

SAP technical support

F. Retière [TRIUMF] representing (a fraction of) the technical support community

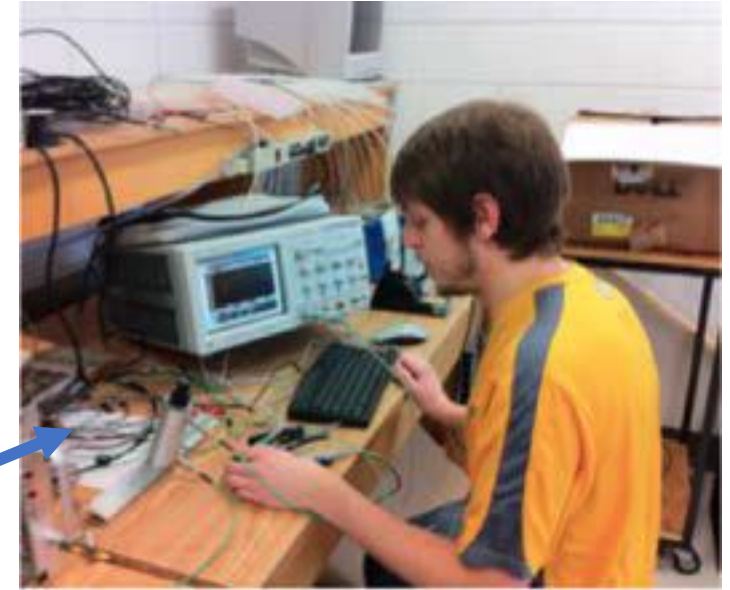
Overall technical SAP support sources

- Cutting edge technical expertise is an absolute necessity to the success of SAP project requiring advanced instrumentation
- Recruiting on a per-project basis is highly inefficient:
 - Risky – Finding the “right” person is challenging
 - Training required
 - Limited team dynamic
- **Alberta MRS**
- **Carleton Uvic Winnipeg MRS**
- **Université de Montreal MRS**
- McDonald Institute
 - Phasing out by 2023
- TRIUMF
 - **Science Technology department**
 - P&S in Physical Science Division
 - Engineering division
- SNOLAB

U. Alberta – Toronto CPP+ MRS team



- Richard Soluk (detector technologist)
- Paul Davis (electronics engineer)



- Mircea Cadbaschi (engineer)
- Chris Ng (engineer)



- And wide ranging capabilities at UofA
- <http://cpp-plus.physics.ualberta.ca/>



U. Alberta – Toronto CPP+ recent projects

- ATLAS Forward proton
- ATLAS-LUCID
- MOEDAL-MAPP (complete detector)
- DEAP-3600 and
- DarkSide-20k
- PICO-40, PICO-500 and Scintillating bubble chambers
- SNO+
- P-ONE



Carleton Technical Team (MRS Supported)

- Personnel

- **James Botte and Olay Chen:**

- **Electronics Specialist and Electronics Technician**
 - analog and digital readout systems, power supplies, equipment certification
 - soldering, circuit design, cabling, system modeling and control

- **Philippe Gravelle**

- **Machinist/Technician** - precision small parts fabrication, welding, vacuum/gas system cleaning and assembly, leak-checking

- **Rodney Schnarr**

- **Designer** - 3-D modeling, concept development, detailed design drawings for fabrication (e.g. CNC), as-built drawings, FEA calculations
 - ⇒ working closely with McDonald Institute and SNOLAB engineers based at Carleton

- Facilities and Equipment

- machine shop, electronics lab, clean rooms, vacuum and gas handling equipment (Swagelok, VCR, Conflat, KF, custom), electronics and DAQ
 - (NIM, VME, LabView), silicon pixel telescope

- Carleton Science and Technology Centre (STC) <https://carleton.ca/stc/>



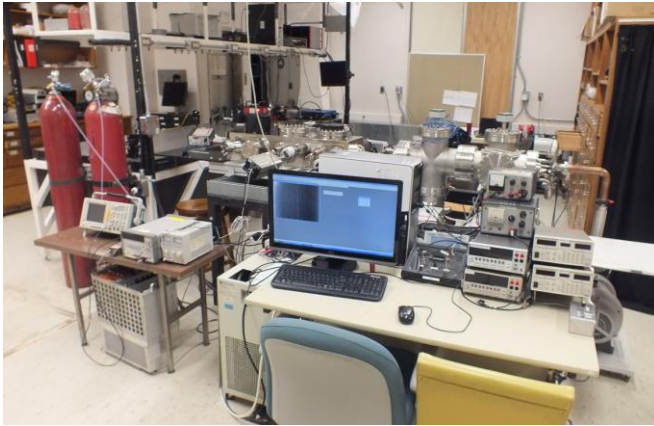
Carleton
UNIVERSITY

Carleton Technical Team

For more than 20 years, the Carleton Technical Team has been contributing to subatomic physics via R&D, Testing, Large-Scale Assembly and Delivery, and Maintenance of particle detector systems for a variety of projects in Canada and around the world.

Select projects that have been supported:

EXO



DEAP



FCAL



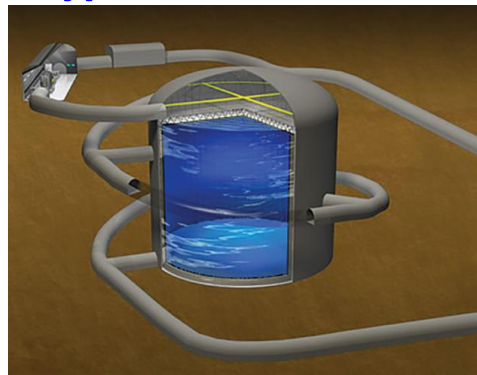
ATLAS



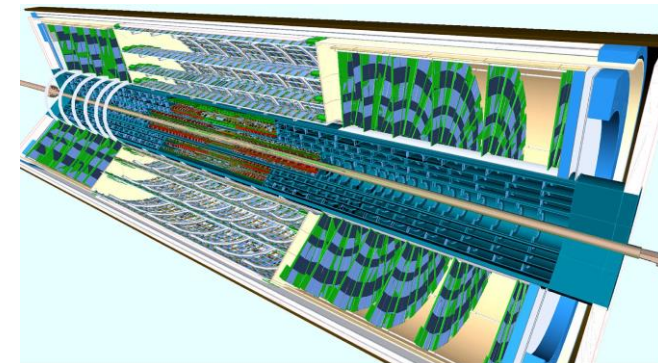
sTGC

ARIEL

Hyper-Kamiokande



ITK



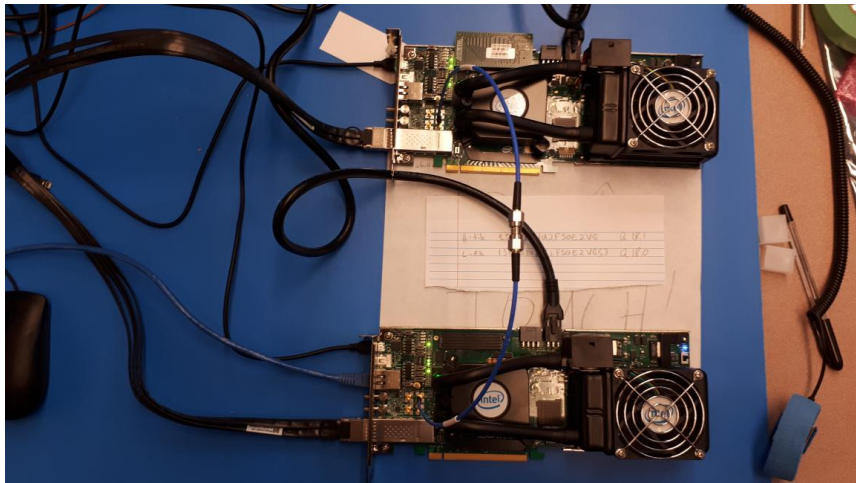


Detector physicist: Sam de Jong (2017-present)

PhD research: designed, assembled, and commissioned thermal neutron detector system using tubes of helium-3 for the Belle II experiment

Current work: FPGA program development for ATLAS LAr Calorimeter and Belle II

Expertise: GEANT4 detector simulation, DAQ software, digital electronics



Resources at the University of Victoria:

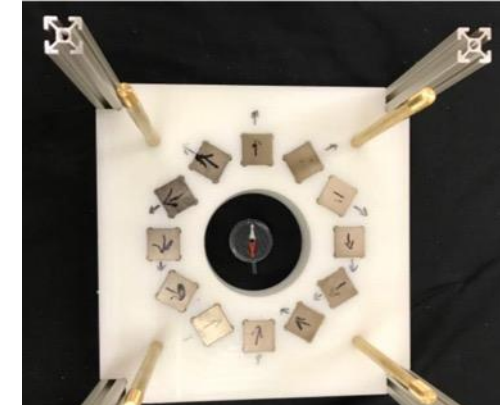
Clean room, vacuum test equipment, local machine shop, electronics shop and general laboratory space

<https://www.uvic.ca/science/physics/vispa/research/resources/index.php>

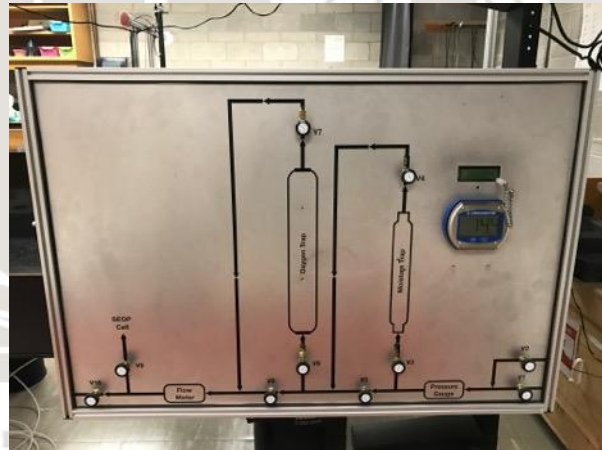
Winnipeg NSERC SAP MRS Resource

For examples of past projects supported by David Ostapchuk see:
www.uwinnipeg.ca/physics/research/nserc-funded-sap-mrs-technician.html

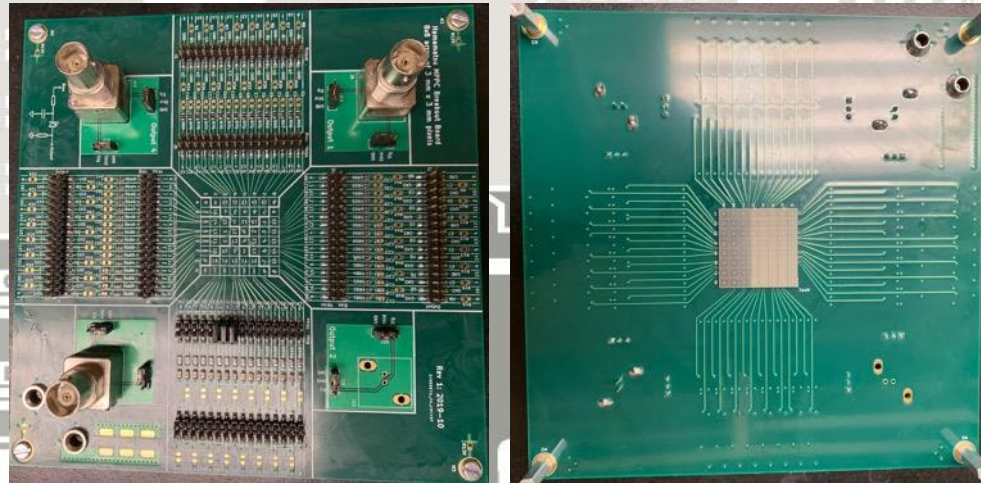
- Technician: David Ostapchuk (MSc Physics)
- General detector fabrication support
 - Electronics PCB, simple machine work, 3D printing, laser cutting
 - Access to North Forge Fabrication Lab (www.northforge.ca)
 - Larger machined parts contracted out to local machine shops
- Resource allocated by UVic/Carleton/UWinnipeg allocation board



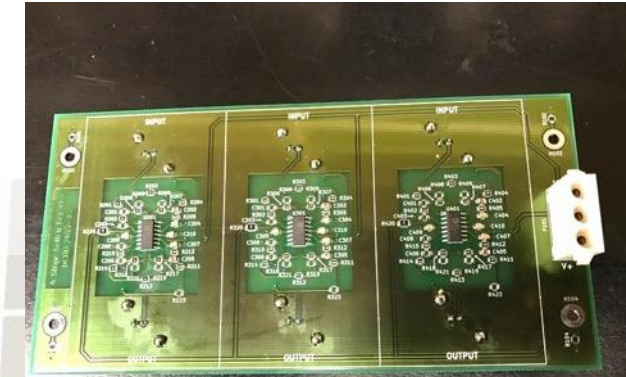
Halbach array for polarized Xe (TUCAN comagnetometer)



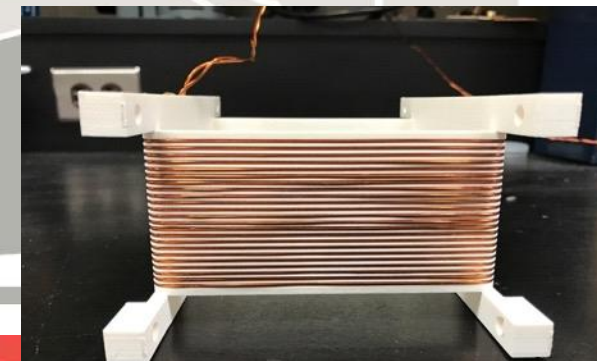
Gas panel for Xe project



MPPC Breakout board for EMPHATIC



Butterworth filters for TUCAN



Spin-flipper coil for TUCAN

Université de Montreal

- MRS personel

- Jean Soucy - Head of machine shop
- Chen-Chao Wen- Software and system expert
- Hongfei Cao - Electronics technician
- Nikolai Starinsky (50% MRS) – Engineering physics
- Tomy Arial (50% MRS) – Mechanical workshop
- Louis Godbout (20% MRS) – Ion beam facility

- Facilities

- Machine shop
- Instrumentation design and prototyping
- Ion beams for testing, calibration and radiation damage

TRIUMF Science Technology department

- Physics Instrumentation group
 - L. Kurchaninov (front end elec.)
 - A. Sher (MC and FEA simulations)
 - A. Sorokin (Elec. R&D tech)
- Detector facility
 - J. Blanco (Mech. tech.)
 - P. Lu (Det. Phys./eng.)
 - R. Henderson (Det. Phys./eng. - head)
 - R. Maharaj (Mech. Tech.)
 - N. Massacret (Det. Phys./eng.)
 - I. Nikonov (Mech. Eng.)
- Detector facility shop
 - C. Chan (fabrication tech.)
 - C. Lim ()
 - Y. Zielinski (machinist)
- Electronics Development
 - D. Bishop (Elec. hardware – head)
 - M. Constables (Elec./Mech. integration)
 - Y. Lin (FPGA)
 - *P. Margetak (Elec. Hardware – MI)*
 - C. Pearson (FPGA)
 - B. Shaw (FPGA)
- Data Acquisition
 - P-A. Amaudruz (System eng. - head)
 - T. Lindner (DAQ system)
 - K. Olchanski (computing infrastructure)
 - B. Smith (User interface)

And research scientists, B. Franke,
N. Hessey (Phys. Inst. Group head and deputy),
F. Retiere (department head)

TRIUMF Sci Tech recent projects

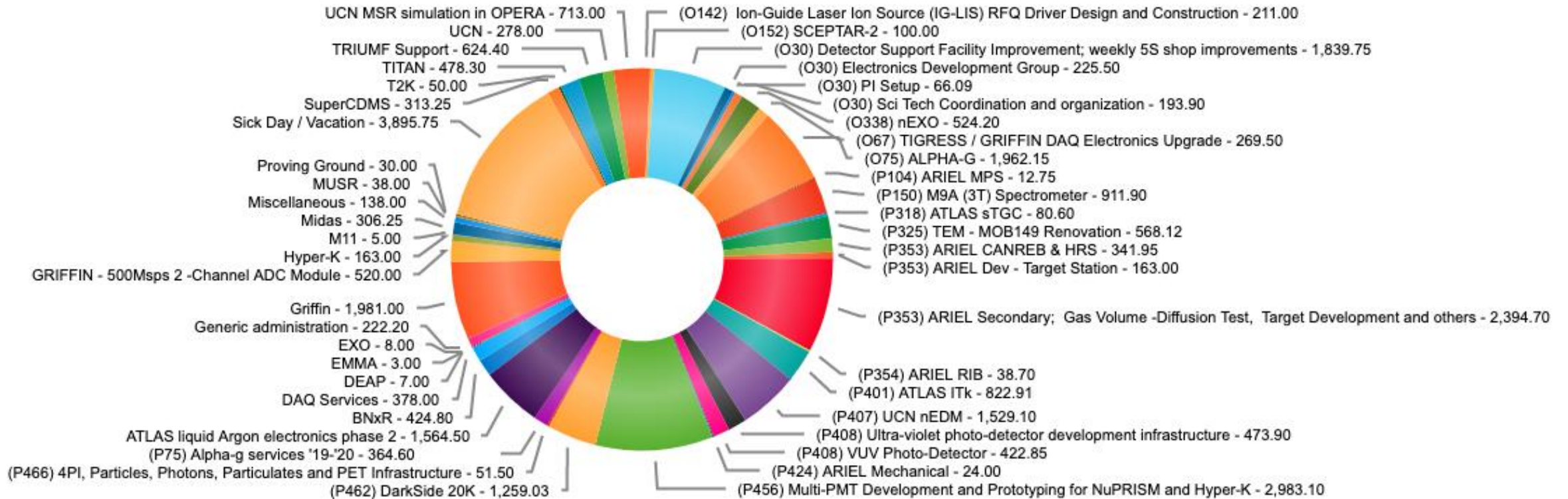
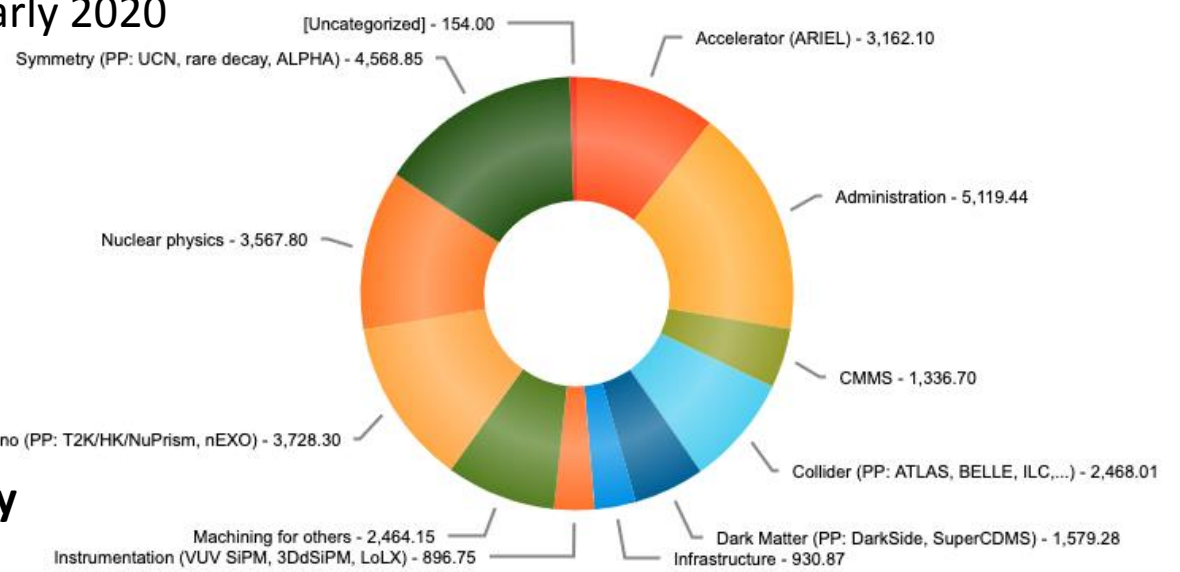
Project list since early 2020

Sci Tech primary mandate is to support the SAP community

Focus on development and not operation

Project list since early 2020

Sorted by type



Management structures

- Carleton-UVic-Winnipeg a prioritization board
 - Reorganized early 2020 to make it more manageable (fewer members)
 - Kevin Graham (Carleton manager), Randie Sobie (Uvic manager), Blair Jamieson (Winnipeg manager), Garth Huber (CINP), Mike Roney (IPP), Miriam Diamond (Toronto) and Fabrice Retiere (TRIUMD, chair)
- CPP+ (Alberta, Toronto) operating committee
 - Alberta [Hallin, Krauss, Pinfeld (Chair)], Carleton [Boulay], Queen's [Chen, Noble], Regina [Huber], Toronto [Orr, Trischuk]
- TRIUMF Science Technology department
 - Project selection/prioritization by TRIUMF management
 - Sci Tech management responsibility on implementation of selected projects
 - In practice fair bit of flexibility for small projects

Moving towards pan-Canadian coordination

- Pros:

- Cross-institution is a requirement for NSERC MRS
- Maximize utilization of the resources
 - the right person for the right job – i.e. foster specialization

- Cons:

- less institutional control

- Steps forward for 2020

- Cross membership of boards and management structures
- Setting up technical level communication channel
 - Share expertise
 - Share knowledge of who can do what
 - Group setup at TRIUMF to support this effort – virtual meeting soon

- Eventually... Single board?

New user/request always welcome

Alberta CPP+, contact Jim Pinfeld, pinfoldster@gmail.com

Université de Montreal, contact Jean-Pierre Martin jpmartin@lps.umontreal.ca

Carleton Uvic Winnipeg, submit <https://particlephysics.ca/wp/wp-content/uploads/Major-Resources-Support-request-form.pdf> to Kevin Graham
dr.kevin.graham@gmail.com

TRIUMF Science Technology dept <https://www.triumf.ca/science-technology/support-request>