

**CORE QUESTIONS and REPORT TEMPLATE  
for  
FY 2009 NSF COMMITTEE OF VISITOR (COV) REVIEWS**

**Guidance to NSF Staff:** This document includes the FY 2009 set of Core Questions and the COV Report Template for use by NSF staff when preparing and conducting COVs during FY 2009. 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 <[www.inside.nsf.gov/od/oia/cov](http://www.inside.nsf.gov/od/oia/cov)>.

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 results 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.

Suggested sources of information for COVs to consider are provided for each item. As indicated, a resource for NSF staff preparing data for COVs is the Enterprise Information System (EIS) –Web COV module, which can be accessed by NSF staff only at <http://budg-eis-01/eisportal/default.aspx>. In addition, NSF staff preparing for the COV should consider other sources of information, as appropriate for the programs 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 that appear over time. The COV also explores the relationships between award decisions and program/NSF-wide goals in order to determine the likelihood that the portfolio will lead to the desired results in the future. 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. 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. For past COV reports, please see <http://www.nsf.gov/od/oia/activities/cov/covs.jsp>.*

**FY 2009 REPORT TEMPLATE FOR  
NSF COMMITTEES OF VISITORS (COVs)**

The table below should be completed by program staff.

<b>Date of COV:</b> 8/9/10 July 2009
<b>Program/Cluster/Section:</b> UCAR and Lower Atmospheric Facilities Oversight Section
<b>Division:</b> Atmospheric and Geospace Sciences
<b>Directorate:</b> Geosciences
<b>Number of actions reviewed:</b> 6 ( <i>including an initial pre-proposal from UCAR and an extension from NCAR</i> )  <b>Awards:</b> 4  <b>Declinations:</b> 0  <b>Other:</b>
<b>Total number of actions within Program/Cluster/Division during period under review:</b>  <b>Awards:</b> 4  <b>Declinations:</b> 0  <b>Other:</b>
<b>Manner in which reviewed actions were selected:</b>  <i>The full set of proposals/awards/extensions made by ULAFOS during the three-year review period was provided by ULAFOS and considered by the CoV.</i>

**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.

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

QUALITY AND EFFECTIVENESS OF MERIT REVIEW PROCESS	YES, NO, DATA NOT AVAILABLE, or NOT APPLICABLE <sup>1</sup>
<p>1. Are the review methods (for example, panel, ad hoc, site visits) appropriate?</p> <p>Comments: <i>The CoV notes that the number of reviews, quality of reviews, and expertise of reviewers provided good guidance to the ULAFOS.</i></p>	Yes
<p>2. Are both merit review criteria addressed</p> <p>a) In individual reviews?</p> <p>b) In panel summaries?</p> <p>c) In Program Officer review analyses?</p> <p>Comments:</p>	<p>Yes</p> <p>Yes</p> <p>Yes</p>
<p>3. Do the individual reviewers provide substantive comments to explain their assessment of the proposals?</p> <p>Comments: <i>In many cases, the reviews were thorough, extensive, and pointed, and appear to have been very helpful to the proposers and ULAFOS staff in providing suggestions for actions.</i></p>	Yes

<sup>1</sup> If “Not Applicable” please explain why in the “Comments” section.

<p>4. Do the panel summaries provide the rationale for the panel consensus (or reasons consensus was not reached)?</p> <p>Comments:</p> <p>The summaries were a good consensus of the major comments provided by the reviewers.</p>	<p>Yes</p>
<p>5. Does the documentation in the jacket provide the rationale for the award/decline decision?</p> <p>(Note: Documentation in jacket usually includes context statement, individual reviews, panel summary (if applicable), site visit reports (if applicable), program officer review analysis, and staff diary notes.)</p> <p>Comments: The ejacket provided all individual reviews, panel summary (where convened) and the program officer review. No site visits were conducted for the reviews in this period.</p>	<p>Yes</p>
<p>6. Does the documentation to PI provide the rationale for the award/decline decision?</p> <p>(Note: Documentation to PI usually includes context statement, individual reviews, panel summary (if applicable), site visit reports (if applicable), and, if not otherwise provided in the panel summary, an explanation from the program officer (written or telephoned with diary note in jacket) of the basis for a declination.)</p> <p>Comments:</p>	<p>Yes</p>
<p>7. Is the time to decision appropriate?</p> <p>Note: Time to Decision --NSF Annual Performance Goal: <b>For 70 percent of proposals, inform applicants about funding decisions within six months of proposal receipt or deadline or target date, whichever is later.</b> The date of Division Director concurrence is used in determining the time to decision. Once the Division Director concurs, applicants may be informed that their proposals have been declined or recommended for funding. The NSF-wide goal of 70 percent recognizes that the time to decision is appropriately greater than six months for some programs or some individual proposals.</p> <p>Comments: <i>While three of the proposals considered were handled in a timely fashion, the competition for the management of NCAR went on for a very long time, stretching over at least three years (though the actual proposal from UCAR was reviewed in about six months). This lengthy process likely consumed an enormous amount of staff time and effort at UCAR, NCAR, and NSF. The CoV recognizes that as this was the first time this competition was</i></p>	<p>Yes</p>

<p><i>conducted, great care had to be taken given the size of the award and the many complex issues involved, and many valuable lessons were learned. The CoV hopes that these lessons are preserved and used to inform and significantly shorten the process the next time around.</i></p>	
<p>8. Additional comments on the quality and effectiveness of the program's use of merit review process:</p> <p><i>Retrospective reviews of past performance and accomplishments, as opposed to the traditional prospective merit reviews, are perhaps more important in the cooperative (management) agreements overseen by the ULAFOS since many of the activities carry on for several decades (e.g., the computing facilities at NCAR). The review process for management activities may need to be revised accordingly.</i></p>	

**A.2 Questions concerning the selection of reviewers.** Provide comments in the space below the question. Discuss areas of concern in the space provided.

<p><b>SELECTION OF REVIEWERS</b></p>	<p><b>YES , NO, DATA NOT AVAILABLE, or NOT APPLICABLE<sup>2</sup></b></p>
<p>1. Did the program make use of reviewers having appropriate expertise and/or qualifications?</p> <p><i>Comments: The sets of reviewers examined by the CoV were well qualified and appear to have accomplished their reviews in an exemplary manner.</i></p>	<p>Yes</p>
<p>2. Did the program use reviewers balanced with respect to characteristics such as geography, type of institution, and underrepresented groups?</p> <p>Note: Demographic data is self reported, with only about 25% of reviewers reporting this information.</p> <p><i>Comments: In general, reviewers represented a good cross-section of the community. Ethnic minorities and women were well represented in the review panels. Panels represented a range of disciplinary expertise.</i></p>	<p>Yes</p>
<p>3. Did the program recognize and resolve conflicts of interest when appropriate?</p> <p><i>Comments: This "Yes" comes with a few caveats. ULAFOS needs to carefully vet reviewers for their personal interest in the outcome of a facilities proposal.</i></p>	<p>Yes</p>

<sup>2</sup> If "Not Applicable" please explain why in the "Comments" section.

<i>There were reviewers for both the CHILL and DoW competitions that were or have subsequently become local major users of these facilities.</i>	
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<p>4. Additional comments on reviewer selection:</p> <p><i>ULAFOS should consider carefully the selection of reviewers for the expected proposals related to the new supercomputing center slated for SE Wyoming. This panel needs expertise not only in the construction of such large facilities, but also in the longer term impacts on the local economy, personnel, and operational strategies. Such large centers operated at a distance from the supported researchers present significant management and personnel challenges which the reviewers and ULAFOS staff will need to consider.</i></p> <p><i>In a review of a facility, especially when there is the possibility of relocation, reviewers should be vetted for their interest in the outcome of the proposal.</i></p>
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**A.3 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.

<b>RESULTING PORTFOLIO OF AWARDS</b>	<b>APPROPRIATE, NOT APPROPRIATE<sup>3</sup>, OR DATA NOT AVAILABLE</b>
<p>1. Overall quality of the research and/or education projects supported by the program.</p> <p><i>Comments: Overall quality of the research involving the supported facilities is high as evidenced by the wide range of publications in peer-reviewed journals with high impact factors and frequent citations.</i></p> <p><i>Education projects supported by the program include a variety of initiatives, such as the UNIDATA Program Center, the SOARS program, and REU's at the field facilities, such as the King Air and the CHILL Radar. These reach a large number of students both directly and indirectly.</i></p>	<i>Appropriate</i>
<p>2. Does the program portfolio promote the integration of research and education?</p> <p><i>Comments: Integration of research and education is accomplished through a</i></p>	<i>Appropriate</i>

<sup>3</sup> If “Not Appropriate” please explain why in the “Comments” section.

<p><i>number of initiatives at NCAR such as the Scientific Visitor Programs, graduate research assistantships, and post-doctoral appointments. At other supported facilities, REU programs and graduate student research provide the desired integration.</i></p> <p><i>The training of the next generation of observational scientists and supporting engineers remains a challenge. The CoV recommends that ULAFOS encourage each supported observational facility to be particularly proactive in this regard.</i></p>	
<p>3. Are awards appropriate in size and duration for the scope of the projects?</p> <p>Comments: <i>The management agreements examined appeared appropriate considering the scale and duration of the operations supported.</i></p>	<p><i>Appropriate</i></p>
<p>4. Does the program portfolio have an appropriate balance of:</p> <ul style="list-style-type: none"> <li>• Innovative/potentially transformative projects?</li> </ul> <p>Comments: <i>Each project within the portfolio possesses a certain degree of innovation. In research addressing the global climate and the atmospheric component of Earth system science, results from NCAR scientists have contributed to and helped transform our understanding of the Earth. The refractivity experiments at the CHILL Radar have shown great promise for providing important information regarding water vapor in the lower atmosphere.</i></p>	<p><i>Appropriate</i></p>
<p>5. Does the program portfolio have an appropriate balance of:</p> <ul style="list-style-type: none"> <li>• Inter- and Multi- disciplinary projects?</li> </ul> <p>Comments: <i>A number of projects being pursued on the cooperative agreements include inter- and multi-disciplinary research relating various physical and mathematical sciences to applied fields. It is important NCAR continue to develop connections to other disciplines, such as the social, economic, and political sciences.</i></p>	<p><i>Appropriate</i></p>
<p>6. Does the program portfolio have an appropriate balance considering, for example, award size, single and multiple investigator awards, or other characteristics as appropriate for the program?</p> <p>Comments: <i>While many of the projects were awarded to single investigators, the size of the awards will enable a large number of research endeavors.</i></p>	<p><i>Appropriate</i></p>
<p>7. Does the program portfolio have an appropriate balance of:</p> <ul style="list-style-type: none"> <li>• Awards to new investigators?</li> </ul> <p>NOTE: A new investigator is an investigator who has not been a PI on a</p>	<p><i>Not Appropriate*</i></p>



<p>previously funded NSF grant.</p> <p>Comments: <i>All the awards were for major facilities and hence made to senior personnel with extensive prior grant experience.</i></p> <p><i>*Our response is taken based on a literal reading of the question. A different approach to assessing this aspect of the ULAFOS' program portfolio would be to examine the number of new investigators attracted to use these facilities or numbers of graduate students and post-docs trained using these facilities. Unfortunately, the data currently being collected by the facilities regarding their user community does not allow such an examination to be made.</i></p>	
<p>8. 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: <i>Major investments are being directed to the Rocky Mountain Front Range area (Colorado – Boulder, Fort Collins) and Laramie, Wyoming). A new facility is being considered for Cheyenne, Wyoming. Admittedly, many investigators from around the U.S. come to these facilities. However, there is clear geographic imbalance in the distribution of NSF dollars allocated to the atmospheric sciences and geosciences in the UFALOS supported facilities. It may be that such a concentration over the long term biases the science being done. For example, we now know a great deal about down slope winds and Front Range thunderstorms, but not nearly as much about lake effect snows or sea breeze fronts.</i></p> <p><i>The CoV recommends that the ULAFOS consider competing facilities such as the DoWs and the CHILL Radar with an eye toward moving them around the nation. If such competitive awards are made in a fashion similar to the UCAR/NCAR award (initial five year, followed by a review to confirm a second five years = ten years), that would see a move every decade, which seems reasonable. With the maturing of the university based atmospheric science programs in the U.S, the CoV anticipates that several universities might be interested in bidding on hosting one or both systems.</i></p> <p><i>The ULAFOS might also from time to time use the RFI process to assess the interest of the broader university research community in developing new community facilities, such as ones for small UAVs for atmospheric research or small scientific ballooning. Similarly there would be an opportunity to insert instruments with newly evolving technologies into the pool of observational instruments or instruments that address new scientific questions as earth science knowledge evolves.</i></p>	<p>Not Appropriate</p>
<p>9. Does the program portfolio have an appropriate balance of:</p> <ul style="list-style-type: none"> <li>• Institutional types?</li> </ul> <p>Comments: <i>There have been no direct investments made at minority serving institutions in this portfolio. While several such institutions may benefit indirectly, such as through opportunities for their faculty and students, more</i></p>	<p>Not Appropriate</p>

<p><i>needs to be done to directly assist such institutions in producing minority scientists for the future workforce.</i></p>	
<p>10. Does the program portfolio have an appropriate balance:</p> <ul style="list-style-type: none"> <li>• Across disciplines and sub disciplines of the activity?</li> </ul> <p>Comments: <i>The program portfolio includes a number of projects that span a wide range of sub-disciplines. Since several of the observing facilities provide capabilities for observing the lower atmosphere, the ULAFOS might consider reaching out to life science projects, such as the NEON effort, to assess interest in developing joint capabilities to observe both weather and ecological phenomena.</i></p>	<p><i>Appropriate</i></p>
<p>11. Does the program portfolio have appropriate participation of underrepresented groups?</p> <p>Comments: <i>No leading programs at minority serving institutions are directly involved. There are few minorities or women in leadership positions at UCAR or in the other facilities management teams.</i></p>	<p><i>Not Appropriate</i></p>
<p>12. Is the program relevant to national priorities, agency mission, relevant fields and other constituent needs? Include citations of relevant external reports.</p> <p>Comments: <i>The NCAR program plans reflect several national priorities, including tropical cyclones and national security issues. Development of the Wyoming computing facility would be consistent with the NRC report "High End Capability Computing." ULAFOS should consider the recent NSB report regarding hurricanes and the recent NRC report, "From the Ground Up" in planning for new facilities or future competitions.</i></p>	<p><i>Appropriate</i></p>
<p>13. Additional comments on the quality of the projects or the balance of the portfolio:</p>	

**A.4 Management of the program under review.** Please comment on:

<p>1. Management of the program.</p> <p>Comments: <i>Overall, the management of the section was judged to be good to excellent. The ULAFOS management team includes highly experienced individuals who clearly care a great deal about their work and its importance to the science and the atmospheric scientific community. On behalf of the scientific community, the CoV expresses its appreciation for the careful, thoughtful management and good stewardship exhibited by every member of the ULAFOS team.</i></p> <p><i>Several complex initiatives (such as the competition for the management of NCAR) involved steep learning curves. The management team responded well to such situations, but required time to do</i></p>
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so. It is to be hoped that the lessons learned are well documented and considered by future ULAFOS team members.

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

Comments: *The creation of the new on-line catalog of observing facilities is a proactive anticipation of future research needs, as is the installation of a mechanism to keep the catalog up to date.*

*With respect to education, training, and outreach, ULAFOS needs to establish metrics for all supported facilities and see regular reports in this area.*

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

Comments: *The ULAFOS personnel were able to clearly articulate the various processes for dealing with UCAR, NCAR, and other entities hosting supported observing facilities. However, the CoV did not find where these processes were written out for use by successors to the current team.*

*While there was evidence in the materials provided showing that ULAFOS staff had consulted the community on computing needs, it was not clear from the provided materials how decisions on priorities for observational facilities were made. (The CoV recognizes that the NCAR planning documents may indirectly reflect such community input.)*

4. Responsiveness of program to previous COV comments and recommendations.

Comments: *The responses appear adequate.*

5. Additional comments on program management:

*The ULAFOS team needs to consider how it describes its relationships with UCAR and NCAR (and other cooperative agreement holders). For example, the appearance of "UCAR" in the section name and on ULAFOS organizational charts blurs the distinctions between UCAR management, the NCAR science and facilities programs, and the ULAFOS team. Sharpening these distinctions will in the long run be good for ULAFOS, UCAR, NCAR, and the science. The CoV suggests that ULAFOS develop a written document that spells out these distinctions and a style sheet to be followed in the preparation of documents in this area.*

## **PART B. RESULTS OF NSF INVESTMENTS**

The NSF mission is to:

- promote the progress of science;
- advance national health, prosperity, and welfare; and
- Secure the national defense.

To fulfill this mission, NSF has identified four strategic outcome goals: Discovery, Learning, Research Infrastructure, and Stewardship. The COV should look carefully at and comment on (1)

noteworthy achievements based on NSF awards; (2) ways in which funded projects have collectively affected progress toward NSF's mission and strategic outcome goals; and (3) expectations for future performance based on the current set of awards.

NSF investments produce results that appear over time. Consequently, the COV review may 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.

To assist the COV, NSF staff will provide award "highlights" as well as information about the program and its award portfolio as it relates to the three outcome goals of Discovery, Learning, and Research Infrastructure. The COV is not asked to review accomplishments under Stewardship, as that goal is represented by several annual performance goals and measures that are monitored by internal working groups that report to NSF senior management.

**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: 1) NCAR's contribution to the AR IV of the IPCC is particularly notable (10 scientists; CCSM used to generate some of the scenarios). This work shared in the Nobel Prize awarded to the IPCC overall.

2) Beyond the anecdotal reports – some of which describe interesting work -- contained in Tab E of the briefing book, the CoV was provided with little information regarding the overall scientific outcomes from the various facilities.

**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: From the information available to the CoV, it appears that the work force at UCAR/NCAR and the other supported facilities is indeed first class. However, it can not be described as broadly inclusive. Only a few minorities and women are found in senior positions and throughout the organizations. Some efforts are being made to rectify this situation, e.g., SOARS, but much more needs to be done. Consider initiatives and collaboration with geosciences faculty at targeted minority institutions.

The CoV takes note of the efforts, particularly at NCAR with the development of the museum aspects of the Mesa Laboratory, to reach out to the wider citizenry in terms of science education. The UCAR website also provides many useful materials for the K-12 community. What appears to be lacking is a well-framed, comprehensive, coherent effort involving all the UFALOS programs in reaching out to the general population.

**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: *This is what ULAFOS does best! The continuous upgrades to the NCAR facilities, the recent rebuilding of the CHILL radar, and most impressively, the acquisition of the HIAPER aircraft are examples of building “the nation’s research capability through critical investments”. The development of new, innovative tools – such as instrumentation for the research aircraft and mesoscale prediction software – are also important activities.*

*Recent efforts with UCAR/NCAR on innovative approaches for the development of a new supercomputing facility are also laudable.*

**PART C. OTHER TOPICS**

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

*The ULAFOS should have requested that each supported facility develop a strategy and implementation plan for increasing diversity in both leadership and staff roles, and submit annual progress reports. Additionally, in recognition of the aging scientific workforce, each supported facility needs a plan to recruit and promote younger scientific/engineering staff to prevent loss of technical expertise and experience.*

**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 CoV finds the above questions adequately covered the program’s performance.

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

*The ULAFOS needs to consider and clarify its role in education and outreach, as carried out by UCAR/NCAR and the other facilities for which it provides oversight.*

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

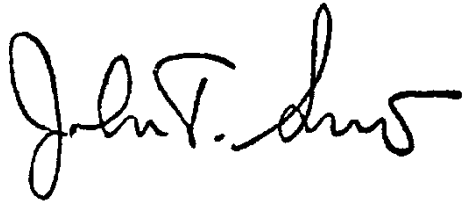
*The CoV expresses its concern re delay in permanently filling the section head position. Given the complexity and extent of the agreements administered by the ULAFOS, this leadership position needs to be filled as soon as possible.*

*The review that will precede the decision on the five-year renewal of the cooperative agreement to manage NCAR should include an assessment of the management performance of UCAR as well as the quality of science produced in NCAR.*

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

*Since these facilities are to be community resources, it is important to show that there is good return (in terms of community use) on the NSF investment. The UFALOS needs to provide more quantitative information on "Results of NSF Investments". The information provided is nice but largely anecdotal. The UFALOS should have each supported facility collect and report annually in common format detailed user information (how many, who, hours of use, dollar costs by user, brief project summary, etc...), including listings of publications and other results produced by each user of the facility. Each facility should conduct an annual survey of its users during the past year to get feedback on its operations and provide to NSF a summary of the survey results and the response of the facility management team.*

**SIGNATURE BLOCK:**

A handwritten signature in black ink, appearing to read "John T. Snow". The signature is fluid and cursive, with a long horizontal stroke at the end.

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For the ULAFOS CoV  
John T. Snow  
Chair