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Building a Hub for Quantum Technology

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Technology Enhancement Fund

- The Legislature recognized the importance research plays in driving economic development in the state and appropriated $85 million over the past 3 years to the technology enhancement fund (TEF).
- The TEF is a research matching fund set up to aid research institutions in securing federal and private research grants by allowing institutions to use TEF balances to provide matches necessary for grant awards.
- The Higher Education Department (HED) promulgated rules and heads the awards committee which reviews applications for TEF awards and has final authority over which projects are funded.
- There have been 4 award cycles to date with $51.8 million allocated to 75 projects at the University of New Mexico, New Mexico State University, New Mexico Tech, and Navajo Technical University.
- In June, $5 million was awarded from the TEF to UNM to provide state matching funds for the quantum computing initiative, the New Mexico Economic Development Department pledged an additional $5 million, though these funds will need to be appropriated by the Legislature during the 2025 session.

Technology Enhancement Fund
(dollars in thousands)

Sources	**FY23**	**FY24**	**FY25**
Beginning Balance		30,735	23,245
Appropriated	45,000	30,000	10,000
Total Funds	**45,000**	**60,735**	**33,245**

Uses			
Round 1 Funding	14,265		
Round 2 Funding		15,881	
Round 3 Funding		11,618	
Round 4 Funding		9,991	
Ending Balance	**30,735**	**23,245**	**33,245**

Quantum Computing Hub

- The federal Economic Development Administration (EDA) awarded $41 million for a quantum tech hub to the elevate quantum initiative, a collaboration between higher education institutions in Colorado, New Mexico, and Wyoming as well as national laboratories and private industry.

    - The original grant proposal was for $70 million but was reduced to $40 million by the EDA.
        - UNM estimates the reduced federal award will still lead to $5.7 million in quantum funding including $2.7 million for workforce development funding and $3 million for instrumentation.
- The tech hub will focus on commercial-ready applications in sensing, computing, networking, and enabling hardware. The consortium aims to expedite lab-to-market translation by establishing globally unique quantum labs and fabrication facilities, reducing the time and cost of commercializing quantum innovation; lowering barriers to quantum entrepreneurship; and building a workforce ready to meet the needs of this growing sector.
- UNM intends to use the funding secured through the grant and other sources to build an incubator laboratory space that facilitates rapid commercialization of quantum information technology products.
    - The initial facility will be a retrofit of an existing building, but the program anticipates outgrowing this space and will likely move in the coming years. The facility is anticipated to generate revenue through grant and contract activities and be self-sustaining in 3-5 years.
    - The laboratory will also provide hands-on access to quantum hardware and workforce development opportunities through Central New Mexico Community College (CNM).
    - There are currently around 3 thousand jobs in quantum technology of which 50 percent do not require a 4-year degree and have average annual salaries of $125 thousand. UNM reports the field will grow to 15 thousand jobs by 2030 with 80 percent of those jobs not requiring a 4-year degree.
    - UNM estimates that the economic impact would likely be realized in 5-10 years from the start of operations.
- UNM is currently working with Sandia National Laboratories on a quantum computing institute that is intended to train a quantum computing workforce.
- Quantum computing leverages the principles of quantum mechanics, using qubits that can exist in multiple states simultaneously (superposition) and be entangled with each other. This allows quantum computers to perform complex calculations much faster than classical computers for certain problems. Despite its potential, the technology is still in its early stages, facing challenges such as qubit stability and error correction.
- The potential applications for quantum computing are vast and include solving complex problems with implications for artificial intelligence, material science, healthcare, and climate tech, among other areas.