TRIUMF

Scince Technology Department Achievemnents and Plans

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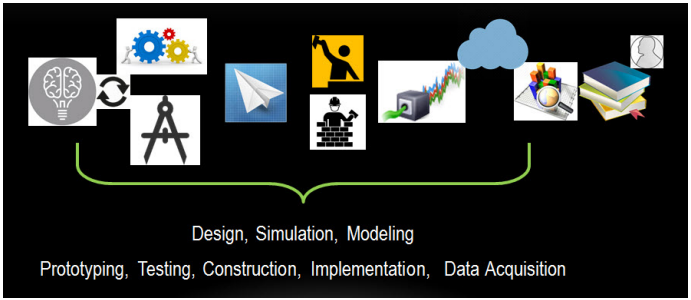
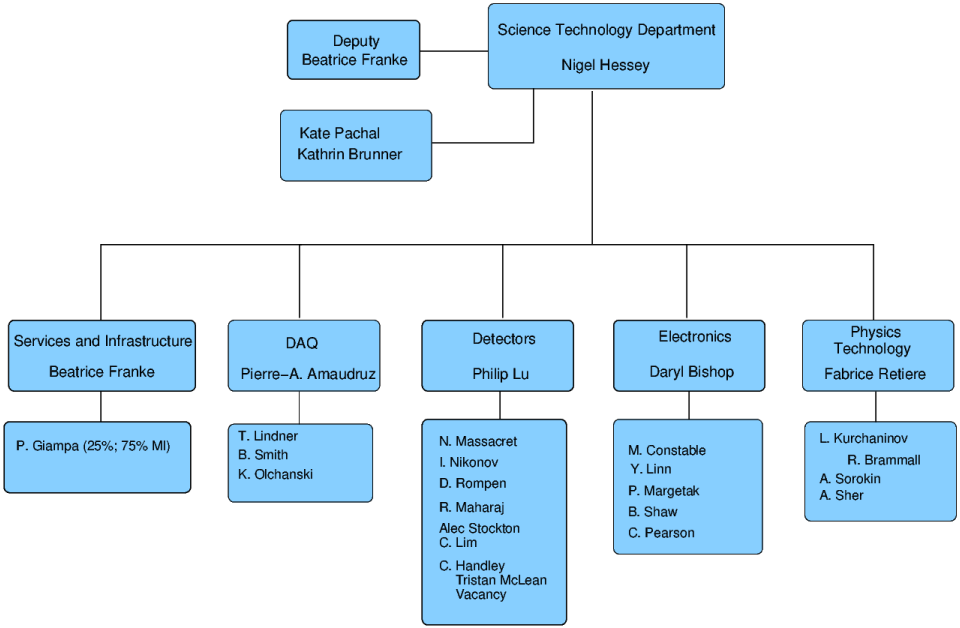
TRIUMF

Introduction to SciTech
Groups and team members
Main achievemnts past 12 months
Five year plans

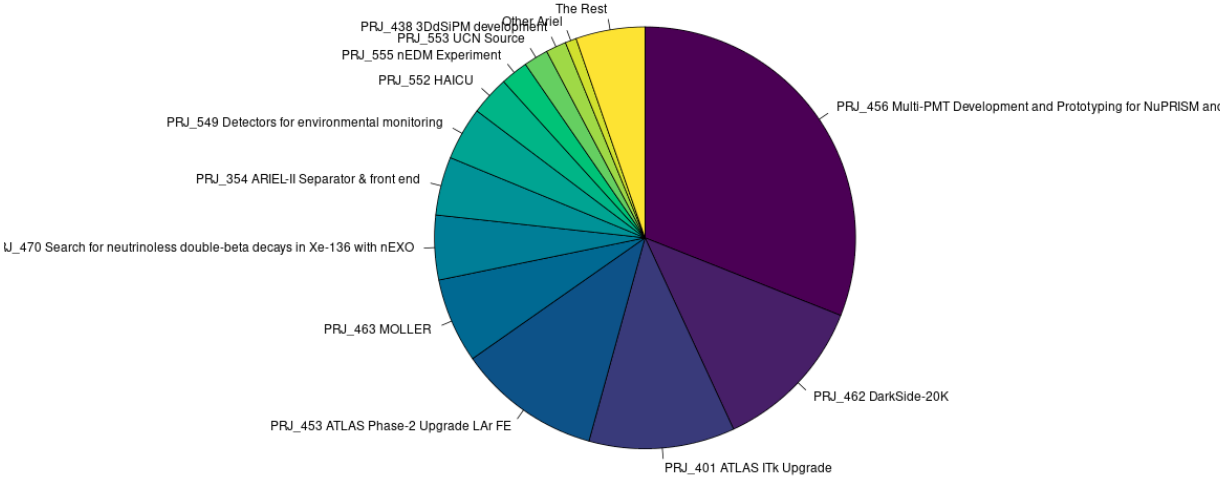


- Keep Canada at the forefront of Particle and Nuclear Physics:
  - Support Canadian experimentalists to make excellent detectors for projects falling under TRIUMF's mission
  - Advance detector technologies to enable future science
- How?
  - Develop and maintain a versatile and flexible team with broad experience in detector systems and associated instrumentation
  - Maintain and up-date the necessary tools and infrastructure
  - Design and develop the best mechanics, electronics, instrumentation, and DAQ for detectors
  - R&D in particle detectors, electronics, DAQ for future experiments: to make better measurements and searches possible
  - Support important non-detector TRIUMF projects, such as ARIEL

Sci Tech Groups and Team members

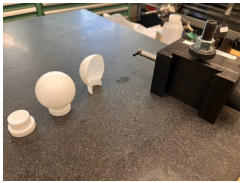


Main projects, past 12 months

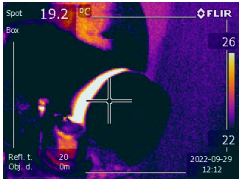


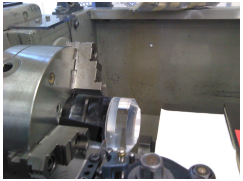
Detector Services Facility (aka Scintillator Shop)

- Machine thin-walled spheres for P-One
- Lots of plastic scintillators for ARIES, and high-precision (flatness better than 50 μm over 700 mm)
- Using infrared camera to make sure part does not over-heat while machining
- Many, many more examples of challenging maching

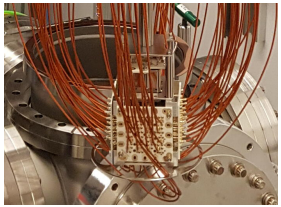
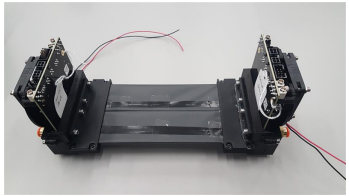



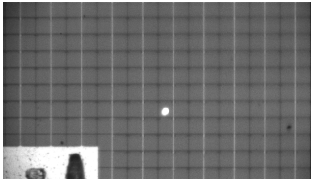




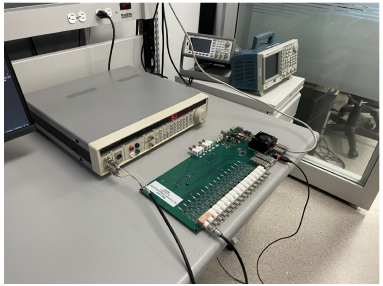


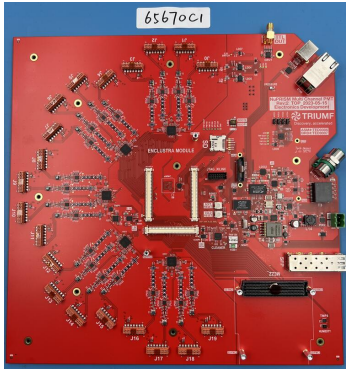
- Light-only Liquid Xenon: electronics, sensor mounting, assembly. Inserted in cryostst at McGill.
- DarkLight: Scintillators made, wrapped, mounted with SiPM readout.
- Characterisation of SiPM: PHAAR and focussed laser light on 35 μm grid of sensors



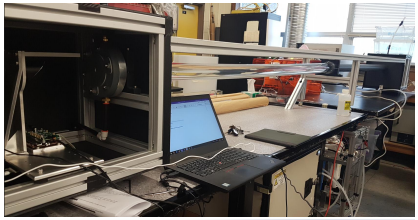
- Moller 16 channel integrating adc boards
- NuPrism mPMT central DAQ boards
- many other projects, including SiPM assemblies for muSR spectrometer upgrades

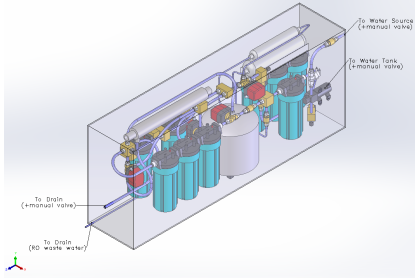




- Support MIDAS DAQ system, widely used
- DAQ being set-up for Darklight
- Darkside: Developed full vertical slice of DAQ system, adopted by the experiment
- Continuing support for Griffin and others
- Maintain computers for DAQ

- Initially for Hyper-K
- Spin-off project for continuous drinking water quality, especially in remote areas with support from First Nations groups
- Long column of water sample, measure attenuation of UV light to quantify and identify pollutants
- Purification system to achieve very clean reference sample





- Moving towards assembly of B0 coil
- Helped with optimising coil positions and then overall design
- Developed in-house panel assembly with honeycomb core

- Detector Development is at the heart of SciTech. We want to continue and enhance this.
- Strong support for the Detector Development Centre
  - World class centre: need expertise, with long term perspective
  - Designers, simulation specialists, detector engineers, fine technicians
  - Can not be hired on a temp basis and limited coverage currently in SciTech
- Submitting a funding request again soon, for support for detectors development: seed money to get a sustained effort going.
- We have a lot of high-tech tools (wire bonder, pick-and-place gantry, optical coordinate measuring machine, cryogenic detector measurement set-ups and so on) bought for other experiments (ATLAS, nEXO, ...)
- A lot of in-house expertise
  - Can lead in many areas
- Quantum Centre also strongly supported. We can help with electronics, DAQ, mechanics, etc.
- (These new-centre iniatives are covered elsewhere)

- SciTech is here to support detector development and associated instrumentation
- Input welcome from experimentalists about what is needed
- Enthusiastic about the Detector Development and Quantum centres in five year plan
- So we can evolve and continue to support and enable the new physics you want to do
- Thank you for your attention