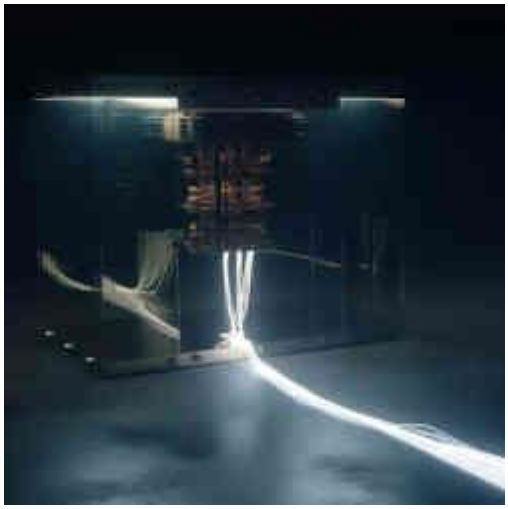
COMMUNICATIONS OF THE ACM

Communications of the ACM (US)

Quantum Computing May be Bolstered by Liquid-Like Electrons

November 1, 2022



When electrons are made to act in what's known as a "helical Tomonaga-Luttinger liquid," there are fewer particle interactions and energy exchange between them and the system.
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Experiments conducted by scientists at the Nanyang Technological University in Singapore may strengthen quantum computing with liquid-like electrons called parafermions.

Electrons coaxed to act in a helical Tomonaga-Luttinger liquid exchange fewer particles and energy between them and the system, reducing the likelihood of error and decoherence in quantum systems.

The researchers deposited atom-thick crystals of tungsten ditelluride onto a graphene substrate, creating a quantum spin Hall insulator.

They cooled the substrate toward absolute zero degrees Fahrenheit (-273 degrees Celsius) and observed increased electron repulsion and collective motion where parafermions theoretically exist. The researchers intend to lower temperatures to 150 millikelvins for experiments that should enable actual observation of parafermion clusters.

From *Tom's Hardware*
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