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, ALPHAq]) 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

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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. photodetector, 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 photodetector 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