

Subatomic Physics Evaluation Section Annual Report

Michel Lefebvre, Chair
University of Victoria
April 2010

I. Introduction

This report summarizes the activities of the subatomic physics (SAP) Evaluation Section (SAPES), formerly known as Grant Selection Committee 19 (GSC-19), in fiscal year 2009-10, and includes the results of the February 2010 competition. The report is provided for information to the NSERC Committee on Grants and Scholarships, and to the Canadian subatomic physics community. The format of the report largely follows the summaries from previous years.

SAPES is unique among NSERC Evaluation Sections since it operates within an annual budget envelope. Individual, Team, and Project Discovery, Research Tools and Instruments (RTI), and Major Resources Support (MRS) grant applications in subatomic physics are evaluated together by SAPES. This comprehensive approach is essential given the complexity and inter-dependency of many proposals, which are often and ever-more frequently parts of international programs and collaborations, and involve many universities and national laboratories. This approach is also essential for planning and stability of execution of large-scale and long-term projects, and for maintaining a balance between large projects and the smaller research efforts that are essential to the breadth and future success of the Canadian SAP program. The envelope structure also helps SAPES to attempt to maintain an appropriate balance between operations and capital investments. Moreover, the SAP community's five-year Long-Range Plan includes the community's priorities, and provides important guidance to SAPES' deliberations. The last Long-Range Plan was produced in 2006.

Another unique strength of SAPES is the extent to which it solicits reviews by international experts of the highest calibre. All major Team, Project, RTI and MRS grants are separately reviewed by *ad hoc* or standing committees of internationally-recognized experts drawn from institutions from around the world. These committees perform exhaustive on-site scientific, technical, and budgetary evaluations, and produce detailed written reports which provide exceptionally valuable input to SAPES for its assessment of the grant applications. Moreover, SAPES generally selects a substantial proportion of international external referees for each proposal, from the smallest individual discovery grant to the largest project proposal. Finally, the membership of SAPES is itself substantially international, with half or more of its members generally coming from institutions in the US and Europe. This level of international review provides an exceptionally high-degree of scrutiny and validation of the research funded by this Evaluation Section.

Despite the internationally-recognized excellence of Canadian SAP research, and the unique strengths of SAPES envelope structure and review processes, it is becoming increasingly difficult for this Evaluation Section to financially support the community's short- and long-term objectives at an appropriate and competitive level to ensure the maximum scientific return on substantial investments already made. This is due in large part to the fact that the SAPES budget has essentially remained flat since many years, while at the same time the SAP community has been extremely successful in its achievements on the international stage and in attracting many new, high-calibre researchers, who are naturally attracted by the excellence of the community and its successes. Furthermore, the SAP community has been extremely successful in obtaining large Canadian Foundation for Innovation (CFI) awards; while this opens exciting possibilities, the lack of a coordinated approach between CFI and NSERC and the assumption that the associated needs in operating funds can be obtained from NSERC, generate severe distortions and pressures on our envelope. For the 2010 competition, SAPES faced the daunting prospect of being able to fund only 46% of the total requested amount. The share of the envelope now committed to the support of research operations has reached a record high of 81%, with very limited ability to support new small-to-medium size capital investments that are not usually entertained by the CFI and that are crucial to the mid- to long-term scientific vision of the community.

There is an urgent need to protect and exploit the considerable investments that have already been made in SAP research. One can justifiably state that the Canadian SAP program has become a victim of its own excellence and successes, and that the currently available operating funds are barely enough to maintain existing activities at a constrained level that is not always sufficient to allow Canadian researchers to contribute to the full extent of their potential. Clearly, the internationally-recognized excellence and contributions of the Canadian SAP community, coupled to the unique strengths of the SAPES envelope, ensure that additional investments in this area will yield exceptionally high returns in cutting-edge knowledge and highly-qualified personnel training. Such additional investments are now more needed than ever.

II. Update on the Envelope Funding

The pressure on the Section's funding envelope has been building for the last several years; it has now reached a level difficult to manage. In particular, substantial investments by federal and provincial government funding agencies have annually injected funds into the SAP program in excess of 50% of the entire SAPES envelope, including substantial capital investments from CFI and various agencies of the Ontario government (but excluding NRC funding of TRIUMF). Other substantial investments by the Canadian government in science and technology, such as the Canada Research Chairs (CRC) program, have also resulted in a fast growth of the number and *the quality* of young faculty in SAP at many Canadian institutions. The latter increase has, in turn, been accompanied by a substantial growth in the number and quality of graduate students and other highly-qualified personnel.

Such renewal and expansion are very welcome, and demonstrate the excellence and vitality of the Canadian subatomic physics community. They pose, however, exceedingly difficult funding challenges in a fixed budget scenario. Since the 2006 Long-Range Plan was released, new funds were allocated to NSERC by the federal government in the 2007 and 2008 budgets, but were specifically provided for clearly targeted priority areas which did not include SAP. A government-mandated Strategic review affected funding of certain programs (not the Discovery Grants program and there was no impact on the envelope) and operations at NSERC in fiscal year 2009-10. The 2010 Canadian Budget included an \$8M allocation to NSERC towards Discovery research; this is encouraging, albeit small; how this may affect the SAP envelope remains to be understood.

The scenario of a flat envelope is thoroughly analyzed in the 2006 LRP report, with the conclusion that it would lead to a curtailing of research operating support and affect growth possibilities in Canadian SAP research activities. In such a scenario, it was recognized that the ability of the Canadian subatomic physics community to exploit the major capital investments of the past decade and to achieve its long-term scientific vision would be jeopardized.

III. Evaluation Section

This year SAPES was again comprised of 12 members, including 3 theorists. Four new members joined this year; they are Gilles Gerbier (Commissariat à l'énergie atomique, France), Randy Lewis (York University), Thomas Papenbrock (University of Tennessee at Knoxville), and Carl Svensson (University of Guelph). SAPES' full membership is given below.

The Chair would like to acknowledge the very demanding task faced by SAPES members throughout the year, up to and especially through competition week. Very long hours of deliberations ensured that each proposal was fairly and consistently evaluated according to the selection criteria. The remarkable professionalism and dedication of SAPES members is manifest in the high quality of its recommendations. The Chair also wishes to sincerely thank SAPES members for their careful and constructive attitude throughout the competition, and for ensuring the conduct of our many discussions in a pleasant atmosphere indeed.

It is a special pleasure for the Chair to thank NSERC staff and the Physics Group Chair for their expert guidance and help in the months leading up to the competition, and during the many long days of competition week: Kim Bonnet (Program Officer), Samir Boughaba (Team Leader), Jean-Claude Kieffer (Director, Institut National de la Recherche Scientifique - Énergie, Matériaux et Télécommunications, and NSERC Group Chair for Physics), Isabelle Blain (Vice-President, Research Grants & Scholarships), and Anne-Marie Thompson (Director, Physical and Mathematical Sciences); Isabelle and Anne-Marie joined the Committee for several important discussions. The Chair wishes to extend his special gratitude to Jean-Claude, who attended most of our competition

sessions, and provided much valued and highly appreciated advice at several critical junctures in the process. Finally, the Chair wishes to express his highest regards and warmest appreciation to Sam for his extraordinary professionalism, patience, commitment and expert counsel throughout the 2009-10 competition year.

Name	Organization	Final Year
Juha Äystö	University of Jyväskylä	(2010)
Gilles Gerbier	Commissariat à l'énergie atomique, France	(2012)
David Hanna	McGill University	(2011)
Garth Huber	University of Regina	(2010)
David Kirkby	University of California, Irvine	(2011)
Michel Lefebvre (<i>Chair</i>)	University of Victoria	(2010)
Randy Lewis	York University	(2012)
Wolfgang Lorenzon	University of Michigan	(2010)
Thomas Papenbrock	University of Tennessee at Knoxville	(2012)
Moshe Rozali	University of British Columbia	(2011)
Kate Scholberg	Duke University	(2010)
Carl Svensson	University of Guelph	(2012)

IV. Policy Meeting and Site Visits

Each year, SAPES launches its operations at a one-day policy meeting in which news from NSERC, including a detailed review of the budget, is communicated to the members. This is also a critical opportunity for the new members to familiarize themselves with NSERC and SAPES operating procedures, to be informed of the process leading to competition week, and to meet the returning members. The policy meeting for this competition was held in Victoria on Sunday October 25, 2009. This was a full working day of presentations by the Chair and Program Officer, and discussions amongst Section members, all of whom attended.

Following the policy meeting, it is a tradition for SAPES to visit Canadian institutions with subatomic physics research programs on a 3-year rotation basis. The visits are conducted for informational purposes only and are not a part of the grant evaluation process. They provide opportunities to communicate information about NSERC and the review process to researchers, while the Section members hear presentations about the researchers' activities and learn first-hand about their infrastructure and environment. The learning process that accompanies these visits is particularly important considering the large number of SAPES members affiliated with non-Canadian research institutions. These visits are also a valuable opportunity for Canadian members to get a full sense of the research environments of their colleagues from one end of the country to the other over their three years of service on SAPES.

This year, the Section visited the University of Victoria on October 26, Simon Fraser University on October 27, TRIUMF on October 28, and finally UBC on October 29.

At each visited institution, the meeting first began with presentations by the Chair, who summarized the discussions at the policy meeting and provided information on the evaluation process of grant applications. Subsequently, and after hearing presentations on the various SAP research activities at the institution, the Section met with the local administration, and was allotted time to interact with students and post-docs involved in NSERC-supported research. These visits provided the Section with an extremely valuable context about research realities at each institution and allowed many informal interactions with the entire spectrum of personnel. Although necessarily fast-paced and intense, these visits are a very precious source of information about the research environment in which Canadian researchers operate and the local support or constraints they may have. Canadian members of SAPES prepared an informal summary on each visit. These reports are available for future SAPES to consult. Since these visits are informational and not, in any way, used as part of any grant evaluation, these summaries are for internal use only.

V. Pre-Review Process

The review of the Notifications of Intent to Apply for a Discovery Grant (Form 180), took place in September. Discovery Grants includes Individual, Team, and Project grants. It involved all the Section Chairs of the Physics Evaluation Group, including the SAPES Chair, and the Group Chair. A teleconference involving all the Section Chairs and the Group Chair was held on September 24 to discuss those applications whose research topics crossed the boundaries of two or more Sections within the Physics Evaluation Group or related to a discipline other than physics. For each application, the intent was to identify the Section (or Evaluation Group, if the research topic related to another discipline) that should take the lead for the review and determine the need to provide or receive expert input from other Evaluation Groups. In the case of SAPES, which operates in a standalone mode with a separate membership, the need to provide or receive expert input was also related to the other physics Sections.

As an outcome of this process, five applications reviewed by GSC-19 in the past were to be reviewed by the Theoretical/Mathematical Physics Section of the Physics Evaluation Group. Furthermore, it was agreed that SAPES would provide expert input, through the participation of its members, to the review of 13 Discovery Grants applications in Theoretical/Mathematical Physics and General Physics. Similarly, it was agreed that one application in SAPES would receive expert input in Theoretical/Mathematical Physics from a member of the Physics Evaluation Group. Moreover, the final decision on three applications was deferred to the Chairs' meeting (see below), to use the information provided in the full applications.

Furthermore, when the notifications of intend to apply (Form 180 for Discovery Grants and Form 181 for MRS) are received, each application is assigned by the Chair to first and second internal reviewers, who are SAPES members with the most appropriate expertise, and with careful consideration of balancing the full workload among all of the members. In the case of Discovery Grant requests, the first reviewer is then required to

recommend five external referees for each of his/her assigned applications. Typically, up to two of the external referees could be chosen from the list of suggested referees on the Form 180. It is in the applicant's interest to suggest referees who are not in conflict of interest according to NSERC guidelines. Internal reviewers generally recommend a substantial fraction of external referees who are from outside Canada.

Similarly, once RTI grant applications are received, the Chair assigns first and second internal reviewers to each of them. External referee reports are not typically sought for category-1 and category-2 RTI grant applications.

VI. Chairs' Meeting

The annual Chairs' meeting was held in Ottawa on November 21, 2009. Following this meeting, and based on exchanges with the various Section Chairs, it was confirmed that the Theoretical/Mathematical Physics Section of the Physics Evaluation Group would take the lead on one specific application. The two remaining applications, for which a final decision was deferred until this meeting, were assigned to SAPES with expert input to be provided by members of the Physics Evaluation Group in Theoretical/Mathematical Physics and General Physics.

VII. Ad hoc Review Committees

In this year's competition, three large grant applications required site visits to be conducted prior to the competition, in the fall of 2009. The reviewed grant applications were DEAP-3600, PICASSO, and SNO+. The DEAP-3600 review took place on December 14, 2009, and the SNO+ review took place on December 15, 2009; both reviews were held in Kingston and attended by the SAPES Chair. The PICASSO review was held in Montreal on December 18, 2009. Furthermore, a review of ATLAS' activities and category-2 RTI grant application was conducted by the ATLAS Standing Review Committee via two teleconference meetings. The first meeting took place November 18, 2009, and the second on December 16, 2009. Garth Huber represented SAPES at both PICASSO and ATLAS reviews.

The reviews were carried out by *ad hoc* or standing Committees of experts, and typically lasted one full day to allow more in-depth evaluations of the projects than what is possible by the review of the written applications. Full reports with recommendations, including budget recommendations, were prepared for SAPES. The reports, without the budget recommendations, were sent by NSERC to the project Collaborations prior to Large Project Day - new this year, the reports *with* the budget recommendation were sent to the project Collaborations after the results of the competition were announced.

A review of SNOLAB took place on December 18, 2008, for the 2009 competition. In the case of Major Resources Support grant applications, NSERC's standard practice is to not conduct consecutive site visits to the same resource two years in a row unless major

developments affected the resource's operations. Consequently, no site review took place for the 2010 competition and SAPES members were provided the December 2008 site visit report.

The Chair also attended the meeting of the Advisory Committee on TRIUMF (ACOT) held November 20, 2009. He will be attending the ACOT meeting on May 14, 2010.

VIII. Large Project Day

It has proved extremely useful to devote one day prior to the beginning of the competition to presentations by the applicants of Discovery Grants and MRS proposals typically requesting an average of \$500K per year or more, besides applicants of category-2 or category-3 RTI grant applications. This is referred to as Large Project Day (LPD). It is also now customary to meet on LPD with management representatives from the Canadian Institute of Nuclear Physics (CINP), the Institute of Particle Physics (IPP), the Perimeter Institute, and TRIUMF. LPD was held this year in Ottawa on Sunday, February 7, 2010. The agenda is attached as Appendix 1.

The day began with *in camera* presentations by Neil Turok (Director of the Perimeter Institute), William Trischuk (Director of the IPP), Kumar Sharma (President of the Board of Directors of CINP), and Gordon Ball (Associate Director of TRIUMF). They provided the Section with the perspective of the communities served by their organizations. Applicants then made presentations and answered questions previously submitted by the Evaluation Section; this was done in an open session that was attended by about 15 members of the community. The invited projects were, in order of presentation, SNOLAB operations, DEAP-3600, SNO+, PICASSO, and ATLAS upgrade.

At the end of the day, the Section had an *in camera* session with Isabelle Blain who updated the Section on NSERC matters, and who heard concerns of SAPES members regarding the financial challenges faced by the envelope in general and in this competition in particular. The SNOLAB operation support challenge, treated in detail in past Chair Reports of 2007, 2008, and 2009, was discussed; Ms. Blain announced that NSERC could provide up to \$250K, from year-end funds outside the envelope, toward this request if required by SAPES. This contribution would not need to be paid back from the envelope.

IX. Beginning of the Competition

The funds available to the Section at the beginning of the competition are shown in Table 1. The base budget from year to year maintains a flat profile, and no new permanent funds have come into the envelope since fiscal year 2007-08. In particular, there was no addition of funds for new applicants who entered the envelope since fiscal

2010 Competition - Subatomic Physics Envelope Budget Competition Budget (February 5, 2010)							
<i>(millions of dollars)</i>							
Budget Item	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
Base Budget	20.665	20.665	20.665	20.665	20.665	20.665	20.665
Cumulative Permanent Transfers:							
New Applicants ¹	1.622	1.622	1.622	1.622	1.622	1.622	1.622
Reallocations ²	0.459	0.459	0.459	0.459	0.459	0.459	0.459
Transfers from other programs ³	0.064	0.064	0.064	0.064	0.064	0.064	0.064
Transfers due to population dynamics ⁴				-0.183	-0.183	-0.183	-0.183
Temporary Transfers:							
ATLAS Cost-to-Completion	0.075	-0.300	-0.300	-0.300	0.000	0.000	0.000
SRO Contribution	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Forward-Borrow	1.200 ⁵	0.000	0.600	-0.150	-0.150	-0.150	-0.150
Miscellaneous		0.075 ⁶					
Total Fiscal Year	24.211	22.666	23.239	22.410	22.477	22.477	22.477
Actual Spending	24.572	22.667	23.006				
Carry-forward⁷	0.103	0.102	0.233				
Commitments⁸				-15.837	-12.330	-3.120	-0.739
RTI budget adjustment⁹	0.126	0.081	0.027	-			
Available for Competition				6.573			

¹ There is no allocation of new funds for new applicants for the 2010 competition.

² FY 2007/08 was the last year for the 2002 reallocations exercise.

³ \$64,000 were added to the envelope as a result of the \$1M increase to the general MRS budget (6.4%).

⁴ Net total of grants held by returning applicants whose new applications will be transferred in/out from SAP Evaluation Section.

⁵ The reimbursement of the forward-borrowed amount of \$1.2M in FY 2007-08 is cancelled. This is the result of NSERC's decision to exceptionally contribute to the interim support of SNOLAB's operation for FY 2007-08 and FY 2008-09, alongside funding partners.

⁶ This payment to the envelope relates to the fact that, following an ad hoc review alongside funding partners, NSERC is exceptionally contributing to the interim support of SNOLAB's operation from outside the envelope for FY 2007-08 and 2008-09. The entirety of the 2007 SAPMR grant to SNOLAB (\$1.275M) was paid back to the envelope (cancellation of the 4 payments of \$300K/year from the envelope to reimburse the forward-borrowed amount of \$1.2M, plus a one-time contribution of \$75K to the envelope in 2008).

⁷ For each year, the carry forward is calculated by subtracting the actual spending from the total fiscal year allotment, then adding the previous year's carry-forward amount.

⁸ These commitments do not include the \$300K paid by the envelope towards the ATLAS Cost-to-Completion

⁹ For the 2010 competition, there will be no RTI adjustment due to the expected constrained funding rate in the RTI competition outside the envelope.

Table 1. Overall budget available at the beginning of the 2010 competition.

year 2008-09, while the amount generated by the 2002 Reallocations exercise flat-lined in fiscal year 2007-08, which was the last year of the implementation of the results of that exercise.

An amount of \$300K was subtracted from the envelope for fiscal year 2010-11 as the final payment to NSERC towards the reimbursement of the \$1.5M contribution for ATLAS' Cost-to-Completion. An amount of \$150K was also subtracted as part of the first reimbursement of a four-year forward borrowing commitment from the 2009 competition. There was a carry-forward of \$233K from last year's competition into this year's budget prior to the competition. There was no RTI budget adjustment.

Taking into account on-going commitments from previous competitions, \$6.573M was available for the 2010 competition (29.3% of the fiscal year budget). This year, SAPES received 64 applications. At the start of competition, the total funds requested for fiscal 2010 amounted to \$14.308M.

Consequently, at that point in the competition, the projected average funding rate for fiscal 2010 was 46% (without taking into account any contribution by NSERC from year-end funds outside the envelope). For comparison, the funding rates for the years 2003 to 2009 were 58%, 55%, 58%, 60%, 55%, 66%, and 66% respectively. It was clear to the members of SAPES that this would be an exceptionally challenging competition.

X. The 2010 Competition

The competition was held in Ottawa over a period of five days, from Monday, February 8 to Friday, February 12, 2010. The first day started with a review of logistics, policies, and procedures, and a presentation of the budget as outlined in the previous section. The Evaluation Section then started Round 1 of the competition, and proceeded with the review of the applications.

The format of the discussions strictly followed NSERC's guidelines and SAPES internal procedures. Previously, in the fall of 2009, at least two SAPES members were assigned to conduct an *internal* review of each application. During competition week, for each application, the first internal reviewer presented all aspects of the proposal and made her/his recommendations (rating, funding, duration). This was followed by additional comments and/or a presentation by the second internal reviewer, who also made recommendations. These in-depth reviews were carried out independently by the two internal reviewers (who were not aware of the other's identity before the first reviewer's presentation), and took into account the reports received from external referees, if available, as well as site visit reports where applicable. Each application was then thoroughly discussed by all SAPES members. At the end of the discussion, each member was asked to rate the application against NSERC's selection criteria: (i) excellence of the researcher(s), (ii) excellence of the proposal, (iii) contribution to the training of HQP, and (iv) need for funds. SAPES then decided whether to recommend funding the application, the level of funding, and the funding duration. Any recommendation was determined

through secret electronic voting. The median vote was selected as the final SAPES recommendation. Members in conflict with any particular application left the meeting room before it was discussed, and were never informed, even by the end of the competition, of the final result.

Once the review of the experimental Individual, Team, and Project Discovery Grants applications, as well as typically large RTI (Categories 2 and 3) and MRS (more than an average of \$500K per year requested) proposals were completed, SAPES members were divided into two sub-Sections: a theory one and an RTI/MRS one. The theory sub-Section reviewed all the theory individual grant applications. The RTI/MRS sub-Section reviewed the Category-1 RTI grant requests (up to \$150K requested in total), as well as the MRS grant applications requesting an average of less than \$500K per year.

As usual, it was strictly forbidden for SAPES members to keep a cumulative total of the recommended awards, in order not to bias the review of applications discussed towards the end, and to ensure that all applications were treated consistently and fairly. Moreover, in order to ensure the integrity of the process, applications could be flagged by any SAPES member, the Group Chair, the Program Officer, or the Team Leader at any time in Round 1, if he/she felt that some aspects of the discussion or the recommendation necessitated further discussion.

The Round 1 deliberations concluded in the early afternoon on Wednesday, February 10. The Team Leader made a presentation on the budget, taking into account the sum of the recommended awards for all the applications. The result was that a sum of \$7.188M had been recommended from the envelope, to be compared to a total of \$6.573M that was available to SAPES, and \$14.308M in requested funds.

Prior to the start of Round 2, a thorough discussion took place to establish the guiding principles for re-evaluation of all proposals in an attempt to balance the budget. The SAPES members were unanimous that the same set of principles would be applied to all proposals, that all proposals would again be assessed strictly on their merits, and that strict account would be taken of the Section's evaluations of the four criteria for each proposal, which had been recorded in Round 1. All applications were then re-assessed and revised funding recommendations made, again using secret electronic vote.

The Round 2 deliberations concluded in the late afternoon on Thursday, February 11. The Team Leader presented the results at the beginning of Round 3. The revised recommendation by the Section was for \$6.525M from the envelope, compared again with the available sum of \$6.573M. At that stage, the SAPES members unanimously agreed to further offset NSERC's kind contribution from year-end funds outside the envelope. By doing so, the budget showed a final positive balance of \$942. It is important to note that unused year-end funds outside the envelope are mostly dedicated to the support of RTI grants in other fields, which do face similar funding challenges as ours.

With a recommended total funding of \$6.572M from the envelope and a total request for fiscal year 2009-10 of \$14.308M, the funding rate for this year's competition is 46% (47% if one adds NSERC's contribution from outside the envelope).

XI. End of Competition Results

The Section's final multiyear budget levels are shown in Table 2. Table 3 shows a multiyear breakdown of theory, experimental operating, MRS, and capital allocations, while Table 4 gives the percentage share of the envelope in theory, operations, and equipment over the period from 2006 through 2010.

As forecast in the 2006 Long-Range Plan, these figures provide quantitative measures of the funding crisis which has loomed over the SAP community for several years. The share of the envelope now committed to the support of research operations has reached a record high of 81%, with little room for small-to-medium size capital investments for emerging endeavours. Furthermore, the outlook for the 2011 competition indicates that the competition budget of \$4.3M will be less than the total of all currently active grants (excluding equipment grants) that are scheduled to return in 2011 (about \$4.7M).

In the recent past, the SAP community has shifted towards the CFI for major capital equipment. This additional source of funding is welcome, but it is important to highlight the fact that it is in turn generating further pressure on the envelope as the latter is the main funding source in support of research and operating costs. It is unfortunate that repeated attempts to foster some level of coordination between CFI and NSERC have not yet succeeded. Moreover, the need for small-to-medium capital investments by SAPES, mostly for proposals that fall outside the mandate of the CFI, will likely increase again in the coming years. In particular, funds from SAPES will be needed for R&D efforts that are crucial for the future of Canadian SAP, and to satisfy the capital needs of the smaller programs that are essential to the breadth of the community.

XII. Recommendations to the DAS Program

This is the fourth year of the Discovery Accelerator Supplements (DAS) program. The objective of this program is to provide substantial and timely resources to outstanding researchers who have a well-established research program, and who show strong potential to become international leaders in their respective area of research. These additional resources are allocated when progress of the incumbent's research program is held back by insufficient funding. Contrary to previous years where GSC-19 would put forward DAS candidates to be further reviewed by a multidisciplinary committee, for this year's competition SAPES could directly allocate one DAS award. During the *first* round of deliberations, for each Individual and Team Discovery Grants application, SAPES members could put forward the applicant(s) after the deliberation and votes. All the potential candidates were then discussed in detail against the DAS selection criteria and

2010 Competition - Subatomic Physics Envelope Budget Post-Competition Budget (March 2, 2010)							
<i>(millions of dollars)</i>							
Budget Item	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Base Budget	20.665	20.665	20.665	20.665	20.665	20.665	20.665
Cumulative Permanent Transfers:							
New Applicants ¹	1.622	1.622	1.622	1.622	1.622	1.622	1.622
Reallocations ²	0.459	0.459	0.459	0.459	0.459	0.459	0.459
Transfers from other programs ³	0.064	0.064	0.064	0.064	0.064	0.064	0.064
Transfers due to population dynamics ⁴			-0.183	-0.183	-0.183	-0.183	-0.183
Temporary Transfers:							
ATLAS Cost-to-Completion	-0.300	-0.300	-0.300	0.000	0.000	0.000	0.000
SRO Contribution	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Forward-Borrow	0.000	0.600	-0.150	-0.150	-0.150	-0.150	0.000
Miscellaneous	0.075 ⁶						
Total Fiscal Year	22.666	23.239	22.410	22.477	22.477	22.477	22.627
Actual Spending	22.667	23.006	22.409				
Carry-forward⁷	0.102	0.233	0.001				
Commitments⁸				-18.146	-5.612	-1.563	-0.824
RTI budget adjustment⁹	0.081	0.027	-				
Available for Competition							

¹ There is no allocation of new funds for new applicants for the 2010 competition.

² FY 2007/08 was the last year for the 2002 reallocations exercise.

³ \$64,000 were added to the envelope as a result of the \$1M increase to the general MRS budget (6.4%).

⁴ Net total of grants held by returning applicants whose new applications will be transferred in/out from SAP Evaluation Section.

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⁶ This payment to the envelope relates to the fact that, following an ad hoc review alongside funding partners, NSERC is exceptionally contributing to the interim support of SNOLAB's operation from outside the envelope for FY 2007-08 and 2008-09. The entirety of the 2007 SAPMR grant to SNOLAB (\$1.275M) was paid back to the envelope (cancellation of the 4 payments of \$300K/year from the envelope to reimburse the forward-borrowed amount of \$1.2M, plus a one-time contribution of \$75K to the envelope in 2008).

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⁸ These commitments do not include the \$300K paid by the envelope towards the ATLAS Cost-to-Completion

⁹ For the 2010 competition, there is no RTI adjustment.

Table 2. Multi-year budget summary at the end of the 2010 competition.

2010 Competition - Subatomic Physics Envelope Budget MULTI-YEAR COMMITMENTS BY CATEGORY Post-Competition (March 2, 2010)						
	2009	2010	2011	2012	2013	2014
EQ - COMMITTED*	\$1,116,000	\$330,000	\$948,000			
EQ - NEW (2010 Competition)	\$677,601	\$519,604	\$155,000			
EQ - TOTAL	\$1,793,601	\$849,604	\$1,103,000			
THEORY-COMMITTED	\$2,561,265	\$2,623,000	\$1,904,000	\$1,207,000	\$577,000	
THEORY - NEW (2010 Competition)	\$772,000	\$816,500	\$798,500	\$683,500	\$507,500	\$507,500
THEORY - TOTAL	\$3,333,265	\$3,439,500	\$2,702,500	\$1,890,500	\$1,084,500	\$507,500
EXP OPS** - COMMITTED	\$4,937,500	\$10,603,000	\$7,241,000	\$15,000	\$15,000	
EXP OPS - NEW (2010 Competition)	\$10,238,000	\$4,904,000	\$4,666,000	\$1,613,000	\$120,000	\$120,000
EXP OPS - TOTAL	\$15,175,500	\$15,507,000	\$11,907,000	\$1,628,000	\$135,000	\$120,000
MRS - COMMITTED	\$2,294,000	\$2,581,340	\$2,237,195	\$1,897,932	\$147,000	
MRS - NEW (2010 Competition)	\$710,000	\$331,468	\$196,000	\$196,000	\$196,000	\$196,000
MRS/MFA - TOTAL	\$3,004,000	\$2,912,808	\$2,433,195	\$2,093,932	\$343,000	\$196,000
TOTAL - COMMITTED	\$10,908,765	\$16,137,340	\$12,330,195	\$3,119,932	\$739,000	\$0
TOTAL - NEW (2010 Competition)	\$12,397,601	\$6,571,572	\$5,815,500	\$2,492,500	\$823,500	\$823,500
GRAND TOTAL	\$23,306,366	\$22,708,912	\$18,145,695	\$5,612,432	\$1,562,500	\$823,500
TOTAL ENVELOPE	\$22,939,169	\$22,859,854	\$22,627,051	\$22,627,051	\$22,627,051	\$22,627,051
ADJUSTMENT (FORWARD BORROW/REIMBURSEMENT)	\$600,000	-\$150,000	-\$150,000	-\$150,000	-\$150,000	
CARRY FORWARD (2009 & 2010) / AVAILABLE	\$232,803	\$942	\$4,332,298	\$16,864,619	\$20,914,551	\$21,803,551

* The committed amount for equipment includes the \$300,000 to be paid by the envelope to NSERC's main RTI program as a reimbursement of the payment NSERC made towards ATLAS' Cost-to-Completion. Up to FY 2010-11.

** EXP OPS = Experimental Operations

Table 3. Breakdown of multiyear commitments at the end of the 2010 competition.

**2010 COMPETITION
ENVELOPE SHARE
THEORY / OPERATIONS / EQUIPMENT**

	2006	2007	2008	2009	2010
THEORY	14%	13%	15%	14%	15%
EXPERIMENTAL OPERATIONS	71%	72%	69%	78%	81%
EQUIPMENT	15%	15%	16%	8%	4%

Table 4. Envelope share in theory, experimental operations, and equipment, from 2006 to 2010.

objective during Round 3. Subsequently, the members rated each candidate on a scale of 1 (excellent) to 5 (below average) through a secret vote, and one candidate was selected by numerical tally of the Section's votes.

The DAS program is not aimed at Project grant applications. As indicated in last year's annual report, a procedure is available for any member of a Collaboration submitting a Project grant application to be considered by SAPES for the DAS program. This year, no individuals were put forward by the Collaborations that submitted Project grant applications.

XIII. Policy Matters

At the end of the competition, the Committee had a session devoted to policy matters. Some of the key points that arose are summarized below.

2011-2016 Long-Range Plan

The Team Leader briefed SAPES members on the 2011-2016 Long-Range Plan (LRP) for Canadian Subatomic Physics. The LRP Committee has now been established; it will start its activities in June 2010. It was stressed that the LRP is a powerful tool that, coupled to the SAPES envelope, has proved to be essential to the numerous successes achieved by our community on the international stage.

Fall Site Visits and Visits of Canadian Institutions

Stressing budgetary pressures, NSERC's Vice-President Isabelle Blain questioned the need for Site Visits, the fall face-to-face policy meeting, and SAPES visits of Canadian Institutions, and asked SAPES members for their opinion on this matter.

SAPES members were unanimous that the Site Visits are of the utmost importance in the Evaluation Section's review process of large and complex requests, and that they are necessary for a responsible and efficient management of the envelope. Many SAPES members felt sufficiently strongly about this point that the idea was entertained of covering some or all of the Site Visits costs from the envelope. SAPES members urged NSERC to maintain the Site Visits as an integral part of the Evaluation Section's activities.

The Chair lauded the objective and value of the fall visits of Canadian institutions, which provide an exceptional venue for all the members (but more particularly for those from outside Canada, which represent at least 50% of the Section) to meet the Canadian community and understand first-hand the conditions in which they are working. Furthermore, the Policy Meeting, conducted the first day of the fall visits, is essential to new SAPES members to familiarize themselves with NSERC and SAPES operating procedures, to be informed of the process leading to competition week, and to meet the returning members. If it were no longer possible to fund such visits, it was argued that

they could possibly be limited to experimental facilities, such as SNOLAB and TRIUMF, but this would be a loss for the SAP community. It was strongly recommended that the fall face-to-face policy meeting be maintained.

XIV. Meeting with CFI Vice-President, Programs and Planning

NSERC's Vice-President Isabelle Blain invited Jac van Beek, Vice-President, Programs and Planning at CFI, to meet with SAPES members after the end of the competition. Mr. van Beek briefed the Section members on the CFI mandate and activities, and its peer review process. This meeting was a unique opportunity for SAPES members to express their great interests in CFI support, but also their concerns mentioned earlier in this report, and the desirability of a link between CFI's review process and the SAP community's Long-Range Plan.

Appendix 1

**SUBATOMIC PHYSICS EVALUATION SECTION
2010 COMPETITION
LARGE PROJECT DAY**

**Sunday, February 7, 2010
Laurier Room (Lower Level)
Marriott Hotel, 100 Kent Street, Ottawa, Ontario**

7h45 - 8h30	Committee's Working Breakfast - <i>in camera</i>	
8h30 - 9h00	Meeting with Perimeter Institute - <i>in camera</i>	N. Turok
9h00 - 9h30	Meeting with the Institute of Particle Physics - <i>in camera</i>	W. Trischuk
9h30 - 10h00	Meeting with the Canadian Institute of Nuclear Physics – <i>in camera</i>	K. Sharma
10h00 - 10h30	Meeting with TRIUMF - <i>in camera</i>	Gordon Ball
10h30 - 10h45	<i>Coffee Break</i>	
10h45 - 11h45	SNOLAB Operations Support	A. Noble
11h45 - 12h45	<i>Lunch</i>	
12h45 - 13h30	ATLAS Upgrade	R. McPherson
13h30 - 14h30	DEAP-3600 Construction and Installation at SNOLAB	M. Boulay
14h30 - 15h30	SNO+	M. Chen
15h30 - 15h45	<i>Coffee Break</i>	
15h45 - 16h30	Search for Dark Matter with the PICASSO Experiment	V. Zacek
16h30	Committee meets <i>in camera</i>	

NOTE: 1 hour presentations: 30 min. of presentation and 30 minutes for Q&A.
45 min. presentations: 25 min. of presentation and 20 min. for Q&A.
30 min. presentations: 20 min. of presentation and 10 min. for Q&A.