



KYUSHU
UNIVERSITY

Kyushu University: Potential contributions and interests

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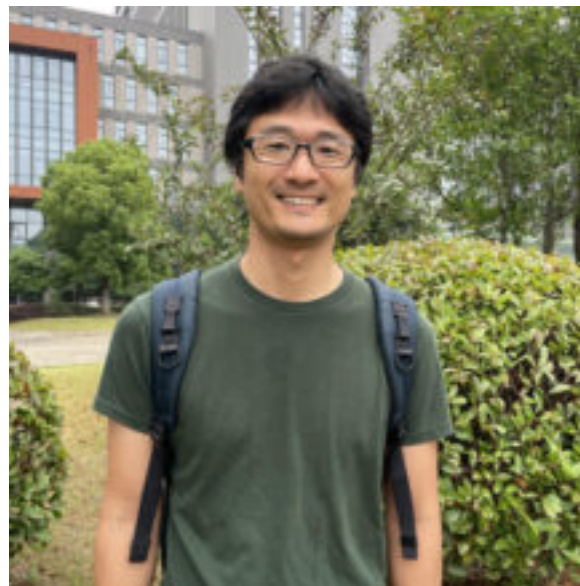
Contributions and interests from Kyushu

Kyushu University (JP):

- interested in developing MOSAIX/EIC-LAS sensors
 - for application to FASER experiment at the LHC
 - Looking forward to pursuing technological synergy between FASER and ePIC-SVT

Our team

Two faculties



Hidetoshi Otono
(Associate Prof.)



Tomohiro Inada
(Assistant Prof.)

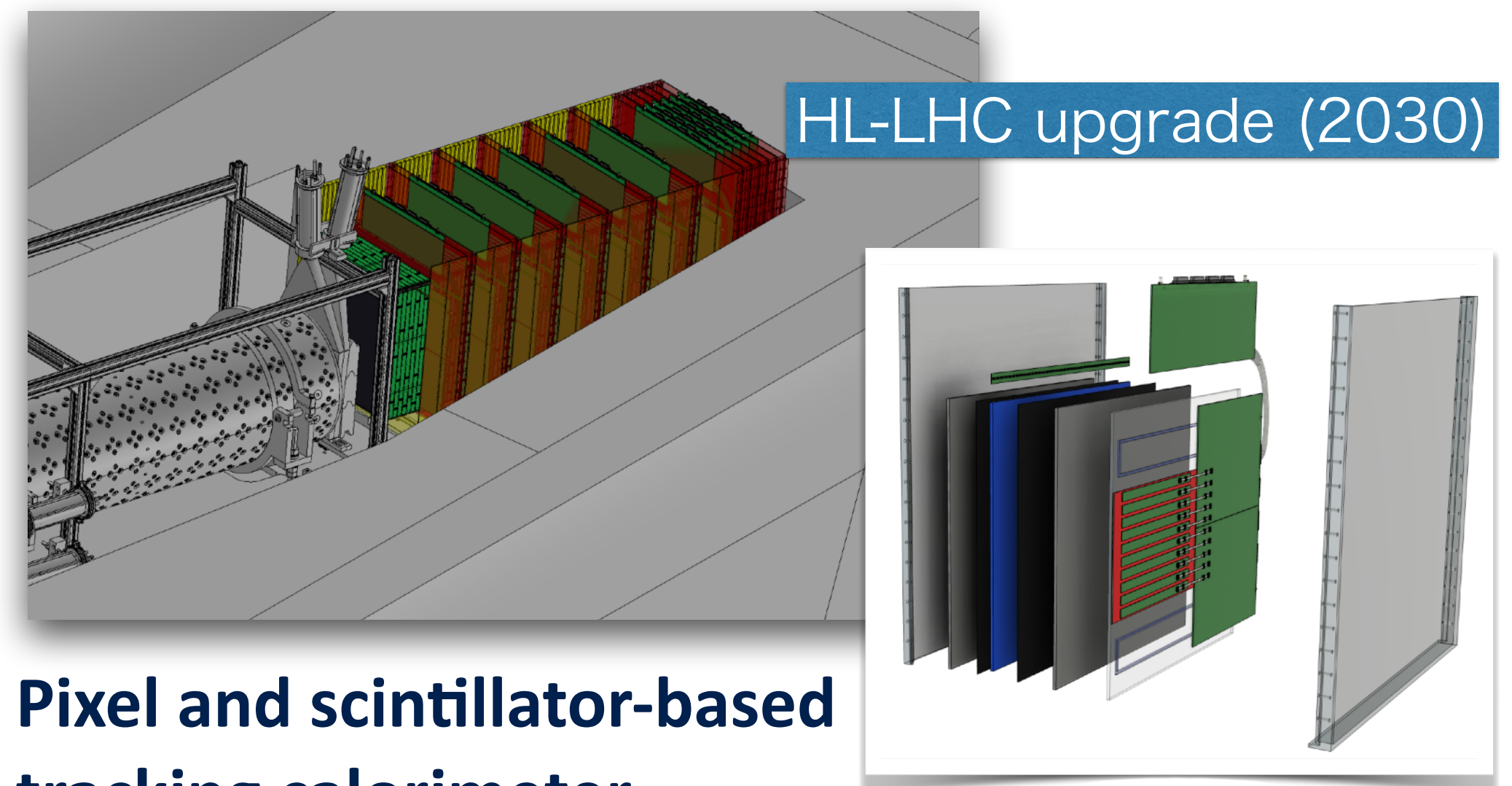
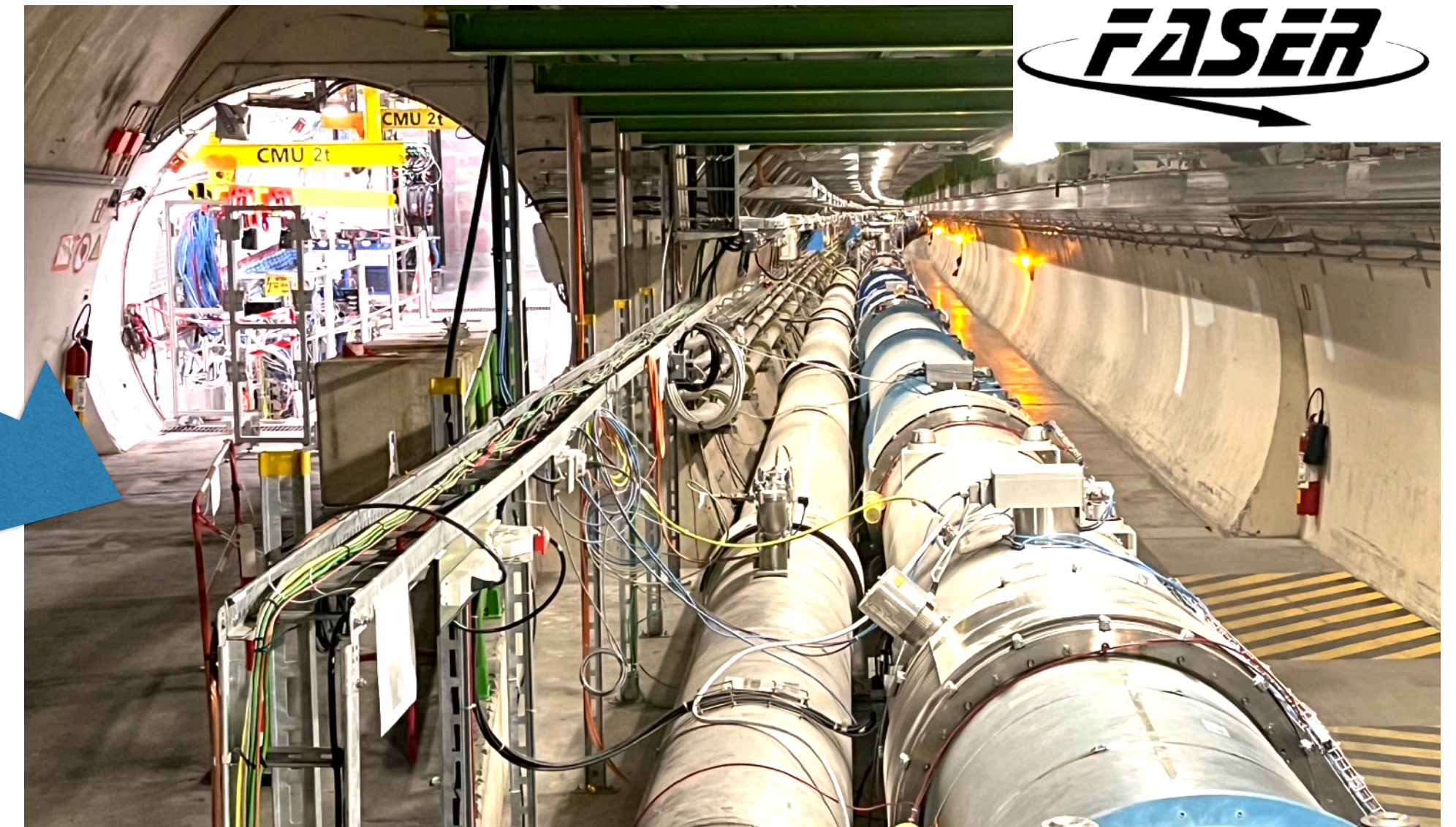
Two students



Daichi Yoshikawa
(PhD student)



Shogo Muramatsu
(Master student)

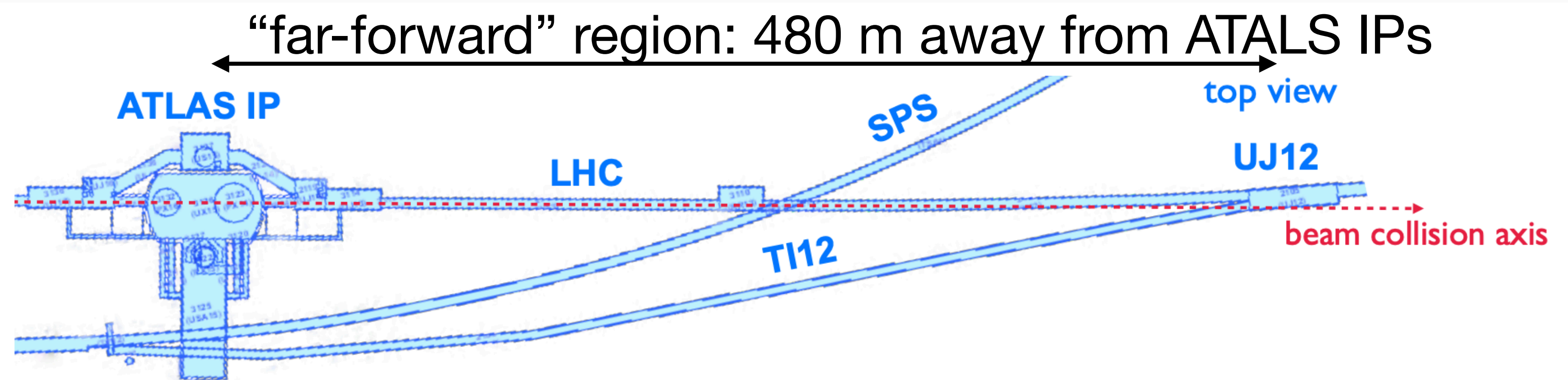


ForwArd Search Experiment (FASER)

Operation since July 2022

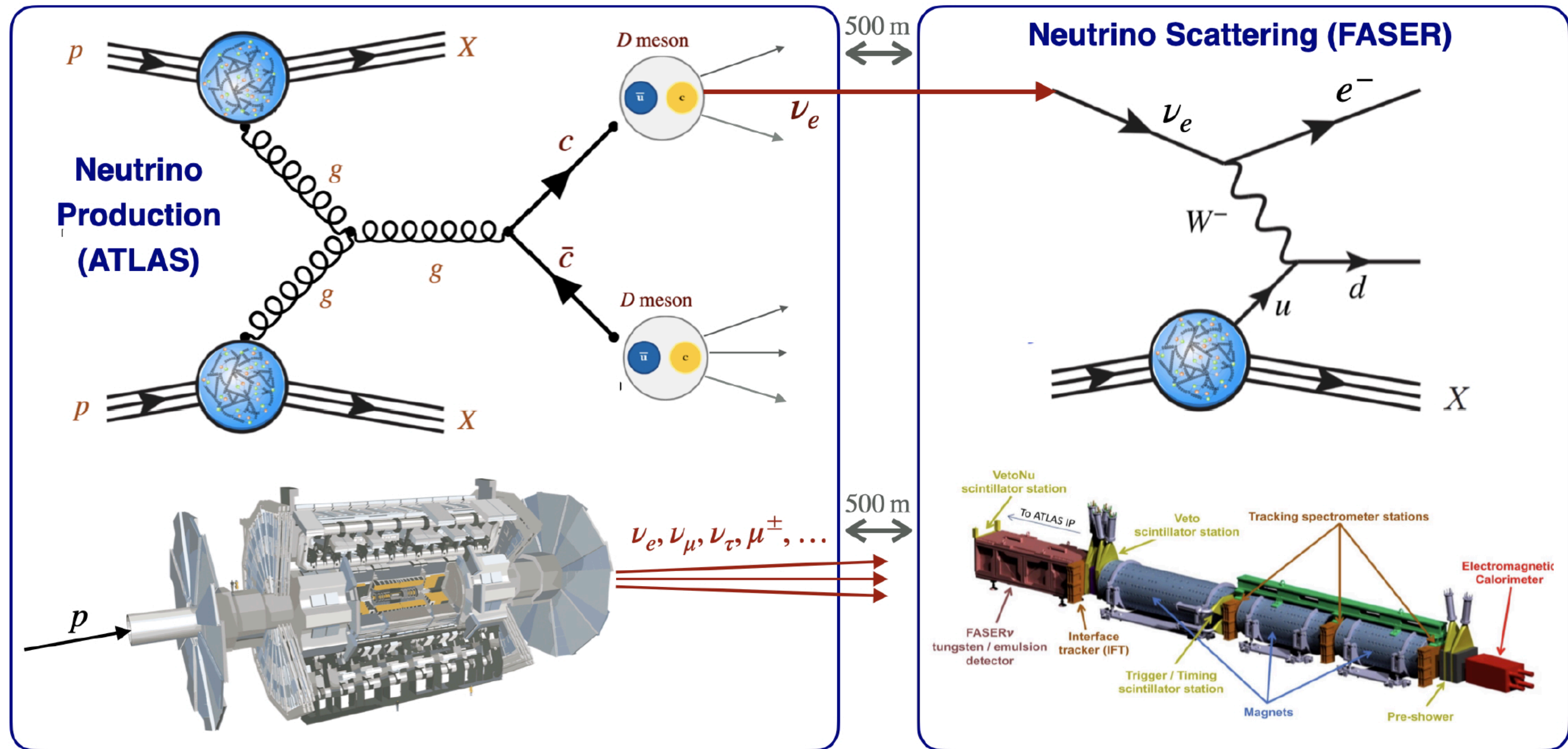
LHC beamline

2018

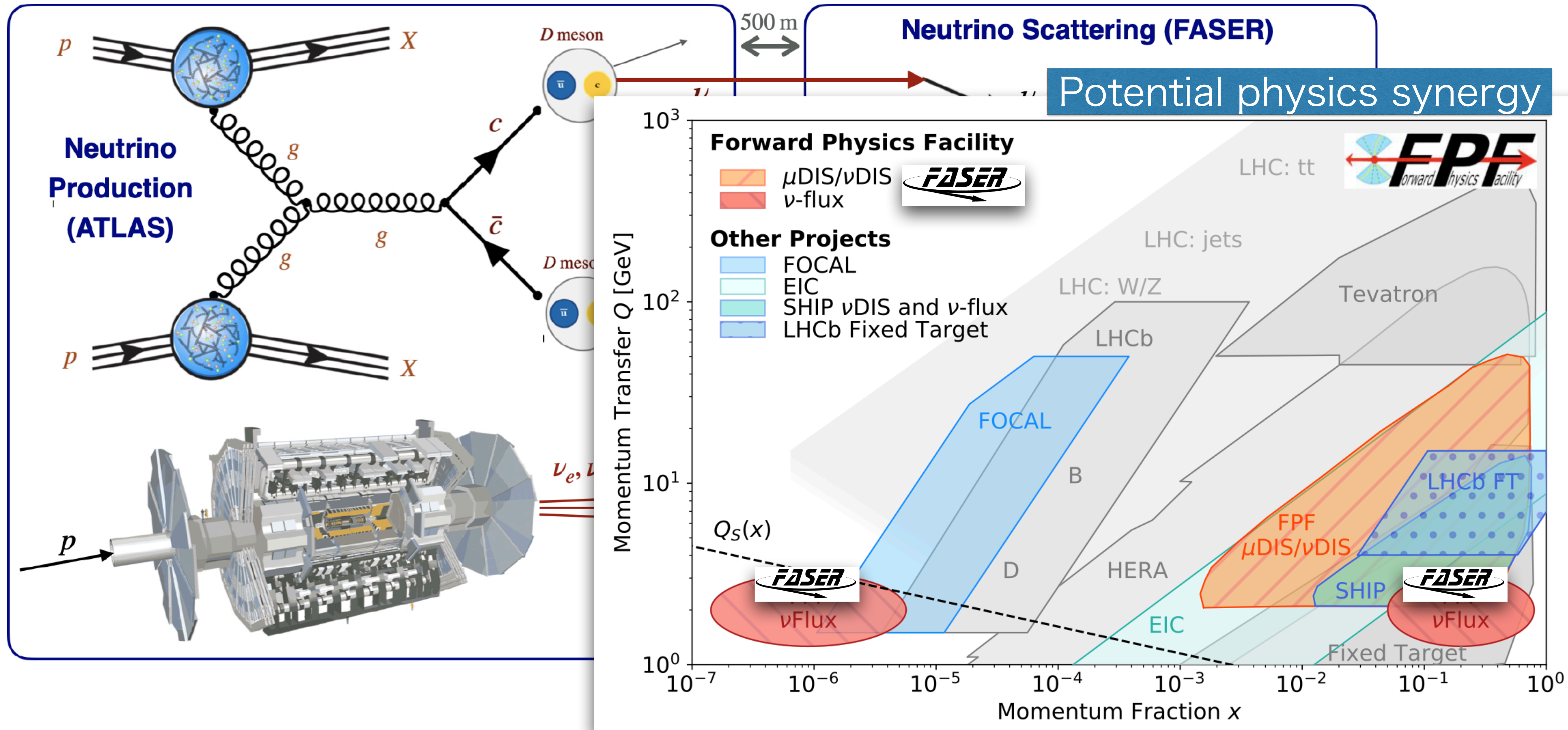


The **far forward region** has an extremely **hard radiation environment**, making continuous detector operation challenging
→ An unused tunnel was renovated, enabling a viable environment for the experiment

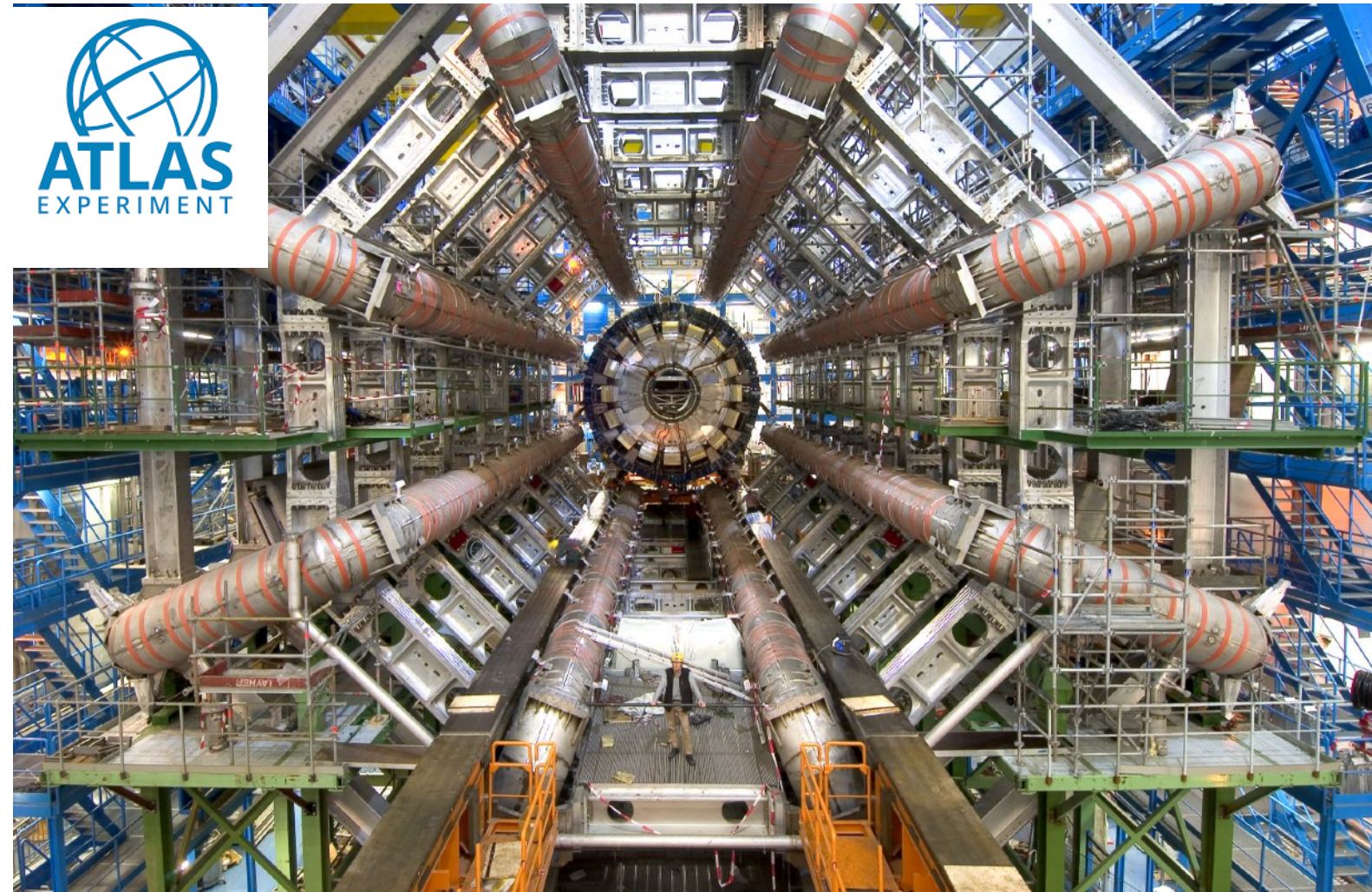
High-energy QCD study using neutrino as a new probe



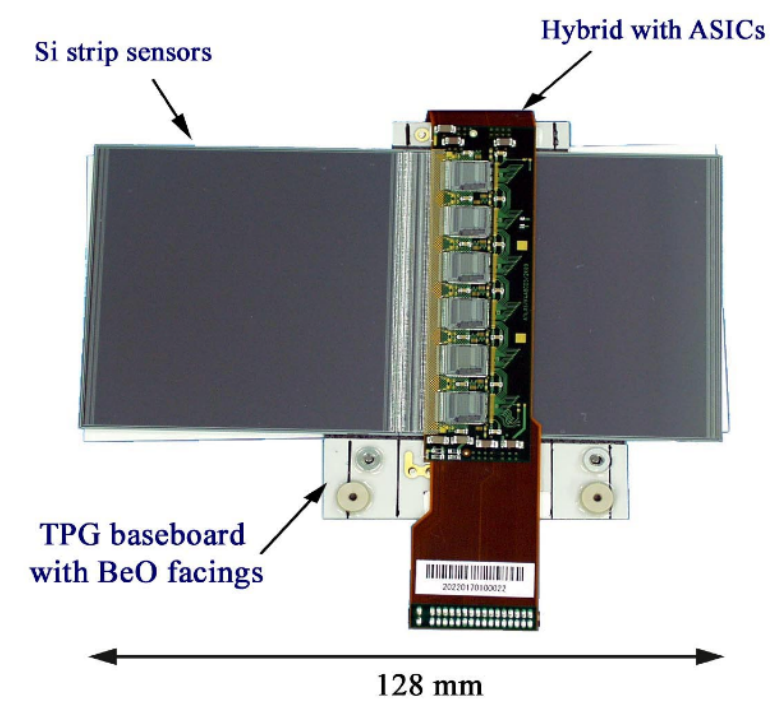
High-energy QCD study using neutrino as a new probe



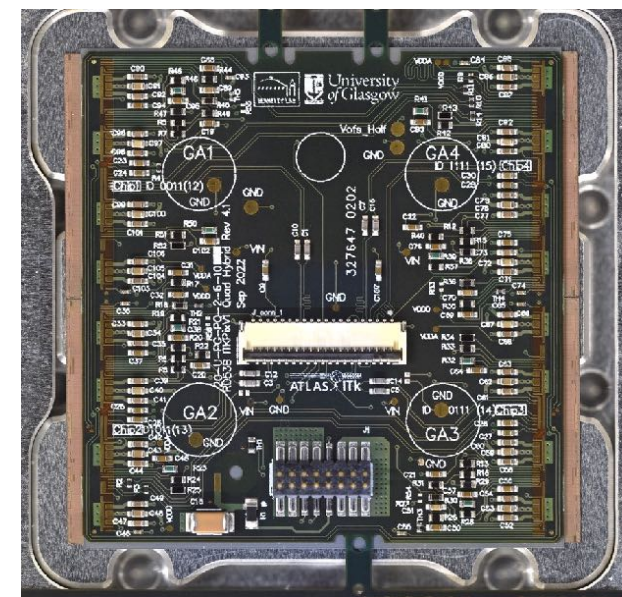
Silicon detector experience



- Strip-based tracker (Operation)
- ITk (Inner Tracker) Detector (Production/QC/DAQ)



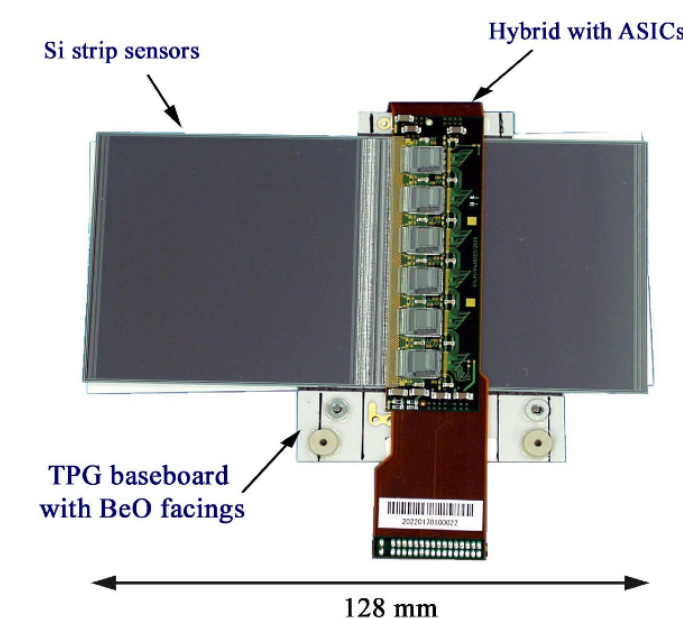
Silicon strip



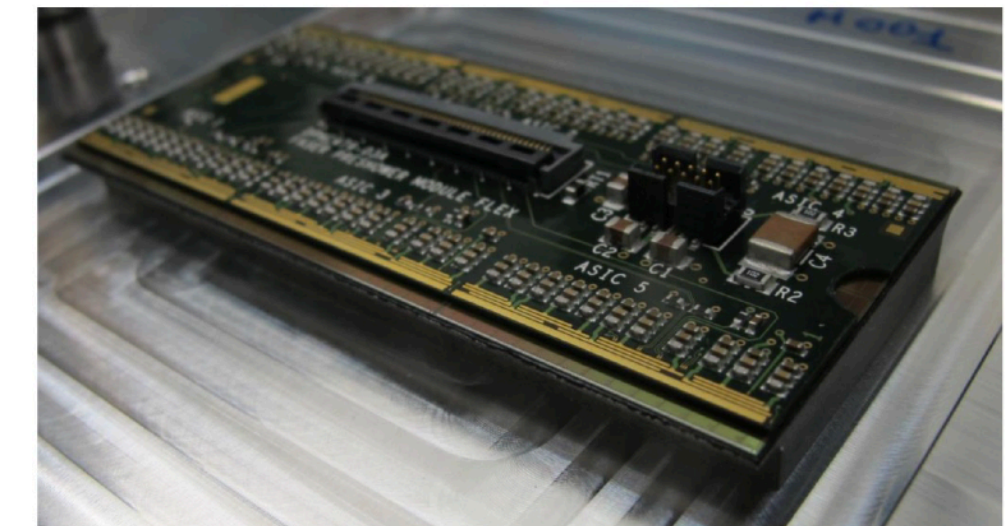
ITk pixel quad-module



- Strip-based tracker (Assembly/Operation)
- MAPS-based Pixel preshower detector (Production/Assembly/Operation)



Silicon strip



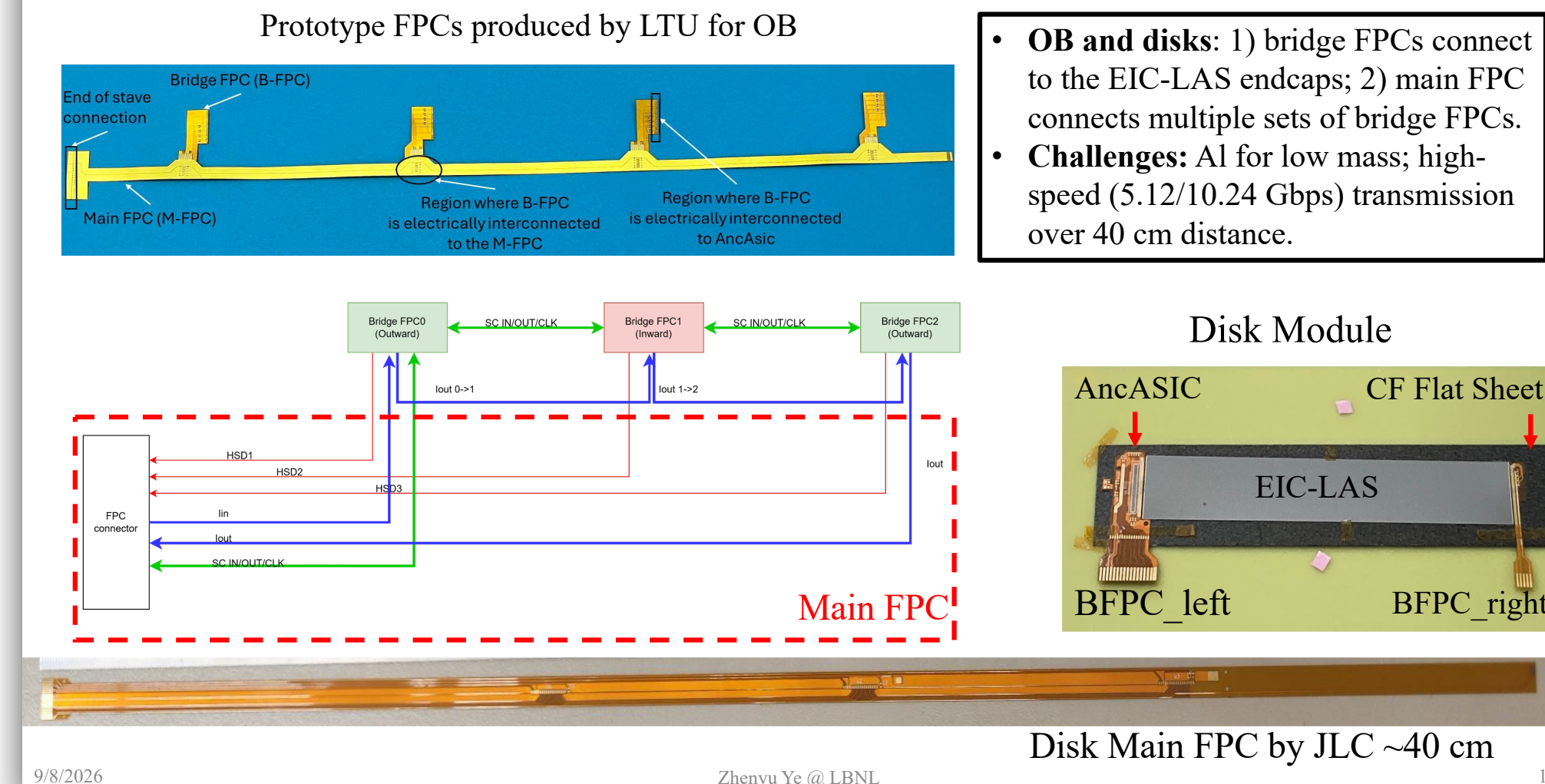
MAPS Pixel detector

On Friday, we would like to discuss some QC/QA thoughts based on these experiences

Potential FPC idea

- Investigating an (nearly) available FPCs
 - Communicating with colleagues in BelleII
 - Study Aluminum FPCs for Low-Material-Budget
 - Want to have a prototype within a-year timescale
- Progress in Aluminum Via Metallization
 - Combined PVD and copper electroplating: successful through-hole metallization
 - Fully wet plating: zincate pretreatment and Ni/Cu metallization
- Hybrid Al/Cu Flex study is also ongoing
 - Copper signal layers and aluminum power layers
 - Ultrasonic Al–Cu bonding through polyimide
 - +10 % material budget from only Al case

Low-mass Al Flexible Printed Circuits for OB/Disks

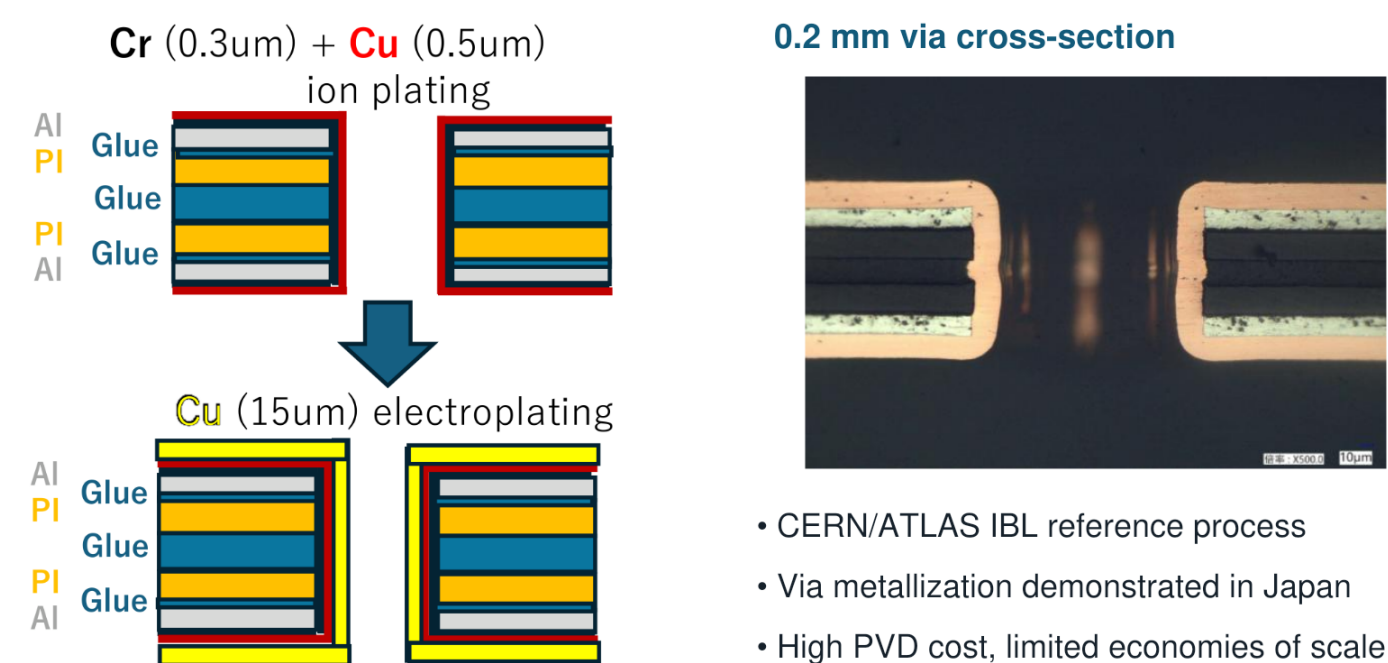


Zhenyu's slide for PIXEL 2026 [\[link\]](#)

Details will be in tomorrow's talk

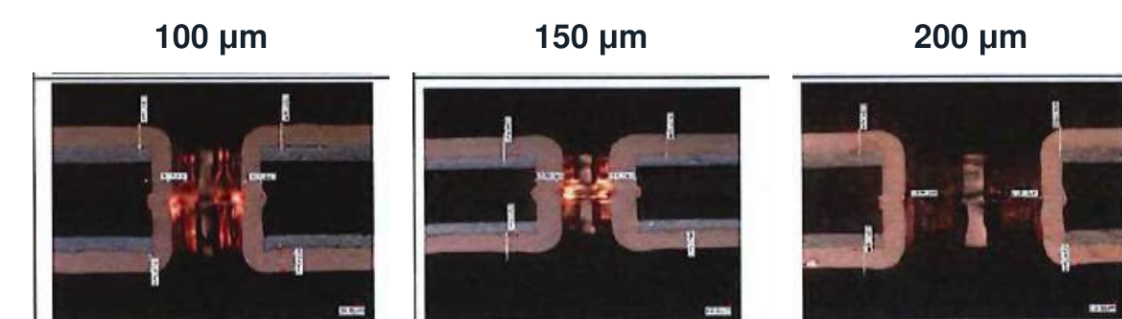
Photos and plots from Y. Onuki [\[link\]](#)

1 Combined PVD and electroplating



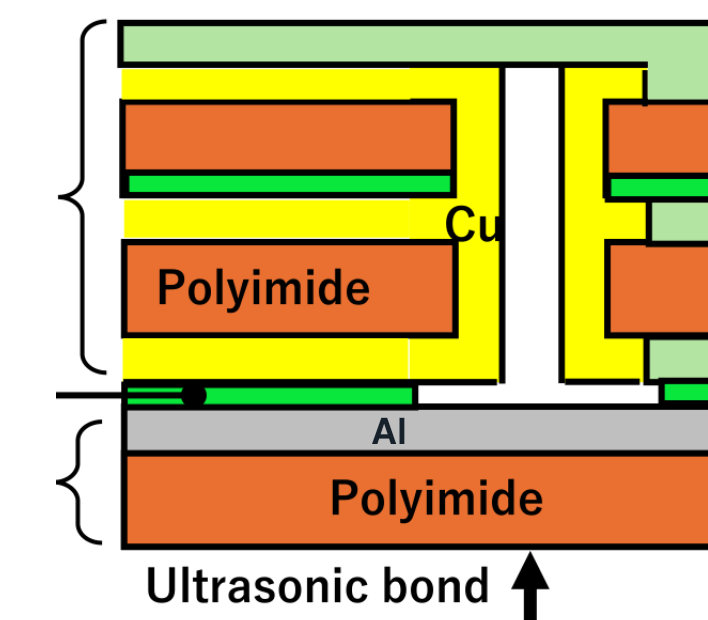
2 Fully wet plating

Via cross-sections

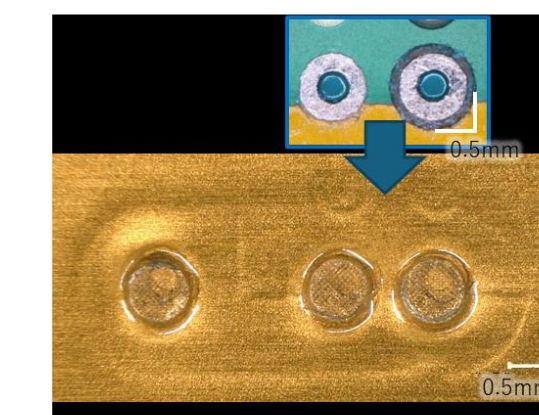


- Zincate pretreatment, electroless Ni/Cu, then copper electroplating
- Beaker-scale demonstration, with potential for lower production cost
- Next: circuit etching and multilayer process integration

3 Ultrasonic Al–Cu bonding



Prototype Al–Cu joints



- Cu signal routing with Al power/ground
- Initial Al–Cu connections demonstrated
- Next: thermal-shock tests and production setup