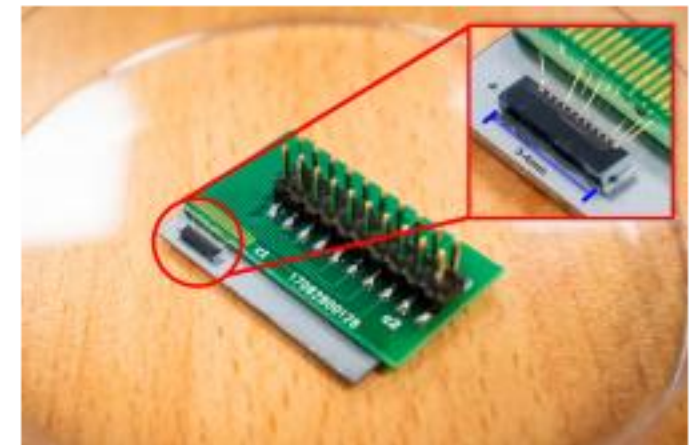


Quantum engineers have reduced the quantum communication chip a thousand times

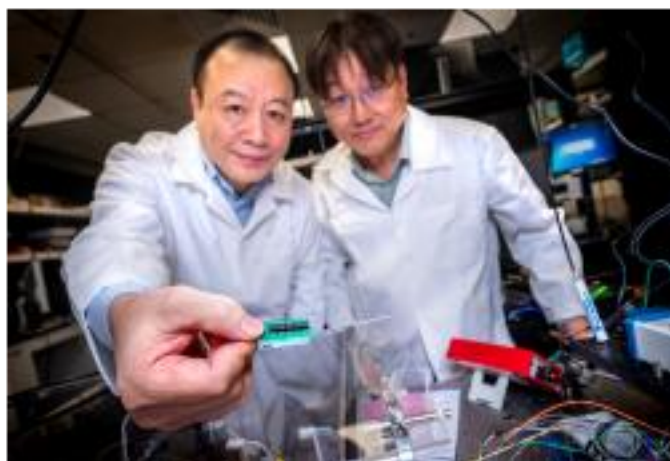
Contemporary communication is facing a quantum attack that is likely to be fatal to her. Hope are quantum technologies that could secure communication against new threats. Until now, it was necessary to have the size of a refrigerator or even an entire floor in the building. Now, quantum communication fits in a chip of a few millimeters.

It is not very obvious yet, but the world with classic communication security, from ATM withdrawals to online shopping with a smartphone, is basically over. Quantum technologies break these technologies. Electronic transmission of PINs or passwords may be successfully compromised, which constitutes a security risk. And this risk will continue to increase.

However, quantum technologies help not only hackers but also vulnerable communication systems that need to be better secured. Quantum engineer Liu Ai Qun of Nanyang Technological University in Singapore (NTU Singapore) and his collaborators have developed a quantum communication chip that is about a thousand times smaller than comparable today's quantum systems. But this chip offers the same luxury quantum security.



Quantum chip. Credit: NTU Singapore.



Liu Ai Qun left. Credit: NTU Singapore.

The new quantum chip measures about 3 millimeters and uses quantum communication algorithms to increase security. The key advantage of this chip is that it takes up much less space than its predecessors. Contemporary quantum systems that can provide quantum trick communication are as large as a refrigerator. Or perhaps as a room or the entire floor in a building. Technology with a few millimeters chips fits on your smartphone, tablet or smart watch.

According to Liu, cyber security is very important in today's world. These are all kinds of data and their communication. Virtually all digital platforms require passwords or biometric data from their users. And these data can be traced or decrypted. Quantum

communication does not need this, because the password and the transmitted information together create a message that is transmitted between the communication participants. Only the recipient with the correct key will read the message. It's like someone would send a locked letter in an envelope and put the key to that lock in the same envelope.

The team's quantum communication chip from NTU Singapore should be economically viable because it uses standard electronics industry materials such as silicon. And its production is not extremely complicated. Liu believes that their research is a bit closer to quantum computers and communication. It could lead to the development of next-generation communication devices, as well as to better security of existing digital services such as online banking or digital government.



NTU Singapore logo.

Liu and his collaborators are now developing a hybrid network that includes traditional optical communication systems and quantum communication systems. Such a network should improve the compatibility of quantum technologies, which can then be used in a wider range of applications.