

# Quantum Computing's New Trust Benchmark

IBM and UChicago establish verifiable advantage, critical for AI's future.

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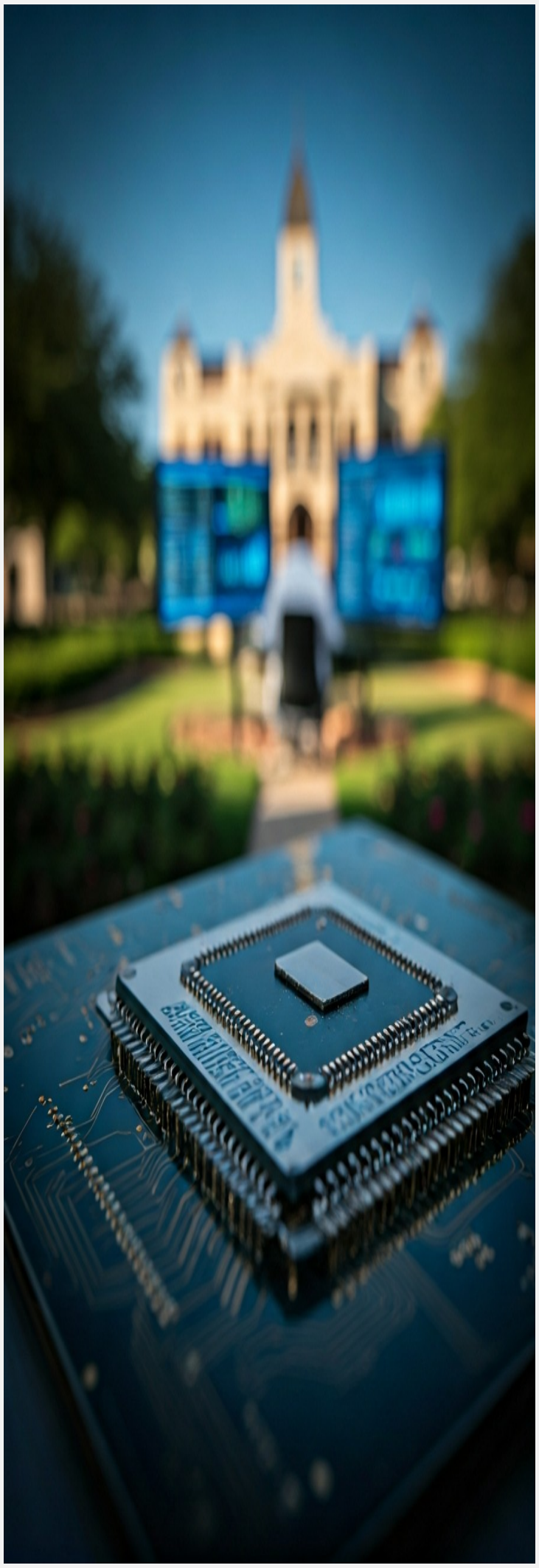
THE DATA

# 15 minutes

## Time for 70-logical-qubit task

IBM's quantum computer completed a complex logical computation with 70 logical qubits, exceeding the practical reach of classical simulators.

This milestone, achieved by IBM and University of Chicago researchers, involved executing 2,415 logical two-qubit operations and 468 logical T gates. The encoded computation demonstrated effective logical error rates 10 times lower than physical error rates, providing statistical confidence in results that classical computers cannot efficiently reproduce.



Source: IBM and University of Chicago · Published August 12, 2026

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# Verifying 'Un-checkable' Quantum Results

As quantum computers tackle problems beyond classical simulation capabilities, the ability to verify their results becomes a paramount challenge. This demonstration introduces a statistical framework to establish confidence in complex quantum computations, a crucial step for high-stakes AI applications in fields like drug discovery or financial modeling where classical cross-validation is infeasible.



# 02

## Accelerating Fault-Tolerant AI Development

This breakthrough moves beyond merely demonstrating quantum speed-up, offering a concrete pathway to build trust in quantum systems even before full fault tolerance is universally achieved. By showcasing reduced effective error rates and providing statistical verification, it sets a new standard for quantum hardware, accelerating the integration of reliable quantum components into advanced hybrid AI architectures.

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