**COVER IMAGE**

When superconducting discs are deposited on graphene they induce local superconducting islands.

The phase coupling between the islands can be controlled by a gate.

Quantum phase fluctuations kill the superconductivity and lead to a metallic state; however, at higher magnetic fields superconductivity can return.

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IMAGE: ZHENG HAN AND VINCENT BOUCHIAT

COVER DESIGN: ALLEN BEATTIE

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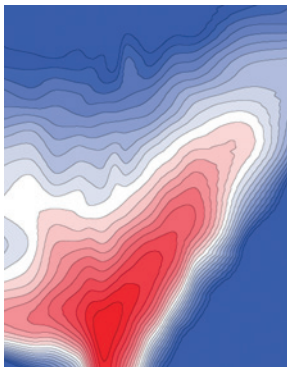
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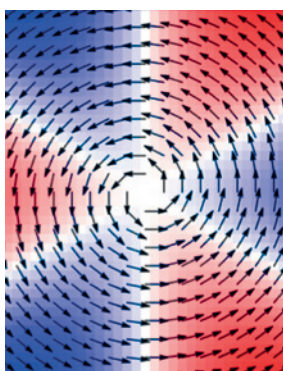
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The thermal and quantum fluctuations around a quantum critical point can be studied independently by mapping the evolution of the spin dynamics in the critical region of a dimerized quantum magnet using neutron scattering.

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Spin polarization due to spin-orbit coupling requires broken inversion symmetry. Now, calculations show that the effect arises from local site-asymmetry rather than global space-group asymmetry, and that a hitherto overlooked form of spin polarization should also exist in centrosymmetric structures.

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