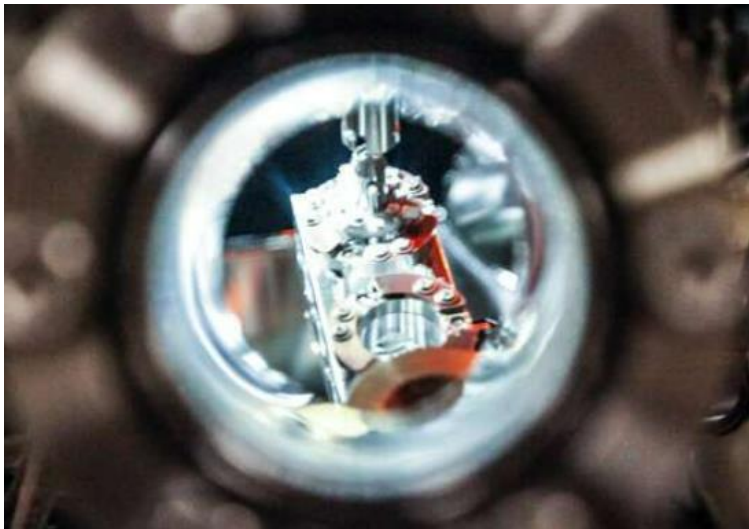


Quantum China

## Electrons that flow like liquids can help development of quantum computers

English translation

Release time: 2022-10-26



Quantum computers that perform computational tasks better than conventional computers have a big obstacle: They are prone to errors in data storage and processing due to environmental disturbances such as vibration. Recently, a research team led by Nanyang Technological University in Singapore has discovered how to control electrons at extremely low temperatures, providing a way to solve this obstacle and develop more powerful and accurate quantum computers.

The team's experimental results show for the first time that strong interactions between electrons can occur under specific conditions. These interactions were previously only predicted in ideal models, observed at the edge of an atomically thin and electrically insulating material at ultra-low temperatures approaching the frigid temperatures of outer space. Now the team has confirmed that interactions at these low temperatures cause electrons to flow like a liquid. This means that electrons tend to move collectively along a line, rather than individually or randomly in different directions.

The special state of matter that allows electrons to move "in line" is called a "helical Tomonaga-Luttinger liquid". This is one of the factors that physicists believe is crucial for holding electrons together to form particles called parafermions. This discovery has significant implications for the development and application of quantum computers.

Source: [Phys.org](https://www.phys.org)

<https://www.quantumchina.com/newsinfo/4540521.html?templateId=520429>