ARGONNE:
LGAD CONSORTIUM INTERESTS

EIC PROJECT INTERESTS

TOPSiDE: Timing Optimized PID Silicon Detector

- TOF/PID/4D Detector concept

Or Implementation of a silicon detector using LGAD's

- Optimizing a 4D detector design concept using simulation framework
- R&D of sensors/modules
  - AC LGAD's
  - Reaching 10 ps timing resolution
  - LGAD related Electronics (CFD?)
  - Monolithic implementation of an LGAD??

- Interested to take a large construction role in an LGAD detector subsystem

ACTIVITIES, EXPERTISE, PERSON-POWER

Now: LGAD Testing

- Sensors from HPK (via UCSC) and BNL
  - Probing, test beam, test bench characterization
- TCAD design
- Electronics design development

Future: Detector design, validation, construction

Module assembly & testing, electronics, mechanical design, cooling, DAQ

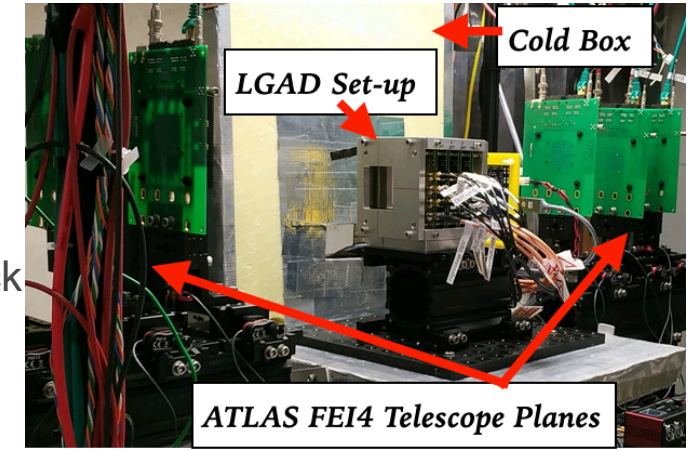
- Engineers, technicians, scientists with relevant experience

Person-power: ~4 scientists (fraction), 1 postdoc, electrical engineer coming on-board now shared w/ UCSC

→ Able to ramp up with more scientists, engineers, etc. with EIC project support

EQUIPMENT AVAILABLE

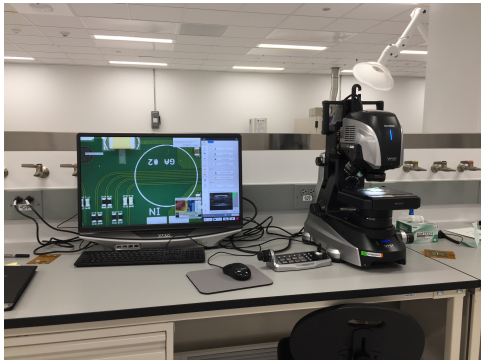
- Pixel Telescope @ Fermilab
  - 72 μm x 13 μm resolution
  - Future upgrade foreseen
- Large clean room
  - Probe station w/ cold chuck
  - Edge-TCT
  - Wire bonders
  - Thermal chamber
  - 3D microscope
  - Smartscope
  - Clean storage room

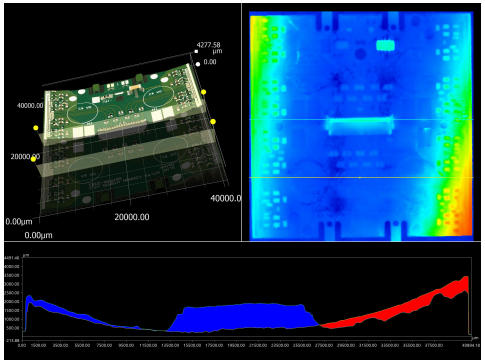


Probe station w/ thermal chuck

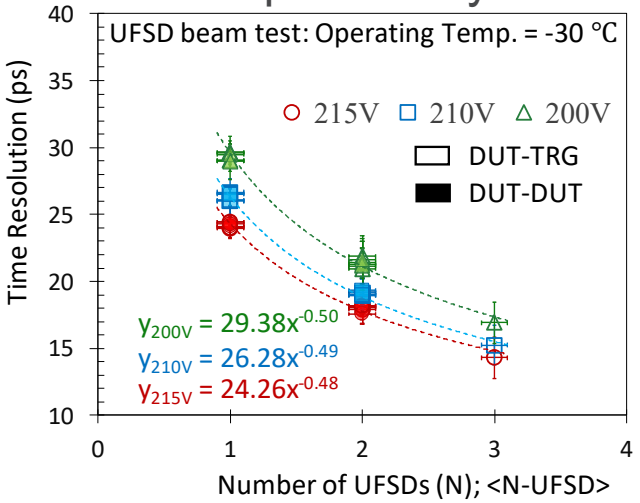
EQUIPMENT CONT.

3D microscope





Test beam results at -30 C:
14.3 ps w/ 3 layers



https://arxiv.org/abs/2010.02499
Submitted to JINST