Subatomic Physics Grant Selection Committee (GSC-19) Annual Report

Edward Brash, Chair GSC-19
Christopher Newport University
April, 2005

"The numbers and statistics contained in the report do not represent the final and official results of the competition; they are included to help the reader understand the context of the competition. The final and official numbers and statistics are the ones presented to the Committee on Research Grants (CORG) during their May meeting following the competition. Note that the numbers and statistics contained in the GSC annual report should not be used for any other purpose than the GSC Annual Report."

Introduction

This report summarizes the preparations of GSC-19 together with the outcomes of the 2005 competition. It is intended that this report be made available to the Canadian subatomic physics community, as well as the NSERC Committee on Research Grants (CORG). In particular, emphasis is placed largely on the past, present, and future management of the GSC-19 funding envelope.

Committee

In 2005, GSC-19 comprised 12 members, including the historical complement of three theorists. The committee membership is shown in Table 1 below. Throughout the year, GSC-19 received expert guidance and assistance from NSERC staff members Kate Wilson, Sandra Zohar, and Valerie Augier. In addition, during competition week, Dr. Pekka Sinervo, Group Chair for Physics, attended a significant fraction of the deliberations, and provided the committee with guidance on matters of policy and historical precedent.

Table 1: 2005 Subatomic Physics Grant Selection Committee

Name	Institution	Term Ends	Expertise
Edward Brash - Chair	U. Regina/CNU	2005	Experimental IEP
Malcolm Butler	St. Mary's University	2005	Theoretical N/IEP
Marcela Carena	Fermilab	2005	Theoretical HEP
Noemie Koller	Rutgers University	2005	Experimental NP
Richard Van Kooten	Indiana University	2005	Experimental HEP
John Martin	University of Toronto	2006	Experimental HEP
David Sinclair	Carleton University	2006	Experimental NP
Clifford Burgess	McGill University	2007	Theoretical HEP
Stephane Coutu	Penn State University	2007	Astroparticle Phys.

Allena Opper	Ohio University	2007	Experimental IEP
François Richard	Orsay	2007	Experimental HEP
Kumar Sharma	University of Manitoba	2007	Experimental NP

Preparations for the 2005 Competition

Site Visits

In the fall of 2004, the GSC visited the central Canadian institutions. On Sunday, October 3rd, the committee met in Toronto for one day policy and orientation session for the GSC members. On Monday, October 4th, the GSC visited the University of Toronto. In addition to the physicists and graduate students from the University of Toronto, we also had an opportunity to meet with a delegation from York University. On Tuesday, October 5th, we met at Carleton University with groups from Carleton, Laurentian, and Queen's University. Finally, on Wednesday, October 6th, the committee traveled to McGill University and the Université de Montréal.

The site visits by the GSC are informational only, and are not intended for the purposes of grant evaluation. These visits allow an opportunity for NSERC to provide information to the community regarding the funding process. In addition, they allow the community a chance to provide feedback to NSERC and the GSC. Perhaps most importantly, the GSC is afforded the opportunity to see the respective research environments of prospective applicants firsthand. For foreign members of the GSC, who may be unfamiliar with the Canadian university system, this is a particularly important component. Finally, NSERC and the GSC benefit greatly from our meetings with the graduate students and research associates at the various institutions.

For each day of the site visit, a report is prepared by an assigned GSC member. These reports are available to the entire committee during competition week, for reference purposes. They are also archived by NSERC, and are available to subsequent committees, both during competition week and prior to subsequent site visits.

External Reviews

In the months preceding the competition week, several external review procedures are carried out. These may be for the purpose of providing an in-depth evaluation of certain large grant requests, or for reviewing the progress of ongoing projects. These external review committees typically include one or two GSC members, as well as several members external to the GSC. In all cases, the reports of the external review committees are provided to all GSC members in advance of competition week, and serve as invaluable guidance in the evaluation process.

Prior to the 2005 competition, the following reviews were held: In September, 2004, a review of the TIGRESS project was carried out, for the purposes of evaluating the progress and status of this ongoing project. In December, 2004, a detailed review of the ATLAS (Canada) project took place at the University of Toronto. Specifically, the

committee was charged with providing a detailed analysis and evaluation of both the ATLAS Project Grant application, as well as an RTI request from the proponents for payments for Cost-to-Completion and Commissioning and Integration. Also in December, 2004, a review of the EMMA project, a new recoil spectrometer planned for ISAC-II at TRIUMF, was held. Finally, in early January, 2005, a review of the KOPIO/Rare Kaon project took place.

Large Project Day

On the Friday prior to the start of the competition week in February, a number of the larger projects, generally those requesting more than $400,000 per year, were invited to make short presentations to the committee. In addition, the presenters had an opportunity to respond to written questions from the GSC which were provided to them in advance. Of course, there were oral questions from the committee following each presentation as well. The committee also heard presentations from Jean-Michel Poutissou, the TRIUMF Science Director, and William Trischuk, the Director of the Institute of Particle Physics.

2005 Competition Prognosis

The budget information, as known during the week of the competition, is shown in Table 2. Data from the previous two years are also shown.

Table 2: Budget data (in k$) as known during 2005 Competition

	FY2003	**FY2004**	**FY2005**
Base Envelope	21,170	21,515	21,601
Carry Forward	799	764	146**
Other Increments*	768	371	371
RTI/SRO Taxes*	-732	-225	-137
Overall Envelope	**22,005**	**22,425**	**21,981**
Funds already committed	12,539	13,214	13,654
Total funds available	**9466**	**9211**	**8327**
Number of grant requests	63	64	72
Total requested	15,108	15,589	15,292
Total awarded	8,701	8,511	?
Balance	**764**	**700**	**?**

* Estimates for 2005 ** See text for further explanation

Of particular note is the Carry Forward amount for the current year ($146k). This amount is different than the suggested Carry Forward amount from the 2004 competition because NSERC arranged to pay for the SNO heavy water insurance costs in one lump

sum in 2004 at a much reduced cost compared to the projected amounts from last year. While this reduces the amount of Carry Forward money, it in turn reduces the total funds already committed for 2005 by the same amount ($700k - $146k = $555k). The line "Other increments" includes new funds from NSERC in support of new applicants with amounts of ($230k, $285k, $285k) in the three years shown. In addition, the reallocation process resulted in ($155k, $86k, $86k) coming into our envelope in the last three years. In 2003, a large amount of unspent funds were "found" and added to our envelope. That year, the envelope was taxed $732k because of the moratorium on the RTI-2 and RTI-3 equipment grant requests in other GSCs. For 2004, the tax was $89k. In the current year, NSERC does not anticipate that such a tax will be necessary. Finally, an addition tax of $137k for the Special Research Opportunities (SRO) program has been applied in 2004 and 2005. Our community is eligible to apply for grants through the SRO program, and any funds awarded will come from outside our envelope. In 2004, the CRO and IOF programs were absorbed into the SRO program.

As compared to the previous two years, this year's committee faced a more difficult task entering the competition, in terms of the amount of funds available compared to the total amount requested.

Competition Process

Round 1

In round 1 of the competition, each of the grant requests is presented and discussed in detail. It is expected that all committee members are familiar with all of the requests prior to the beginning of competition week. In addition, for each application, two committee members are assigned to "referee" each request in detail. During round 1, each referee presents the request to the full committee, and provides an independent funding recommendation. Following a general discussion of the application, the committee votes on whether to fund the application, and on the duration of the grant. The funding levels are voted upon by (secret) electronic ballot, and the median level of funding is selected as the award amount for this round. It is important to note that no running tally is kept of the results of round 1 by any members of the committee, in order to ensure fairness throughout. In 2005, the first round proceeded normally, and took three full days to complete. On the afternoon of the third day, the committee was split into two subcommittees; one which discussed smaller equipment and MFA applications, and another which discussed the theory applications.

According to NSERC guidelines, round 1 is to be carried out essentially without regard to budget pressures. However, given the very difficult situation that the committee faced with respect to the budget entering the competition, the GSC chair advised the committee prior to the beginning of round 1 that it would be unrealistic to take this approach at the outset. Therefore, the referees were requested to be strict in their funding recommendations. It was felt by the committee at the end of round 1 that while the standards were very high, they were applied fairly and uniformly.

Round 2

At the beginning of the second round, a tally was made of the total funds allocated in the first round (for the upcoming funding year). Despite the relatively high threshold that was set in the first round, the committee found itself in the situation where the 2005 envelope was overspent by almost $900k (or about 11% of the funds available in the competition). Given that the total funds available to the committee prior to the beginning of the competition was smaller than in 2004 by about $900k, this result may not be that surprising.

Prior to beginning the round 2 discussion of individual proposals, the committee discussed the general philosophy of how this shortfall might be overcome. In particular, the committee felt that it had already been very strict in the round 1 funding recommendations, and that "trimming" applications even further might seriously threaten the success of a large number of the proposed endeavors. The committee looked at a large number of factors in attempting to come to a consensus on this issue, including projections for the next several years, the fraction of the envelope devoted to capital equipment, and the funding prognosis for sources external to NSERC, including TRIUMF and the U.S. funding agencies. Following a very long discussion, the committee unanimously agreed that a prudent choice for the overall health of the Canadian subatomic physics community might be to defer the funding of some of the larger projects, including those that were before the committee this year, as well as those for which funds had already been committed from previous competitions. In each case where this decision was considered, the committee felt that there were significant uncertainties which could make deferment the best choice. It should be noted that for projects for which funds have been awarded from a previous competition, deferment of that award is an entirely valid and supported option according to NSERC policy, should uncertainties in the project warrant such a decision.

In contrast to the usual round 2 procedure, which is to go through each of the individual proposals in the same order as in round 1, the committee decided that it would be far more effective to discuss the proposals and projects for which deferment was being considered first. Essentially then, round 2 was divided into two sections: an initial phase where the deferment case was being considered, and then a second phase where each individual proposal was considered for a second time.

The round 2 procedure took a full day. At the end of round 2, a number of additional reductions had been made by consensus of the committee. As well, the committee recommended to NSERC that the 2005 – OG installment of the KOPIO major installation grant awarded in 2001 be deferred to 2006-07, due to uncertainties in the overall RSVP project in the US. These actions allowed a $242k surplus to be carried forward to 2006. These results are summarized in Table 2, below.

Round 3

On the final day, a third round of discussion took place. The main focus of this discussion was to look at the overall breakdown of the envelope, especially in terms of capital equipment spending, and committed funds in the coming years. In addition, a few applications, selected by committee members were discussed. At the end of round 3, no changes were made in the award levels as compared to round 2. The committee agreed that should any additional funds enter the envelope for the 2005 competition, they would be applied to the carry-forward amount. The remainder of the day was devoted to the completion of the notifications of decision. The committee internal referees for each application are responsible for providing initial drafts of the comments to be sent to the applicants in April which indicate how the committee arrived at its recommendations.

Table 2: Budget data (in k$) as known during 2005 Competition

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Funds already committed	12,539	13,214	13,654
Total funds available	**9466**	**9211**	**8327**
Number of grant requests	63	64	72
Total requested	15,108	15,589	15,292
Total awarded	8,701	8,511	8,825
Balance	**764**	**700**	**-498**
KOPIO MIG deferment			740
Final Balance			**242**

* Estimates for 2005

Summary of Award Recommendations

In Table 3, a summary of the awards in 2005 is given. Approximately 21% of the applications were not funded in this competition. This is somewhat higher than the typical level over the last five years (approximately 10%), and is indicative of the difficult budget situation that the committee faced, to some extent. In particular, it is important to note that a relatively small fraction of the capital equipment grant requests

were successful, and only about 15% of the requested funds in this category were awarded.

Table 3: Summary of grant requests and awards in the 2005 competition

Type	number of requests	requested amount (k$)	number of awards	Awarded amount (k$)
Individual (Theory)	18	1,082	16	703
Individual/Group (Experiment)	14	930	12	434
Project	17	8,884	16	6,362
Equipment	17	3,152	8	492
Infrastructure	6	1,245	5	835
Totals	**72**	**15,292**	**57**	**8,825**

Evolution of the Subatomic Physics Envelope

As stated in the previous section, the committee was not able, due to budget pressures, to fund any of the large equipment requests in the current competition. This was noted as an area of potential concern. The committee felt strongly that adequate levels of capital funding must be maintained in the overall subatomic physics envelope. In Table 4, a breakdown of the subatomic physics envelope spending by grant category is presented, and summarizes the results over the last several competitions together with this competition. Of particular note is that despite the relatively low level of success of the (major) equipment grant requests in this competition, the overall fraction of the subatomic physics envelope being spent on equipment remains consistent with previous years (or even slightly higher). Moreover, the total absolute dollars devoted to capital spending continues to rise.

The results for the equipment spending in the envelope may be understood when one considers that even though the GSC has funded a relatively small fraction of major equipment requests in both the 2004 and 2005 competitions, in previous years several major equipment proposals were funded which committed significant amounts of absolute equipment dollars in both 2004 and 2005. The committee also looked at the projections for next year's competition (2006). As it stands now, 22% of the committed funds for next year are for equipment spending.

It should also be noted from Table 4 that the fraction of the total envelope devoted to theory grants continues to increase, in keeping with the recommendations of the previous reallocations committee, as well as the subatomic physics five year planning committee.

The process of increasing the spending on theory is one that has been phased in over a number of years, and should essentially be complete now.

Table 4: Summary of grant awards by grant type in the 2005 competition

	2001	2002	2003	2004	2005
Equipment	13	15	15	16	16
Infrastructure	5	4	5	5	5
Indvidual/Group (Experiment)	7	8	8	8	9
Individual (Theory)	12	11	12	13	14
Project	64	62	60	58	56
Equip. Absolute Dollars	**$2440k**	**$2965k**	**$3096k**	**$3476k**	**$3520k**

(Note: Numbers shown for individual categories are percentages of the total envelope)

In Table 5, a breakdown of the subatomic physics envelope is shown for the current year, as well as for next three years. For future years, conservative estimates of the amount of money coming into the envelope for new applicants have been made. The reallocations amount is fairly well defined up until 2007, as is the Strategic Research Opportunities (SRO) reduction.

The primary point to be taken from the table below is that the available funds for the 2006 competition are predicted to be approximately equal to what was available in the previous two years. In addition, the 2006 committee will have the benefit of full knowledge of the TRIUMF budget, as well as potentially a new five year plan for the subatomic physics community, which hopefully should provide guidance on how to manage the large number of major capital equipment projects which are anticipated for ISAC-II, T2K, SNOLab, as well as other projects.

Table 5: Projected Evolution of the Subatomic Physics Envelope

	2005	2006	2007	2008
Base	21,601,334	21,687,668	21,774,002	21,860,336
Reallocation	86,334	86,334	86334	
Envelope	21,687,668	21,774,002	21,860,336	21,860,336
Carry-Forward	146,254	243,072		
New Applicants	285,000	230,000	230,000	230,000
SRO Reduction	-137,000	-137,000	-137,000	
Total Envelope	21,981,922	22,110,074	21,953,336	22,090,336

Projected Available Funds		**9,178,805**	**16,002,836**	**19,925,836**