Zapata and University of Maryland Collaborate to Advance New Paradigm in Quantum Software

January 12, 2026

Initiative aims to publish a formally verified implementation of Shor's quantum factoring algorithm with relevance to cryptography and other high-value domains

BOSTON, Jan. 12, 2026 (GLOBE NEWSWIRE) -- Zapata Quantum, Inc. (OTC: ZPTA) ("Zapata", "Zapata Quantum" or the "Company"), a pioneer in quantum computing application and algorithm development, today announced a collaborative research effort with the University of Maryland (UMD), a global leader in quantum computing and quantum information science. The effort will demonstrate a fundamentally new approach to building quantum applications grounded in formal verification.

"We are honored to partner with UMD, one of the world's leading academic institutions in quantum computing," said Sumit Kapur, Chief Executive Officer of Zapata Quantum. "This collaboration positions Zapata at the forefront of the field, advancing rigorous, verification-driven approaches that the quantum ecosystem will increasingly depend on."

A Fundamentally New Way to Build Quantum Applications

As quantum algorithms increase in scale and complexity, the translation of complex mathematical formulations into quantum circuits has become one of the most difficult, manual, and error-prone steps in quantum application development. The Zapata-UMD collaboration uses end-to-end formal, or mathematical proof-based, verification to address this issue and maintain correctness throughout the process.

"Formal methods have a long history in classical software engineering, but their adoption in quantum computing is still emerging," said Runzhou Tao, Assistant Professor at the University of Maryland and Fellow at the Joint Center for Quantum Information and Computer Science (QuICS). "This collaboration demonstrates how formal verification can be applied in practice to a non-trivial quantum algorithm that is central to the field."

"This work establishes a verification-first model for building quantum applications," added Yudong Cao, project lead and Zapata co-founder. "Instead of beginning with manually derived code and validating it after the fact, we start from a proof of correctness and let the software follow from that proof. As quantum software complexity increases alongside hardware capability, this shift is essential for viable commercial applications."

Zapata aims to publish the results of the collaboration as a formally verified implementation of Shor's quantum factoring algorithm along with associated resource estimates, enabling independent validation and reuse by the broader research and engineering community. While Shor's algorithm serves as a natural starting point due to its complexity and relevance to the high-value problem of cryptography, Zapata views this work as a foundational template which can be extended to other high-value commercial domains such as quantum chemistry, materials science, optimization, and finance.

Addressing a Systemic Gap in Quantum Application Development

The ability to design and validate reliable applications has emerged as a central challenge in quantum computing. In a December 2025 paper titled The Grand Challenge of Quantum Applications, researchers at Google noted that "when it comes to the hard work required to uncover and substantiate truly promising quantum applications, the quantum industry appears to face a classic collective action problem, leading to systemic under-investment in this area."

As the only publicly traded, pure-play, hardware-agnostic quantum software company, Zapata is uniquely positioned to address this challenge. "While the bulk of the field is focused on lower levels of the stack, our experience and platform are centered around the higher-level development of applications for real-world commercial use cases," concluded Kapur. "Formal verification will allow us to deliver provable correctness and reliability—capabilities that are essential for quantum computing to reach its full potential."

About Zapata Quantum

Zapata Quantum is a leading hardware-agnostic, pure-play quantum software company focused on accelerating quantum application development. With a portfolio of more than 60 granted and pending patents developed over seven years, Zapata supports applications across cryptography, pharmaceuticals, finance, materials discovery, defense, and more. The Company is the only organization to have participated across all technical areas of DARPA's Quantum Benchmarking program and has worked

with Fortune 500 enterprises and government agencies to translate quantum advances into real-world impact. Learn more at zapataquantum.com.

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