Report on the 2003 NSERC Subatomic Physics Grants Competition

N. S. Lockyer
Chair, GSC 19
University of Pennsylvania

Introduction

This report summarizes the process of the NSERC subatomic physics (SAP) competition (GSC-19) for the year 2003. It is intended for use by the SAP community and the NSERC Committee on Research Grants (CORG). It includes a list of the members, an overview of the site visits, and a financial summary from competition.

Committee Membership

The committee was composed of 12 members:

Genevieve Belanger, LAPTH Annecy (HEP Theory)
Marcela Carena, Fermilab (HEP Theory)
Malcolm Butler, St. Mary's College (NP, IEP Theory)
Ed Brash, University of Regina (IEP, NP experiment)
Rick Van Kooten, Indiana University (HEP experiment)
John Carr, Centre de Physique des Particules, Marseille (astroparticle)
Peter Jackson, TRIUMF (NP experiment)
Dean Karlen, Victoria University (HEP experiment)
Louis Lessard, Universite de Montreal (astroparticle)
Nigel Lockyer University of Pennsylvania (chair) (HEP experiment)
Brad Sherrill, Michigan State University (NP experiment)
Noemie Koller (is this spelt right?), Rutgers University (NP experiment)

The first year members are Marcela Carena, Ed Brash, Rick Van Kooten, Malcolm Butler, and Noemie Koller.The retiring members are Geneviève Bélanger, John Carr, and Peter Jackson.

Kate Wilson, Subatomic Physics and Space Sciences Manager, and program officer Michèle Beaudry provided guidance to the committee with regard to established rules and practices**.**

Policy meeting-Orientation session

The policy meeting and orientation session was held in Edmonton Alberta on October 20th, 2002. Members absent were John Carr, Marcela Carena, and Geneviève Bélanger. This day is used to explain the procedures and policies to the new members and to refresh the memory for the returning members. This time is also used to discuss the budget situation and to plan the whole competition cycle.

The GSC internal procedures were discussed, including the issue of conflict of interest, which is taken very seriously, consultation with other GSCs when required, and the external reviewers process (form 180) used for most applications(all except MFA and equipment applications). The ad-hoc review mechanisms were also explained; these include the permanent oversight committees for SNO and Atlas, and the project reviews then being planned for ISAC related proposals, as well as for the Rare-K decay proposal, and TWIST. The Large Projects Day (LPD) process was explained to the new committee members. Applicants who have submitted large proposals are invited to transmit to the GSC the most recent and up-to-date information concerning their project. In the past, projects requesting more than $200K were invited. The Manager of the SAP program, and the program officer are responsible for the final invitation slate, in consultation with the GSC chair. Questions to the invited applicants are prepared in advance of LPD by the GSC committee and Chair, and forwarded to the applicants.

The Policy and Orientation meeting also serves as a training session for the new members, so part of the day is devoted to the actual competition process. The Chair assigns two internal reviewers to each application. For very large applications a third internal reviewer is sometimes assigned. During the competition week, the internal reviewers present each application. After a full discussion, the committee takes a secret vote (scale is 1-5) on the four NSERC criteria: merit of the proposal, excellence of the researchers, contribution to the training of highly qualified personnel (HQP), and urgency/need for funds. Members also vote on the recommended funding. The median values for the criteria and funding are recorded. Subcommittees, formed by the chair, evaluate the equipment, computing, MFA, and theory applications, and present their recommendations to the full committee. Once all applications have been evaluated, and funding recommendations totalled, the committee proceeds to round two, during which all applications are reviewed again, this time keeping the committee's budget constraints in mind. It is at this point that weak applications that survived round one may be eliminated, and other applications trimmed. At this point the committee breaks for the day; round three ("buyer's remorse"), on the last day, allows any concerns to be addressed, and some fine tuning may take place.

Site Visits

The site visits began October 21, with the committee visiting the facilities at the University of Alberta. The committee then traveled to the University of Regina on October 22 and finally to the University of Manitoba on October 23. Two professors from the University of Winnipeg met with the group at the University of Manitoba.

The main goals of the site visits are to provide information about NSERC and the GSC process, get feedback from the community to NSERC, and see the research environment first hand. This is especially useful for the non-Canadian members of the committee. The format of the visits is the same at each university: a brief presentation is made by the program officer on what's new at NSERC, the GSC Chair gives a brief overview of the SAP envelope and explains the procedures used by the committee during the evaluation process, and the university groups are invited to make brief presentations of their general research activities. It must be remembered that the committee is not there to review the specific proposals submitted by that university's researchers, but rather to get a general idea of the research

environment at the institution. The committee also meets with representatives of the university's administration, and with graduate students and postdoctoral fellows.

Overall, the feedback from the groups was very useful and the visits provided the committee with a much better understanding of local concerns, and the unique issues associated with each university.

Large Projects Day

Large Projects Day was held over two days, Friday January 31 and Saturday February 1, at NSERC The IPP Director (R. Keeler) met in-camera with the GSC and so did the TRIUMF Director of Research (J-M Poutissou). To help the committee understand the role of the Perimeter Institute in relation to Canada's high energy theory program at the universities and TRIUMF, an in-camera session was held with Howard Burton, Executive Director of the Perimeter Institute. It is very likely that Perimeter Institute researchers will apply to NSERC in the future. Projects which presented were Atlas (R. Orr, Toronto) , D0 (D.O'Neil, SFU), TWIST (G. Marshall, TRIUMF), Rare Kaons (D. Bryman, UBC), Hermes (A. Miller, TRIUMF), QWeak (S. Page, Manitoba),Veritas (D. Hanna, McGill), Zeus (J. Martin, Toronto), Trinat (J. Behr, TRIUMF), TUDA (L. Buchmann, TRIUMF), TITAN (J. Dilling, TRIUMF), and TIGRESS and 8pi (C. Svensson, Guelph).

The committee expressed the view that the LPD should be limited to one day and that the agenda in the future should allow much more time for questions and discussion. It was felt that the answers to prepared questions were useful but did not fully cover the issues that had arisen once the committee had an opportunity to confer in-camera. The session with the Director of Research from TRIUMF was especially useful due to the fact that several large projects proposed for TRIUMF were being reviewed.

There exists some tension in the community arising from the feeling that those applicants invited to LPD are able to "lobby" the committee, placing those not invited at a disadvantage. The committee is aware of this issue, and recommends that NSERC continue to pay attention to the need for updates from large projects and the perception by some members of the community, while ensuring that LPD remains both manageable and useful.

Project Reviews

Each year a number of major projects whose funding request is before the GSC are thoroughly reviewed by a panel of international experts in the field that have invested more time to understand the issues than the GSC during competition week. This year 5 projects were reviewed: ATLAS, Rare Kaon Decay, TWIST, TIGRESS, and TITAN. Also, although SNO was not applying for renewal of funding, the SNO Agency Review Committee science subcommittee conducted its annual meeting to review the progress of the experiment. Although the GSC does not feel constrained to follow the recommendations of the project reviews, these recommendations are taken very seriously during the evaluation process in

February. The final reports are made available to the respective collaborations, although the funding recommendation of the review committee is removed.

Five Year Plan

The 5-year plan represents guidance from the entire community, and the planning exercise in the 5-year plan was very useful to the GSC, especially when trying to understand the impact and importance of future projects. While the GSC did not follow exactly the recommendations of the 5-year plan, it did take into consideration the need to put aside some money for future investments in new major projects to try and avoid another borrowing agreement with NSERC in the future, and generally followed the funding trends outlined in the plan.

Chairs Meeting

The Chairs of all the GSCs met on November 24, 2002 to arrange consultations and ensure that all applications are sent to the most appropriate GSC. For GSC-19, the changes are generally very minor, so the Chair takes the opportunity to review the assignment of internal reviewers and the list of external referees. The Chair and the Program officers also decide at this time which projects should be invited to Large Project Day.

Applications for Funding

There were 63 applications to review this year. This compares to 80 last year and 58 the year before. The total requested for this year was $15,108,056, while last year was about $17.5M and the year before was $6.5M. This year was remarkable for the large amount requested for major equipment, nearly $3.5M, while last year it was $1M, and the year before that $0.4M. A summary of the amount requested in the 2003 competition is broken down by type of application in Table 1.

Table 1: Summary of grant applications

Grant type	Number received	Amount requested ($K)
Project/Group	19	8,860,062
Individual	30	2,006,388
Equipment (including computing)	6	346,624
Major equipment	4	3,480,855
Major Facilities Access (MFA)	4	414,127
Total	63	15,108,056

Spending by Research areas

The spending by research areas for the past two years is shown in Table 2. The actual categories
allow the reader to have a snapshot of the entire GSC-19 envelope. The remarkable changes that took place this year are the doubling of the investment in ISAC, which is preparing for the ISAC-II program at TRIUMF. The Rare-K Decay program at BNL, is a combination of E-949 and KOPIO. The funding for both programs is uncertain in the US, although the NSF has stated they plan to commence funding KOPIO in US fiscal year 2006. A few programs are winding down, such as OPAL and HERMES, and the funding profile reflects the ramp. The increase in infrastructure support represents new support for large computer centers dedicated to HEP.

Table 2: Spending by research areas. Amounts will not add up due to rounding.

	2001-2002	2002-2003	2003-2004
Nuclear Physics	815.9	848	540
Intermediate Energy	891	1,028.40	968
TRIUMF non-ISAC	646	781	581
ISAC	1,001.00	1,397.10	2,726
SNO	3,641.00	4,395.00	4,265
ATLAS	3,278.00	3,402.00	3,480
Babar	650	804	868
Rare K Decay	926	1,060.00	470
CDF	250	323.5	490
OPAL	700	370	211
ZEUS	750	750	675
HERMES	385	290	200
Future Collider R&D	149	159	180
Astroparticle and other	273.5	707	839
Infrastructure	1,516.90	1,536.00	1,826
Computing	178.5	157	149
Theory	2,158.30	2,333.00	2,635
Total	18,210.10	20,341.00	21,101.00

Evolution of the SAP Envelope and Reallocation

This year the results of the third reallocation exercise by NSERC were implemented. The SAP community did well. Funds were received for theory and new applicants, Atlas, ISAC,

SNO, R&D and astroparticle physics. Once the funds put into the reallocations pot were taken into account, the base envelope for SAP was increased by $115,111 in 2003 and will receive an additional $86,334 in each of the next four years -- since the average Discovery grant duration at NSERC is being raised to five years, the reallocation results will be implemented over the same cycle. At the end of the reallocation cycle, the envelope will have gained $460 445. It should be noted that the GSC is obliged to spend the allocated funds only for the purpose they were requested. .

The submission from the GSC 19 steering committee, and the final results of the reallocations process are available on the NSERC web site (http://www.nserc.ca/programs/real2000-e.htm)

Financial Discussion

The financial overview of GSC-19 is shown in Table 3. The budget for the 2003 competition is summarized in the middle column and the awards total $8,701,403. An amount of $763,922 is carried forward. This carry forward is not as much as suggested in the 5-year plan due to the budget pressure and the reduction in the GSC envelope from the large equipment (RTI 2&3) moratorium.

Budget pressures at NSERC necessitated the imposition of a one-year moratorium on large equipment applications. GSC-19, due to the envelope system, was allowed to accept, and fund, to large equipment proposals, such as those submitted by Titan, Tigress, Atlas electronics, and QWEAK. No other discipline GSC has an envelope, and so no other discipline was allowed to submit applications for large items of equipment (those costing more than $150,000). However, to be fair to the other research communities, NSERC removed a portion of the money in the envelope. The amount removed was determined on the basis of the amount requested for all types of equipment, and the expected funding rate for all equipment applications in all the GSCs. As a result of this exercise, a total of $732 462 was made unavailable to the envelope

Summary

This year's competition was successful in that three new major programs were funded: Titan, Tigress and QWEAK. In addition, R&D funds for neutrino oscillation experiment were approved. Atlas received some increased and continued strong support, and CDF received an increase to reflect three new collaborators. ZEUS continues to be well-supported; in addition, theory support continues to grow as does that for astroparticle physics. Finally, the Linear Collider project received R&D funds, as well as support for accelerator research at TRIUMF. Overall, the program is very healthy, and the Canadian SAP community has demonstrated that it can mount and sustain an exciting, high quality program.

Table 3: Evolution of the envelope

	2002	2003	2004	2005	2006	2007
Base envelope	20,940,000	21,170,000	21,285,111	21,371,445	21,457,779	21,544,113
Reallocation		115,111	86,334	86,334	86,334	86,334
TOTAL SAP ENVELOPE	20,940,000	21,285,111	21,400,222			
ANNUAL DEBT REPAYMENT	-84,205					
Total Committed	-7,351,908	-13,039,328	-13,118,525			
Available for competition	13,503,887	8,245,783	8,281,697			
Carry-over (GSC saving)		799 004	763,922			
Carry-over (grant termination)	34,250					
(B) Commitments and Carry-over from Previous Years	34,250	799,004	763,922			
2001 Competition: Funds Transferred from GSC17 to Lessard Project	20,000	20,000				
2002 Competition: ADDITIONAL FUNDS (news & previous nil awards)	230,000	230,000				
Kopio grant deferral		500,000				
Unspent funds from the envelope		403,000				
© Additional Funds	250,000	1,153,000	230,000	230,000	230,000	
(D) Equipment budget reduction		-732,462				
(A+B+C-D) AVAILABLE FUNDS FOR COMPETITION	13,788,137	9,465,325	9,275,619			
Funds allocated to competition	12,989,133					
Funds allocated in 2003 competition		-8,701,403				
FREE BALANCE	799,004	763,922				