Slide 1
Good afternoon. We're Vipin Chaudhary and Dmitri Maslov from the NSF Directorate for Computer & Information Science & Engineering, or CISE.
We are the Program Directors managing the **Quantum Computing and Information Science Faculty Fellows,** or **QCIS-FF.**

In this webcast, we will provide a brief overview of the QCIS-FF program, and describe some of the most important things you need to know about submitting a proposal.

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This webinar in intended to orient the CISE community to the QCIS-Faculty Fellows competition, summarize the program and peer-review criteria, and answer questions. Of course, the ultimate goal is to improve the quality of your proposals.

Here is an outline of today's presentation. We'll start with a description of the QCIS-FF program followed by an overview of the NSF 19-507 solicitation.

We will then take questions from you, the audience. Some of the questions we have already received are included at the end of the presentation.
This document will be available on the program website.

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Next we talk about the **QCIS-Faculty Fellows** program, its priorities and goals and how we implement it.

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In 2016, the National Science Foundation (NSF) unveiled a set of "Big Ideas," 10 bold, long-term research and process ideas that identify areas for future investment at the frontiers of science and engineering. One of these ideas, "The Quantum Leap: Leading the Next Quantum Revolution," advances quantum technologies of the future: quantum computing, quantum communication, quantum simulations and quantum sensors.
Recent advances in understanding and exploiting quantum mechanics are laying the foundation for generations of new discoveries that can benefit society in unforeseen ways.
This "quantum revolution" requires a highly-trained workforce that can advance the envelope of what is possible, through research and development of practical solutions for quantum technologies.

Academic faculty serve a vital role in the development of this workforce, by training the next generation of students while performing vital research.

The disciplines of computer science (CS), information science (IS), and computer engineering (CE) are at the nexus of the interdisciplinary breakthroughs needed to design advanced quantum computing, modeling, communication and sensing technologies.
NSF recognizes that there is inadequate research capacity in the CS/CE disciplines in the realm of Quantum Computing & Information Science (QCIS).

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The QCIS-FF program is intended to add to the existing academic workforce in quantum computing and communication.

As such, the program will be able to support the hires of faculty who do not currently hold tenure-track or tenured academic positions, or support faculty hired from overseas, but will not support hiring of existing faculty from eligible U.S. institutions (e.g., lateral faculty movement).

Specifically, QCIS-FF seeks to support departments and schools in U.S. institutions of higher education that conduct research and teaching in computer science, information science, and/or computer engineering, with the specific goal of encouraging hiring of tenure-track and tenured faculty in quantum computing and/or communication.

Cross-disciplinary and multi-department hires are welcomed; however, intellectual ownership and primary assignment should be with the department primarily engaged in research and teaching activities for computer and information science and engineering.

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The program guiding principles are outlined by these four items, namely,

The commitment of the department, school, and university to building, growing, and sustaining a long-term interdisciplinary effort in QCIS;

The integration of the quantum faculty with the rest of the department;

How the new hire enhances cross-departmental research collaborations such as those across physics, mathematics, material sciences, electrical engineering, and computer and information science; and

How the new hire enables creation and support of educational programs in QCIS, including cross-disciplinary course offerings at both the undergraduate and graduate levels.

These guiding principles form the solicitation specific review criteria that we will discuss soon.

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Quantum Computing and Information Science Faculty Fellows (QCIS-FF) is a CISE-only program that involves program officers from Division of Computing and Communication Foundations, Dmitri Maslov, and Office of Advanced Cyberinfrastructure, Vipin Chaudhary.

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Next we talk about this specific solicitation opportunity (NSF 19-507), including budgets, PI eligibility, proposal details, and review criteria.

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The total request per position cannot exceed $750,000.

NSF funding will support the entire academic year salary and benefits of a single tenure-track or tenured faculty member for a duration of up to three years.

The total anticipated funding for this program is **$6,750,000**

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Submission of a Preliminary Proposal is required to be eligible to submit a Full Proposal. Preliminary proposals must be submitted, via FastLane, by 5 p.m. submitter's local time on the due date for preliminary proposals, namely, December 17, 2018 and July 1, 2019 for the next year.

Submitters will receive feedback from program staff indicating either encourage or discourage.

An encourage finding generally indicates that the proposal appears to be responsive to the program guidelines and is a candidate for further development relative to the solicitation.

A discourage finding generally indicates that the project is typically not responsive to the program, is more suited to another NSF opportunity, or has serious conceptual flaws that would not benefit from further development as a full submission.

The feedback provided pursuant to the preliminary proposal is advisory only; submitters of both "encouraged" and "discouraged" preliminary proposals are eligible to submit full proposals.

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The eligibility criteria for the QCIS-FF program are as follows:

Proposals may only be submitted by universities and colleges.

The number of proposals per principal investigator is limited to one.

In the event that any individual exceeds this limit, any proposal submitted to this solicitation with this individual listed as PI, co-PI, or Senior Personnel after the first proposal is received at NSF will be returned without review. No exceptions will be made.

Please review the solicitation for details.

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Preliminary proposals are required and must be submitted via the NSF FastLane system, even if full proposals will be submitted via Grants.gov.

The preliminary proposal should consist of three elements: Cover Sheet, Project Description, and Biographical Sketch. No other sections are required or may be included in the preliminary proposal.

In the cover sheet, the PI should be indicated. The budget indicated on the Cover Sheet should be the overall project budget total.
The Project Title on the Cover Sheet should begin with "QCIS-FF Preliminary" followed by a colon, then the title of the project. For example, **QCIS-FF Preliminary: Title**.

The Project Description is limited to two pages. The following information is required at the beginning of the Project Description: Project Title and Project Personnel and their departmental affiliations. This section should also contain a concise description of all aspects that a full proposal must address, and in sufficient detail to permit assessment of the ideas, the intent, the value, and the integration.

An NSF format Biographical Sketch of the PI is required.

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For the cover sheet, enter the preliminary proposal number associated with this full proposal in the box "Show Related Preliminary Proposal No. If Applicable."

Proposal Titles must indicate the QCIS-FF program followed by a colon, then the title of the project. For example, **QCIS-FF: Title**.

Collaborative proposals are not allowed in response to this solicitation. Subawards may not be requested as part of budgets in proposals submitted to this solicitation.

The Project Summary consists of an overview, a statement on the intellectual merit of the proposed activity, and a statement on the broader impacts of the proposed activity.

Please provide between 2 and 6 keywords at the end of the overview in the Project Summary.

In the Project Description describe the research and education activities to be undertaken in **up to 15 pages**. Describe curriculum development activities, in a separate section (included in these page limits) titled "Curriculum Development Activities." All proposals should seek to transcend the barriers that separate CS/IS/CE disciplines from other scientific disciplines that pursue the study of quantum information science, and describe these efforts in a separate, clearly-identifiable section in the Project Description. A clear description of the hiring process and the strategy to provide adequate interdisciplinary support and mentoring to the newly hired faculty should be presented.

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Additional supplementary documents include:

A data management plan. This is a standard NSF requirement.

Letters of Collaboration (if any) should include documentation of funded or unfunded collaborative arrangements of significance to the proposal. Letters of collaboration should be limited to stating the intent to collaborate and should not contain endorsements or evaluation of the proposed project. The REQUIRED format for letters of collaboration is in the NSF Proposal & Award Policies & Procedures Guide (PAPPG).

Quantum information science is inherently interdisciplinary, and collaborations can be a useful vehicle to promote interdisciplinary interactions.

Provide current, accurate information for all personnel and institutions involved in the project. NSF staff will use this information in the merit review process to manage reviewer selection.

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As for all proposals received by NSF, QCIS-FF reviewers and panelists will be asked to consider the intellectual merit and broader impact for each proposal for their reviews, panel discussions, and panel summaries.

In addition to these standard criteria, QCIS-FF reviewers and panelists will also be asked to consider additional review criteria that are unique to the QCIS-FF program.

More on this in a few moments.

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When evaluating NSF proposals, reviewers are asked to consider:

- what the proposers want to do?

- why they want to do it?
- how they plan to do it?
- how they will know if they succeed?
- what benefits would accrue if the project is successful?

These issues apply both to the technical aspects of the proposal (the intellectual merits) and the way in which the project may make broader contributions (the broader impacts).

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In addition to the standard NSF review criteria, the proposals will be evaluated on QCIS-FF specific review criteria, namely,

- The commitment of the department, school, and university to building, growing, and sustaining a long-term interdisciplinary effort in quantum computing and information science;
- Integration of the quantum faculty with the rest of the department;
- How the new hire enhances cross-departmental research collaborations such as those across physics, mathematics, material sciences, electrical engineering, and computer and information science; and
- How the new hire enables creation and support of educational programs in QCIS, including cross-disciplinary course offerings at both undergraduate and graduate levels.

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Awards will be issued as continuing grants, with annual increments tied to yearly assessments, with a letter from the department chair annually affirming departmental support for the hired faculty along the following aspects:

The hired faculty continuing his/her full-time tenure-track or tenured employment with the institution receiving the award;

The continued support of the institution as well as the satisfactory performance of the hired faculty in educational and research activities in QCIS and toward tenure;

Demonstration of interdisciplinary research collaborations, by both the department as well as by the faculty supported through the award, that advance the state of QCIS research; and

A detailed statement of contributions to QCIS over the preceding year by the faculty supported by the award. These contributions and their relevance to QCIS will be evaluated internally by NSF.

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So, in summary,

- The QCIS-FF program is envisioned to accept proposals in 2018 and 2019, with application deadlines noted in this solicitation.
- Institutions that have not received prior funding from this program will be prioritized during subsequent years of the program.
- The QCIS-FF program is intended to add to the existing academic workforce in quantum computing and communication.
- As such, the program will be able to support the hires of faculty who do not currently hold tenure-track or tenured academic positions, or support faculty hired from overseas, but will not support hiring of existing faculty from eligible U.S. institutions (e.g., lateral faculty movement).

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We have now completed the formal portion of the presentation. Before opening the telephone lines to questions from the audience, we would like to address a few of the questions we have already received. Dmitri Maslov is now going to address those questions.

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Proposals are solicited from departments of computer science, information science, and/or computer engineering. PIs are restricted to the Department Chairs/Heads, or persons acting in such or similar capacities. A PI may submit no more than one proposal per deadline.

- If I am the PI on a proposal to NSF 19-507:
    - Can I be the PI on any other proposal to NSF 19-507? NO
    - Can I be a co-PI on any other proposal to NSF 19-507? NO
    - Can I be Senior Personnel on any other proposal to NSF 19-507? NO
    - Are co-PIs allowed on a proposal to NSF 19-507? NO
    - Are Senior Personnel allowed on a proposal to NSF 19-507? NO

Only the Department Chair/Head may participate as PI, on at most one proposal for this solicitation.

In the event that any individual exceeds this limit, any proposal submitted to this solicitation with this individual listed as the PI after the first proposal is received at NSF <u>will be returned without review</u>.

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Both preproposals and proposals must be received by 5 p.m. submitter's local time on the established deadline date. Failure to submit by 5 p.m. submitter's local time will result in the preproposal or proposal not being accepted.

Please carefully read and follow the instructions provided in the solicitation itself and the NSF *Proposal & Award Policies & Procedures Guide (PAPPG).* If you need additional help preparing and submitting your proposal, we recommend that you contact your institution's Sponsored Projects Office.

You may use either Grants.gov or Fastlane to apply for the full proposal but can only use Fastlane for Preliminary proposal.

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Proposals may only be submitted by the following:
Institutions of Higher Education (IHEs) - Two- and four-year IHEs (including community colleges) accredited in, and having a campus located in the US, acting on behalf of their faculty members. Special Instructions for international Branch Campuses of US IHEs: If the proposal includes funding to be provided to an international branch campus of a US institution of higher education (including through use of subawards and consultant arrangements), the proposer must explain the benefit(s) to the project of performance at the international branch campus, and justify why the project activities cannot be performed at the US campus.

Note that the goal of QCIS-FF program is to grow US workforce, and thus the focus of this solicitation is on the US campuses.

NSF funding will support the entire academic year salary and benefits of a single tenure-track or tenured faculty member for a duration of up to three years. The total request per position cannot exceed $750,000.

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On behalf of the National Science Foundation and the QCIS-FF team, we thank you for participating in this webinar.

The slides and the script for this webcast, as well as an audio recording, will be available at http://www.nsf.gov/events/ and the program webape. On that page, you'll need to look for this webcast among the list of events. I invite your questions now, via email or via telephone to Vipin Chaudhary or Dmitri Maslov.