



China Outpaces US In Quantum Computing And Quantum Encryption

If China wins the Quantum computing war, it will obsolete land-based communication infrastructure and give China complete dominance over data encryption. China has already indicated that it will invest whatever resources are necessary to win this race, which many have compared to the original race to land on the moon. □ TN Editor

U.S. and other Western scientists voice awe, and even alarm, at China's quickening advances and spending on quantum communications and computing, revolutionary technologies that could give a huge military and commercial advantage to the nation that conquers them.

The concerns echo — although to a lesser degree — the shock in the West six decades ago when the Soviets launched the Sputnik satellite, sparking a space race.

In quick succession, China in recent months has utilized a quantum satellite to transmit ultra-secure data, inaugurated a 1,243-mile quantum link between Shanghai and Beijing, and announced a \$10 billion

quantum computing center.

“To me, what is alarming is the level of coordination of what they’ve done,” said Christopher Monroe, a physicist and pioneer in quantum communication at the University of Maryland.

Perhaps more than the accomplishments of the Chinese scientists, it is the resources that China is pouring into the research into how atoms, photons and other basic molecular matter can harness, process and transmit information.

“It doesn’t necessarily mean that their scientists are better,” said Martin Laforest, a physicist and senior manager at the Institute for Quantum Computing at the University of Waterloo in Ontario, Canada. “It’s just that when they say, ‘We need a billion dollars to do this,’ bam, the money comes.”

The engineering hurdles that China has cleared for quantum communication means that the United States will lag in that area for years.

“The general feeling is that they’ll get there before us,” said Rene Copeland, a high-performance computer expert who is president of D-Wave (Government) Inc., a Vancouver-area company that uses aspects of quantum computing in its systems.

But building a functioning quantum computer sets forth different kinds of challenges than mastering quantum communication, and may involve creating materials and processes that do not yet exist. Once thought to be decades off, scientists now presume a quantum computer may be built in a decade or less. The stakes are so high that advances by the U.S. government remain secret.

“We don’t know exactly where the United States is. I fervently hope that a lot of this work is taking place in a classified setting,” said R. Paul Stimers, a lawyer at K&L Gates, a Washington law firm, who specializes in emerging technologies. “It is a race.”

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