



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

Subject: Limited Competition: Enabling Quantum Leap: Quantum Interconnect Challenges for Transformational Advances in Quantum Systems (QuIC-TAQS) (NSF 21-553)

Date: February 2, 2021

UNM Researchers,

The **Quantum Interconnect Challenges for Transformational Advances in Quantum Systems (QuIC - TAQS)** program is designed to support interdisciplinary teams that will explore highly innovative, original, and potentially transformative ideas for developing and applying quantum science, quantum computing, and quantum engineering in the specific area of [quantum interconnects](#). Quantum interconnects are an integral part of all aspects of quantum information science. Proposals should have the potential to deliver new concepts, new platforms, and/or new approaches that will implement the transfer of quantum states efficiently across platforms and over large length scales. Progress in the area of quantum interconnects will enable breakthroughs in quantum sensing, quantum communications, quantum simulations, and quantum computing systems. This Quantum Interconnect Challenges solicitation will support the process of translating such ideas into reality.

Competitive proposals are expected to present a collaborative, integrated approach and make a compelling case for how the selected topics are unified to potentially deliver a breakthrough in quantum interconnect technologies. Interconnected quantum systems, whether the interconnection is between quantum interfaces, chip-to-chip, or across continent-scale distances, rely on a set of common quantum communication elements. To fully realize the potential of quantum interconnection, significant [convergent research](#) by an interdisciplinary team is required, to advance areas such as: <sup>1</sup>Quantum memory and/or quantum repeaters with error correction ability; <sup>2</sup>High rate quantum entanglement sources, memory buffers and detectors; <sup>3</sup>Spatial-temporal encoding for high bit rates; <sup>4</sup>Efficient multiplexing and demultiplexing technology; <sup>5</sup>Transduction from optical and telecommunications regimes to quantum computer and quantum-sensor relevant domains. Diverse and innovative ideas that fit with the scope of quantum interconnects are encouraged. A discussion of examples of application specific challenges is available in the solicitation.

Each project team may receive support of up to a total of \$2,500,000 over the project duration of 4 years. **The deadline for the submission of the required Pre-Application to the sponsor is April 12, 2021. Invited full proposal applications are due June 14, 2021.** More information can be found at [https://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=505860](https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505860).

**This is a limited competition.** The sponsor will accept no more than **one preliminary proposal** per institution as the lead. In addition, *no individual may appear as Senior Personnel (Principal Investigator, Co-PI, and Faculty Associate or equivalent) on more than two QuIC - TAQS preliminary proposals.* The Principal Investigator (PI) must be a faculty member employed by the submitting organization. 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.*

1. Submit a required statement of interest by **Noon, Friday, February 19, 2021** in the form of an up to *one page* project summary using the following format:
  - a. **Overview** section, include the title of the project, the name of the PI and the lead institution, and a list of co-PIs and senior personnel along with their institutions;
  - b. **Intellectual Merit** section, provide a succinct summary of the of the proposed project. This should also articulate how the project leverages and/or promotes advances in quantum interconnects; and
  - c. **Broader Impacts** section, describe the broader impacts of the proposed work, including the potential long-term impact on national needs
2. **Submit a 5-page pre-proposal narrative plus coversheet, budget overview, NSF formatted biosketches, and references cited (details below); all documents in a SINGLE PDF file, 11 point font) by NOON on Tuesday, March 2, 2021 to [limited@unm.edu](mailto:limited@unm.edu) with the subject line indication: QuIC TAQS – your name.** No late submissions will be considered.

The limited competition pre-proposal to UNM must include:

- A cover sheet that lists the project title and all senior personnel with each person's institution and contact information
- 5-page pre-proposal narrative that includes:
  - **Vision and Goals:** Describe the vision and specific goals of the proposed research, explicitly addressing how the different PIs and research topics mesh together 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 Interconnects:** Describe how the project leverages and/or promotes advances in quantum interconnects
- Budget overview (using Table below) and 1-page budget justification
- Biosketches (NSF format) for PI, Co-PIs, and Senior Personnel
- References cited

|                                    | <b>Year 1</b> | <b>Year 2</b> | <b>Year 3</b> | <b>Year 4</b> | <b>Total</b> |
|------------------------------------|---------------|---------------|---------------|---------------|--------------|
| <b>Faculty Salary &amp; Fringe</b> |               |               |               |               |              |
| <b>Postdoc Salary &amp; Fringe</b> |               |               |               |               |              |
| <b>Staff Salary &amp; Fringe</b>   |               |               |               |               |              |
| <b>Student Salary &amp; Fringe</b> |               |               |               |               |              |
| <b>Equipment</b>                   |               |               |               |               |              |
| <b>Travel</b>                      |               |               |               |               |              |
| <b>Participant Costs</b>           |               |               |               |               |              |
| <b>Subaward Costs*</b>             |               |               |               |               |              |
| <b>Other Costs</b>                 |               |               |               |               |              |
| <b>F&amp;A Costs</b>               |               |               |               |               |              |
| <b>Total Costs</b>                 |               |               |               |               |              |

\*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 are affiliated with HSC, please contact Corey Ford ([CFord@salud.unm.edu](mailto:CFord@salud.unm.edu)) or Cassandra Misenar ([CMisenar@salud.unm.edu](mailto:CMisenar@salud.unm.edu)) for more information.*