LEGISLATIVE EDUCATION STUDY COMMITTEE
BILL ANALYSIS
56th Legislature, 1st Session, 2023

Bill Number SB79 **Sponsor** Soules

Tracking Number .223774.1 **Committee Referrals** SEC/SFC

Short Title NM University Quantum Materials and Tech Program

Analyst Hathaway **Original Date** 1/23/23
Last Updated

BILL SUMMARY

Synopsis of Bill

Senate Bill 79 (SB79) appropriates $15 million to the University of New Mexico (UNM) to establish a quantum materials and technologies program. The program would be established in collaboration with New Mexico State University (NMSU), the New Mexico Institute of Mining and Technology (NMIMT), and the federal research laboratories in New Mexico.

Funds would be available for expenditure in FY24 through FY28 and would be used for curricula, faculty, and technologies, as well as to develop workforce training programs in the use and maintenance of quantum materials technologies.

FISCAL IMPACT

The bill appropriates $15 million from the general fund to the board of regents of UNM for expenditure in FY24 through FY28. Any unexpended or unencumbered balance remaining at the end of FY28 shall revert to the general fund. SB79 notes no more than $3 million of the total appropriation could be expended in any given fiscal year.

SUBSTANTIVE ISSUES

What are Quantum Materials? The Princeton Materials Institute at Princeton University has written that quantum materials are "vaguely defined as materials that don't behave according to laws of classical physics" and notes examples include superconductors, complex magnets, or topological materials. Quantum materials are currently used in technologies such as hospital MRIs that use superconductors or hard disk drives that use magnetoresistance sensors to function. In addition to currently used technology, quantum materials are also being used to develop many novel technologies including faster computers, quantum computers, improved optical sensors, or levitating trains.

The Higher Education Department (HED) agency analysis was not available at the time this analysis was written.

ADMINISTRATIVE IMPLICATIONS

UNM notes it would need to use administrative resources to determine how to distribute and administer funds. UNM also notes SB79 does not define how funds will be administered or distributed and does not provide guidance on reporting requirements.

UNM reports it would also need to develop criteria for distribution, tracking, and reporting on the use of appropriated funds. In addition, UNM will need to work with the other institutions slated for collaboration (NMSU, NMT, and the federal research laboratories in New Mexico) to define research plans and metrics for evaluating success.

The New Mexico Economic Development Department (EDD) reported in its agency analysis of SB79 the proposed bill may result in some additional economic development opportunities for the state by enabling collaboration between research universities, community colleges, and national laboratories. EDD also notes the research and development enabled by the provisions of SB79 may support the expansion of new businesses, job creation, innovation, and workforce development opportunities.

OTHER SIGNIFICANT ISSUES

UNM Center for Quantum Information and Control. The Center of Quantum Information and Control (CQuIC) is an interdisciplinary research center located at UNM. The center functions across the university's departments in physics and astronomy, electrical and computer engineering, and chemistry and chemical biology. CQuIC is focused on quantum information science, including quantum computation, quantum simulation and complexity, quantity control and measurement, quantum metrology, and quantum optics and communication.

UNM Intended Uses of Funding. In its analysis of SB79, UNM writes that while New Mexico's established quantum research centers, including CQuIC, are "leaders in their field," there are additional and urgent needs for research resources and personnel specifically in the area of quantum materials. UNM further notes the efforts to be supported by SB79 include:

(1) Capacity building to bring more capital inflow to New Mexico. UNM notes there are often federal funding opportunities to support quantum materials and technologies, but not enough staff and researchers to generate proposals, which are then awarded to competitors and that may affect New Mexico's ability to be competitive.
(2) New faculty and staff hires for a joint institute—called Quantum New Mexico Institute—between UNM and Sandia National Laboratory.
(3) The development of a summer innovation and entrepreneurship program in quantum technologies. UNM notes this program would be intended to facilitate innovation, encourage startups, and lay groundwork to create a venture studio focused on quantum materials and technologies.
(4) Workforce training efforts in kindergarten through 12th grade (K-12), continuing into two- and four-year colleges, and including graduate programs.
(5) Coordinating and supporting broad efforts in material synthesis.
(6) Development of new and existing faculty talent in quantum materials and technologies through startup packages for new faculty and NMSU, NMT, and UNM, in addition to support for postdoctoral positions that UNM notes would include positions for individuals from underrepresented backgrounds.
(7) Development of student talent by establishing research assistantships;

(8) The establishment of quantum science and engineering courses that UNM notes would be accessible by all New Mexico colleges and universities; and
(9) Targeted statewide workforce training initiatives.

NMSU and NMIMT Implications. In its analysis of SB79, NMSU notes the opportunities for quantum technology have historically created capacity in northern New Mexico and the proposed measures could help create capacity in southern New Mexico. NMT, in its analysis, notes the funding proposed in SB79 could help expand infrastructure and a statewide network to bolster research and capacity in quantum materials and technology statewide.

RELATED BILLS

Relates to Senate Bill 154, Quantum Info Science Tech Faculty, which appropriates $500 thousand to the New Mexico Institute of Mining and Technology for expenditure in FY24 through FY27 to hire a designated quantum information science technology faculty member.

SOURCES OF INFORMATION

- LESC Files
- University of New Mexico
- Economic Development Department
- New Mexico Institute of Mining and Technology
- New Mexico State University

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