Search for the Director of the Quantum New Mexico Institute
University of New Mexico
Albuquerque, New Mexico

The University of New Mexico (UNM) seeks a dynamic, innovative, results-oriented, and proven leader to serve as the inaugural permanent Director of the recently launched Quantum New Mexico Institute (QNM-I), one of UNM's premier strategic research centers and the home of an innovative partnership with Sandia National Laboratories. Reporting directly to the Vice President for Research (VPR), and as a faculty member of the College of Arts and Sciences or the School of Engineering, the Director will advance research, business development, and workforce development initiatives. The Director will join QNM-I near its founding, with significant momentum towards its ambitious vision of making New Mexico's quantum technology ecosystem one of the finest in the world on the eve of the next revolution in quantum information science.

UNM provides education to nearly 29,000 students, more than 80 percent of whom are New Mexico residents. The University has one of the most diverse student bodies of any major research university in the nation and is one of only 22 Hispanic-Serving Institutions (HSI) in the U.S. that has a Carnegie Classification of Highest Research Activity (R1). UNM is ranked among the top 100 Research and Development-Performing Institutions in the U.S., with expenditures of over 350 million dollars annually. UNM provides an excellent environment for research-university education and training and produces a unique demographic of superbly trained researchers for our nation.

Launched in January 2024 as a joint venture with Sandia National Laboratories, QNM-I builds on the strengths in quantum information science at UNM, Sandia National Laboratories, and across New Mexico. New Mexico has a rich history in the development of quantum information science and Sandia National Laboratories is a global authority on benchmarking quantum systems and designing and manufacturing ion traps. QNM-I maintains a creative and entrepreneurial faculty from the UNM Departments of Physics and Astronomy, Electrical and Computer Engineering, Chemistry and Chemical Biology, Computer Science, Mathematics and Statistics, Mechanical Engineering, and Chemical and Biological Engineering.

As the inaugural permanent Director of QNM-I, the Director will have the opportunity to establish a strategic vision and plan for the new Institute, ensuring its sustainable growth, expanding extramural funding, and developing new partnerships with a range of stakeholders. They will bring a deep understanding of the needs of researchers in quantum-relevant fields as well as a facility to communicate

with a variety of audiences, from government officials to industry leaders to top researchers. In doing so, the Director will lead the Institute towards achieving its mission of accomplishing transformative, long-lasting breakthroughs in quantum information science and engineering and the shared vision of creating an ecosystem within New Mexico that provides a home for quantum companies and scientists from around the world.

In meeting these ambitious goals, the Director will address the following key opportunities and challenges:

- Develop and execute a strategic vision and plan for QNM-I that positions New Mexico at the forefront of quantum information science and engineering
- Increase the visibility and prominence of QNM-I, its initiatives, and New Mexico's quantum technology ecosystem nationally and internationally
- Advance QNM-I's research productivity and infrastructure to attract the nation's brightest minds as faculty and collaborators and expand the Institute
- Build new partnerships and enhance existing partnerships that advance QNM-I's mission
- Ensure sustainable funding from a variety of sources

A list of the desired qualifications and characteristics of the Director, prepared by QNM-I stakeholders with the assistance of Isaacson, Miller, a national executive search firm, can be found at the conclusion of this document. Background information and key details related to the position are also included below.

ABOUT THE UNIVERSITY OF NEW MEXICO

Founded by an act of the New Mexico Territorial Legislature in 1889, the University of New Mexico opened its doors in June 1892, 20 years before its namesake would become a state. The University now offers over 215 degree and certificate programs, including approximately 94 baccalaureates, 71 masters, and 37 doctoral degrees through the Anderson School of Management, College of Arts and Sciences, College of Education and Human Sciences, College of Fine Arts, Graduate Studies, Honors College, College of Nursing, College of Pharmacy, College of Population Health, College of University Libraries and Learning Sciences, School of Architecture and Planning, School of Engineering, School of Law, School of Medicine, and University College. For more information about UNM, see Appendix I at the conclusion of this document.

ABOUT SANDIA NATIONAL LABORATORIES

For more than 70 years, Sandia has delivered essential science and technology to resolve the nation's most challenging security issues. Operated and managed by National Technology and Engineering Solutions of Sandia, LLC, a subsidiary of Honeywell International Inc., Sandia National Laboratories functions as a contractor for the U.S. Department of Energy's national Nuclear Security Administration.

In keeping with its vision as the nation's premier science and engineering laboratory for national security and technology innovation, Sandia recruits the best and the brightest, equips them with world-class

research tools and facilities, and provides opportunities to collaborate with technical experts from many different scientific disciplines.

Sandia grew out of America's World War II effort to develop the first atomic bombs. Today, keeping the U.S. nuclear stockpile safe, secure, and effective is a major part of Sandia's work, but its role has evolved to address additional complex threats facing the nation. Sandia now carries out research and development in nuclear deterrence, national security programs, global security, energy & homeland security, and advanced science & technology. Of Sandia's more than 16,700 staff, approximately 2,000 conduct work related to quantum technology and quantum information science, many of whom are eager to partner with academic institutions to advance the impact of quantum technology on society.

Sandia opened their second main site in California's Livermore Valley in 1956. Sandia/California is uniquely situated at the edge of the San Francisco Bay Area, in close proximity to first-tier universities, Silicon Valley companies, and other top research laboratories and facilities.

ABOUT THE OFFICE OF THE VICE PRESIDENT FOR RESEARCH

The mission of the Office of the Vice President for Research (OVPR) is to advance innovation and discovery. UNM believes that research is education and, as New Mexico's premier R1 institution, the University is uniquely positioned to provide an unparalleled education for students and world-class opportunities for faculty and staff. The core OVPR comprises 19 staff, faculty, and student employees and a budget of around 13.5 million dollars.

There are three types of centers and institutes at UNM. Category I research centers are within academic departments, Category II centers are within colleges or schools, and Category III centers cut across units of the university and report directly to the Office of the Vice President for Research (OVPR) or the Office of the Provost and Executive Vice President for Academic Affairs. There are currently 11 research centers and institutes managed by the OVPR. Included in the 11 centers and institutes is the New Mexico Established Program to Stimulate Competitive Research (NM EPSCoR). Each center/institute has broad faculty and interdisciplinary representation, as well as external grant funding and interdisciplinary programs. The OVPR provides an overarching management support structure that includes high-level HR, facilities, financial support, information technologies, management assistance, and staff development. Although some of these centers and institutes support themselves through grants and contracts, others are centrally funded by the OVPR as they provide support, research, and analysis of importance to New Mexico and UNM.

The administrative costs of the OVPR, including support for Centers and Institutes, are currently entirely funded by the recovery of Facilities and Administrative (F&A) costs from grants to main campus researchers. Additional F&A is returned to the OVPR from grants to the UNM Health Sciences Center (HSC) investigators that include collaborations with main and branch campus researchers, based upon the level

of effort by the investigator on the main or branch campus. After the OVPR costs are covered, the F&A is then distributed to centers, schools, colleges, departments, and PI's.

Since Dr. Ellen Fisher joined the team at the OVPR as Vice President for Research (VPR) in 2021, there has been a dedicated commitment to furthering the Office's reach and impact across the university through a culture of collaboration and transparency. The recently developed five-year research strategic plan outlines goals focusing broadly on strengthening the research enterprise at UNM while ensuring ethical and compliant research practices. There are also opportunities to build and enhance external relationships with private entities, government, and community partners to secure financial resources and realize UNM's ambitious objectives.

THE CURRENT CONTEXT OF QNM-I

In 2022, the University of New Mexico and Sandia National Laboratories announced the ambitious goal to transform the state of New Mexico into a global powerhouse in the emerging quantum technology market. As noted, this goal emerged from the already significant strength in quantum technology in the state, built on the expertise of Sandia National Laboratories, Los Alamos National Laboratories, and UNM. UNM's Center for Quantum Information and Control (CQuIC) brings significant expertise in quantum computation, quantum simulation and complexity, quantum control and measurement, quantum metrology, and quantum optics and communication. CQuIC, which will be part of the new QNM-I, is the recipient of the National Science Foundation's Focused Research Hub in Theoretical Physics.

In January 2024, QNM-I was launched as a Category III center at UNM in partnership with Sandia National Laboratories. It builds on the momentum of CQuIC with new fellowship opportunities, including the Sandia Gil Herrera Fellowship in Quantum Information Science. Further, UNM and Sandia are in the final stages of developing a memorandum of understanding that will expand opportunities for UNM students to participate in collaborative research between UNM and national labs. UNM has also embarked upon a multi-year faculty cluster hire initiative in the areas of quantum science and engineering, and the new Director will have the opportunity to help direct hires through this initiative to support the goals of QNM-I. Two affiliated faculty will start in Fall 2024, and five to six hires total are planned, with the opportunity for even more. Current affiliated faculty include six tenure track/tenured faculty from the Physics and Astronomy, Electrical & Computer Engineering, and Chemistry departments. Additional interested faculty have also been identified as potential QNM-I members. The Director will arrive with one or two staff members supporting the Institute, including a senior program manager. The Institute is currently supported by funds from the Provost's and VPR's offices with a current annual budget of $200,000 in unrestricted funds as well as a portion of the F&A recovered from grants managed by the Center. There may be additional start-up funds for the Institute negotiated upon the Director's arrival.

UNM has graduated more than 40 doctorates in physics who are now quantum information science leaders in academia, national labs, and industry across the nation. Moreover, the Center for Hight Technology Materials (CHTM) has a strong reputation in cutting-edge research in quantum materials

engineering. To facilitate and execute research and superb educational opportunities in quantum science and engineering, the partnerships with Sandia National Laboratories, Los Alamos National Laboratories, and private industry provide a unique opportunity for faculty, postdocs, and student researchers.

ROLE OF THE DIRECTOR

Reporting directly to the VPR, the Director of QNM-I will oversee all of the activities of the Institute, including developing strategic plans, supervising staff, projects, activities, and the Institute's budget, and representing QNM-I to the University and external communities at all levels. They will establish a vibrant and well-funded collaborative research enterprise, create active research partnerships within the University and with strategic partners outside the university, mentor faculty, post-docs, and students in developing research programs within the QNM-I mission, and enhance QNM-I's portfolio of external funding by facilitating and catalyzing the acquisition of grants and contracts awarded to QNM-I faculty. They will serve on the OVPR Research Council to develop and implement OVPR initiatives in conjunction with other research leaders across campus.

KEY OPPORTUNITIES AND CHALLENGES FOR THE DIRECTOR

The next Director will leverage the State's significant intellectual resources and dedication to workforce and ecosystem development to drive the Institute to even greater impact by addressing the following opportunities and challenges:

Develop and execute a strategic vision and plan for QNM-I that positions New Mexico at the forefront of quantum information science and engineering

As the first permanent leader of QNM-I, the Director will establish and execute the Institute's first multi-year strategic plan. The Institute's ambitious goals include achieving research breakthroughs that enhance the impact of quantum technology on society, developing a diverse pipeline of quantum researchers who will serve as the workforce of this rapidly expanding industry, and creating a dynamic quantum ecosystem that attracts industry and research investment to New Mexico. In support of these goals, the Director will leverage the state's historical and current strength in quantum technology development, including the unique opportunity to work directly with New Mexico-based National Laboratories with deep expertise in quantum fields. The Director will work with the Institute's diverse stakeholders, including affiliated faculty, UNM's OVPR, partners at the National Laboratories, and other research, government, and industry partners to ensure buy-in and create a clear and compelling roadmap for QNM-I's success.

Increase the visibility and prominence of QNM-I, its initiatives, and New Mexico's quantum technology ecosystem statewide, nationally, and internationally

A key marker of success for the Director will be enhancing the reputation of QNM-I and New Mexico's quantum technology ecosystem and leveraging that reputation to further attract top talent locally,

nationally, and internationally to increase investment in the region. In doing so, the Director must first engage at the state level, building buy-in from the state legislature and relevant state agencies to ensure that the development of a quantum information science ecosystem is a statewide priority, included in New Mexico's science and technology planning. With support from UNM representatives, they will build individual relationships with key New Mexico government officials and legislative representatives.

Further, the Director will engage holistically with the economic development of the state. They will seek federal grant support for economic development engines and investments from industry, particularly local technology companies, to advance the overall prosperity of the state of New Mexico. By raising the prominence of the quantum ecosystem in New Mexico, the Director has the opportunity to secure meaningful investments that will improve quality of life in the state. They will also increase the visibility and prominence of the great work happening at UNM to continue to position UNM and Sandia as thought partners in the national and international conversations around quantum information science.

Advance QNM-I's research productivity and infrastructure to attract the nation's brightest minds as faculty and collaborators and expand the Institute

Essential to QNM-I's mission as a Category III research center is the creation of a dynamic research ecosystem that enables interdisciplinary research and breakthroughs in quantum information sciences and engineering. The Director will inherit an already successful research enterprise, with significant faculty affiliates across multiple departments and Colleges, established partnerships with national laboratories, and increased institutional investments to expand faculty research capacity around quantum technology. As the new Director, they will encourage creativity and greater research productivity while also ensuring an equitable supportive infrastructure that eases barriers to research success. Given the complexity of working across campus administrative structures and National Laboratory regulations related to national security, the Director will bring a savvy, solutions-oriented approach to enhancing collaborations. Further, they will integrate the Institute's research mission with graduate and undergraduate educational programs of the highest quality, ensuring the next generation of scientists is fully prepared to advance the field.

As research productivity and impact increases, the next Director will also be charged with the expansion of QNM-I to reach even greater heights. They will expand the interdisciplinary nature of the Institute to attract engagement from even more disciplines across UNM's Colleges and Schools. They will oversee and expand the staff of the Institute as needed and leverage the growing reputation of UNM's quantum program to recruit and retain even more prominent scholars as affiliates of the Institute.

Build new partnerships and enhance existing partnerships that advance QNM-I's mission

The success of the Institute, by definition, depends on the creation of a collaborative ecosystem with QNM-I at the core. The Director will be a consummate partnership- and relationship-builder, consistently and proactively seeking new ways to partner with a greater range of organizations that are invested in the

growing success of New Mexico's quantum technology ecosystem. They will inherit a strong partnership with Sandia and will pay careful attention to enhancing this relationship to maximize collaborative research advancement and workforce development. They will seek to build new partnerships with Los Alamos National Laboratories and other local and regional quantum-related companies and organizations.

The next revolution in quantum information science and engineering will require a convergence of computing power in the region, and QNM-I has the opportunity to be a central player in this development. Further, it will require a diverse and capable workforce, trained in the latest quantum technologies. The Director will develop partnerships to enable New Mexico's development in these areas and will work to expand the presence of technology companies in the state.

Ensure sustainable funding from a variety of sources

As a new Institute, QNM-I has already received significant investments from the Provost/EVP for Academic Affairs and the VPR at UNM. However, achieving the Institute's ambitious goals will require a steady increase in sources of funding and a sustainable approach to QNM-I's expansion. Increasing research productivity of QNM-I's affiliated faculty is an essential task, and the next Director will ensure faculty are competitive for federal, state, and other research grants. The Director will also engage with a wide variety of audiences internally and externally to ensure investment in QNM-I's compelling mission. This could include revenue-generating partnerships with a range of organizations, direct relationships with legislators and other government officials, and engagement with philanthropic organizations or individual donors. Therefore, the Director will be expected to play a large external role, building relationships regularly and championing the great work happening within QNM-I for continued investment for many years to come.

QUALIFICATIONS AND CHARACTERISTICS

The Director of QNM-I must bring a proven record of scholarly achievement and leadership at a level commensurate with obtaining a faculty position. A Ph.D., or equivalent, in a field within a QNM-I relevant field and at least three years of leadership experience in a research setting is required. In addition, the successful candidate will have many, if not all, of the following qualifications and characteristics:

- A record of research excellence in at least one of the areas within QNM-I's mission
- A record of success in securing competitive research funding, including for large, multi-investigator, and/or multi-institutional projects
- Demonstrated experience of successful leadership in a highly productive research setting
- Experience with coordination and integration of interdisciplinary graduate research and educational programs, including successful mentoring of junior researchers
- Management experience, including oversight of day-to-day operations, maintaining budgets, policy and process development and implementation, and supervision of staff

- Excellent communication skills for a variety of audiences, including faculty and researchers, administrators, government officials, and industry representatives
- A deep commitment to diversity, equity, and inclusion and a track record of supporting and/or developing related initiatives
- A deep intellectual curiosity and interdisciplinary approach to quantum information sciences
- A high level of integrity and emotional intelligence

Location

New Mexico is known as "The Land of Enchantment" or "Tierra del Encanto" because of its scenic beauty and rich history. New Mexico offers a wide variety of adventures, art, music and dance, breathtaking landscapes, and multicultural heritage, including a combination of Native American, Hispanic, and Anglo cultures that cannot be found in any other state in the U.S. New Mexico has the highest percentage of Hispanics in the U.S., including descendants of the original Spanish/Mexican settlers who have lived in the area for more than 400 years, as well as more recent immigrants from a variety of nations in Latin America. It has the second-highest percentage of Native Americans as a proportion of the population, and the fourth-highest total number of Native Americans. The major Native American nations in the state are Pueblo, Navajo, and Apache peoples.

Oil and gas production, agriculture, the arts, the film industry, tourism, and federal government spending are important drivers of New Mexico's economy. State and local governments have a comprehensive system of tax credits and technical assistance to promote job growth and business investment, especially in new technologies. The state is home to more Ph.D. holders per capita than any other state in the country as it is home to Sandia National Laboratories, Los Alamos National Laboratory, Intel, several other research facilities, and several land management agencies including the Forest Service and National Park Service.

New Mexico has one of the most diverse landscapes in the world, with a range of incredible outdoor adventures to match. The geography ranges from snow-capped 13,000-foot peaks, wildflower fields, thick forests of cottonwoods, white sand dunes, volcanoes and lava fields, to vast expanses of ranchland and desert.

The University of New Mexico Main Campus is located in Albuquerque, the most populous city in New Mexico with its own rich culture and heritage as one of the oldest cities in the U.S. Averaging 310 days of sunshine a year, it is also a great place for outdoor activities, including biking, skiing, or golfing on some of the best golf courses in the Southwest. Residents and visitors alike take advantage of the many traditional New Mexican restaurants, enjoy world-class visual and performing arts, and visit the many museums and historical sites around the state. Albuquerque is home to the International Balloon Fiesta, the world's largest gathering of hot-air balloons. The Sandia Mountains run along the eastern side of Albuquerque, and the Rio Grande flows through the city, north to south. More information about Albuquerque can be found at http://www.visitalbuquerque.org/.

Applications, Inquiries, and Nominations

Screening of complete applications will begin immediately and continue until the completion of the search process. For best consideration, applications should be submitted by September 27, 2024. Inquiries, nominations, referrals, and CVs with cover letters should be sent via the Isaacson, Miller website for the search: https://www.imsearch.com/open-searches/university-new-mexico-quantum-new-mexico-institute/director.

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UNM is an Equal Opportunity/Affirmative Action employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, citizenship, disability or protected veteran status.

APPENDIX I: THE UNIVERSITY OF NEW MEXICO

UNM comprises its Albuquerque Campus as well as its branch campuses in Gallup, Los Alamos, Taos, and Valencia. There is also a campus and regional health center in Rio Rancho. The Albuquerque Campus student population reflects the ethnically diverse population of New Mexico and includes historically underrepresented groups – approximately 44% of the student population are Hispanic, 5% Native American, 4% Asian, 2% African American, 3% multi-racial, and 5% are international. The Hispanic student population includes some with deep roots going back many generations in the region while others are recent immigrants from Latin America; Native American students come from 24 tribes that have ancestral homeland ties to New Mexico including 20 Pueblos, the Navajo Nation, and the Jicarilla Apache Nation, Mescalero Apache Tribe, and the Fort Still Apache Tribe. The populations at the branches are equally diverse, with, for example, the student population of the Gallup campus being nearly 70% Native American. It is a point of pride that the University is composed of a complex intersection of cultures and backgrounds.

UNM boasts an outstanding faculty that includes four National Academy of Sciences/Engineering Members, five National Academy of Inventors Fellows, 60 Fulbright Scholar program awardees, and many fellows of various other associations and societies. Faculty publish in high impact professional journals such as *Science*, *The New England Journal of Medicine*, *Nature, Biological Psychiatry, Proceedings of the National Academy of Sciences, Journal of the American Chemical Society, Physical Review Letter, International Journal of Art and Design Education*, and *Journal of Politics*, as well as with major academic publishers such as Cambridge University Press and Oxford University Press, and with the University of New Mexico Press. UNM professors have been quoted in local newspapers and media, and in national publications such as *Business Week, Los Angeles Times, The New York Times, The New Yorker, Newsweek, Parade Magazine,* and *U.S. News and World Report*, among others. They have shared their expertise on CNN, Good Morning America, Nova, National Geographic, the Today Show, National Public Radio, local news stations, and other television and radio shows.

At UNM, research, scholarship, and creative activity are not just limited to STEM fields. They include several nationally recognized interdisciplinary research groups focused on bioinformatics and collections-based research; ecology and climatology; human evolution, social and behavioral dynamics, and addictions; and materials science and optical sciences and engineering. Excellence in additional disciplinary units includes computational and data sciences; high energy density physics; medieval studies; regional resource economics, sustainable water, and environment; southwest anthropological research and socio-cultural studies; Latin American studies; indigenous planning; and land arts of the American West. Developing areas of research and scholarship strength include community-engaged arts, education, and public health; high performing computing; neuroscience, learning, cognition and memory; and clean energy systems.