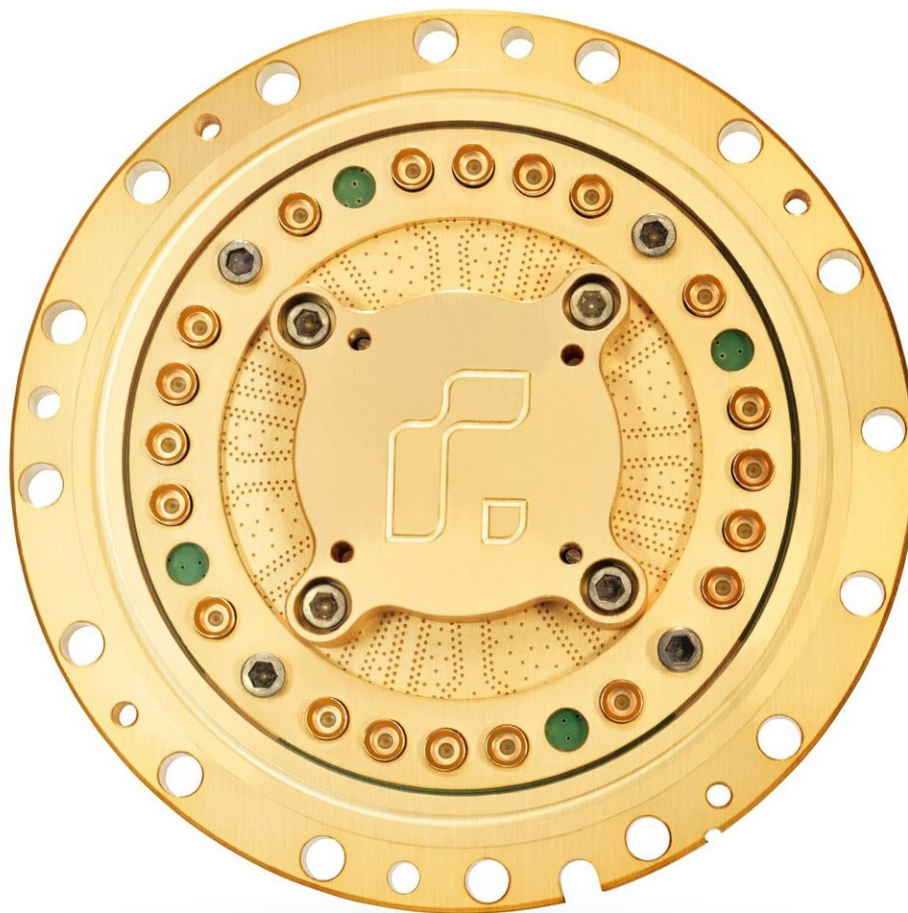# Quantum Cloud Services is entering arena with big prize offer

September 10 2018, by Nancy Owano

Credit: Rigetti Computing

Quantum computers newsmaker Rigetti Computing has announced Quantum Cloud Services and, along with that, a $1 million contest prize for a conclusive demonstration of quantum advantage.

Takers will be those who take to the idea of exploring quantum machines' potentials through the cloud. Rigetti's platform was also noted in the context of stepping into the "cloud establishment" arena. *Forbes* said, "CEO Chad Rigetti's challenger to the cloud establishment comes with a major technological ace: what the startup says is the first-ever cloud service powered by quantum computing."

The prize, meanwhile, will go to the first person or team using the QCS to demonstrate that a quantum machine is capable of showing what was called "quantum advantage." Competition details are said to follow at the end of next month.

Rigetti fleshed out his concept of quantum advantage in a blog. "This is the inflection point where quantum computers first begin to solve practical problems faster, better, or cheaper than otherwise possible." Rigetti believes that this quantum "advantage" will be reached in new markets and domains, "changing the ways in which problems are solved across industries."

MIT Technology Review got down to what sets quantum computing apart from traditional computing.

Traditional machines use standard digital bits that can represent either 1 or 0, said -but qubits can be both at the same time.

"Adding just a few extra qubits to a machine—and linking them via a phenomenon known as 'entanglement'—creates exponential leaps in computing power," said Martin Giles, the review's San Francisco bureau chief.

Giles further compared the traditional way of getting experiment results with the new approach.

"To run such experiments, researchers often program their own classical computers with hybrid quantum algorithms that then use application programming interfaces, or APIs, to call on quantum machines in the cloud for specific bits of a calculation." The results are shipped to the traditional machines.

Quantum computers promise to run calculations far beyond the reach of any conventional supercomputer, but what exactly is QCS? This is a cloud computing platform where quantum processors are integrated with a classical computing infrastructure, said the blog.

"QCS tackles the problem with a data center containing both quantum computers and classical ones in a system optimized to run entire hybrid algorithms," said Giles.

Rigetti Computing is a five year old startup as described by *Forbes*. *MIT Technology Review* said the company recently unveiled "the world's most powerful quantum processor, a 128-qubit model that tops the previous record holder, Google's 72-qubit Bristlecone chip."

"In August, we announced that we are building 128-qubit quantum computers with the low error rates needed to achieve advantage. These systems are based on our scalable 16, 32, and 128-qubit Aspen quantum processors," wrote Rigetti.

What's next? "We will be granting early access to Quantum Cloud Services in the coming weeks," he said. "You can sign up to reserve a QMI today at rigetti.com."

 More information: www.rigetti.com/

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