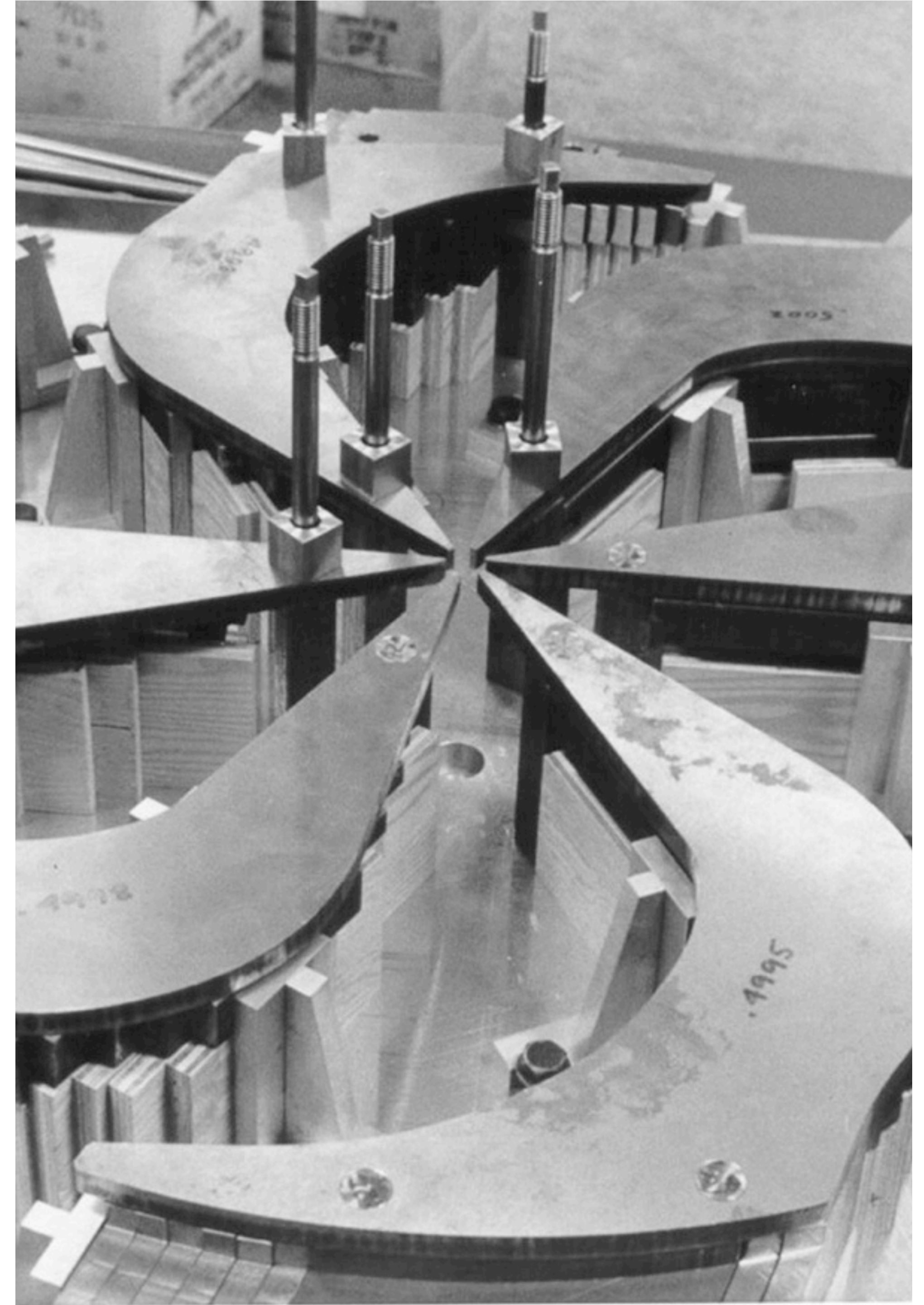




IPDC @ TRIUMF

James Nikkel

McDonald Institute Annual Community
Meeting
July 28, 2026

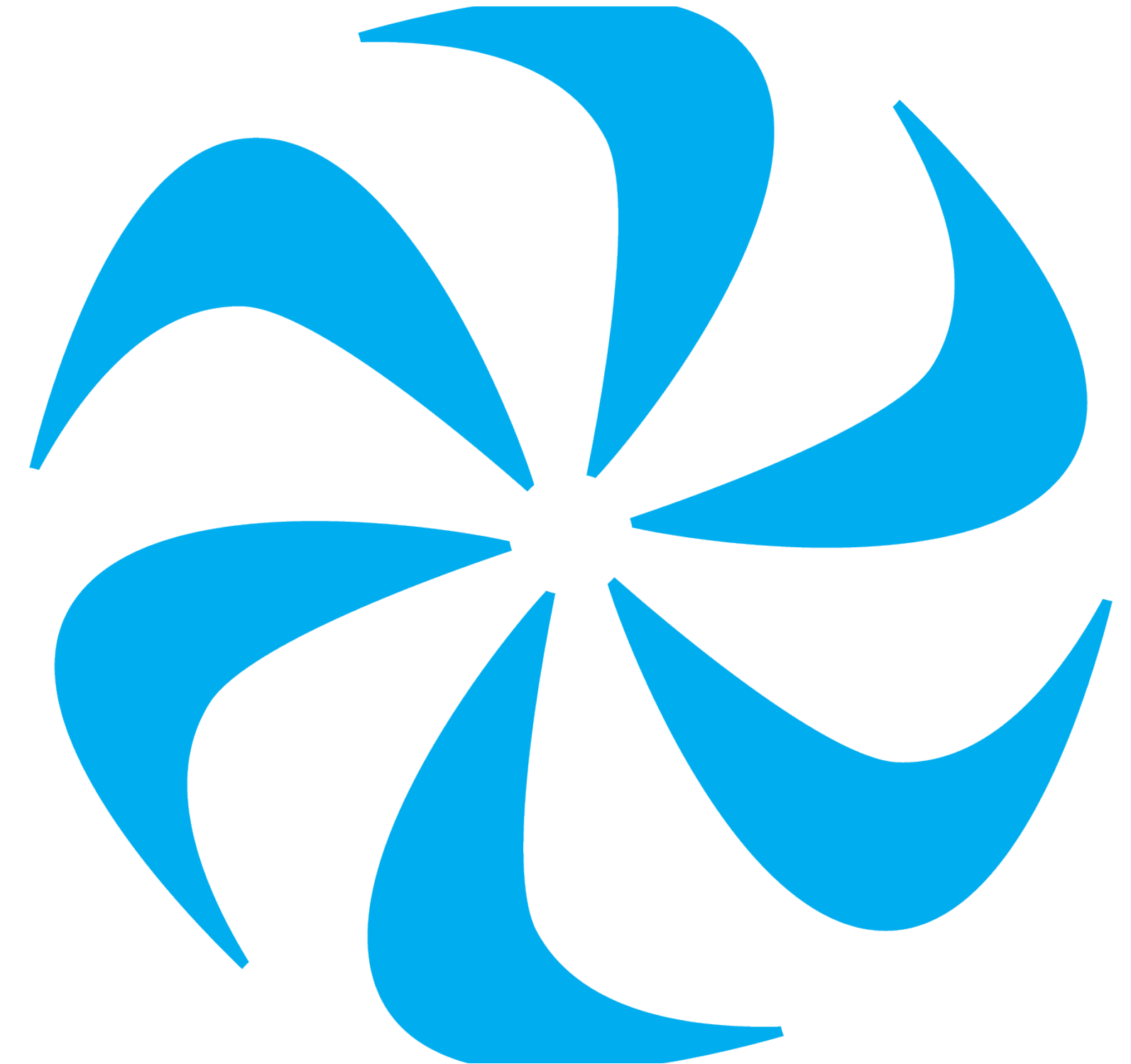


Discovery,
accelerated

Facilities and Personnel

2

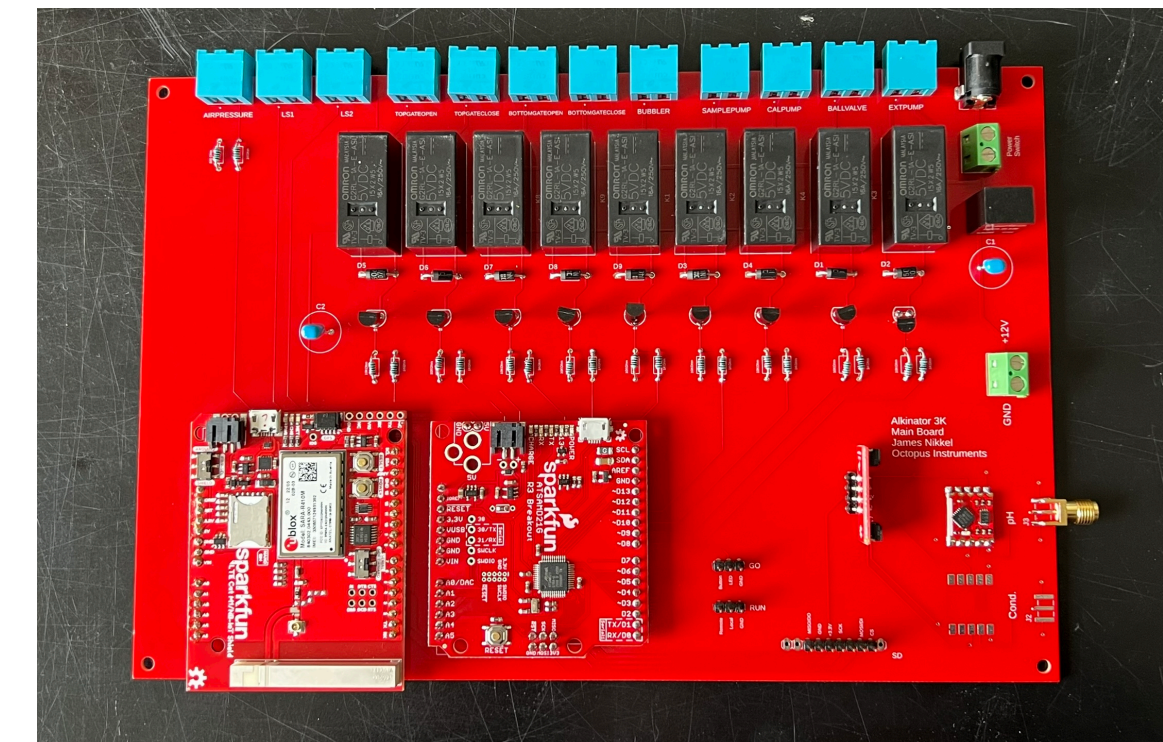
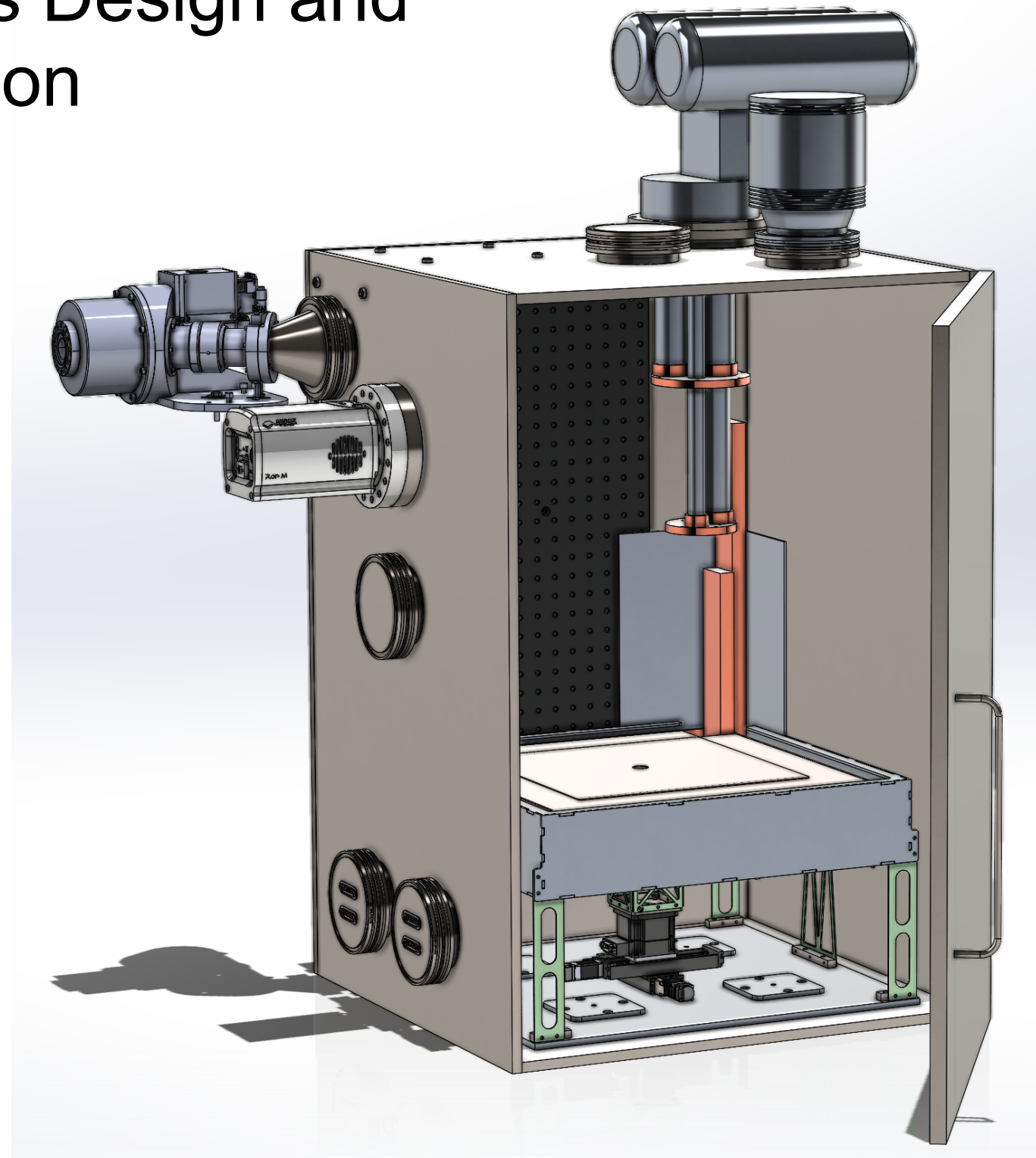
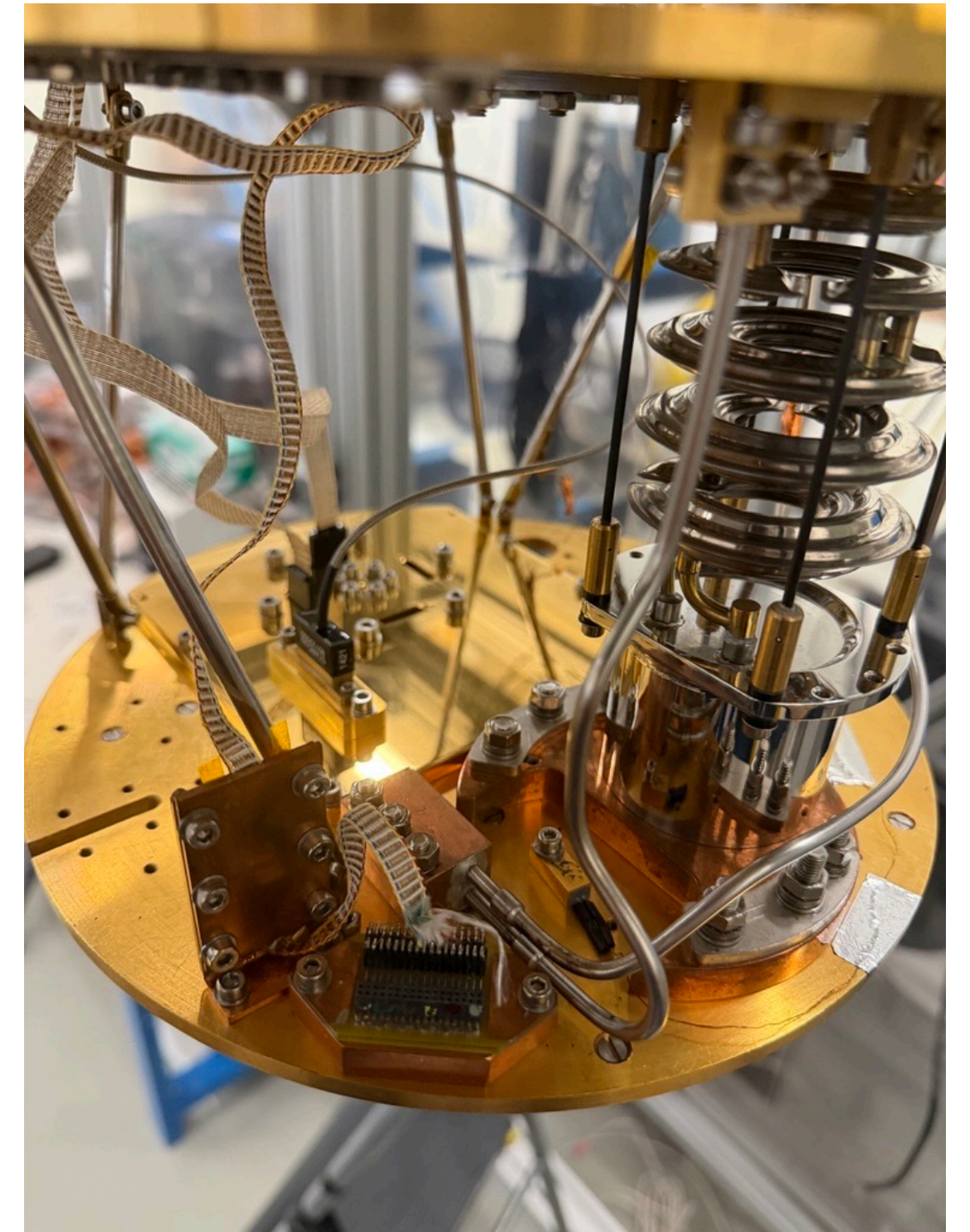
- TRIUMF is Canada's particle accelerator centre
- TRIUMF's programs in scientific research, education, and commercialization have enjoyed considerable success and many have had substantial impact
- Ultimately, these programs are based on pure research in subatomic physics and exploit the opportunities provided by TRIUMF's core facilities and its synergy with the university research community
- Integrated Project Delivery Centre personnel at TRIUMF consists of five members



TRIUMF is located on the traditional, ancestral, and unceded territory of the xwməθkwəy̓əm (Musqueam) People, who for millennia have passed on their culture, history, and traditions from one generation to the next on this site.

James Nikkel - Research Scientist

- Detector and instrumentation specialist
 - Cryogenic and environmental systems
 - Background in particle astro-physics, nuclear physics, carbon capture, air and water quality monitoring
- Systems Design and Simulation

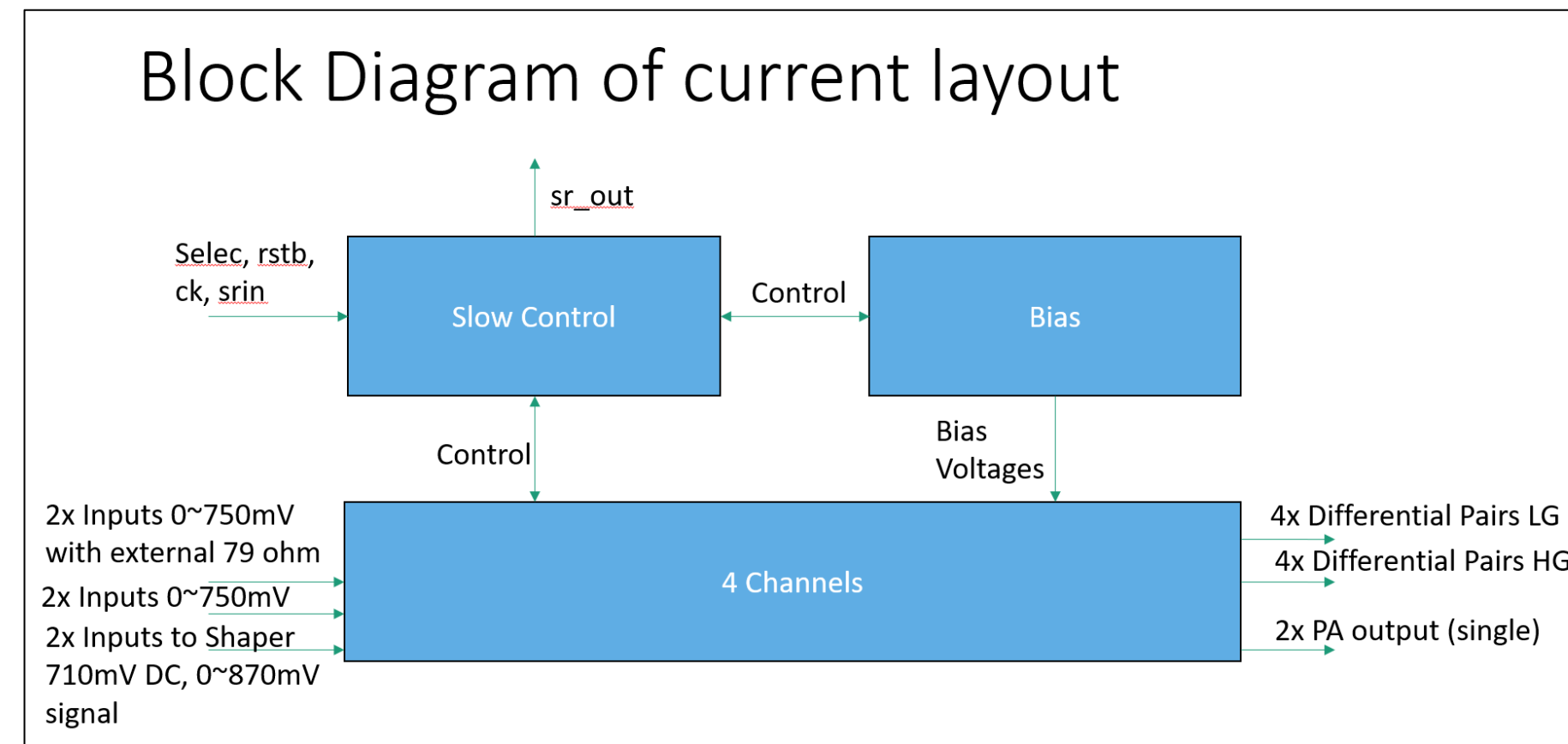


Leanne Beet - Facility Manager

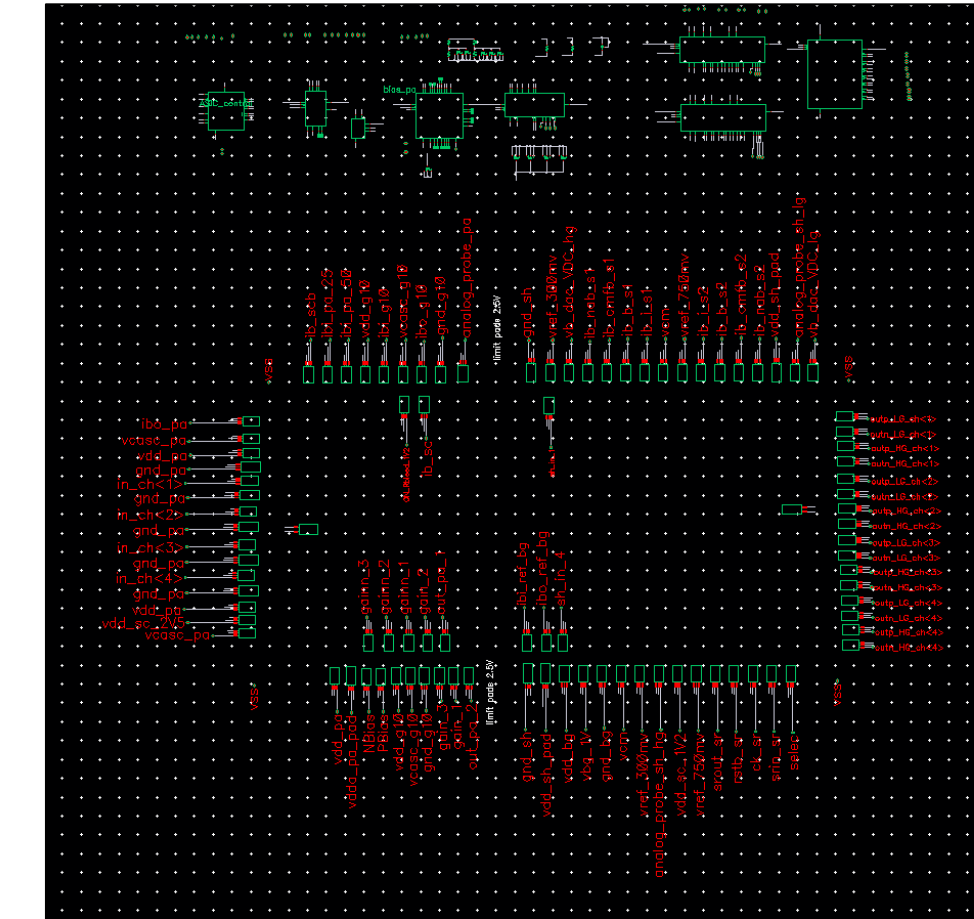
Leanne brings over seven years of research management experience to TRIUMF. She majored in Biochemistry at McGill University and completed additional postgraduate studies in biochemistry, data science, and project management. She previously worked as a Lab Manager and Wing Manager within the UBC Life Sciences Institute from 2017 to 2024. At TRIUMF, Leanne is the Astroparticle Physics Facility Manager, overseeing the operation of several detector testing and characterization facilities. She contributes her project management knowledge to the IPDC.



Roger Brammall - Embedded electronics specialist EIT



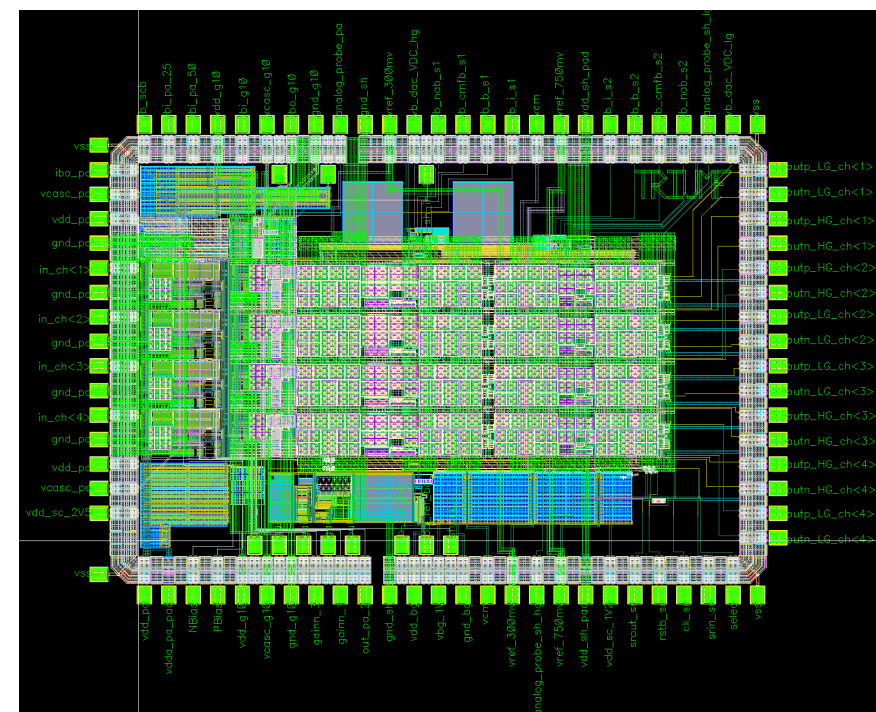
Block Diagram planning and explanation of design



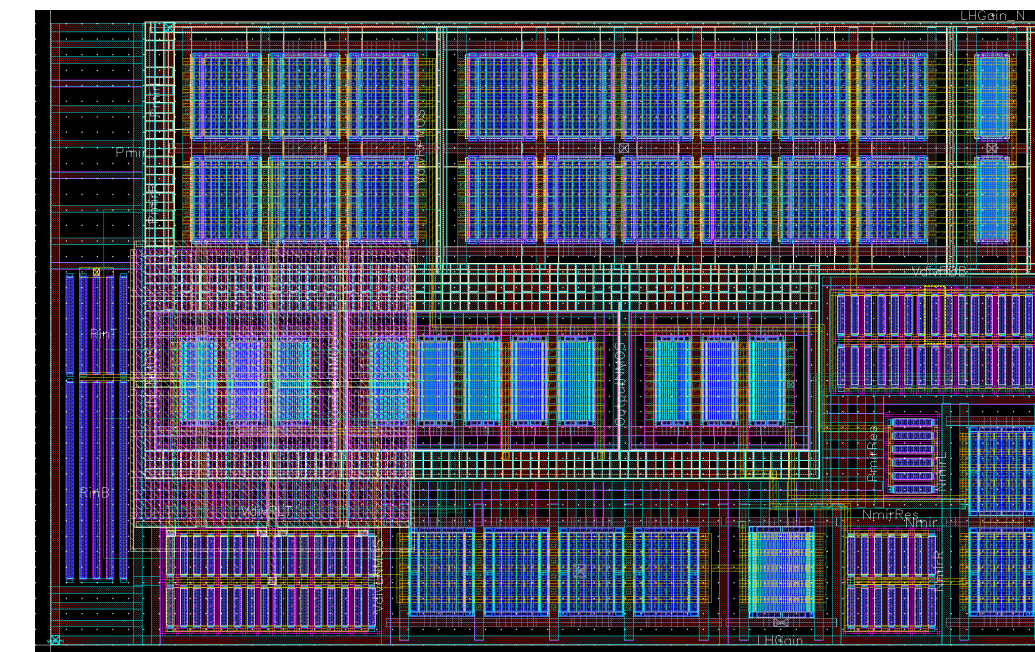
Top Level ASIC schematic

Electronics Engineer-In-Training:

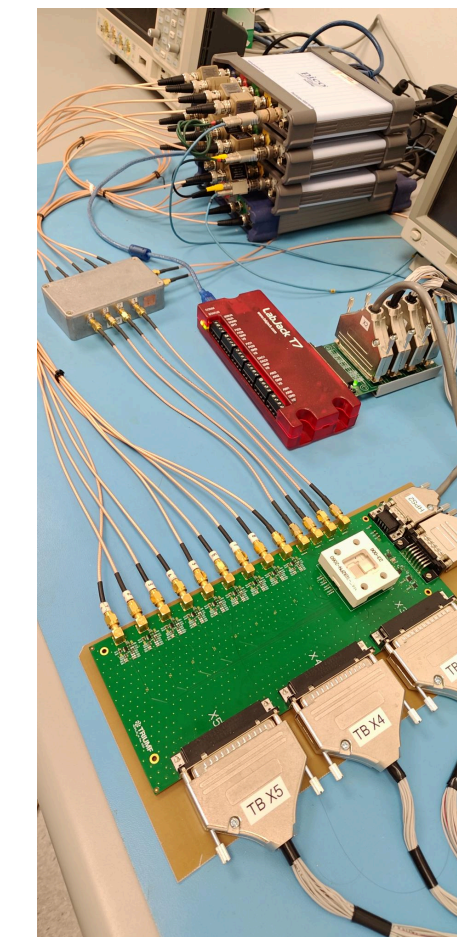
- ASIC mixed signal design
- Simulations
- PCB Design
- Test Setup and test plans



Top Level ASIC Layout



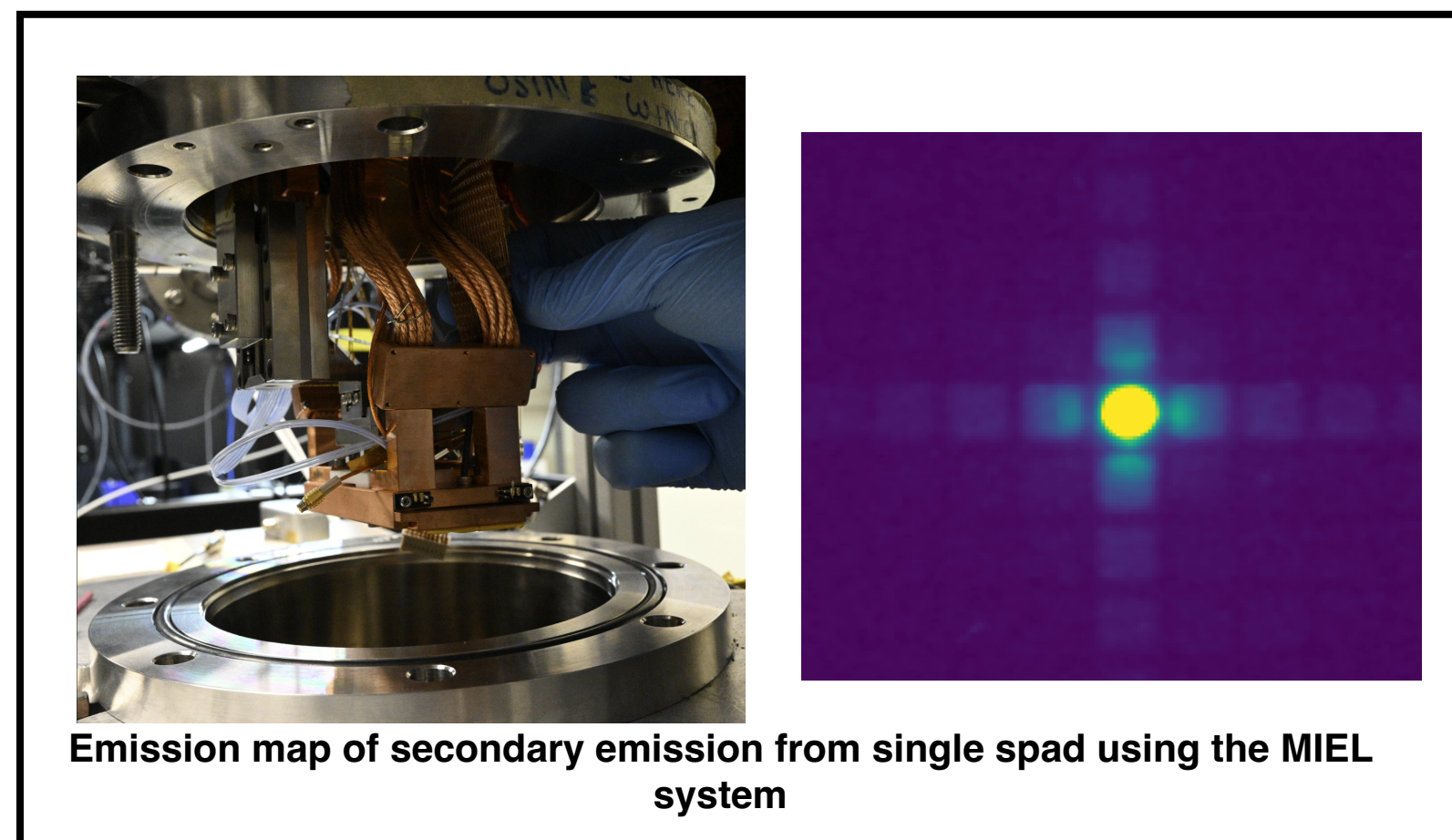
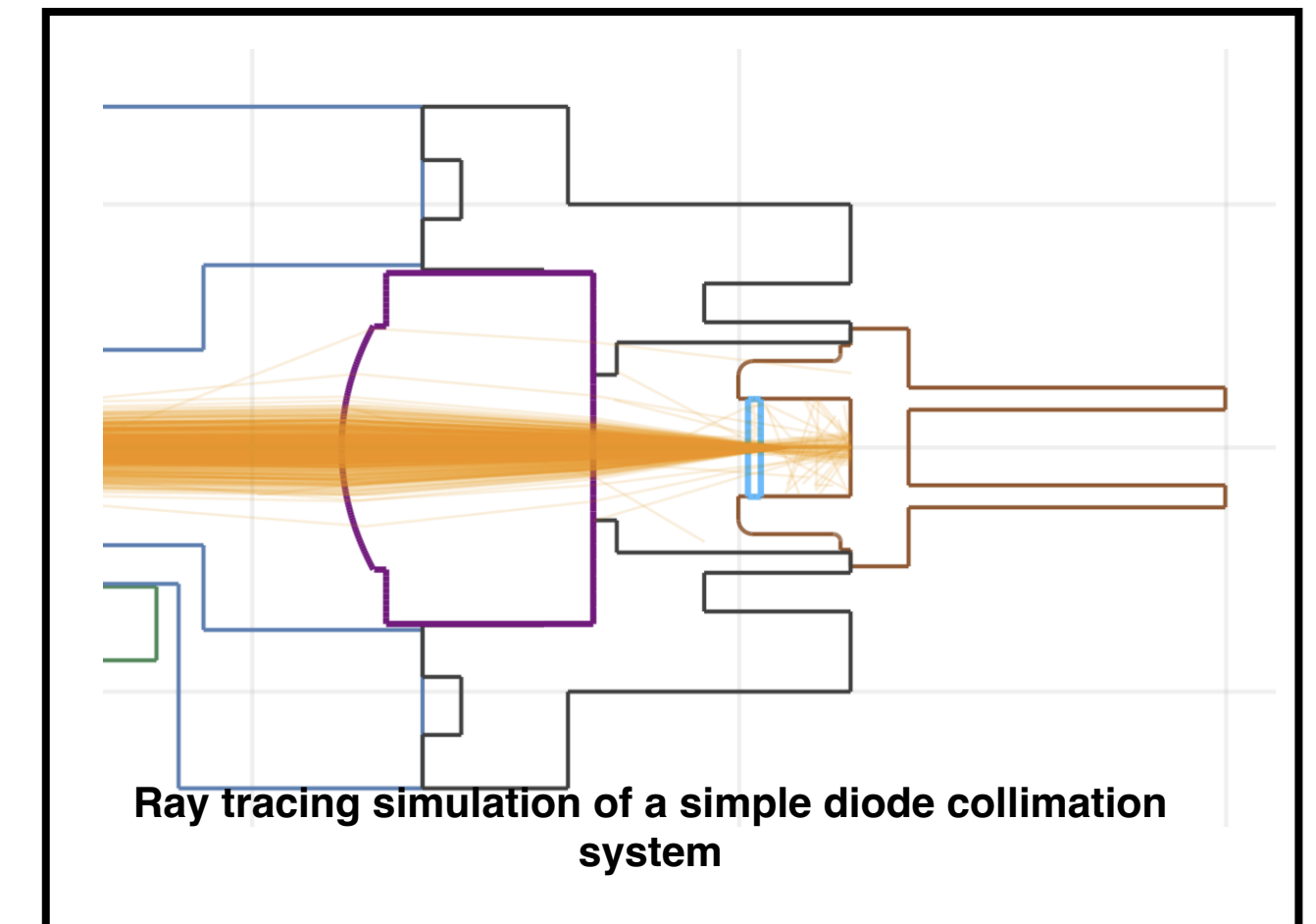
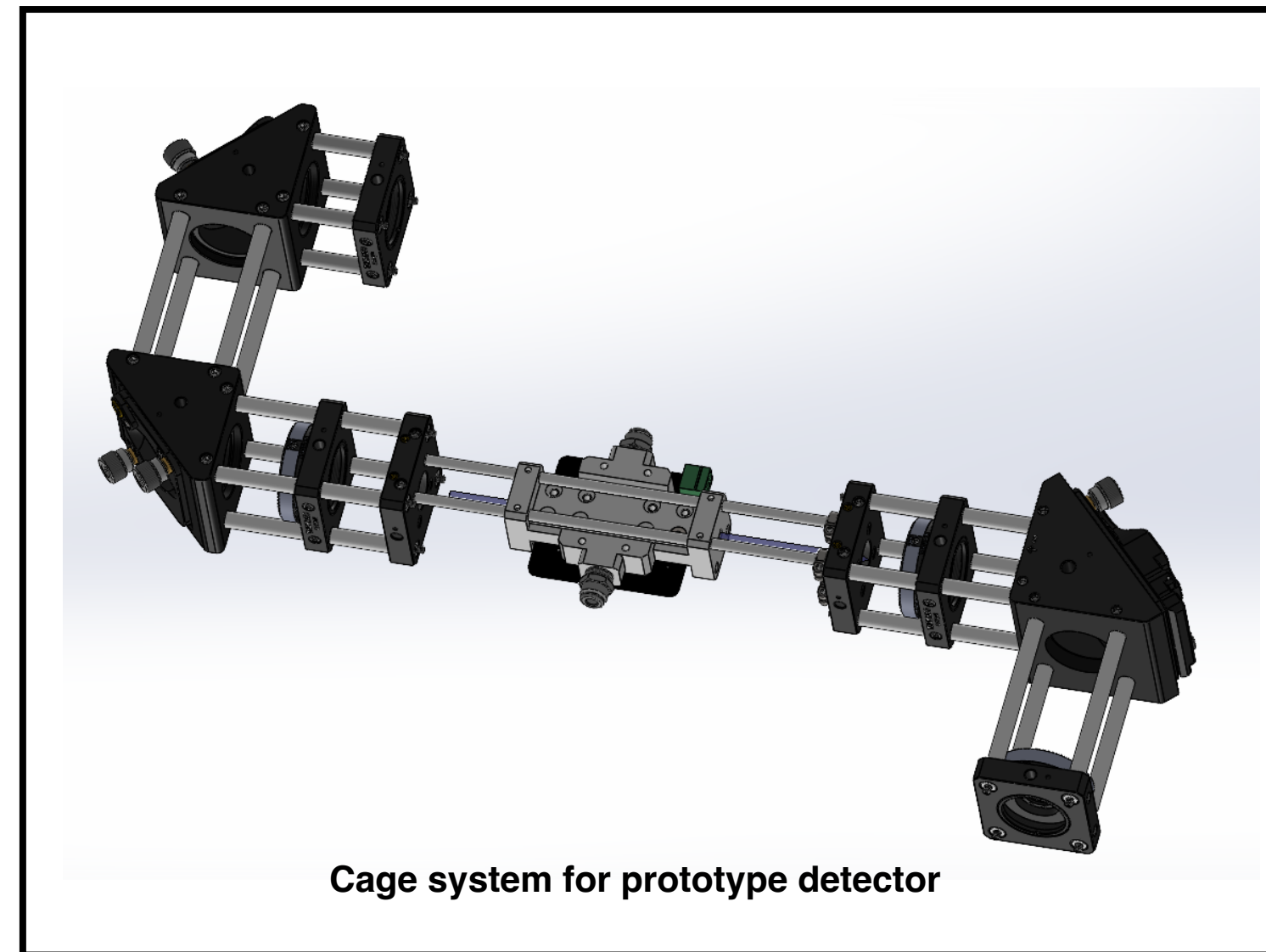
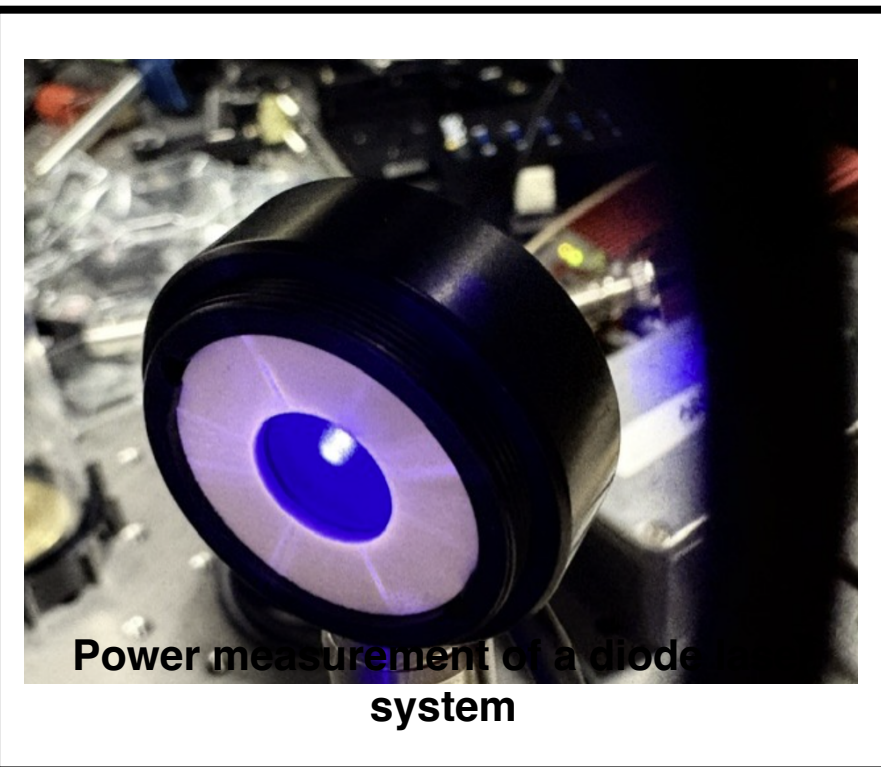
Layout of analog amplifier



Characterization Testbench

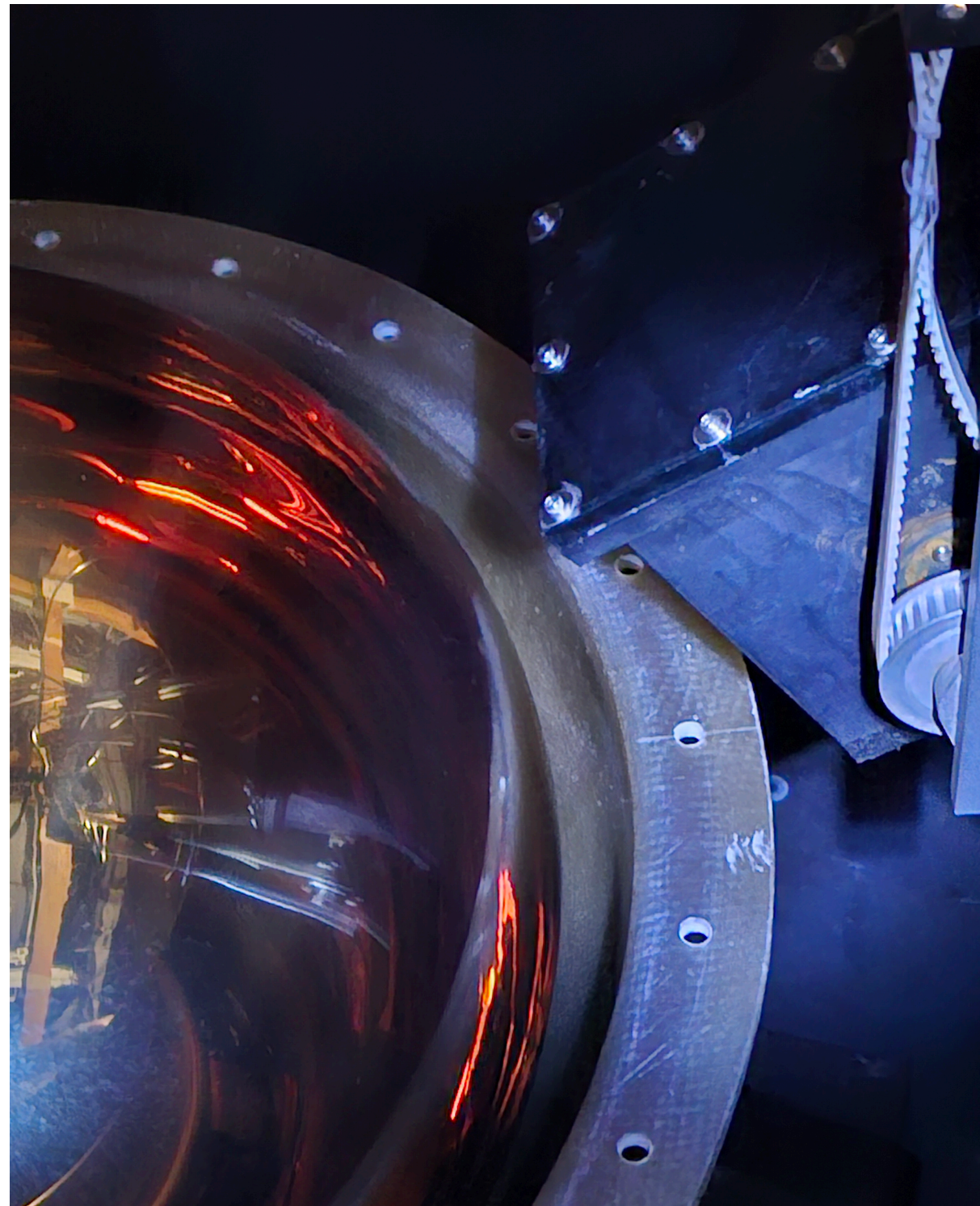


Kurtis Raymond - Detector Specialist EIT



- Optics
 - Broadband Femtosecond laser systems
 - Beam routing, and optical system setup/design
 - Laser diagnostics (spectroscopy, autocorrelation, beam profiling)
 - Simulation
 - FDTD simulation of optical structures
 - Ray-tracing for systematic effects of optical systems (stray light, optical performance)
- SiPMs
 - General characterization/device design (Secondary emission, fast timing performance, etc)

The light-injection optical box moving nearby a 20" diameter SK Photomultiplier Tube



Ben Smithers

Ben Smithers - Detector Scientist (DAQ)

The Photosensor Test Facility (left)

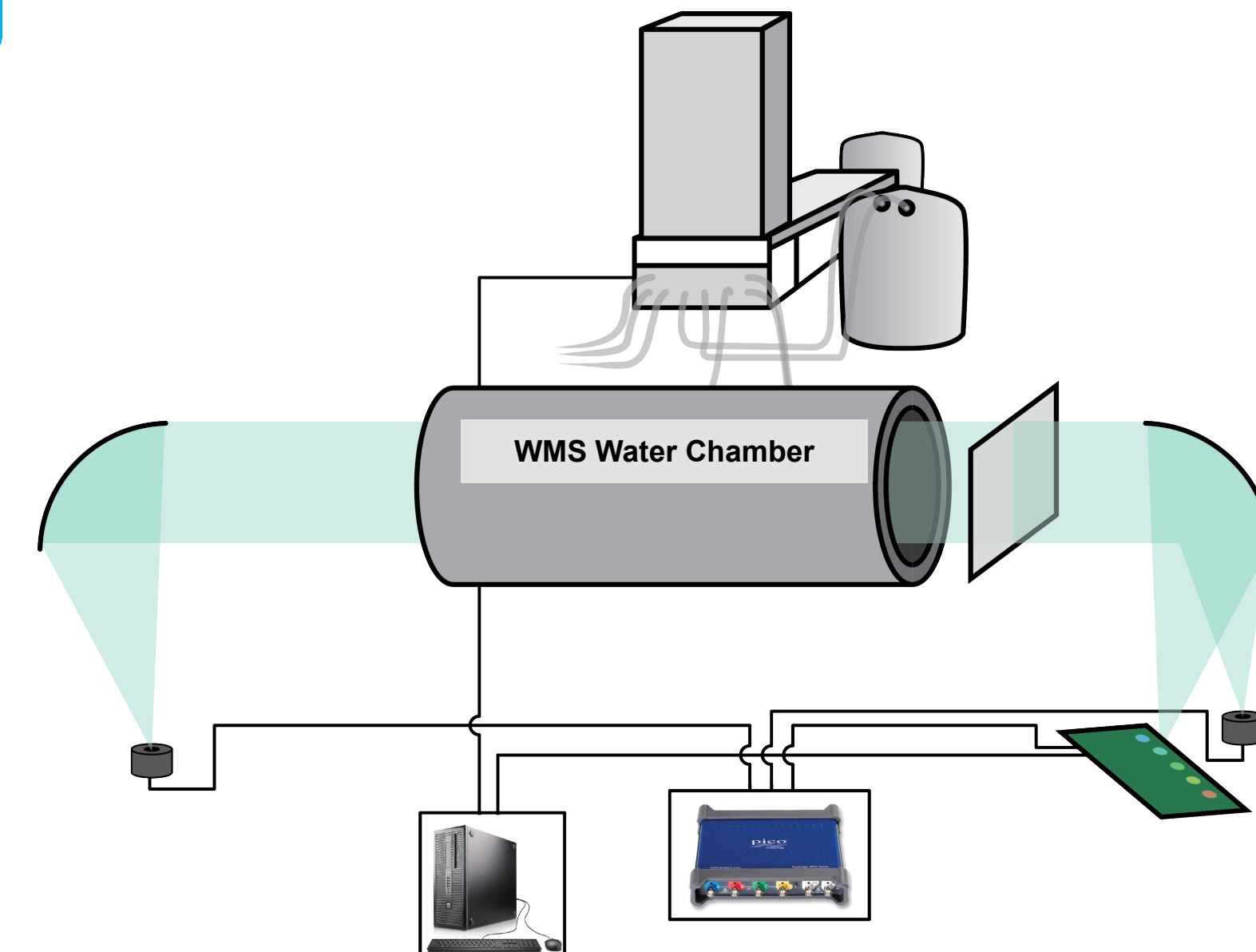
- The PTF is used to characterise the response of PMTs to light incident from different angles and at different magnetic fields
- It has been used for Super-K, Hyper-K, and for P-ONE
- Developing the DAQ systems needed by PTF for studying multi-PMT modules under development for Hyper-K

The Water Monitoring System (right)

- The WMS has been developed for high-precision real-time monitoring of water quality
- Further improving the system based on lessons learned during the WMS deployment for the WCTE at CERN
- Working on improving the system for the environmental conditions it will face at Hyper-K
- Studying the systems performance and contaminant-identifying capabilities



The WMS as instrumented for WCTE@CERN



Thank you Merci

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