Rigetti Introduces Novel Chip Fabrication Process For Scalable, High Performing QPUs

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Rigetti's novel technique, Alternating-Bias Assisted Annealing (ABAA), allows for more precise qubit frequency targeting, enabling improved execution of 2-qubit gates and a reduction in defects, which both contribute to higher fidelity. This work was recently published in *Nature Communications Materials*.

BERKELEY, Calif., Aug. 15, 2024 (GLOBE NEWSWIRE) -- Rigetti Computing, Inc. (Nasdaq: RGTI) ("Rigetti" or the "Company"), a pioneer in full-stack quantum-classical computing, today announced that its paper introducing a novel chip fabrication process, Alternating-Bias Assisted Annealing (ABAA), was recently published in *Nature Communications Materials.* ABAA allows for more precise qubit frequency targeting, enabling improved execution of 2-qubit gates and improvement in performance, which both contribute to higher fidelity. This technique is now being leveraged to fabricate chips for Rigetti QPUs, including the Novera™ QPU and the upcoming Ankaa™-3 system.

The basis of Rigetti's superconducting qubits are Josephson Junctions (JJs), which are two thin layers of superconducting metal (aluminum) separated by a barrier (aluminum oxide). Electrons are able to tunnel across the insulator from one electrode to another — resulting in a characteristic frequency for the qubit that allows for it to be controlled and measured. While the reproducibility and energy loss in these junctions has been difficult to control, the simplicity, scalability, and ease of fabrication of these superconducting devices makes them one of the most desirable platforms for building quantum computers. Finding a solution to the junction reproducibility problem has been a long-standing goal in the field.

Rigetti researchers discovered that by applying a series of low, alternating voltages at room temperature to the oxide barrier, the qubit frequencies can be precisely targeted. The ability to controllably tune qubits prior to a chip being packaged is essential for large-scale QPU production. This improves the addressability of the qubits, speeds up interactions, and improves the scalability of the technology. Unlike more complicated solutions that address the problem of tuning frequency, which often require laser trimming of the chip, the ABAA technique is a simple and scalable process that only requires sending pulses of voltage to the chip.

"We've long known that having our own foundry is a tremendous asset to our chip design and fabrication processes. Introducing the ABAA technique is a perfect example of our ability to rapidly test and implement new methods to improve our capabilities," says Dr. Subodh Kulkarni, Rigetti CEO. "We believe this new technique strengthens our path to scaling to even higher qubit count systems with greater control over our qubit performance."

In addition to improving the precision and the accuracy of Rigetti's qubits, the ABAA technique has also proven to heal some of the defects and imperfections in the JJs, allowing for clearer communication between qubits and couplers — which also leads to improved performance due to less interference on the circuit.

The Company will leverage the ABAA technique for its anticipated 84-qubit Ankaa-3 system, which is expected to be deployed by the end of 2024.

About Rigetti
Rigetti is a pioneer in full-stack quantum computing. The Company has operated quantum computers over the cloud since 2017 and serves global enterprise, government, and research clients through its Rigetti Quantum Cloud Services platform. The Company's proprietary quantum-classical infrastructure provides high performance integration with public and private clouds for practical quantum computing. Rigetti has developed the industry's first multi-chip quantum processor for scalable quantum computing systems. The Company designs and manufactures its chips in-house at Fab-1, the industry's first dedicated and integrated quantum device manufacturing facility. Learn more at www.rigetti.com.

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Cautionary Language Concerning Forward-Looking Statements
Certain statements in this communication may be considered "forward-looking statements" within the meaning of the federal securities laws, including but not limited to, expectations with respect to the Company's business and operations, including its expectations related to the use of the ABAA technique for qubit frequency targeting resulting in improvements in chip performance and allowing for scaling to higher qubit systems with greater control over qubit performance and expectations of the ABAA technique in connection with the anticipated 84-qubit Ankass-3 system. These forward-looking statements are based upon estimates and assumptions that, while considered reasonable by the Company and its management, are inherently uncertain. Factors that may cause actual results to differ materially from current expectations include, but are not limited to: the Company's ability to achieve milestones, technological advancements, including with respect to its technology roadmap, help unlock quantum computing, and develop practical applications; the ability of the Company to obtain government contracts successfully and in a timely manner and the availability of government funding; the potential of quantum computing; the ability of the Company to expand its QPU sales; the success of the Company's partnerships and collaborations; the Company's ability to accelerate its development of multiple generations of quantum processors; the outcome of any legal proceedings that may be instituted against the Company or others; the ability to maintain relationships with customers and suppliers and attract and retain management and key employees; costs related to operating as a public company; changes in applicable laws or regulations; the possibility that the Company may be adversely affected by other economic, business, or competitive factors; the Company's estimates of expenses and profitability; the evolution of the markets in which the Company competes; the ability of the Company to implement its strategic initiatives, expansion plans and continue to innovate its existing services; the expected use of proceeds from the Company's past and future financings or other capital; the sufficiency of the Company's cash resources; unfavorable conditions in the Company's industry, the global economy or global supply chain, including financial and credit market fluctuations and uncertainty, rising inflation and interest rates, disruptions in banking systems, increased costs, international trade relations, political turmoil, natural catastrophes, warfare (such as the ongoing military conflict between Russia and Ukraine and related sanctions and the state of war between Israel and Hamas and related threat of a larger conflict), and terrorist attacks; and other risks and uncertainties set forth in the section entitled "Risk Factors" and "Cautionary Note Regarding Forward-Looking Statements" in the Company's Annual Report on Form 10-K for the year ended December 31, 2023, the Company's Form 10-Q for the three months ended June 30, 2024, and other documents filed by the Company from time to time with the SEC. These filings identify and address other important risks and uncertainties that could

cause actual events and results to differ materially from those contained in the forward-looking statements. Forward-looking statements speak only as of the date they are made. Readers are cautioned not to put undue reliance on forward-looking statements, and the Company assumes no obligation and does not intend to update or revise these forward-looking statements other than as required by applicable law. The Company does not give any assurance that it will achieve its expectations.