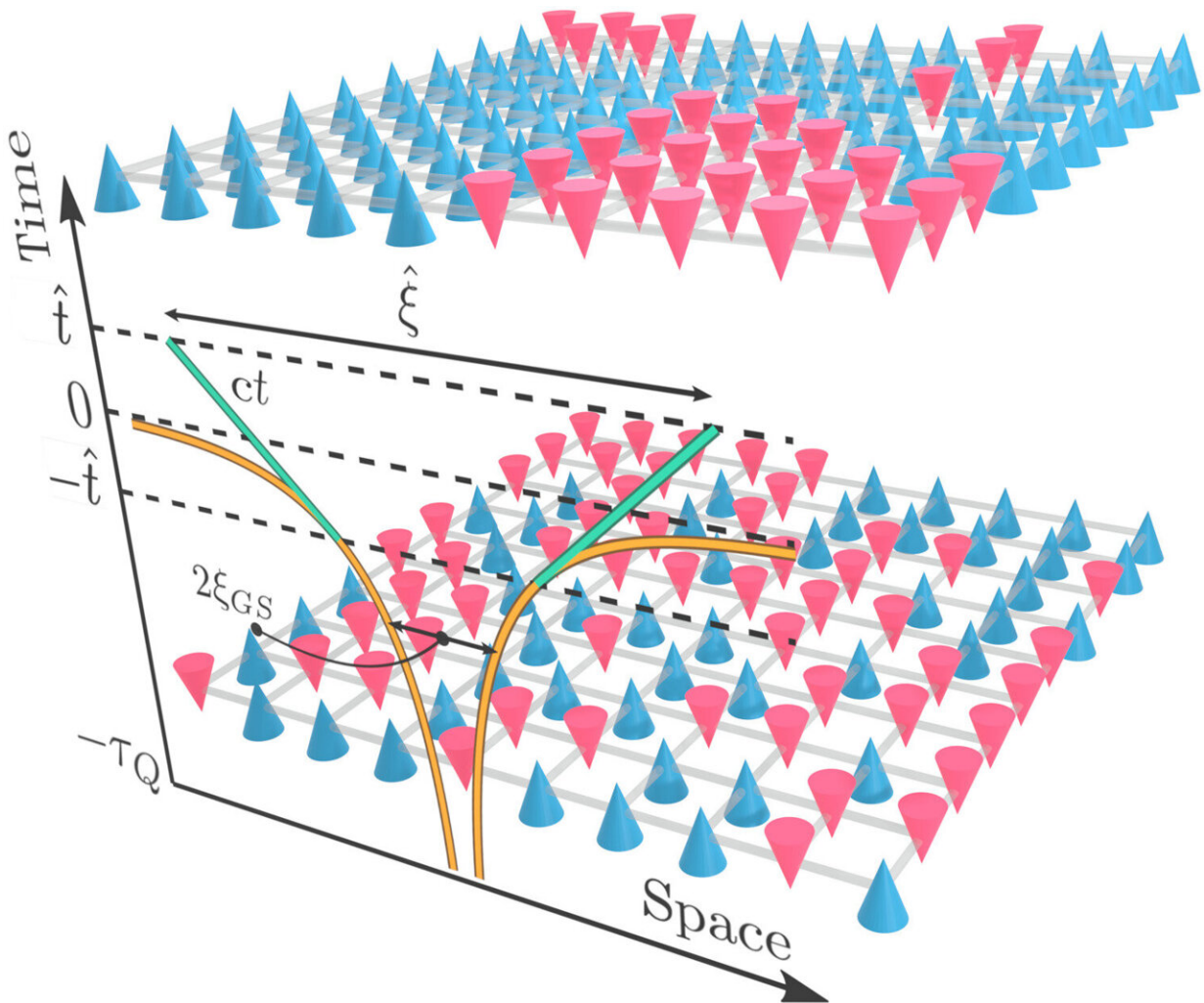


Researchers answer fundamental question of quantum physics

September 22 2022, by Michael Hallermayer



Schematic depiction of the dynamics across a phase transition in a two-dimensional spin-1/2 model. In the initial paramagnetic state (bottom), spins align with the direction of the transverse magnetic field. A measurement of the spin configuration in that state along the ordering direction would then typically

yield a random pattern of spins pointing up (blue cones) or down (red cones). After a slow ramp across a quantum critical point, the system develops a quantum superposition of ferromagnetic domains, which, upon measuring spin configurations along the ordering direction, will yield typically a collapse onto a mosaic of such domains (top). On the front face, we include the growth of the ferromagnetic correlation range as a function of time t starting from $t = -\tau_Q$ as the ramp progresses across the critical regime with the critical point located at $t = 0$. The healing length ξ^{\wedge} that determines the size of domains in the Kibble-Zurek (KZ) mechanism is set at the characteristic time $\|t$

Citation: Researchers answer fundamental question of quantum physics (2022, September 22) retrieved 19 April 2024 from <https://phys.org/news/2022-09-fundamental-quantum-physics.html>

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