

**FY 2007 REPORT TEMPLATE FOR
NSF COMMITTEES OF VISITORS (COVs)**

The table below should be completed by program staff.

Date of COV: July 17-18, 2007
Program/Cluster/Section: NSF Scholarships in Science, Technology, and Mathematics
Division: Division of Undergraduate Education
Directorate: Directorate for Education and Human Resources
Number of actions reviewed: Awards: 30 Declinations: 60 Other: 2
Total number of actions within Program/Cluster/Division during period under review: Awards: 281 Declinations: 545 Other: 68
Manner in which reviewed actions were selected: The NSF staff randomly selected award jackets and declinations for the S-STEM COV review by sorting proposals according to the last digit of each proposal ID number. Each proposal ending in '4' was selected for COV review. This resulted in a list that comprised approximately 10% of all proposals submitted to S-STEM during FY2003, 2004 and 2006. These proposals consisted of 30 awards, 60 declines, and two return-without-review proposals. The selection process chosen for S-STEM was pre-approved by the Chair of the COV.

The 2007 COV review of NSF's Scholarships in Science, Technology and Mathematics (S-STEM) Program took place on July 17 and 18 at NSF Headquarters in Arlington, VA. Members of the COV were: Jane Daniels (chair), *The Henry Luce Foundation*; Madelaine Bates, *CUNY Bronx Community College*; Susan Metz, *Stevens Institute of Technology*; Tony Mitchell, *North Carolina State University*; and Donald Wink, *University of Illinois Chicago*. We would like to take this opportunity to formally express our appreciation to Duncan McBride; Kasey Yturralde, Susanna Olague, and Lacy Holland-Wallace for their excellent work in preparing us for our responsibilities and their assistance while we conducted our review. Kasey Yturralde was particularly efficient in securing documents we needed and providing assistance with the E-Jacket system. Each of you made our difficult task a bit less daunting. We also appreciate the receptiveness of Cora Marrett, Bernice Anderson, Linda Slake, Corby Hovis, and other DUE program directors as we shared our preliminary findings.

PART A. INTEGRITY AND EFFICIENCY OF THE PROGRAM'S PROCESSES AND MANAGEMENT

A.1 Questions about the quality and effectiveness of the program's use of merit review procedures. Provide comments in the space below the question. Discuss areas of concern in the space provided.

QUALITY AND EFFECTIVENESS OF MERIT REVIEW PROCEDURES	YES, NO, DATA NOT AVAILABLE, or NOT APPLICABLE ¹
---	---

¹ If "Not Applicable" please explain why in the "Comments" section.

<p>1. Is the review mechanism appropriate? (panels, ad hoc reviews, site visits)</p> <p>Comments: The review mechanism seems to be appropriate. The COV reviewed a random sample of proposals submitted in three cycles (2003 and 2004 of the CSEMS program and 2006 of the S-STEM program). The sample consisted of 30 awarded and 60 declined proposals.</p> <p>Most of the reviewers adhered to the Proposal Recommendation Process and summarized the proposal's intellectual merit and broader impact. A majority of the proposals were reviewed by four or five reviewers.</p> <p>There were no site visits involved in the S-STEM program.</p>	<p>Yes</p>
<p>2. Is the review process efficient and effective?</p> <p>Comments: Prior to the meeting, the reviewers were provided with the procedures for the review process that included the procedures and descriptions of the ratings. After each member of the panel had reviewed the proposal, a Panel Summary (summary of discussion not a summary of individual reviews) was prepared by a member of the panel. This and the individual reviews were used by the program officer to prepare a Review Analysis which provides the panels' ratings for internal use. This is a very efficient and effective process. In the proposals the COV examined, almost all the reviews supported the decision to Recommend or Decline. There were two proposals which received favorable ratings which the program officer did not recommend funding. In each case, the COV agreed that there was a justifiable reason for his/her decision.</p>	<p>Yes</p>
<p>3. Do the individual reviews (either mail or panel) provide sufficient information for the principal investigator(s) to understand the basis for the reviewer's recommendation?</p> <p>Comments: The majority of individual reviews provided enough information for the principal investigator to support the reviewer's recommendation. Among the Recommended projects that the COV reviewed, there were two or three instances that an individual raised a weakness in the proposal or in the institution's academic program that was not reflected in either the Panel Summary or in the Review Analysis.</p>	<p>Yes</p>
<p>4. Do the panel summaries provide sufficient information for the principal investigator(s) to understand the basis for the panel recommendation?</p> <p>Comments: There is wide variability in the comprehensiveness of the Panel Summaries from one paragraph to two pages. In general, there may not be sufficient information for the principal investigator(s) to understand the basis for the panel's recommendation.</p>	<p>Yes</p>

<p>5. Is the documentation for recommendations complete, and does the program officer provide sufficient information and justification for her/his recommendation?</p> <p>Comments: In the vast majority of the proposals reviewed by the COV that were recommended or declined for funding, the program officer's Review Analysis provides a summary of the ratings and recapitulates the Panel Summary of the individual reviews. This is a sufficient justification for his/her recommendations.</p>	<p>Yes</p>
<p>6. Is the time to decision appropriate?</p> <p>Comments: The time to decision in the proposals reviewed by the COV was extremely good. On average, over 75% of the decisions were made within six months. Only one took longer than 12 months and that was a proposal for which the program officer had a number of questions for the principal investigator before a recommendation to fund was made.</p>	<p>Yes</p>
<p>7. Additional comments on the quality and effectiveness of the program's use of merit review procedures:</p> <p>None</p>	

A.2 Questions concerning the implementation of the NSF Merit Review Criteria (intellectual merit and broader impacts) by reviewers and program officers.

Provide comments in the space below the question. Discuss issues or concerns in the space provided.

IMPLEMENTATION OF NSF MERIT REVIEW CRITERIA	YES, NO, DATA NOT AVAILABLE, or NOT APPLICABLE ²
<p>1. Have the individual reviews (either mail or panel) addressed both merit review criteria?</p> <p>Comments: Among the individual reviews 100% of all awards that the COV reviewed and 100% of a sample of declinations did address both merit review criteria.</p>	<p>YES</p>

² In "Not Applicable" please explain why in the "Comments" section.

<p>2. Have the panel summaries addressed both merit review criteria?</p> <p>Comments: Among the panel summaries reviewed by the COV 52% of all awards did address both merit review criteria.</p> <p>54% of the '06 declinations reviewed (50% sample) addressed both merit review criteria.</p> <p>60% of the '04 declinations reviewed addressed both criteria.</p> <p>87% of the '03 declinations reviewed addressed both criteria.</p>	<p>YES</p>
<p>3. Have the <i>review analyses</i> (Form 7s) addressed both merit review criteria?</p> <p>Comments: Among the review analyses 100% of all awards reviewed by the COV and 100% of a sample of declinations did address both merit review criteria.</p>	<p>YES</p>
<p>4. Additional comments with respect to implementation of NSF's merit review criteria:</p> <p>The <i>review analyses</i> and <i>individual reviews</i> have a consistent emphasis on the “intellectual merit” and “broader impacts” criteria. It is apparent that these questions are specifically asked on the form itself, and/or the instructions to reviewers include the requirement to respond to these questions directly.</p> <p>There is not a consistent emphasis on the “intellectual merit” and “broader impacts” criteria in the <i>panel summaries</i>. Most often, panel summaries cover strengths and weaknesses of the proposal to varying detail and extent. Inherent in the discussion of strengths and weaknesses is the concept of “intellectual merit”, but “broader impacts” are rarely included. A requirement and/or change in form that stipulates that the panel summary address and cite strengths and weaknesses within the topics of “intellectual merit” and “broader impact” can easily solve this concern.</p>	

A.3 Questions concerning the selection of reviewers. Provide comments in the space below the question. Discuss areas of concern in the space provided.

SELECTION OF REVIEWERS	YES , NO, DATA NOT AVAILABLE, or NOT APPLICABLE ³
<p>1. Did the program make use of an adequate number of reviewers?</p>	<p>Yes</p>

³ If “Not Applicable” please explain why in the “Comments” section.

<p>Comments: Except for one review panel in the 2006 cohort, all proposals had at least four reviewers rate the project. A thorough check of panel members' discipline against the type of proposals they reviewed indicated an excellent attempt to match the two. Panels were diverse in terms of disciplines and institution type. In the case of that one 2006 cohort panel, all 11 proposals assigned to that panel were reviewed by the COV. Nine of the 11 were from PIs at community colleges and the panel members all were from community colleges or comparable environments. Ratings assigned by the three reviewers to the eleven proposals were appropriate. The COV reviewed recommendations and final actions on these and found no cause for concern since none of the three had conflicts of interest with any of the proposals, and all proposal received at least three reviews.</p>	
<p>2. Did the program make use of reviewers having appropriate expertise and/or qualifications?</p> <p>Comments: In response to the 2002 COV recommendation, the program now collects discipline information on panel reviewers. After reviewing the database for all proposals processed in the three cohorts, a majority of awards and declines randomly selected by the program for review by the COV, plus another eleven assigned to a 2006 cohort panel with only three members, the COV is satisfied that this requirement is being met. However, identifying industry and information technology experts to serve as panel members continues to be a challenge for this program.</p>	<p>Yes</p>
<p>3. Did the program make appropriate use of reviewers to reflect balance among characteristics such as geography, type of institution, and underrepresented groups?⁴</p> <p>Comments: In response to the last COV recommendation, the program has developed 'Selection of Reviewer' procedures that resulted in what appears to be a much larger, more diverse reviewer pool. A spot check of reviewer demographics against proposals they reviewed indicates the program is making reasonable attempts to ensure balance. Summary reviewer demographics for all three cohorts indicate a reasonable balance in terms of the characteristics cited in this question, including underrepresented groups. Desired program efforts to expand the pool of reviewers to include student services and financial aid professionals are commendable. However, it would be helpful if, in addition to education degree, the panel reviewers' current job title is also collected. The program should continue to refine these procedures and document as appropriate, the extent to which selected reviewers are meeting established selection procedures objectives.</p>	<p>Yes</p>
<p>4. Did the program recognize and resolve conflicts of interest when appropriate?</p>	<p>Yes</p>

⁴ Please note that less than 35 percent of reviewers report their demographics last fiscal year, so the data may be limited.

<p>Comments: The COV checked a database of all panel results for the three cohort proposals under review, to see if COIs reduced the number of reviews below an acceptable number, and found none. In the case of one 2006 cohort where one panel only had three members, no COIs were reported for any of the 11 proposals assigned to this panel.</p>	
---	--

5. Additional comments on reviewer selection:

Although the question ‘Did the panel provide adequate documentation to justify actions taken?’ was deleted from the current template in this section, a confirmation spot check seemed appropriate for this program. Each of the three cohorts of proposals was checked for consistency by examining the scores of low-rated proposals funded and high-rated proposals rejected. In two of the three cohorts, at least one rejected proposal scored significantly higher than another that was funded. A thorough check was made of these four proposals. Information contained in the review analysis for the rejected proposals was more than adequate to justify rejection of the two proposals that scored higher. The recommendations of panels were appropriately considered and the program made reasonable final decisions based on additional information available to the program on prior PI history and performance. All final decisions and actions taken appear to be appropriate.

The last COV recommended inclusion of more industry and information technology reviewers as panel members. The program continues to be challenged with that goal and expressed difficulty in finding and convincing these professionals to serve on review panels. The current COV suggests linkage to or soliciting suggestions from university-industry partnerships and professional organizations may help. Targeted groups may include university cooperative education programs, the national Conference on Industry and Education Collaboration, university programs and academic departments’ industrial advisory boards, and university career service officers’ recruiting networks. Other sources for potential industry reviewers could be scholarship selection committees of technical and diversity-based organizations such as SWE, GEM, AWIS, IEEE, ASME, AIChE, ACM, etc. If the NSF supported Corporate Foundation Alliance were revived, this would be another excellent source of potential reviewers from the STEM workforce.

A.4 Questions concerning the resulting portfolio of awards under review. Provide comments in the space below the question. Discuss areas of concern in the space provided.

<p>RESULTING PORTFOLIO OF AWARDS</p>	<p>APPROPRIATE, NOT APPROPRIATE⁵, OR DATA NOT AVAILABLE</p>
---	---

⁵ If “Not Appropriate” please explain why in the “Comments” section.

<p>1. Overall quality of the research and/or education projects supported by the program.</p> <p>Comments: The projects are rated very high by the reviewers, who seem to be consistent among themselves in almost all cases where an award is made. This includes indications of particular merit or impact in each of the projects that received an award. The emphases included making sure that the projects supported multiple aspects of the educational experience of students, although this varied from project to project. Research was occasionally discussed in the proposal and was noted positively by the reviewers, but this was not consistent. This is understandable given the scarcity of models for the fact that many awards are for freshmen and sophomore students; have a focus on engineering, computer science, and mathematics; and that the program has relatively few funds for activities outside of student support. There were a few proposals that sought to document changes in pedagogy that would be supported in conjunction with these programs (for example, peer learning). However, the scope of the S-STEM project means that there are essentially no funds for new educational innovations in courses themselves.</p>	<p>Yes</p>
<p>2. Are awards appropriate in size and duration for the scope of the projects?</p> <p>Comments: Almost all awards follow the guidelines of a maximum award, with the number of awards to students calculated to use the available funds. This means that the number of students receiving an award varies by institution, since tuition and fee costs vary also. The duration of the projects (four years) seems appropriate, although it means that very few students can be followed to graduation.</p>	<p>Yes</p>
<p>3. Does the program portfolio have an appropriate balance of:</p> <ul style="list-style-type: none"> • Innovative/high-risk projects?⁶ <p>Comments: The projects that have received awards often have one or more aspects that are recognized by the reviewers as distinctive. These range from having strong support systems (such as learning communities, tutorial services, and research placements) to innovative recruitment efforts (such as community outreach). However, the average proposal in the sample we reviewed had only six references with fewer than four to the literature of STEM recruitment and retention. Many proposals had no references at all. This lack of reference to literature suggests that the programs are not based on knowledge or evaluation of other programs.</p>	<p>Yes</p>

⁶ For examples and concepts of high risk and innovation, please see Appendix III, p. 66 of the Report of the Advisory Committee for GPRA Performance Assessment, available at <www.nsf.gov/about/performance/acgpa/reports.jsp>.

<p>4. Does the program portfolio have an appropriate balance of:</p> <ul style="list-style-type: none"> • Multidisciplinary projects? <p>Comments: The education of students naturally occurs in more than one discipline. Therefore, it is not surprising to find multiple disciplines, especially mathematics in combination with a natural science or engineering program, present in many proposals. There were relatively few examples of projects that attempted to support or educate students in an interdisciplinary fashion.</p>	<p>Yes</p>
<p>5. Does the program portfolio have an appropriate balance of:</p> <ul style="list-style-type: none"> • Funding for centers, groups and awards to individuals? <p>Comments: All proposals in the projects that we reviewed included multiple PI's, a very positive sign. This often included individuals from multiple departments who had specific roles in managing the program and working with students. The presence of student support centers, such as Minority Engineering Programs, was often a prominent part of the project. However, research centers did not appear. This is appropriate.</p>	<p>Yes</p>
<p>6. Does the program portfolio have an appropriate balance of:</p> <ul style="list-style-type: none"> • Awards to new investigators? <p>Comments: Within the full proposal listings we find that almost one third of proposals go to new PI's. In a few cases this is because there has been a change in a PI from a previously funded CSEMS. However, it is still true that this program brings in many PI's who have never had any kind of NSF grant.</p>	<p>Yes</p>
<p>7. Does the program portfolio have an appropriate balance of:</p> <ul style="list-style-type: none"> • Geographical distribution of Principal Investigators? <p>Comments: The geographical distribution of awards is consistent across the Nation—with about one award per one million persons. Although a statistical analysis was not performed, it is apparent that no region of the country has a disproportionate share of the awards. Similarly, several states with relatively small populations have received a proportionate share of the awards.</p>	<p>Yes</p>
<p>8. Does the program portfolio have an appropriate balance of:</p> <ul style="list-style-type: none"> • Institutional types? <p>Comments: As with both the experience of the PI's and their geographic distribution, the institutional types are closer to a balance that reflects the distribution of students in the US. There are several awards that have been made to community colleges and comprehensive</p>	<p>Yes</p>

<p>institutions. Relatively few seem to have been made to liberal arts colleges and to research universities. This is appropriate given the importance of community college and comprehensive institutions as entry points for STEM majors. Data on the whole program shows an approximately equal distribution among associates, bachelors, masters, and doctoral institutions. This matches the data on the applications received. However, doctoral institutions have become dominant, a trend which should be monitored.</p> <p>The COV notes that there are no examples of multi-institutional grants within the sample set. This means an opportunity to support students through the transition from two-year to four-year institutions may be missed.</p>	
<p>9. Does the program portfolio have an appropriate balance of:</p> <ul style="list-style-type: none"> • Projects that integrate research and education? <p>Comments: Some of the projects have explicit discussion of research for the students, but in these cases the research is an opportunity for the students, not a basic part of the program. This makes sense given the resources involved. However, the unevenness of research opportunities may mean that some students are not being brought further into the STEM education pipeline.</p>	<p>Yes</p>
<p>10. Does the program portfolio have an appropriate balance:</p> <ul style="list-style-type: none"> • Across disciplines and subdisciplines of the activity and of emerging opportunities? <p>Comments: In the case of these grants, we interpret balance as a question of disciplinary focus. There is a good balance of the original CSEMS disciplines—computer science, engineering, and mathematics. The revision of the program to include natural science has resulted in only a few programs that include that area, either in conjunction with CSEM or as standalone. We expect this to change as the natural science undergraduate education community becomes more aware of the S-STEM program. The data on disciplines served from the NSF Form 1295, however, seem to be skewed in terms of “NEC” programs, suggesting that the form is not capturing well the specific departments affected.</p>	<p>Yes</p>
<p>11. Does the program portfolio have appropriate participation of underrepresented groups?</p> <p>Comments: All awardees in the sample set gave clear indications of how they would make additional efforts to recruit underrepresented groups. Some featured this, including the development of innovative strategies. The self-report student demographic data shows that Black / African-American students are present in large numbers (16.6%), showing that the program has achieved balance closer to the demographics of US</p>	<p>Yes</p>

<p>students. Data on Latino / Latina students is not available for comparison, however.</p> <p>Statistics were also presented to the COV that indicated a good mix of PIs and Co-PIs who were female and members of underrepresented racial and ethnic group. The COV also found it very positive that the proportion from both of these categories (gender and race/ethnicity) has increased from FY2003 to FY2006.</p>	
<p>12. Is the program relevant to national priorities, agency mission, relevant fields and other customer needs? Include citations of relevant external reports.</p> <p>Comments:</p>	<p>NA</p>
<p>13. Additional comments on the quality of the projects or the balance of the portfolio:</p> <p>The balance of the projects in the portfolio seems appropriate to the goal of having scholarships available in ways that will match the demographics, including enrollment patterns, of undergraduate STEM students. Geographic balance is also present. The quality of the proposals, as noted, is clearly seen to be high, usually because of one or more clear elements of strength in terms of recruiting and retaining students in STEM majors. However, the lack of a linkage to other strategies for improving the experience of STEM undergraduates—for example, research-based reformed pedagogy or induction into research or design projects—is problematic.</p> <p>A comparison of the S-STEM awards and those who received CCLI grants in the four year period 1999-2002 (as a sample period) showed more than half of the institutions that had an S-STEM award had a CCLI in that time period. There were more than 20 S-STEM grants given to a PI who had a CCLI award. Examining these overlap cases to see what, if any, benefit accrued to an S-STEM proposal that was able to make use of CCLI-supported innovations, would be a way to test if “cross-fertilization” between the programs could and should be encouraged.</p> <p>In the same vein, the lack of references in the proposals to current research and optimal practice in pedagogy and students services is a concern, suggesting that innovation may be ad hoc and not based in the literature.</p>	

A.5 Management of the program under review. Please comment on:

<p>1. Management of the program.</p> <p>Comments: The overall management of the program appears to be very effective. Specific comments on management pertaining to the quality and effectiveness of the program’s use of merit review procedures; implementation of NSF review criteria; selection of reviewers; and the resulting portfolio of awards are addressed earlier in this report (sections A.1 through A.4 respectively).</p>
--

The COV finds the management of the S-STEM program very capable and extremely flexible in responding to changing legislation and accommodating a different number or distribution of proposals than anticipated.

The COV believes that further development of a system for student recipient tracking is necessary for effective S-STEM program management. NSF staff or external contractors need to develop a consistent tracking system that is appropriate across institutions and time. The COV could find very little outcome assessment information to ascertain if the S-STEM program is achieving goals set forth in the program solicitations and management plans.

The COV believes that the S-STEM program staff has done an excellent job of increasing the number and diversity of individuals in the pool of potential reviewers. We recommend that the staff focus on continued development of the reviewer pool with particular attention to increasing the representation of scientists and engineers employed in the scientific and technical workforce. (See A.3.5 for additional recommendations)

2. Responsiveness of the program to emerging research and education opportunities.

Comments: The program could be more effective by suggesting in the solicitation that P.I.s investigate CCLI, ASA or STEP innovation that might exist at their institution, or others, and integrate the knowledge into their proposal. After awarding S-STEM grants, the program could help P.I.s learn about emerging educational research and best practices through an annual or biannual P.I. meeting. Two important benefits would result from such conferences – P.I.s who are faculty members focused on research and teaching in STEM disciplines would gain knowledge on research and best practices related to student support services; and P.I.s from institutions that do not have cutting edge innovations in curriculum and pedagogy would gain an understanding of practices that might improve the education of STEM students, particularly the scholarship recipients on their campus.

3. Program planning and prioritization process (internal and external) that guided the development of the portfolio.

Comments: The Program Management Plan, Timeline and Program Solicitation for each year reviewed by this COV guided the development of the portfolio.

4. Additional comments on program management:

In almost every case S-STEM program officers have successfully addressed the recommendations made by the 2002 COV. See Section A.3.5 for suggestions for increasing the participation of industry representation on the review panels as recommended in the 2002 COV report.

Several NSF programs have separate, fairly extensive databases for participant data collection. For example, LS-AMP uses QRC developed/hosted WebAmp/AmpMars report for annual collection and data reporting. S-STEM could benefit from having similar data collection procedures. That data would have benefitted the COV as we attempted to assess participant diversity and overall program success.

PART B. RESULTS OF NSF INVESTMENTS

B. Please provide comments on the activity as it relates to NSF’s Strategic Outcome Goals. Provide examples of outcomes (“highlights”) as appropriate. Examples should reference the NSF award number, the Principal Investigator(s) names, and their institutions.

B.1 OUTCOME GOAL for Discovery: *“Foster research that will advance the frontier of knowledge, emphasizing areas of greatest opportunity and potential benefit and establishing the nation as a global leader in fundamental and transformational science and engineering.”*

Comments: The S-STEM program is a scholarship program, not a research-focused program. Therefore the COV felt that this question was not applicable to the S-STEM program.

B.2 OUTCOME GOAL for Learning: *“Cultivate a world-class, broadly inclusive science and engineering workforce, and expand the scientific literacy of all citizens.”*

Comments: The goals of the S-STEM program are not specific to teaching and learning, but they do include the intent to increase the STEM workforce.

Some examples of S-STEM projects with notable accomplishments are: Award 9987227 at Green River Community College in Washington state; Award 0094454 at Monroe Community College; Award 0095228 at Miami-Dade Community College; and Award 9912177 at Temple University.

Please see section C for additional information that is indirectly related to this NSF outcome goal.

B.3 OUTCOME GOAL for Research Infrastructure: *“Build the nation’s research capability through critical investments in advanced instrumentation, facilities, cyberinfrastructure and experimental tools.”*

Comments: The COV did not find this question relevant to the S-STEM Program.

PART C. OTHER TOPICS

C.1 Please comment on any program areas in need of improvement or gaps (if any) within program areas.

The COV found five areas—some of them major gaps, others only minor improvements that

need attention.

1. A consistent, reliable program for tracking student recipients through job placement is needed.
2. The S-STEM program needs to provide guidelines to P.I.s for program-specific information that should be included in the Annual Report. In addition the COV recommends that program officers be more pro-active in encouraging the submission of annual reports. A review of jackets for 2003 & 2004 revealed that 69% of the jackets had no annual report (31%) or annual reports that were too brief (38%) to provide worthwhile information to assess progress (see C.2)
3. The program has not integrated itself well within the scope of work in DUE. Although keeping it as a standalone, scholarship-focused program makes sense, we noted that few proposals sought to show that students would experience supportive pedagogy in their STEM learning, perhaps diminishing the impact of the S-STEM scholarships. Of course, the scope of the S-STEM project means that there are little or no funds for new educational innovations or for new student support services. Still, reference to prior or ongoing reform of teaching and learning for STEM majors or to significant innovation in student support systems does much to show that a campus was amenable to student progress in STEM degree tracks. Similarly, requiring more systematic exposition of the rationale for particular ideas (e.g., by citing relevant literature or previously funded projects) would help investigators (and the NSF) be more confident that changes in student experience were linked to research-based innovations. (based on items in A.4)
4. Program management should give more attention to disseminating information to the natural sciences communities for the next few years, until they become familiar with the S-STEM program.
5. Effectiveness of individual and panel reviews could be improved by more specific guidelines for Panel Summaries and a reminder to reviewers of the program-specific interpretation of intellectual merit and broader impact as stated in the Program Solicitation.

C.2 Please provide comments as appropriate on the program's performance in meeting program-specific goals and objectives that are not covered by the above questions.

To assess the program's performance in meeting program-specific goals and objectives the COV decided to focus on the program solicitation goals rather than respond to questions B.1, B.2 and B.3 which were not directly relevant to S-STEM.

Program solicitation goals:

- Improved educational opportunities for students
- Increased retention of students to degree achievement
- Improved student support programs at institutions of higher education
- Increased numbers of well educated and skilled employees in technical areas of national need.

By direction of the Program Staff, comments are based on three sources of information:

- Phase One Summary Report
- Phase Two Survey Findings 2003-2004 Summary Report
- Annual reports (finals are not due yet) for 2003 and 2004 awards.

Although the Phase One Summary Report and the Phase Two Survey Findings 2003-2004 Summary Report presented interesting information, the COV recognizes that the information is not based on the cohorts under review. The annual reports of the 2003 and 2004 awards presented varying degrees of information related to the S-STEM program solicitation goals:

- 31% of the jackets reviewed had no reports.
- 38% of the jackets reviewed had very brief reports or were void of student data related to retention or tracking.
- 31% of the jackets reviewed had sufficient student data to be able to track results, though not presented in any uniform way because there is no requirement to do so. Some programs appeared very successful in meeting the goals of S-STEM in terms of retaining the students, improving student support programs and increasing educational opportunities for students, while some did not.

A full evaluation with rigorous methodology is needed to be able to tell if the program is meeting the program solicitation goals. An initial effort of this has been done prior to the period studied by the COV, but that did not have the depth required. This evaluation would be independent of, but should link with a data based study of student tracking within and beyond the S-STEM scholarship period.

C.3 Please identify agency-wide issues that should be addressed by NSF to help improve the program's performance.

Our comments about the need to track students relate to a more general problem that is agency-wide. That is obtaining quality longitudinal information on student progress through undergraduate STEM majors. This program, and others, might be served well by a broad, widely available tracking system that would work with a sample of students from multiple STEM education initiatives.

The COV recommends that NSF add the headings “Intellectual Merit” and “Broader Impact” to the Panel Summary template on Fastlane, so that all summaries reflect information pertaining to both review criteria (as is currently done on the individual reviews and the review analysis).

C.4 Please provide comments on any other issues the COV feels are relevant.

The question of part time students remains a pressing one for promoting undergraduate STEM majors by non-traditional students. We recognize that many institutions may not be able to work effectively with part-time students. But we recommend that the program consider inviting a limited number of proposals that focus on part-time students specifically, so to investigate how part-time students can be supported by S-STEM scholarships, for

example when students are advanced in their STEM major but need to finish college part-time.

C.5 NSF would appreciate your comments on how to improve the COV review process, format and report template.

Process: The COV has no suggestions for improvement, but we would like to reiterate our appreciation of NSF staff members' ability to prepare the COV for its work and their willingness to respond quickly to our needs during the review.

Report Template: The COV suggests that NSF consider a "Section D" that would permit individual programs to include important program-specific questions in the COV template.

SIGNATURE BLOCK:

For the COV of the Scholarships in Science, Technology, and Mathematics Program
Jane Daniels
Chair