**QNM and Elevate Quantum Partnership Opportunities**

**New Mexico Quantum Maker Space**

**Goal**: Establish and launch a dedicated joint Quantum Information Science & Technology Maker Space

* Build dedicated, modern infrastructure for quantum information science and technologies (QIST) that is based in Albuquerque, New Mexico (NM) and operated jointly through the Quantum New Mexico Institute (QNM-I). This space will serve as the primary hub for QIST operations in NM and will be representative of partners across the state.
* Provide space to support joint research and development activities to advance QIST technologies of interest to core NM stakeholders and strategic partners. Space would include next-generation technology testbeds, lab space to support joint strategic QIST programs, and offices for QNM partners. Will serve as the first joint R&D space for QIST that serves the entire state. Space to account for ~1/3 of building footprint.
  + **Sandia Trapped Ion Experimental Team Lab**: ~2400 sq ft total. 2000 sq ft lab space to support 3-4 simultaneous experiments, 200 sq ft side room for prep (soldering, baking vacuum chambers, etc.), 200 sq ft cleanroom for packaging. HVAC requirements of +/- 2 degrees, chilled water. Equipment would include lasers, racks for control electronics, test equipment, optical tables, cryostats, etc.
  + **Sandia Trapped Atom Experimental Team** **Lab**: ~2000 sq ft total. 1800 sq ft lab space to support 3-4 simultaneous experiments and 200 sq ft side room for prep (soldering, baking vacuum chambers, etc.). Shared cleanroom space with Trapped Ion Lab (see above). HVAC requirements of +/- 2 degrees, chilled water. Equipment would include optical tables, vacuum equipment, lasers, and enabling technology.
  + **LANL Trapped Atom Experimental Lab(s)**: @Mike Martin and @Mike Rabin.
  + **UNM Experimental Lab(s)**: @Ivan Deutsch and @Dave Hanson
* Provide platform to engage and host leading quantum industry QIST technologies and platforms, helping drive engagement with established QIST industry and fostering the development of a dedicated industrial quantum complex in New Mexico. Additionally, provide co-working space that designed to bring together the community and drive QIS economic development in the state. Space to account for ~1/3 of building footprint.
* Provide dedicated lab space, lecture halls, and learning platforms to promote QIST workforce development activities in NM. Through a dedicated workforce development Center, we can break down the high barriers of entry, leverage the world class experts in NM to teach the next generation, and expand diversity in the field by engaging underserved communities in the state. Space to account for ~1/3 of building footprint.

**Partners:** Bring together stakeholders across the State to ensure

* Co-led by UNM (Dave Hanson/ Ivan Deutsch), Sandia (Setso Metodi/ Jake Douglass), and LANL (Mike Rabin/ Mike Martin)
* Academic Institutions (UNM, NMSU, NMT, CNM, others?)
* National Labs (Sandia Labs, Los Alamos National Labs, Air Force Research Lab)
* Government (NM EDD, MRCOGS, City of Abq, etc.)
* Community (Roadrunner Studios, Dale Decker & Team, etc.)

**Metrics of Success:**

* Bring x (4?) established QIS companies to the state of NM to perform meaningful work in the next 3-5 years.
* Train x students in the facility over the next x years
* Expand QNM partnerships to x new NM partners.
* Launch x labs of multi-institutional teams to help drive engagement and prepare next gen workforce
* Bring x experimental faculty hires to the state to help maintain academic leadership in the field

**Motivation and Value Propositions**

* Builds on over 25 years and over $400M of investments in QIST at UNM, Sandia, and LANL
* Will serve as the focal point to create a regional QIST industrial sector, driving economic impact in an area where NM is currently a world-leader but in jeopardy of losing our leadership.
* Through dedicated efforts can truly expand diversity and inclusion in the field, providing new opportunities in high tech jobs for NM residents. Keep great minds in NM!
* Remove barriers to entry and roadblocks to growth for QIST companies. Access to fabs (CINT, MESA, etc.) could be a differentiating thing for new businesses. Additionally, environmental testing capabilities for sensing such as radiation, fog tunnel, flight tests could all be relevant.
* Become THE region for QIST for national security

**Ask:** To realize this vision we are requesting the following funds

* $8M through Elevate Quantum (current EQ ask is $30M for CO through MAKE)
* $8M through matching funds (current EQ ask is $6M for CO through EQ partners for MAKE)
  + $4M for infrastructure and building funds. Support basic infrastructure, capital equipment purchases, etc.
  + $3M dedicated industry engagement package. Funds directed to industry to establish operations in NM
  + $1M to QNM-I to support leadership and administration activities.

**Elevate Quantum LAUNCH Start-up Network**

**Goal**: Partner with Elevate Quantum (EQ) to stand up a world class QIST startup accelerator

* Hosted at the NM Quantum Maker Space, partner with EQ and ecosystem development partners to support quantum industry and launch new ventures.
* Gain access to a large network of VCs and Angel Investors through EQ partnerships.
* Leverage the expertise of the community to develop a quantum business resource hub, a digital platform offering toolkits and guides on navigating the QIST industry, intellectual property law, regulatory compliance, and market entry strategies.

**Partners:** Bring together partners across NM to spur economic development activities.

* Led by …
* Academic Institutions (UNM (Rainforest?), NMSU Arrowhead, CNM Ingenuity)
* National Labs (Sandia Integrated Partnerships Organization, LANL Feynman Center)
* Government (NM EDD, MRCOGS, City of Abq, etc.)
* Community (Roadrunner Studios, Dale Decker & Team, etc.)

**Metrics of Success:**

* Launch x new quantum companies
* Build and launch coordinated IP strategy for state of NM to maximize tech transfer impact
* Launch of new program through NM business schools focused on QIST and entrepreneurial activities

**Motivation and Value Propositions**

* Provide dedicated support to aid in tech transfer in a coordinated and impactful way
* Provide opportunity to build new quantum industry partners in the state
* Remove barriers to entry and roadblocks to growth for QIST companies. Access to fabs (CINT, MESA, etc.) could be a differentiating thing for new businesses. Additionally, environmental testing capabilities for sensing such as radiation, fog tunnel, flight tests could all be relevant.
* Become THE region for QIST for national security

**Ask:** To realize this vision we are requesting the following funds

* $2M through Elevate Quantum (full EQ ask is $10M for the LAUNCH initiative)
* $1M through matching funds (full EQ ask is $10M from VC’s for the LAUNCH initiative)
  + Can we get these matching funds from somewhere in NM? What we want them to go towards?

**Quantum Learning Lab**

**Goal**: Launch a first of its kind Quantum Learning Lab to support quantum technician pathways

* Support efforts to launch the Quantum Learning Lab (QuLL) User Facility at Central New Mexico Community College (CNM) to help address the nation’s critical need for a quantum workforce by providing hands-on learning opportunities to students, educators, and professionals in the mountain west.
* Leveraging space at this **\*CNM Workforce Development location\*,** establish a quantum information science and technology (QIST) user facility that is dedicated to engaging students from diverse communities that provides opportunities to learn about and work on real hardware and experiments related to QIST.
* Bring together subject matter experts and academic partners in NM to build novel programming based on atomic systems, which are relatively low cost and applicable to the broadest number of regional employes and mission spaces.
* Through intentional partnerships, create accessible, hands-on experiments that are paired with learning modules that can be adapted to a wide range of user backgrounds and education levels.

**Partners:** Leverage NM’s world class QIS community to prepare the next gen QIS workforce

* Co-led by Sandia (Megan Ivory, Jake Douglass) and CNM (Brian Rashap)
* Academic Institutions (UNM, NMSU, NMT, CNM, Navajo Tech, Fort Lewis College, others)
* National Labs (Sandia Labs, Los Alamos National Labs, Air Force Research Lab)
* Government (govt partners here?)

**Metrics of Success:**

* Launch x labs of multi-institutional teams to help drive engagement and prepare next gen workforce
* Bring x experimental faculty hires to the state to help maintain academic leadership in the field
* Bring 4 established QIS companies to the state of NM to perform meaningful work
* Train x students in the facility over the next x years

**Motivation and Value Propositions**

* Scale efforts in quantum workforce by leveraging established programs from K-12 (e.g. QCaMP) through graduate programs (UNM PhD, internships at national labs, etc.) to expand participation in the field.
* Help address the current workforce gaps (only 1 in 3 QIS jobs can currently be filled)
* Help prepare an expert workforce that will help draw industry to the state.
* Through dedicated efforts can truly expand diversity and inclusion in the field, providing new opportunities in high tech jobs for NM residents. Keep great minds in NM!

**Ask:** To realize this vision we are requesting the following funds

* $3M through Elevate Quantum (current EQ ask is $3M for NM for QuLL)
* $3M through matching funds (current EQ ask is $3, source TBD)
  + Funds to be used for the purchase of equipment, paying for time spent developing curricula, administration, and to provide scholarships for all students who go through the course (free to students in pilot program)