



From: Faculty Research Development Office (FRDO)  
Office of the Vice President for Research

Subject: Limited Competition: Quantum Sensing Challenges for Transformational Advances in  
Quantum Systems (QuSeC-TAQS) (NSF 22-630)

Date: October 4, 2022

UNM Researchers,

The **QuSeC-TAQS** program supports coordinated, interdisciplinary efforts to develop and apply quantum sensor systems, with demonstrations resulting in proof of principle or field-testing of concepts and platforms that can benefit society. QuSeC-TAQS proposals should have the potential to deliver new concepts, new platforms, and/or new approaches to implement and utilize quantum sensors. Proposals must articulate how the project will develop quantum sensing systems that address a particular need and can demonstrate improved capabilities or performance compared to classical systems. Proposals should be innovative, must focus on quantum functionality, and should result in experimental demonstrations.

This is a crosscutting program with participation from the BIO, CISE, EHR, ENG, MPS and TIP Directorates. This is no longer a "Big Ideas" solicitation because the quantum leap big idea activity is now part of the larger quantum information science and engineering priority area. Proposed projects should pursue either or both of the following tracks: **a)** Explore new ideas using for enhanced sensing functionalities using quantum information science and engineering principles. Proposals should describe how the project will result in experimental tests or a proof of principle for new concepts, platforms, or approaches for enhanced sensing. **b)** Translate quantum information science and engineering discoveries into scalable quantum sensor systems or networks. Proposals should describe how the project will demonstrate advantages for targeted applications as a result of applying fundamentally quantum phenomena.

Proposals should come from interdisciplinary teams of at least three (3) investigators who collectively contribute synergistic expertise from domains such as engineering, computer science, mathematical and physical sciences, biology, or geoscience. This requirement is intended to stimulate collaborations and grow the community of researchers who develop, co-design, and utilize quantum sensors. Some areas where quantum sensors might be applied include, but are not limited to chemical, material, biological, and health sciences, navigation, security, and remote sensing, astronomy, fundamental physics, and the advancement of quantum technologies for revolutionary approaches to computing and networking.

Each project team may receive support of up to a total of \$2,500,000 over the project duration of 4 years. It is not expected that all awards will receive the maximum amount; the size of awards will depend upon the type of research program proposed. Required preliminary proposals are due to the NSF on December 16, 2022. Invited full proposals are due April 3, 2023. More information can be found at <https://www.nsf.gov/pubs/2022/nsf22630/nsf22630.pdf>.

**This is a limited competition.** The sponsor will accept up to two (2) preliminary proposals and up to two (2) invited full proposals per lead institution contingent to the requirement that the proposed projects are in substantially different research areas. A minimum of one PI and **two** Co-PIs must participate. *If you are interested in participating in this limited competition, please follow the required 2-part process below.*

- STEP 1:** Submit a required statement of interest by **NOON, Friday, October 21, 2022** via UNM's InfoReady Review portal. This is a required step and no late submissions will be considered. Your statement of interest can be up to *one page* using the following format:
- Overview**, include the project title, name of the PI and the lead institution, and a list of Co-PIs and senior personnel along with their institutions;
  - Intellectual Merit**, provide a succinct summary of the proposed project. This should also articulate how the project leverages and/or promotes advances in quantum interconnects; and
  - Broader Impacts**, describe the broader impacts of the proposed work, including the potential long-term impact on national needs.

**STEP 2: Submit a 5-page pre-proposal narrative, a budget overview and 1-page budget justification\*, NSF formatted biosketches, and references cited; 11-point font) by NOON on Thursday, October 27, 2022 via UNM's [InfoReady Review portal](#).** No late submissions will be considered.

The 5-page pre-proposal to UNM must include:

- List of all senior personnel with each person's institution
- **Vision and Goals:** Describe the vision and specific goals of the proposed research, explicitly addressing how the different PIs and research topics mesh to achieve the research goals
- **Approach and Methodology:** Describe the approach and methodology that will be used to achieve the research vision and goals
- **Relevance to Quantum Sensing:** Describe how the project leverages and/or promotes advances in quantum sensing

\*Preliminary proposal budgets should not include detailed subaward budgets. However, the budget justification should include planned levels for subawards to any partner institution.

If you have any questions, please contact [limited@unm.edu](mailto:limited@unm.edu).

*If you are affiliated with HSC, please contact HSC Limited Competition at [HSC-LimitedComps@salud.unm.edu](mailto:HSC-LimitedComps@salud.unm.edu) for more information.*