

China's Satellite Sends Unbreakable Digital Data from Space

written by GEG | August 15, 2017



Chinese scientists succeeded in sending the first 'hack-proof' digital signal from a satellite to Earth. It is a major achievement in what they call a global quantum communication network. The word 'quantum' is from 'quantum physics' which includes the concept that some things cannot be observed, because the act of observation instantly changes the object so it can no longer be observed or that it is observed incorrectly. Applied to encrypted data signals, the data changes its encryption code the instant it senses any unauthorized attempt to read the signal. This technology is highly sought after to provide a competitive edge in military and financial communications. –GEG Chinese scientists have become the first to realize quantum key distribution from a satellite to the ground, laying the foundation for building a hack-proof global quantum communication network.

The achievement based on experiments conducted with the world's first quantum satellite, Quantum Experiments at Space Scale (QUESS), was published in the authoritative academic journal Nature on Thursday.

The Nature reviewers commented that the experiment was an impressive achievement, and constituted a milestone in the field.

Nicknamed "Micius," after a 5th Century B.C. Chinese philosopher and scientist who has been credited as the first person ever to conduct optical experiments, the 600-kilogram-plus satellite was sent into a sun-synchronous orbit at an altitude of 500 kilometers on Aug. 16, 2016.

Pan Jianwei, lead scientist of QUESS and an academician of the Chinese Academy of Sciences (CAS), said the satellite sent quantum keys to ground stations in Xinglong, in north China's Hebei Province, and Nanshan, near Urumqi, capital of northwest China's

Xinjiang Uygur Autonomous Region.

The communication distance between the satellite and the ground station varies from 645 kilometers to 1,200 kilometers, and the quantum key transmission rate from satellite to ground is up to 20 orders of magnitude more efficient than that expected using an optical fiber of the same length, said Pan.

When the satellite flies over China, it provides an experiment window of about 10 minutes. During that time, the 300 kbit secure key can be generated and sent by the satellite, according to Pan.

“That, for instance, can meet the demand of making an absolute safe phone call or transmitting a large amount of bank data,” Pan said.

“Satellite-based quantum key distribution can be linked to metropolitan quantum networks where fibers are sufficient and convenient to connect numerous users within a city over 100 km. We can thus envision a space-ground integrated quantum network, enabling quantum cryptography- most likely the first commercial application of quantum information- useful at a global scale,” Pan said.

The establishment of a reliable and efficient space-to-ground link for faithful quantum state transmission paves the way to global-scale quantum networks, he added.

[Read full article here...](#)