The CFREF application
Astroparticle physics

Tony Noble,
Queen's University

To ensure the highest level of international excellence, the Canadian Particle Astrophysics Research Centre (CPARC) will:

- **Expand on the scientific culture** at Queen's and partner institutions (Alberta, Carleton, Laurentian, Montréal, Toronto, CIFAR, IPP, SNOLAB, and TRIUMF) by building a powerful 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**.
- Help obtain maximal scientific output from the **current suite of experiments at SNOLAB** by hiring key additional resources, strengthening international collaborations, and involving the expanded scientific community in the undertaking.
- Create a **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.
- Actively involve **industrial partners** in this development and strongly facilitate innovation transfer.
- Embed **students** at all stages of their career in this increased scientific culture, developing their experimental and foundational theory skills while **creating training opportunities** through linkages to colleges, industries, and international exchange programs.

Main elements requested: The people

- 10 new faculty members at universities across Canada (Queen's, Alberta, Carleton, Laurentian, Montreal, Toronto). Based on need for the program.
- 2 Research Scientists …. Most likely at SNOLAB, to support the experimental effort.
- Ramping up to 13 PDF and 32 graduate students supported annually.
- Engineering and technical staff
- Administration and outreach officer
- Support for undergraduate summer research positions and internships in industry.

Main elements requested: The rest.

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

The Support:

Support has been received from Queen's, Alberta, Carleton, Laurentian, Montreal and Toronto Universities as well as from SNOLAB, TRIUMF, IPP, CIFAR, PI

- Start up funds for new faculty
- CFI Allocations for new positions
- Maintaining positions after CFREF
- Supporting other positions outside CFREF
- Indirect: Building renovations
- Teaching release
- Workshops and similar.
- Indirect costs of research

Status

First round:

- Queen's administration wished to support a pan Canadian astroparticle physics application.
- Individual efforts at other institutions were not supported to go forward
- There was a mad flurry to pull this together by end of February having understood the program only in mid January. Total ask: 53 M$
- Results from the first round are expected in early July … 3 weeks from now.

Second round: if necessary

- I think this was a good application, given that there were only a few weeks to put it together and the rules were changing rapidly as we developed it. However, we have some time to do better if we re-submit in the second round with a sufficiently new application.

- I have started work on how this might be expanded … with other institutions and other initiatives that I think we missed in the first application, and will be working with the community on this in the upcoming weeks.