# Technical support for experiment development and construction

1) TRIUMF and detector construction
2) R&D in SAP community

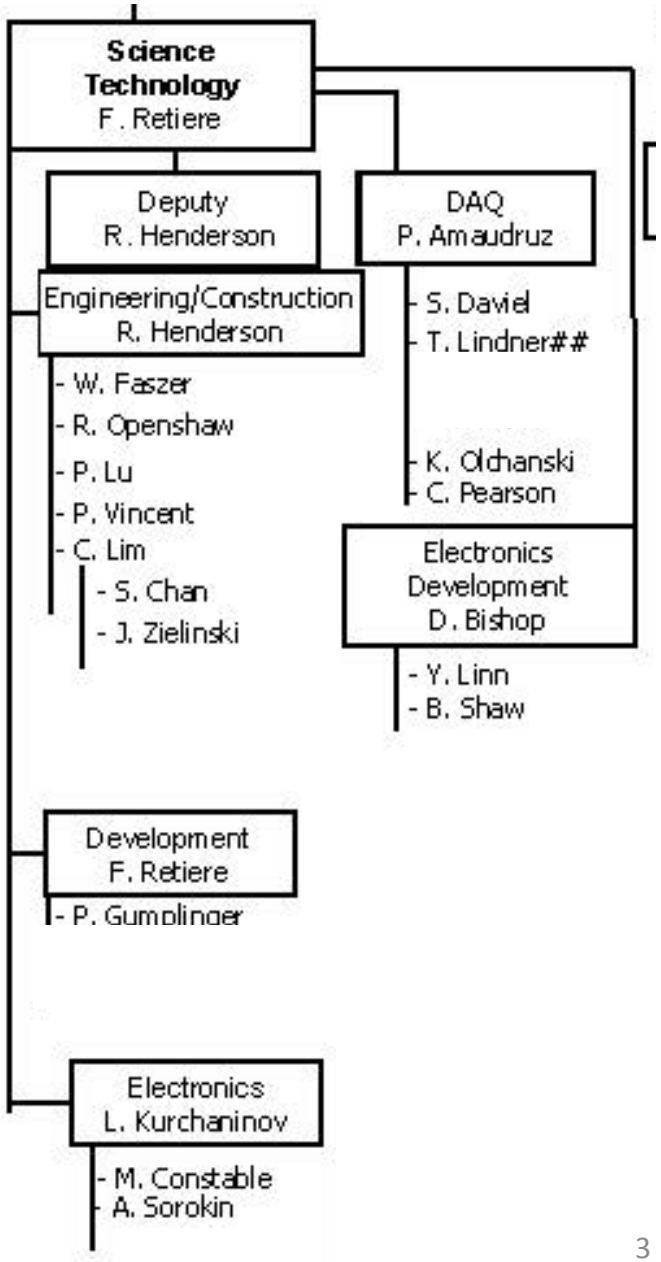
F. Retière, TRIUMF

# Experiment construction, a changing funding model

- In the past TRIUMF funding via NRC contribution agreement was able to support major projects (e.g. ISAC, T2K, etc.) together with NSERC (pre-2010), and CFI (post 2010)
- Currently TRIUMF funding via NRC contribution agreement covers operational needs and manpower for flagship project ARIEL-II
- Project funds (ARIEL-II capital + detector projects [ATLAS, ALPHAg]) have to come from competitive sources like CFI
- CFI projects bring in new capital for hardware and manpower (helps maintain level of TRIUMF expertise)

# TRIUMF science technology department

- A new organization for technical support created in 2014
- Combine Detector facility, Detector electronics, Electronics development, Data acquisition
  - + GEANT4 and some R&D
  - Considering adding conceptual design and project management capabilities
- A vertical integration to better respond to user needs…?
  - Can do everything (?)



# Working together on future projects

- Short term
  - ATLAS-TGC
  - ALPHAg
    - All stages: design / construction / commissioning
    - Mechanical, electronics, DAQ. Scale comparable to T2K
- Long term. Securing projects in the next CFI round
  - ATLAS-ITK, PINGU/Hyper-K, Experiment or R&D for SNOLAB, … your project?

- TRIUMF's view
  - We need/want to work with you on projects
    - Sharing resources. Identify expertise at various institutions?, Could the MRS model be adapted?
    - Sharing expertise. Technical network. Organize yearly workshop at the technical level (E.g. for electronics engineer/tech and machinist)
    - Sharing science? could take parts of a project without TRIUMF contributing scientifically
  - The community needs state-of-the-art infrastructure
  - Improve ties with industry to enhance our "benefit to Canadian" credentials

# R&D paving the way for future projects or pie in the sky?

- Main pros:
  - new technology enables new physics
    - Copying is ok but requires catching up later on
  - Spin-off to other (applied) fields
    - Benefit to Canadians
    - E.g. photo-detectors for imaging, materials science
- Main cons
  - May not succeed
    - Sub-critical effort is often a serious issue
  - May never be used
    - Projects get canceled or delayed. E.g. will ILC or nEXO get funded?
- R&D within Canadian SAP now
  - Weak or strong?
    - Is it a matter of opinion?
  - No clearly dominant institution
    - Opportunity for collaboration
  - Current funding model tends to be project oriented
    - except startup?
    - Possible issue for shared R&D between projects
- Supporting R&D in the future (LRP)?
  - Towards what end?
  - Focused or not?

# My view on R&D

- Organizing R&D in Canada
  - Model 1: uncoordinated R&D
    - Maximize academic freedom
    - Serious sub-critical risk
    - Foster new ideas
  - Model 2: pan-Canadian collaboration
    - Focus on few technologies: e.g. photo-detector, tracking or calorimeter
    - Ensure sufficient resources available for success
    - Foster synergies between groups
  - Model 3: in-between
    - Foster ideas early on
    - Focus later on
    - Best solution if we can make it work
- Now is the time to discuss and come up with a plan for the LRP and future funding opportunities

- Opportunity to push for photo-detector R&D in Canada
  - Multiple compelling projects
    - PP: nEXO, DEAPer (?), SNO++(?), Hyper-K, PINGU
    - Nuclear physics: Compton shields, LaBr,…
    - Others: muSR, medical imaging
  - Competitive expertise and resources in Canada
    - Analog SiPMs at TRIUMF
    - 3D integrated at U.Sherbrooke (for medical imaging)
    - Wide PMT expertise (e.g. PTF)
  - Some possible connections with Industry: Zecotek, Dalsa,…
  - Funding models
    - Infrastructure from CFI? Drive by medical imaging?
    - Include other technologies
  - … Planning a dinner meeting on Tuesday evening