

**CORE QUESTIONS and REPORT TEMPLATE**  
**for**  
**FY 2004 NSF COMMITTEE OF VISITOR (COV) REVIEWS**

**(Please note:** Because calendar year 2004 is the last year in which a competition will be held for this program some of the questions in the accompanying document may seem inappropriate. We have marked those so you are aware that you need not address those issues. In addition other items needed to be edited from the usual text so they applied to a sunsetted program. We have edited the text accordingly so those of you who have served on other COV will find the text of the directions slightly different for this COV than for others.)

**Guidance to NSF Staff:** This document includes the FY 2004 set of Core Questions and the COV Report Template for use by NSF staff when preparing and conducting COVs during FY 2004. Specific guidance for NSF staff describing the COV review process is described in Subchapter 300-Committee of Visitors Reviews (NSF Manual 1, Section VIII) that can be obtained at <http://www.inside.nsf.gov/od/gpra/>.

NSF relies on the judgment of external experts to maintain high standards of program management, to provide advice for continuous improvement of NSF performance, and to ensure openness to the research and education community served by the Foundation. Committee of Visitor (COV) reviews provide NSF with external expert judgments in two areas: (1) assessments of the quality and integrity of program operations and program-level technical and managerial matters pertaining to proposal decisions; and (2) comments on how the outputs and outcomes generated by awardees have contributed to the attainment of NSF's mission and strategic outcome goals.

Many of the Core Questions are derived from NSF performance goals and apply to the portfolio of activities represented in the program(s) under review. The program(s) under review may include several subactivities as well as NSF-wide activities. The directorate or division may instruct the COV to provide answers addressing a cluster or group of programs – a portfolio of activities integrated as a whole – or to provide answers specific to the subactivities of the program, with the latter requiring more time but providing more detailed information.

The Division or Directorate may choose to add questions relevant to the activities under review. NSF staff should work with the COV members in advance of the meeting to provide them with the report template, organized background materials, and to identify questions/goals that apply to the program(s) under review.

**Guidance to the COV:** The COV report should provide a balanced assessment of NSF's performance in two primary areas: (A) the integrity and efficiency of the **processes** related to proposal review; and (B) the quality of the **results** of NSF's investments in the form of outputs and outcomes that appear over time. In the case of sunsetted programs such as this the COV can also be asked to explore the relationships between award decisions and program/NSF-wide goals in order to inform NSF of how lessons learned from this program can lead to improved design and management of future programs with similar aims and structure. Discussions leading to answers for Part A of the Core Questions will require study of confidential material such as declined proposals and reviewer comments. *COV reports should not contain confidential material or specific information about declined proposals.* Discussions leading to answers for Part B of the Core Questions will involve study of non-confidential material such as results of NSF-funded projects. It is important to recognize that the reports generated by COVs are used in assessing agency progress in order to meet government-wide performance reporting requirements, and are made available to the public. Since material from COV reports is used in NSF performance reports, the COV report may be subject to an audit.

*We encourage COV members to provide comments to NSF on how to improve in all areas, as well as suggestions for the COV process, format, and questions.*

**FY 2004 REPORT TEMPLATE FOR  
NSF COMMITTEES OF VISITORS (COVs)**

Date of COV <u>August 9 and 10, 2004</u>
Program/Cluster: NSF- NATO Postdoctoral Fellowships in Science and Engineering
Division: <u>Graduate Education</u>
Directorate: <u>EHR</u>
Number of actions reviewed by COV <sup>[1]</sup> : Awards: <u>18</u> Declinations: <u>41</u> Other: <u>2</u>
Total number of actions within Program/Cluster/Division during period being reviewed by COV <sup>[2]</sup> : Awards: Declinations: Other:
Manner in which reviewed actions were selected: <u>Every fifth jacket for each year, both awarded and declined proposals</u>

**BACKGROUND**

The NSF-NATO postdoctoral Fellowships have the following goals:

- to promote the progress of science and closer collaboration between scientists and engineers of NATO Partner countries, and scientists and engineers in the United States;
- to recognize the accomplishments to date of beginning scientists and engineers; and
- to provide an experience in the US which will increase professional competence.

NSF has managed the NATO program since 1959 as it has gone through various changes including the cancellation of the senior fellows program and more recently (2002) the cancellation of the U.S. postdoctoral fellows going abroad. NATO has decided that the 2004 competition is the last competition under the current arrangement. NATO is restructuring and consolidating its science programs.

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

Briefly discuss and provide comments for *each* relevant aspect of the program's review process and management. Comments should be based on a review of proposal actions (awards, declinations, and withdrawals) that were *completed within the past three fiscal years*. Provide comments for *each* program being reviewed and for those questions that are relevant to the program under review. Quantitative information may be required for some questions. Constructive comments noting areas in need of improvement are encouraged. Please do not take time to answer questions if they do not apply to the program.

**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.

<b>QUALITY AND EFFECTIVENESS OF MERIT REVIEW PROCEDURES</b>	<b>YES, NO, DATA NOT AVAILABLE, or NOT APPLICABLE</b>
Is the review mechanism appropriate? (panels, ad hoc reviews, site visits) Comments:	Yes See comments

<p>The review mechanism followed the standard NSF procedure of peer review. After at least three ad hoc reviews were received for each proposal, a review panel was convened. Disciplinary sub panels within this panel examined relevant proposals and reviews in its discipline submitted by the ad hoc reviewers. The subpanel then presented their summary evaluation to the panel as a whole. All review panel members had then read all the reviews submitted by the subpanels.</p> <p>The choice of reviewers was an arduous process for this program as the specialty areas for which reviewers are needed are very broad and difficult to predict prior to the arrival of applications. Given this complication, we believe that the Program Manager has done a very good job of getting the appropriate reviewers.</p> <p>Also see answer to q.1 of Section A3.</p>	
<p>Is the review process efficient and effective?  Comments: Steps of the review process appear to have been done on time. There is evidence of correspondence with the PIs etc that clarify the process.</p>	<p>Yes</p>
<p>Are reviews consistent with priorities and criteria stated in the program's solicitations, announcements, and guidelines?  Comments:  For the most part, the reviews are consistent with guidelines although some of the reviews were sparse in detail. However, prior to 2003, Criterion 2 (broader impact) was often not applied evenly by the reviewers. Reviews were improved significantly in detail with the 2003 proposals.</p>	<p>Yes  See comments</p>
<p>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?  Comments:  Individual reviews are sometimes erratic and uneven in the details and in addressing the two criteria. The quality of reviews seemed to improve when the proposal page limit was increased from 3 to 5 pages.</p>	<p>Yes. See comments</p>
<p>Do the panel summaries provide sufficient information for the principal investigator(s) to understand the basis for the panel recommendation?  Comments:  In general, the panel summaries provided good information for the PIs, especially in the accepted proposals. There was a variation from year to year and between funded and not funded proposals, the former being clearer.</p>	<p>Yes.</p>
<p>Is the documentation for recommendations complete, and does the program officer provide sufficient information and justification for her/his recommendation?  Comments: Reasons for declination were not always clear. Part of this is due to the constraints of various kinds on the grant program. The attempt to distribute grants over countries and disciplines produced some apparent discrepancies. For example, one of the proposals receiving two "E"s and one "VG" had to be turned down, and the reason was not obvious until we spoke with the program officer and learned that it was because of the keen competition in that discipline, and an attempt to distribute successful grants across the disciplines.</p>	<p>Yes  See comments</p>

<p>These features, however, seem to be due to the nature of the program rather than an omission of the program officer.</p>	
<p>Is the time to decision appropriate? Comments:</p>	<p>Yes</p>
<p>Discuss issues identified by the COV concerning the quality and effectiveness of the program's use of merit review procedures:</p> <p>The integrity of the program management is high.</p> <p>The program director, who has done this for over a decade, has done a remarkable job in getting the reviewers and conducting reviews efficiently and in a timely manner, especially given the specially challenging nature of this program and the numerous issues of "calibration" because of the diversity of scientific cultures represented in the program. Carolyn Piper is to be especially commended for her thorough understanding and attention to this program. Because of her continuity of service, the "long term memory" of the program has been preserved.</p> <p>- Although a very good attempt is made to secure appropriate reviewers, the numerous specialties represented in the proposals in some instances led to a lack of specific expertise being represented in the subpanels. In these cases the reviews tended to be less informative and specific. A suggestion to overcome this would be to use information provided by U.S. host scientists in the "current and pending proposals" section of the proposal; reviewers recruited to consider the host scientists proposals to other NSF panels should also be well qualified to review NATO Fellowship proposals. We recognize the difficulties in getting reviewers, especially given all the time constraints.</p> <p>- 3 pages, the originally allowed length for proposals (before 2004) did not provide enough space to elaborate on the proposals, especially with respect to the broader impact. Changing the proposal length to 5 pages overcame that challenge.</p> <p>- There is no explicit statement in the proposal solicitations or review that asks for a description of the possibilities for future collaborations between the visiting scholar and host, or in general.</p> <p>The above points are worth remembering for any future program design.</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
<p>Have the individual reviews (either mail or panel) addressed whether the proposal contributes to both merit review criteria?</p> <p>Comments:            The focus of individual reviews seems to be on Criterion 1: Intellectual merit rather than the broader impact. This is a general issue with proposals from other programs as well and is not unique to this program. The attention to criterion 2 has improved significantly since the 2003 group. The short length (3 pages) allowed for the proposal prior to 2004 compounded this problem. "Broader impact" is an ambiguous term in general and is usually clarified in solicitations through sample questions and listing of attributes to help the proposal writer. In future solicitations for similar programs involving international exchange, NSF should pay special attention to providing examples of broader impact and ask a set of leading questions to enable response to Criterion 2. The program annual report for 2001 states that an additional criterion of the applicant's potential for further international collaboration is included. To what extent this criterion was followed in the reviews is not clear from the reviews and summaries examined by the COV. Some additional questions regarding the educational value (what the researchers will take back with them) and long-term collaboration between the researchers should be included.</p>	<p>Yes. See comments</p>
<p>Have the panel summary reviews addressed whether the proposal contributes to both merit review criteria?</p> <p>Comments:            As mentioned in the previous section, some panel summary reviews, especially those prior to 2003 did not always address criterion 2. They improved significantly from the 2003 proposals on.</p>	<p>Yes, partially before 2003. See comments</p>
<p>Have the <i>review analyses</i> (Form 7s) addressed whether the proposal contributes to both merit review criteria?</p> <p>Comments:            Form 7s were always clear on criterion 1, especially on accepted proposals. They tended to be less detailed on declined proposals.</p>	<p>Yes, for the most part</p>
<p>Discuss any issues or concerns the COV has identified with respect to NSF's merit review system.            - As this is an international program, there is bound to be ambiguity in the interpretation of</p>	

the merit review criteria. By using the NSF criteria in exactly the same sense as in the domestic proposals, the solicitations and hence reviews did not always account for the differences in the various professional and intellectual cultures from which these applications come.

Because of the information exchange and the more or less uniform adoption of scientific criteria, criterion 1, intellectual merit is more uniformly interpreted by all. Criterion 2 may be more culture-specific. (Here we mean culture in the broadest sense of the term, to include professional, institutional, and regional norms and practices).

Criterion 2 is important in this kind of program. In fact, it is more than just an NSF process – integrating research and outreach, and trying to communicate the scientific culture of the US are important aspects of international exchange. The final reports show only a few examples of criterion 2 kind of impact – mentoring, etc. In future programs of this type, it would be desirable to add more social responsibility and other social components to the program.

The other point is that the “product” here is as much, or perhaps more, the scholar than the science. This gives special meaning to both criteria. This point deserves reflection.

In future programs, we recommend that special attention be paid to the elaboration of the criteria with these cultural aspects in mind:

-- Spell out measures of intellectual merit (peer-reviewed publications?), opportunities to extend the work to other areas, etc.

-- Interpret broader impact to mean, for example:

- Collaboration to continue after the project
- Opportunities for the post-doctoral fellow
- Long-term prospects for the project and the scholar
- Likelihood of the project or postdoctoral training having an impact on the home country of the visitor through scholarly or economic means
- The extent to which some of the ethos of the social responsibility of science and scientists (reaching out for more inclusion of traditionally underrepresented populations, mentoring junior people, and other “educational outreach” characteristics of the U.S. scientific enterprise is conveyed to the visiting scholar through adjunct experiences while here, in addition to the purely scientific experience).

Giving such specific examples in the solicitations may be of help in articulating the goals of future programs.

**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
<p>Did the program make use of an adequate number of reviewers for a balanced review?  Comments:  A large number of reviewers were identified, and ad hoc reviewers selected from those based on the subject areas of the proposals, with request for suggestions for other reviewers.  The review panel was then convened based on the areas of the proposals; subject sub-panels then evaluated the individual proposals within their areas and presented summaries in the whole panel discussion.  We believe this process worked well on the whole; but once in a while, there was not an adequate representation among ad hoc reviewers or panel members of the specialty of a proposal, and one of the reviews tended to be sparse.</p> <p>Suggestion from a COV member: It may be useful to look at the reviewers on past proposals of the Host scientist related to the subject at hand, and use them as Ad hoc reviewers.</p>	Yes
<p>Did the program make use of reviewers having appropriate expertise and/or qualifications?  Comments: See remarks in sections above about the special efforts made</p>	Yes
<p>Did the program make appropriate use of reviewers to reflect balance among characteristics such as geography, type of institution, and underrepresented groups?  Comments:  This is not as strictly applicable or easy to apply for this program as for domestic proposals. Many aspects of reviewers, the special areas of expertise for example, need to be priorities in selection of reviewers.  However, to the extent possible this seems to have been done, by using the various databases of NSF which already follow these precepts.</p>	Yes



Did the program recognize and resolve conflicts of interest when appropriate?  
Comments:

Yes.

Discuss any concerns identified that are relevant to selection of reviewers.

It might be useful to draw from NSF databases from specific disciplines to select reviewers with most appropriate expertise in the subject area. For example, as described above, can the same reviewers be used who might have been selected to review the PI's proposals submitted to a chemistry panel.

The program has tried its best to get appropriate reviewers for a very diverse range of proposal areas and concentrations. The process also improved with time. It is almost impossible to avoid an occasional lack of fit of reviewer in a program with such diverse areas.

**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 align="center"><b>RESULTING PORTFOLIO OF AWARDS</b></p>	<p align="center"><b>APPROPRIATE, NOT APPROPRIATE, OR DATA NOT AVAILABLE</b></p>
<p>Overall quality of the research and/or education projects supported by the program. Comments: Synopsis of Programs and awards as well as review history were provided which indicate that the projects were of superior quality.</p>	<p>Appropriate</p>
<p>Are awards appropriate in size and duration for the scope of the projects? Comments: The brief length (one year or less) is not always conducive to the scope of many projects. This was however a variable not within NSF control for this program, but may be a consideration for other future programs.</p>	<p>Appropriate, but see comments</p>
<p>Does the program portfolio have an appropriate balance of: · High Risk Proposals? Comments: Given the diverse range of the projects and reviewers, this is not easily judged. "High risk" is not easy to interpret in this context.</p>	<p>Data not available</p>
<p>Does the program portfolio have an appropriate balance of: · Multidisciplinary Proposals? Comments: Proposals follow current trends in science – topics, approaches. This is good. The research areas involving interdisciplinary and cutting edge areas improved over time.</p>	<p>Appropriate</p>
<p>Does the program portfolio have an appropriate balance of: · Innovative Proposals? Comments: To the extent possible, Proposals follow current trends in science – topics, approaches. This is good.</p>	<p>Appropriate</p>
<p>Does the program portfolio have an appropriate balance of: · Funding for centers, groups and awards to individuals? Comments:</p>	<p>N/A</p>

<p>Does the program portfolio have an appropriate balance of:</p> <ul style="list-style-type: none"> <li>· Awards to new investigators?</li> </ul> <p>Comments: By definition, after the Senior Fellow component was eliminated, the program supports new investigators, namely, Postdoctoral fellows.</p>	<p>Appropriate See comments</p>
<p>Does the program portfolio have an appropriate balance of:</p> <ul style="list-style-type: none"> <li>· Geographical distribution of Principal Investigators?</li> </ul> <p>Comments: 17 of the 23 partner countries received grants in the period examined, although there was a much larger proportion of proposals from 2 or 3 countries. This type of balancing was done with care by the program director with attention to the quality of the proposals as well. Of the 23 or so NATO partner countries, NSF approved funding from seventeen of them showing an active attempt to have geographical distribution.</p>	<p>Yes. Within the guidelines of the NATO funding</p>
<p>Does the program portfolio have an appropriate balance of:</p> <ul style="list-style-type: none"> <li>· Institutional types?</li> </ul> <p>Comments:</p>	<p>Appropriate</p>
<p>Does the program portfolio have an appropriate balance of:</p> <ul style="list-style-type: none"> <li>· Projects that integrate research and education?</li> </ul> <p>Comments: It could be argued that the training of postdoctoral fellows is indeed education and that the program inherently integrates research and education. But this “integration” is used with a very specific meaning in domestic proposals and is a perhaps unique trend in the U.S. It may be desirable in the future to pay special attention to convey the various examples of such integration to the proposers and ask the PIs (especially as they are U.S. institutions and scientists) to pay attention to this aspect, and to note examples in their final reports so that we can collect examples and show to future applicants. An emphasis on how the postdoctoral training will be used back in the home country of the postdoctoral visitor should be made.  That said, we recognize that this is a difficult objective to accomplish in the short time-period of the awards. In the proposals we reviewed, there was one example of a mentoring project carried out by the postdoctoral fellow.</p>	<p>Appropriate, but See comments</p>
<p>Does the program portfolio have an appropriate balance:</p> <ul style="list-style-type: none"> <li>· —Across disciplines and subdisciplines of the activity and of emerging opportunities?</li> </ul> <p>Comments: There are a number of projects which seemed to focus on the Fellow learning new techniques. This is an example of an “emerging opportunity”, provided the Fellow has the infrastructure and equipment to continue the work in the home country.  Some observations: --The number of proposals in the life sciences is high; and 75% of the awards go to the life sciences. -- Mathematics and social sciences are poorly represented in the number of proposals received. Social sciences are almost non-existent.</p>	<p>Appropriate, although this is hard to judge</p>

Does the program portfolio have appropriate participation of underrepresented groups? Comments:	NA
Is the program relevant to national priorities, agency mission, relevant fields and other customer needs? Include citations of relevant external reports. Comments:	Yes, For agency (NATO) mission
Discuss any concerns identified that are relevant to the quality of the projects or the balance of the portfolio. Project quality of awarded projects seems to be good, within the constraints of the program.	

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

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Management of the program.  
Comments: Excellent  
The management plan for each competition is well articulated and follows the overall guidelines and standards of practice of NSF and the guidelines required by NATO. The plan is carried out with integrity and efficiency, and with care. This is quite a job given the numerous parameters of the program and the large number and diversity of participating countries.

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Responsiveness of the program to emerging research and education trends.  
Comments: This is not an easy aspect to judge and not strictly applicable. As the proposal depends on the scholars here and abroad making the connections, it is a somewhat a random networking process.  
A number of the awards seem to be for postdoctoral fellows to learn the state-of-the-art techniques. In these cases, it would seem that the program was responsive to research trends.

We noted a small trend of the same institution getting more than one scholar over the years, and think this is due to an increased awareness of the program by the institutions involved, and faculty who are conversant with international opportunities. This is not a bad aspect as long as the program is widely advertised, and there is every indication that it currently is adequately advertised.

Education trends seem to be largely overlooked (interpreting these as pedagogy, technology, and practices emerging in U.S. education). This is not surprising since at least in the beginning, in Eastern European countries, the research and education function are kept quite separate. Some further thinking needs to go into future research proposals since these systems are changing a bit in this region.

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Program planning and prioritization process (internal and external) that guided the development of the portfolio under review.  
Comments: Not applicable

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Discuss any concerns identified that are relevant to the management of the program.  
The program was very well managed within the scope of the review –award-final report time period and requirements.  
What would have been nice and provided some real picture of the overall impact of the

program are the facts about what happened subsequently in the case of the postdoctoral fellow and the host and home institutions—so we could know long-term impact of the program.

In future programs of this type, it would be good to implement a 2- or 3- year follow-up and feedback from at least the U.S. PI, preferably from both sides. Could there be a Fastlane feature designed as a “tickler” for a 2-3 year follow-up by the program manager with the PI?

## **PART B. RESULTS : OUTPUTS AND OUTCOMES OF NSF INVESTMENTS**

NSF investments produce results that appear over time. The answers to the first three (People, Ideas and Tools) questions in this section are to be based on the COV's study of award results, which are direct and indirect accomplishments of projects supported by the program. These projects may be currently active or closed out during the previous three fiscal years. The COV review may also include consideration of significant impacts and advances that have developed since the previous COV review and are demonstrably linked to NSF investments, regardless of when the investments were made. Incremental progress made on results reported in prior fiscal years may also be considered.

The following questions are developed using the NSF outcome goals in the NSF Strategic Plan. The COV should look carefully at and comment on (1) noteworthy achievements of the year based on NSF awards; and (2) the ways in which funded projects have collectively affected progress toward NSF's mission and strategic outcomes; and (3) lessons learned that can inform NSF concerning future directions for achieving similar goals. NSF asks the COV to provide comments on the degree to which past investments in research and education have contributed to NSF's progress towards its annual strategic outcome goals and to its mission:

- To promote the progress of science.
- To advance national health, prosperity, and welfare.
- To secure the national defense.
- And for other purposes.

Excellence in managing NSF underpins all of the agency's activities. For the response to the Outcome Goal for Organizational Excellence, the COV should comment, where appropriate, on NSF providing an agile, innovative organization. Critical indicators in this area include (1) operation of a credible, efficient merit review system; (2) utilizing and sustaining broad access to new and emerging technologies for business application; (3) developing a diverse, capable, motivated staff that operates with efficiency and integrity; and (4) developing and using performance assessment tools and measures to provide an environment of continuous improvement in NSF's intellectual investments as well as its management effectiveness.

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

- In the first sentence above, it says that "NSF investments produce results that appear over time". This is a very critical point to note in the case of the "investment" made in each postdoctoral fellow – the chief product – in this program. This was a unique program, an "experiment" in scientific knowledge and training exchange.

- **Uniqueness of the NATO program:**

The program includes considerations of the family of the postdoc and hence attempts to give a total experience for the Fellow.

Looks at career of the postdoc (Ph.D. work, references, potential for having a productive career) to judge the proposal.

It also required references from peer scientists in the home country which is not required by NSF.

- **We recommend that the program be reviewed as a whole in a retrospective study.**

The NATO program has been running for many years, yet no summary statistics about the researchers, research, and broader impacts are available, either from the US program or from the NATO program as a whole. Retrospective studies are hard to get data for, but an effort to get as much data as possible and analyze the overall long-term impact with particular attention to what this specific experience and its results did for the postdoctoral fellow and the host institution would be worthwhile to guide the design and implementation of any new international program in this vein. Some indicators of impact such as

publications; future and long-term research between the researchers or the two laboratories; graduate students sent abroad as a result of the NATO program by the host researchers; etc. These indicators can then be used to study the impacts on international scientific collaboration projects in the future. Another component that has not been tapped is the components that the foreign researcher brings to the US laboratory – new or better skills such as analytic and mathematical skills; a different perspective on the problem which proved fruitful; or new data from a previously unknown source.

The COV surveyed a sampling of proposals from 2001 and 2002 to identify quantifiable outcomes (details provided at the end of this document). When final reports are written one year after the end of the fellowships, publications from the collaborative research are either just appearing in print, or are still in some stage of preparation or review. The COV believes one year is too short a time in which to judge the outcomes of the fellowships.

At minimum, PIs in the U.S. could be surveyed for anecdotal evidence of long-term outcomes of the projects.

Several aspects could be used as metrics to judge success: and continue collaborations

1. number of publications during the Fellowship and those stemming from that collaboration; , collaborations, new techniques; websites,
2. Feedback from host universities

Continued collaboration could be encouraged by

- Increasing networking through internet – this does not seem to be promoted although recommended by the last COV.

General observations:

-- Future exchanges must go both ways; US exchange should not go away; The COV is concerned about truncating programs in which US scientists go abroad.

-- Increase attention to integrating research and education

-- NSF's Office of International Science and Engineering may find useful lessons from the NATO program and this COV report should be shared with them, if possible.

-- In response to their question, the COV was informed that there are opportunities for short periods of time, IGERT a little longer; graduate research fellows, etc scattered within divisions;

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**B.1 OUTCOME GOAL for PEOPLE: Developing “a diverse, competitive and globally engaged workforce of scientists, engineers, technologists and well-prepared citizens.”**

Comments:

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This is very much a program about developing a “competitive, global workforce” within the narrow realm of scientific research in a designated set of countries.

The program has been effective in this sense, by focusing on the training of postdoctoral fellows. As we have no sense of the broader impact, it cannot be assessed what the impact on the home country science was. Given that these are individual scholars, it is not expected to lead to a systemic change. One can assume that the effect on the home institution of the visitor was positive, given the enhanced educational/technical benefit to the postdoctoral scholar.

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**B.2 OUTCOME GOAL for IDEAS: Enabling “discovery across the frontier of science and engineering, connected to learning, innovation, and service to society.”**

Comments: It is clear ideas involved in the specific projects are being developed and furthered. But as in the comment above, it is hard or not even relevant to assess societal impact.

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**B.3 OUTCOME GOAL for TOOLS: Providing “broadly accessible, state-of-the-art S&E facilities, tools and other infrastructure that enable discovery, learning and innovation.”**

Comments: We noticed that several of the projects involved learning of state-of-the-art S&E tools by the postdoctoral fellows. A concern was raised by the members of the COV that it was not always evident whether this type of work and the practice of the learning that occurred could be sustained once the Fellow returned to the home country. It is not clear that the infrastructure and resources would always be available. An example was cited by a member of the COV where the postdoctoral fellow does not have access to the state-of-the-art equipment for molecular biology that he learned to use on the Fellowship.

In this respect, we are heartened to learn of the “re-integration” awards, as described to us by the program personnel

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**B.4 OUTCOME GOAL for ORGANIZATIONAL EXCELLENCE: Providing “an agile, innovative organization that fulfills its mission through leadership in state-of-the-art business practices.”**

Comments: Not applicable

## **PART C. OTHER TOPICS**

### **C.1 Please comment on any program areas that could have been improved or gaps (if any) that existed within program areas.**

There are gaps noted in the number of applications from mathematics and social sciences. Since the programs are advertised evenly across all fields one must assume that this is a professional/cultural issue. Some methods should be developed to address this issue in future programs.

### **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.**

The international exchange of scientists is important for the US as well as European science. The COV notes that the exchange works both ways and benefits the host laboratory as well as the visiting scholar. NSF should consider adding this element to their programs, perhaps as an extension of Criterion 2. The COV was interested to hear that an international component may become a more regular feature of IGERT. Note, however, IGERT is a graduate student training program, rather than a postdoctoral program. The NATO program was very special in its emphasis.

The new programs under the Office of International Science and Engineering (OISE) sounds promising.

NATO should also be encouraged to reinstate this program to have NATO country postdoctoral fellows to visit U.S. institutions.

### **C.3 Please identify agency-wide issues addressed by this program that NSF should now look to other programs to provide.**

In the big picture, the conduct of science is a global process. US science is in a global competition that requires us to expose foreign scientists to the US scientific enterprise, to expose US scientists to the foreign scientific enterprise, and to take advantage of foreign trained scientists to further our scientific objectives. In return for the latter, we should participate in broadening the training of foreign scientists by offering them post-doctoral training. All of these activities together form the basis for substantial collaborations that result in better science being done both here and abroad. While NATO and the EU are providing such opportunities in their multi-lateral and national science programs, the US is becoming a minor player compared to Europe in fostering such international collaboration.

The OISE Postdoctoral Award fellowship program at NSF seems to be an adequate substitute to the NATO program, although it only provides support for US scientists to go abroad and not for foreign scholars to visit the U.S. Additional programs could possibly reinstate travel for senior US scientists to travel abroad since they are the ones who will encourage their less senior researchers to do so; and also programs to bring more foreign researchers to the US. Another question is how US universities can be encouraged to initiate and maintain international contacts. Could there be some question in proposals asking about the international experience of the PIs or the university department? Can NSF lead the way to assure that there is some positive reward for having international experience and making this part of the US scientific "culture?"

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

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

The documentation for review was very well-prepared with summaries and copies of relevant documents such as program solicitations.

It was a lot of material to digest in the time given for the review. However, the review protocol was sent to the COV prior to the meeting. The NSF staff was very helpful during the site meeting.

The COV understands that it was not sent to the COV members ahead of time so as not to ask them to spend time reviewing these. However, it would have been useful to get the folder sent to the COV members about a week prior to the date of the visit so they could familiarize themselves with some of the details.

### **C.6 Please address the adequacy of the response of the program to advice from the previous COV.**

The previous COV had 4 major recommendations. They are noted below, along with the actions in response:

1. Increased attention to the integration of research and education: Specifically addressing this issue in proposals and reviews was erratic. However, the program solicitation did have special mention of integration of research and education. Furthermore, the very nature of the program, postdoctoral research, has an educational component.
2. Networking and connectivity that takes advantage of the internet: There is no evidence that any followup attempt was made to explore this possibility.
3. Feedback from host institution: Although the final report is one feedback, this COV reiterates the need for longer term data collection and follow-up in any future program design.
4. Supplemental funding to the program: Although suggested by the COV, it was not a possibility for implementation due to the source of the funding coming from the NATO program.

### **C.7 Have appropriate and sufficient data been collected from Fellows and their Institutions that would allow NSF to assess the extent to which the program as a whole progressed towards its intended goals and outcomes?**

The data collection from the Fellows following their experience was not done in any systematic way. It would seem very useful to collect short term and long term follow-up data.

For example,

In the final report prompts, certain features could be added: future plans for this collaboration or related work and collaborations to continue; whether these are international in nature; what resources may (or may not) be available or useful. In retrospect of the one year, does this appear to seem the most useful avenue the Fellow could have chosen for his/her development, what were the most significant features in the host institution that helped the Fellow, etc.

Then, if these aspects and other outcomes and accomplishments could be followed periodically, for example at 2 years and 5 years after the grant period, this would give us a lot of very useful information for the design of new programs, for best practices, and for future program evaluation.

The attachment has three detailed descriptions of retrospective anecdotal accounts from three members of the COV who had been PIs in the past and describe their continued collaborations. It would be very useful to get similar stories to get at some salient features of successful programs, lessons learned and best practices.

### **C.8 What additional evaluation activities are needed in order to document the program's impact? ,**

A retrospective study. Also see several of the points above

### **C. 9 What lessons can be learned from this program that might be applied to future programs with similar aims and structure?**

Many of these have been covered above. There are numerous lessons about how programs of great impact can be established. The COV stresses the need for a true exchange where Americans go abroad as well.

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Nuggets: Quantifiable outcomes from Fellowships in 2001 and 2002.  
Outputs from a sampling of proposals funded in 2002:

Proposal No.	Publications	Other activities
DGE-0209520	1 submitted 1 conf. Proc. submitted	Participated in two scientific meetings; Taught in course
DGE-0209555	1 submitted	
DGE-0209246	2 published 2 submitted	Website development
DGE-0209594	2 published 1 submitted 1 in preparation	Website development
DGE-0209661	1 in preparation	Attended 1 meeting and submitted abstract
DGE-0209674	None	Worked with HS students
DGE-0209459	1 published 1 accepted 1 submitted	2 presentations at scientific meetings.

In general, all projects seem to have led to new contacts and collaborations.

#### Highlights from 2001

- Darius Strumski , Fellow at UCSD Scripps submitted one publication and presented a paper at the Ocean Optics XVI Conference at Santa Fe, NM in November m 2002 while a Fellow. (Proposal No. 0108025).
- Lonnie Wollmuth, Fellow at SUNY-Stony brook, working with PI Dr. Yelshansky has one publication in preparation, and received training in a new technique in molecular biology (# 0108063)
- Postdoctoral Fellow (#0108076) submitted one publication, had one in preparation, in addition to a paper in a Conference proceedings and development of software for power systems analysis.

Detailed descriptions of outcomes in three cases:

Anecdotes from three members of COV who were host scientists is added as attachment to this document. These show that there can be significant follow-up, underscoring the usefulness of these Fellowships and the need to document.

In the first instance, the host scientist's Senior NATO Fellowship in 1978, ultimately led to a Postdoctoral fellow in his lab in 2004, due to the long-standing collaborations he developed over time.

Final thoughts:

As a final comment, the COV commends the Program Manager Carolyn Lyons Piper for her dedication and long-standing commitment and effective management of a complex program through several changes.

The organization of material, and the summaries and documentation provided to the COV were excellent as were the introductory presentations. The COV thanks Arneeta Speight for all the arrangements and Terry Woodin, Bianca Bernstein and Carolyn Piper for the informative introductory sessions and subsequent clarifications requested by the COV.

**SIGNATURE BLOCK:**

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For the NSF-NATO Postdoctoral Fellowships in Science and Engineering  
Indira Nair  
Chair

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[1] To be provided by NSF staff.

[2] To be provided by NSF staff.