The Canada First Research Excellence Fund (CFREF)

An application led by Queen's University but meant to support the "entire" community

Goal: International Scientific Leadership in Particle Astrophysics by Canada

Tony Noble,
Queen's University

“CFREF helps competitively selected Canadian postsecondary institutions turn their key strengths into world-leading capabilities.”

The Fund helps institutions:

- compete with the best in the world for talent, for partnership opportunities, and to make breakthrough discoveries;
- seize emerging opportunities and strategically advance their greatest strengths on the global stage; and
- implement large-scale, transformational and forward-thinking institutional strategies.

➡ Builds on existing strengths. Aims at global leadership

CFREF Schedule

Round 1:

Program Announcement: Late Dec, 2014

Notice of intent deadline: February 2, 2015

Application deadline: March 2, 2015

Funding to be awarded: Up to $350 million

Results announced: July 2015

Very Fast !

Queen's led a proposal for Particle Astrophysics in Canada which was well received, but ultimately not successful in Round 1.

Round 1 Results:

- Laval: Technologies to Support Sustainable Development and Health in Canadian North. 98M$
- Sherbrooke: Quantum Research for Revolutionary Changes in Information Processing and Advanced Materials. 33.5M$
- UBC: Quantum Materials Research and Future Technologies. 66.5 M$
- Saskatchewan: Agricultural Industry and Improve Global Food Security. 37.2M$
- Toronto: Research To Create Life-Saving Cells, Tissues and Organs. 114 M$

Total: 349.2 M$

CFREF Round 2

Funding: to be awarded: Up to $900 million

Notice of intent deadline: November 9, 2015

Adjudication of Notice of Intent: January 2016

(51 applications winnowed to 30 at this stage)

Fit to Program. Demonstrated existing capacity

Full Application deadline: March 29, 2016

Short List to be announced: ~July 8 2016

Review of short-listed projects: July 17/18

Final Selection: “Summer 2016”

Canadian Particle Astrophysics Research Centre

CPARC

To ensure the highest level of international excellence CPARC will:

1. Expand on the scientific culture at Queen's University and its partner institutions by building a powerful and integrated team working on all aspects of particle astrophysics including the SNOLAB experimental program, astroparticle and astrophysics theory, related observational astrophysics, cosmology, detector development and low background techniques.

Build scientific and technical capacity and broaden the scope of scientific community within Canada

CPARC will:

2. Create an integrated research team with the critical mass and skills required to prepare and lead the next generation of increasingly challenging experiments. This will attract international scientists and technology along with the capital and operational funding necessary to allow one or more global-scale next-generation detectors to be hosted at SNOLAB.

CPARC: Create scientific capacity and wherewithal to ensure we are positioned to lead in a next generation, truly global scale project.

SNOLAB: Create the environment where these international collaborations see SNOLAB as the place to go to enable the science. Not just in depth and cleanliness, but in demonstrated ability to engage with experiments to enable science delivery safely and expeditiously.

CPARC will:

3. Help obtain maximal scientific output from the suite of experiments that are currently operational or under development at SNOLAB by hiring key additional personnel, strengthening international collaborations, and engaging the broadened scientific community in the undertaking.

CPARC: Apply some of the new resources strategically to help with the current program. (This was something we avoided saying in round 1 and the reviewers criticised us for that). We have to tread carefully as CFREF is meant for incremental research capacity, and a transformative program …. Not more of the same. None-the-less we help position ourselves for the future by delivering on the existing programs….which could do with additional scientific resources.

CPARC will:

4. Actively collaborate with industry to facilitate knowledge transfer and subsequent innovation.

CPARC: Put dedicated resources onto this with the responsibility to make it happen. Not just lip service.

CPARC will:

5. Embed students at all stages of their careers in this enhanced scientific culture, developing their experimental and foundational theory skills while creating training opportunities through linkages to colleges, industries, and international exchange programs.

CPARC: Plan for summer schools, graduate student exchange programs, summer students, students working with industrial partners, CREATE-like graduate training program….

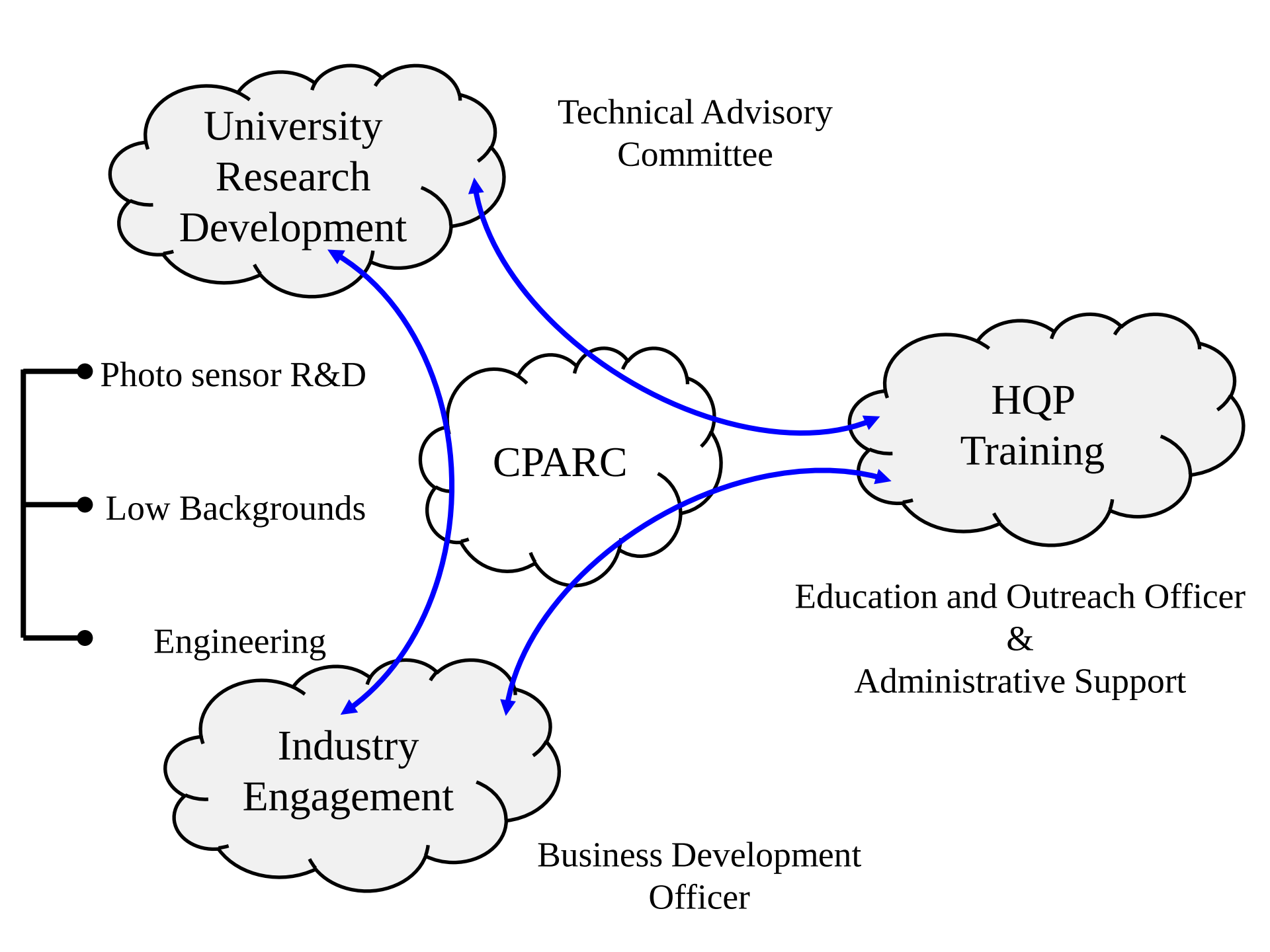
- Hire a person with responsibility to oversee this activity.
- Develop new graduate training experience
- Provide opportunities for researchers to create inquiry based learning experiences for undergraduate students by integrating teaching with research.

CPARC will:

6. Engage non-expert audiences, including the general public and high school students and teachers, in SNOLAB research through programs such as a Queen's University visitor centre, public lectures and workshops for high school students and teachers.

CPARC: Organize this. (And hire somebody with the responsibility to do so). Particularly focused on developing the scientific culture at Queen's and within Kingston, but recognizing:

- Queen's is surrounded by partners which facilitates some sharing of visitors and events…
- Benefit from and work with established outreach offices at SNOLAB, PI, TRIUMF…


University
Research
Development
Technical Advisory
Committee
Photo sensor R&D
Low Backgrounds
Engineering
CPARC
HQP
Training
Education and Outreach Officer
&
Administrative Support
Industry
Engagement
Business Development
Officer

Research Partnerships

Queen's U.

U. Alberta

U. British Columbia

Carleton U.

U. Laurentian

McGill U.

U. Montreal

U. Toronto

CIFAR

IPP

PI

SNOLAB

TRIUMF

Lead Institution

Eligible Universities

Research Institutes

Main elements requested: The people. We will ramp up to:

- 7 new faculty members at Queen's in physics (theorist, experimentalist, engineering physicist, astro/astroparticle experimentalist), radio-chemist, geo-chemist/isotopic, nuclear materials engineering. To build on core group at Queen's with interdisciplinary expertise relevant to development of low background techniques, detector design, and broadening of the field.
- 7 new faculty members at universities across Canada (Alberta, Carleton, Laurentian, Montreal, Toronto). "SNOLAB experimentalists"
- 4 Research Scientists and 3 project managers to support the SNOLAB scientific program.
- 4 Engineers, 1 designer, and 15 technical positions
- 18 PDF and 39 graduate students supported annually. (Some in shared pool)
- Scientific Director, Managing Director, Finance Officer, Business Development Officer, HR&Board Secretary, Education and Outreach Officer, 2 Admin @ QU, 1 at CU and 1 at LU
- Support for undergraduate summer research positions and internships in industry.

Main elements requested: The rest.

- International PhD exchange program & Graduate teaching
- Undergraduate summer school
- Public and scientific lecture series
- Travel in support of building collaborations, sabbatical support …
- Small amounts of equipment to run the offices/outreach/visitor's centre…
- Pool of money to support scientific effort that would normally come from NSERC (but these faculty are not NSERC eligible while on CFREF)
- Frontier Ventures Fund to support innovative research that carries higher risk.

Rough idea of the Budget: (in k$)

Strategy	Funds From CFREF	Funds From Queen's	Funds From U. Partners	Funds From Other	In-kind Contrib.
Science	46,676	6,215	5,127	1,000	2,199
Implementation	5,288	1,421	55		
Total Direct	**51,963**	**7,636**	**5,182**	**1,000**	**2,199**

These are the real costs of doing research. Dominated by personnel costs

Rough idea of the Budget: (in k$)

These are the indirect costs of doing research. 33% of direct costs where applicable.

Strategy	Funds From CFREF	Funds From Queen's	Funds From U. Partners	Funds From Other	In-kind Contrib.
Science	15,559	8,516	7,836		
Implementation	1,763	1,743	214		
Total In-Direct	**17,321**	**10,259**	**8,050**		

Total from CFREF = 51,963 + 17,321 = $69,284 k

Random thoughts, ideas , concerns …. Be careful what you ask for.

1. Need to work with SNOLAB facility to position both to support the field in the best possible way with appropriate level of overlap.

2. Role of each in spearheading the science, scientific leadership vs enabling the science through the excellence of the facility and delivery of the programs.

3. Funding Risk. Need clear objectives for both SNOLAB and CPARC to ensure continued financial support ….CPARC must not appear to offer support that should be the responsibility of SNOLAB, and visa versa, which could undermine the support through MSI for SNOLAB for example.

4. Stress on the SAP envelop. How do we deal with the impact of all these new faculty positions appearing in the SAP envelope if it doesn't grow proportionally.

5. Relative roles in terms of program coordination nationally and internationally.

6. How is the strategic plan for SNOLAB influenced by the decision on CFREF … should we defer some of the work on the strategic plan until such decision is made?

Random thoughts, ideas , concerns …. Be careful what you ask for.

7. There are areas of overlap that need to be managed/optimized

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- Research scientists/engineers/project management
- Personnel working on site. Who do they report to, what is best model
- Coordination within community

8. What happens at the end of 7 years…. How do we sustain this? All faculty are expected to be continued as part of the agreement, but there are another 30 engineering/technical positions to support, plus 55 postdocs and students. The latter I expect have to get picked up by individual grants as faculty move off CFREF and become NSERC eligible … need to work on swelling the envelope. The technical positions … is this a model for a future NSERC MRS that is truly pan Canadian ??