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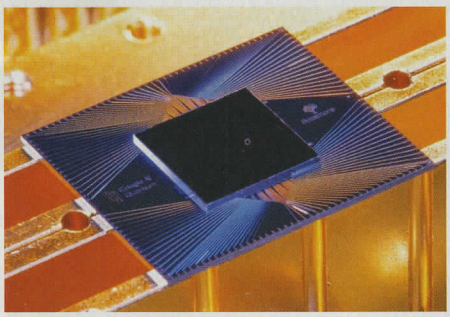

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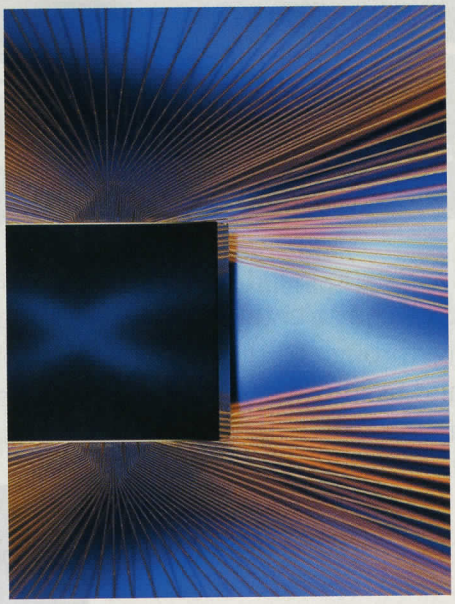

ON THE COVER

In this week's issue, **John Martinis** and his colleagues describe a significant step in the development of quantum computing. The researchers have demonstrated experimentally that a programmable quantum computer can outperform the world's most powerful conventional processors — a state known as quantum supremacy. The team used a quantum processor made up of 53 functional qubits to sample the output of a quantum circuit generating random numbers. The quantum processor, dubbed Sycamore, was able to collect 1 million samples from the circuit in roughly 200 seconds, a feat that the authors estimate would take a state-of-the-art supercomputer around 10,000 years to perform. The cover shows an artistic rendering of the Sycamore chip. Cover image: JVG.
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