National Science Foundation Response to the JASON Report 'Fundamental Science and Security'

National Science Foundation

Statement from NSF Director France A. Córdova

I would like to express my great appreciation to the JASON group for their well-considered and valuable report on fundamental science and security, which they submitted to NSF in December 2019.

In early 2019, NSF commissioned a study from the JASON group, an independent group of high-level academics that interfaces with the security community. NSF asked JASON to examine the value and risks of the openness generally associated with fundamental research. NSF also asked what good practices could be put into place by academic researchers and funding agencies such as NSF to balance the open environment of fundamental research with the needs for national and economic security. JASON submitted their report responding to these questions to NSF on December 13, 2019. NSF publicly released the unclassified report, available at http://www.nsf.gov/JASON_Security_Report.

In the report, JASON provided NSF with many helpful findings and recommendations. JASON found that the U.S. needs to continue to attract and retain the best science talent from across the globe. NSF strongly agrees with the importance of continuing to encourage foreign-born scientists to train and work in the U.S. The 2020 Science and Engineering Indicators report, titled "The State of U.S. Science and Engineering" confirms that the United States is "the destination for the largest number of internationally mobile students worldwide (19% in 2016)." Additionally, a majority of science and engineering doctorate recipients with temporary visas stayed in the U.S. The two largest (by number) international sources of U.S. Ph.D. students are the countries of China and India.

The stay rates in the United States for Chinese Ph.D. degree holders remained stable at 84% from 2013-2017 and the stay rates for Indian Ph.D. degree holders remained at 85% during this period.

The U.S. research environment is internationally diverse. JASON stated that this U.S. research environment is based upon the values of ethics in science including objectivity, honesty, accountability, fairness, and stewardship. The JASON group found that there are indeed problems that stem from foreign influence with respect to research transparency, lack of reciprocity, and reporting of commitments and potential conflicts of interest.

NSF appreciates JASON's affirmation that the actions of some foreign governments pose significant threat to the U.S. research ecosystem. NSF has already taken several steps to protect the integrity of the research enterprise and these efforts continue to progress:

1. In January 2020, following a public comment process that began in April 2019, NSF issued clarifications to its proposal disclosure requirements to ensure proposers provide information on all sources of current and pending research support. This information will help those that are part of the NSF review process to consider both the capacity and potential research overlaps of the proposers. NSF has also clarified the biographical sketch disclosure requirements to ensure that any titled position is identified, whether or not remuneration is received. NSF expects all proposers to adhere to these newly clarified requirements no later than June 2020.
2. As part of its revised Proposal and Awards Policies and Procedures Guide (PAPPG), NSF announced that use of an NSF-approved format will be required in preparation of both the biographical sketch and current and pending support sections of the proposal. Therefore, the community will be able to provide disclosure information in a standardized format.
3. In April 2018, NSF announced that all NSF personnel and those at NSF under an Intergovernmental Personnel Act Agreement (IPA) were required to be U.S. citizens so that a uniform security standard can be applied.

4. As of July 2019, NSF prohibits all NSF personnel and IPAs from participating in a [foreign talent recruitment program](#).
5. NSF has developed training for NSF employees on science and security that will be implemented in early 2020.
6. NSF co-chairs the Joint Committee on the Research Environment (JCORE) as well as the JCORE subcommittee on research protection, both established in mid-2019. Through JCORE, NSF coordinates policy and practices on science and security with the White House, with sister science agencies, and with the intelligence and law enforcement communities.

Creation of the Position of Chief of Research Security Strategy and Policy

Per the JASON findings, NSF acknowledges that more work needs to be done to define the scale and scope of the problem. There are also additional actions that need to be planned and taken regarding science and security at both the agency level and the JCORE level. Effective March 2020, NSF has created the position of Chief of Research Security Strategy and Policy. The Chief of Research Security Strategy and Policy will be the NSF focal point to provide science and security strategy and policy recommendations to NSF leadership and to represent the agency at JCORE and other interagency forums. NSF plans to name an individual to this position in the near future.

The Chief of Research Security Strategy and Policy will chair an NSF strategy group to develop NSF recommendations for the agency to maintain scientific openness and collaboration while taking action to uphold the ethics and values of the scientific enterprise. The Chief of Research Security Strategy and Policy will be responsible for developing detailed implementation plans in response to the JASON report and to address continuing needs in science and security. As the JASON report found, there are many stakeholders with the responsibility for maintaining the integrity of fundamental research. The Chief of Research Security Strategy and Policy will work across this stakeholder community to develop good practices to assess risk and take appropriate actions.

NSF will continue to focus its efforts on both international collaboration and reinforcement of the tenets that support the success of the fundamental research enterprise. Please find enclosed NSF's responses to JASON's recommendations.

France A. Córdova
Director

NSF Response to JASON Recommendations

1. **JASON recommendation: The scope of expectations under the umbrella of research integrity should be expanded to include full disclosure of commitments and actual or potential conflicts of interest.**

   NSF response: NSF agrees that disclosure of all professional appointments and all sources of current and pending support, whether foreign or domestic, is essential so that research institutions can determine potential conflicts of interest or commitment and so that NSF can determine any potential capacity or overlap issues.

   NSF has clarified its disclosure requirements in the revised NSF PAPPG (NSF 20-1). NSF also requires submission of biographical sketches and current and pending support information via use of an NSF-approved format. These actions will contribute to NSF's good stewardship of taxpayer funding by bringing to light information so that research integrity can be preserved and so that any breaches to this integrity can be addressed. NSF's newly developed internal training will reinforce disclosure requirements.

2. **JASON recommendation: Failures to disclose commitments and actual or potential conflicts of interest should be investigated and adjudicated by the relevant office of the NSF and by universities as presumptive violations of research integrity, with consequences similar to those currently in place for scientific misconduct.**

   NSF response: There have been cases where breaches to science and security have been investigated by the NSF Office of Inspector General (OIG) and the OIG has recommended that NSF take administrative action such as debarment or return of NSF award funds which may be similar to actions taken to address research misconduct. However, the OIG has also referred some cases to the Department of Justice due to offenses that may merit civil or criminal action. It is important to acknowledge that consequences depend on the scope of the violation and that these may be further-reaching than the administrative actions that are in place to address cases of research misconduct.

   Several incidents have involved non-disclosure of an affiliation with a foreign government talent recruitment program. NSF's policy is that proposers must disclose any appointment or source of current or pending support, including involvement in a foreign government talent recruitment program. Distinguishing features of a foreign government talent recruitment program include:
   (a) Compensation provided by the foreign state to the targeted individual in exchange for the individual transferring knowledge and expertise to the foreign country. The compensation can take several forms, such as cash, research funding, honorific titles, career advancement opportunities, promised future compensation, or other types of remuneration or other consideration.
   (b) Recruitment refers to the foreign state sponsor's active engagement in attracting the targeted individual to join the foreign-sponsored program and transfer their knowledge and expertise to the foreign state. The targeted individual may be employed and located in the United States or in the foreign state. Note that, generally, an invitation by a foreign state to simply attend or present work at an international conference would not constitute recruitment.

   NSF also is in the process of developing a new term and condition for use by an NSF awardee if it discovers that a Principal Investigator or co-Principal Investigator on an active NSF award failed to disclose current support information as part of the proposal submission process. This new term and condition will direct grantees on how to electronically submit the requisite information.

   NSF will continue to coordinate with the NSF OIG as cases arise and will take the appropriate action needed to address violations. The Chief of Research Security Strategy and Policy position will assist the agency in this cooperation with the NSF OIG.

3. **JASON recommendation: NSF should take a lead in working with NSF-funded universities and other entities, as well as professional societies and publishers to ensure that the responsibilities of all stakeholders in maintaining research integrity are clearly stated, acknowledged, and adopted. Harmonization of these responsibilities with those of other federal research-funding agencies is encouraged.**

NSF response: NSF agrees with the importance of working with NSF-funded universities and other entities regarding the importance of clarifying the responsibilities of all to maintain research integrity. Within the past year, NSF has conducted significant outreach on NSF disclosure requirements, including participation in the annual meetings of the Federal Demonstration Partnership, Council on Government Relations Association for Public and Land Grant Universities (APLU), and American Association of Universities (AAU) as a keynote speaker on science and security. The NSF Director and Chief Operating Officer have participated in FBI and National Academy of Science roundtables with university presidents to ensure communication with the intelligence community and law enforcement. NSF leadership at the highest levels meets regularly with university leadership specifically to discuss science and security issues.

NSF is working with other U.S. government agencies to consider harmonizing requirements and systems, when practicable. Other agencies have indicated their desire to use the same automated system as NSF for disclosure, and NSF is actively coordinating with them. Through the JCORE Research Protection subcommittee, NSF is working to harmonize definitions of terms such as "conflicts of commitment." Through the JCORE Administrative Requirements subcommittee, NSF is working with other agencies to streamline and coordinate processes to reduce administrative burden.

4. **JASON recommendation: NSF should adopt, and promulgate to all stakeholders, project assessment tools that facilitate an evaluation of risks to research integrity for research collaborations, and for all non-federal grants and research agreements.**

NSF response: NSF is using the Enterprise Risk Management (ERM) framework to identify and mitigate risks in science and security. This work began through the NSF research protection working group in 2019.   The Chief of Research Security Strategy and Policy will take on the leadership role of working with NSF's ERM team to capitalize on the existing efforts and fully describe science and security risks, develop risk assessment tools, and implement risk mitigation strategies. Additionally, NSF is working through JCORE to collect best practices in risk assessment and mitigation from the research community, from other agencies, and from the intelligence community. JCORE is currently developing an approach to promulgate these best practices in the community.

5. **JASON recommendation: Education and training in scientific ethics at universities and other institutions performing fundamental research should be expanded beyond traditional research integrity issues to include information and examples covering conflicts of interest and commitment.**

NSF response: Several research institutions and organizations have taken the initiative to develop education and training in scientific ethics to include conflicts of interest and commitment. The AAU and APLU have collected several examples of such training to provide information for other institutions and organizations to use. Through the NSF Chief of Research Security Strategy and Policy, NSF is also in the process of reviewing its internal science and security training modules to adapt them for potential external use. The Chief of Research Security Strategy and Policy will be leading the development of an external training and communication plan in science and security and research integrity.

6. **JASON recommendation: NSF should support reaffirmation of the principles of NSDD-189, which make clear that fundamental research should remain unrestricted to the fullest extent possible, and should discourage the use of new CUI definitions as a mechanism to erect intermediate-level boundaries around fundamental research areas.**

NSF response: NSF supports openness and transparency in fundamental research. In 2018, in its Statement on Security and Science (NSB-2018-42), the National Science Board "strongly reaffirm(ed) the principle behind President Reagan's National Security Decision Directive 189 (NSDD-189)." Through the sharing of data and information, scientists can replicate, challenge, or improve upon research and move fields forward. In some cases, there may be a need to protect certain data and information for national, military, or economic security purposes. NSF will work with other U.S. government agencies to maintain the distinction between research that should continue to be made open to the scientific community and research that should be protected due to security concerns.

7. **JASON recommendation: NSF should engage with intelligence agencies and law enforcement to communicate to academic leadership and faculty an evidence-based description of the scale and scope of problems posed by foreign influence in fundamental research, as well as to communicate to other government agencies the critical importance of foreign researchers and collaborations to U.S. fundamental research.**

NSF response: NSF currently funds over 3,000 projects with an international component. The agency will continue to reinforce that international collaboration and participation are essential to our continued scientific advancement.

NSF agrees with the need for an evidence-based description of the scale and scope of the problems posed by foreign influence in fundamental research. An increased number of incidents in this realm have been brought to NSF from the OIG (see the NSF OIG September 2019 semiannual report). Other U.S. science agencies have also seen an increased number of incidents, some of which have been reported by news media. Additionally, grantee organizations have reported that they are acting upon several instances of nondisclosure, many of which are personnel actions and therefore not yet public.

Undisclosed affiliations and sources of support are a concern and are potentially detrimental to the research system, which is built on trust and shared ethics and norms. As many of the potential conflicts are not disclosed, understanding the full scope and scale is a great challenge. NSF will continue to work to uphold the norms of research integrity and communicate the need for disclosure and for ethical and responsible conduct of research.

8. **JASON recommendation: NSF should further engage with the community of foreign researchers in the United States to enlist them in the effort to foster openness and transparency in fundamental research, nationally and globally, as well as to benefit from their connections to identify, recruit and retain the best scientific talent to the United States.**

NSF response: NSF believes that engagement with the full community of researchers, both foreign and domestic, is necessary to discuss the importance of openness and transparency in fundamental research. Internationally, NSF is coordinating with the U.S. Department of State and sister science agencies on coordinated international engagement to discuss issues of science and security. NSF has participated in meetings with colleagues from Japan, Canada, the UK, Germany, France, Sweden, Australia, and elsewhere. NSF intends to further discuss these issues at the May 2020 Global Research Council annual meeting which will be held in Durban, South Africa, where 60 research councils from around the world participate.

9. **JASON recommendation: NSF and other relevant U.S. government agencies should develop and implement a strategic plan for maintaining our competitiveness for the top science and engineering talent globally, taking advantage of new opportunities for engagement that might arise, even as others become more challenging.**

NSF response: NSF agrees with the great importance of international engagement and of U.S. competitiveness for the best talent. NSF's specialized focus on STEM education, with a more than $900 million budget, has programs that

concentrate on maintaining the excellence of the U.S. STEM educational system. Competition for the best talent is growing globally, as the 2020 Science and Engineering Indicators report states. The U.S. remains the largest funder of science and engineering research, but other countries are rapidly increasing their expenditures as a percentage of GDP. NSF's strategic focus is exemplified by the 10 Big Ideas, and the White House is working across the U.S. government to strategically focus on Industries of the Future. NSF's leadership in these areas, coupled with the specific efforts to develop diverse U.S. talent through programs such as the Graduate Research Fellowships Program and INCLUDES, will increase the pool of top science and engineering talent available in the U.S. These approaches also present great opportunity for international collaboration and attraction for the best scientists from around the world. NSF has designed its MULTIPLIER program to send teams abroad to centers of excellence to promote such collaboration.