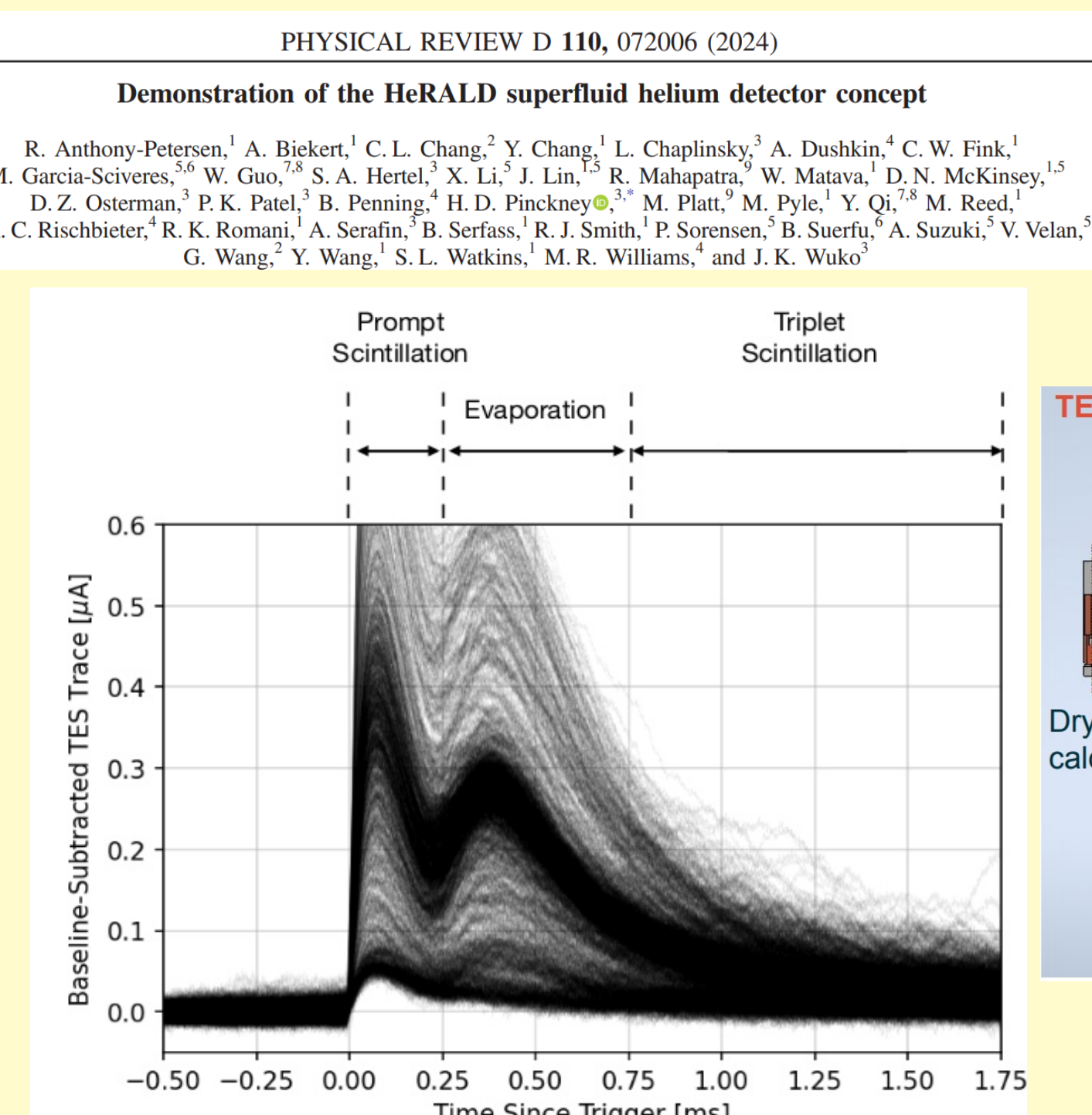


Different models prefer different materials
Need to explore multiple different targets!

Mt. Ikenoyama



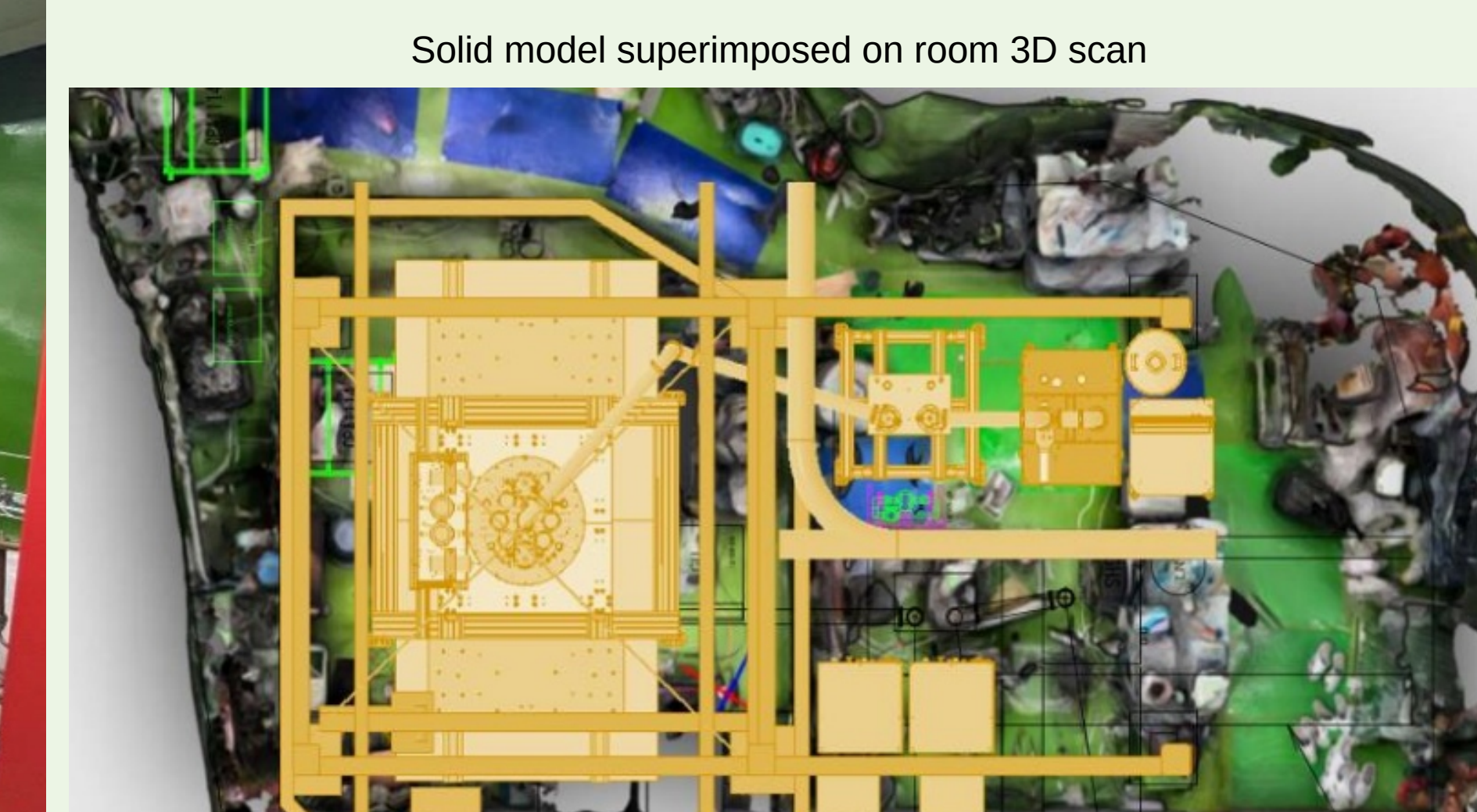
Planned target #1: 1g-yr version of HeRALD



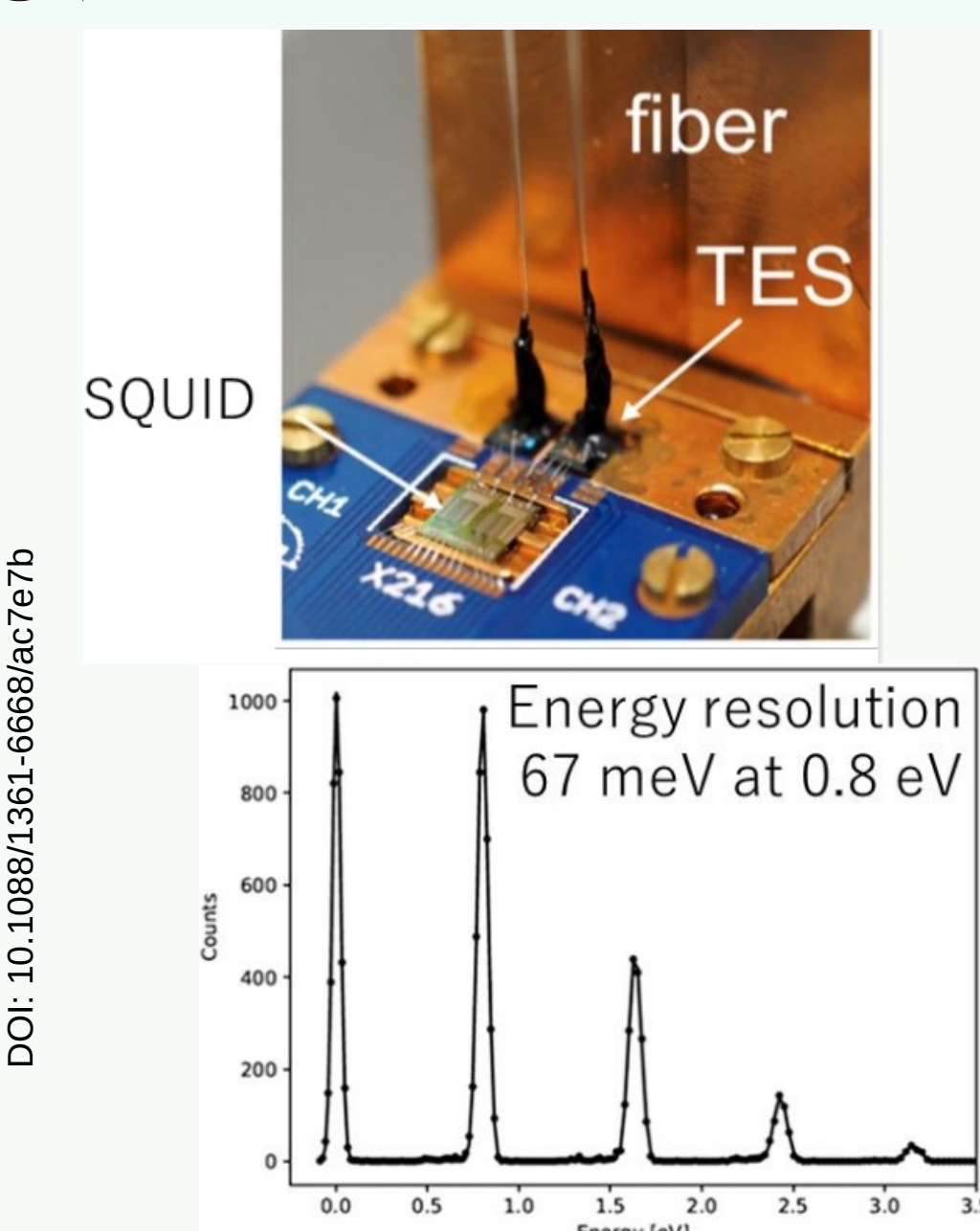
Facility, Shielding, Cryo, & DAQ/Cal

comprise most of the cost and effort. Therefore: Make those a common service that can host a wide range of targets and sensors

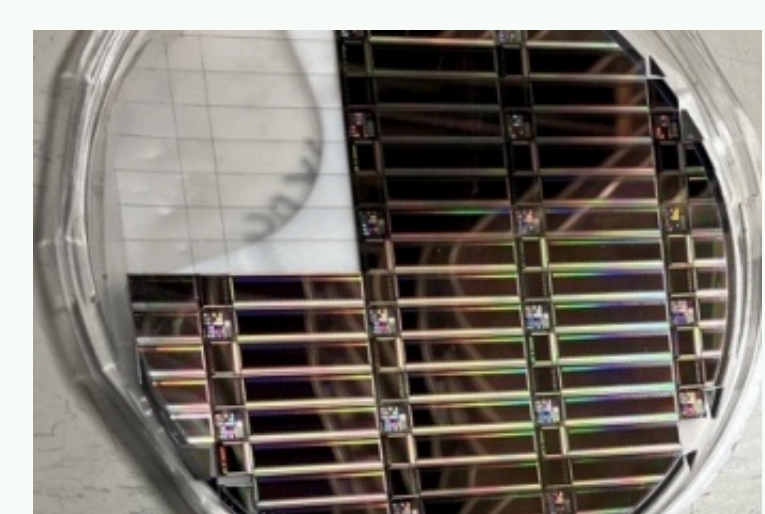
CRYOLAB INSTALLATION STATUS 3/25



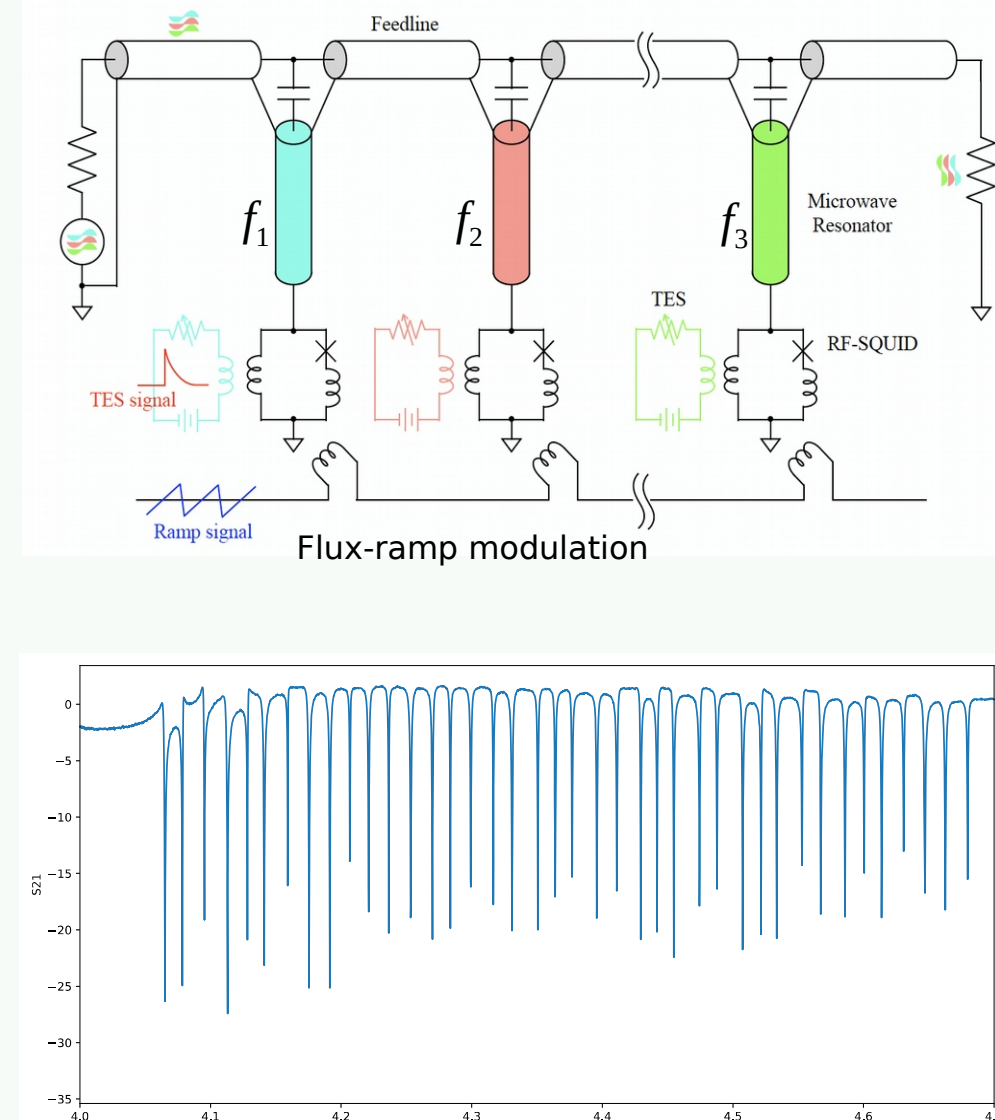
Planned target #2: Superconducting Al with Optical TES



RF multiplexed readout for achieving higher target mass by multiplexing 1000 devices



Y. Nakashima, Appl. Phys. Lett. 117, 122601 (2020)



TBD
New collaborations possible

SHIELDING & CRYO

* Shield on rail system for quick open and close

* XLD fridge – large experimental volume

* 10-100 DRU background target

