

# **Best of Last Week – Doing away with spacetime singularity, quantum simulation butterfly and impact of skipping breakfast**

December 4 2017, by Bob Yirka

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The computational processing power of quantum bits (qubits) is poised to have profound impacts on diverse fields of science and engineering. The picture is a photograph of a superconducting chip (area of entire chip: 1 cm<sup>2</sup>) consisting of 9 qubits in a 1-D array. Microwave pulses are applied to control the states of the qubits and their interaction and control the dynamics in the system. Such Josephson-junction based superconducting systems are a leading physical implementation for quantum computation and simulation processing. Credit: Erik Lucero, Google

(Science X)—It was a good week for physics as Brazilian physicist Juliano Cesar Silva Neves [explored the possibility of vestiges of a universe previous to the Big Bang](#)—and suggested that to understand the origins of the universe, we might have to do away with the idea of a spacetime singularity. Also, a combined team from MIT and Harvard University [demonstrated one of the largest quantum simulators to date](#), offering a new way to manipulate quantum bits. And an international team conducted [an experiment that showed that the arrow of time is a relative concept, not an absolute one](#)—without violating the second law of thermodynamics. Also, a group from Google working with a team with members from the U.S., Greece and Singapore, used photons in a quantum chip [to allow a butterfly to emerge from a quantum simulation](#)—actually, a fractal structure known as the Hofstadter butterfly. And a team working in China set [a new record with 10-qubit entanglement](#) on a superconducting circuit.

In other news, a team at NASA [activated thrusters on Voyager 1 after 37 years of disuse](#), repositioning it so that its antenna could continue to point back at Earth. And a team at Virginia Tech College of Engineering showed [that it is better to leave a buffer for your bumper](#) when pulling up behind a car at a stop light, because shorter distances will not ensure that you get through the light before it changes. Also, a team with members from Harvard University and the University of Rochester working with young volunteers reported that [brain scans reveal why rewards and punishments don't seem to work on teenagers](#). And an international team of researchers conducted an analysis of ancient DNA and announced that it revealed [a previously unrecognized genus of extinct horses that once roamed North America](#).

And finally, if you are one of many who have taken to skipping breakfast as a means of losing weight, you might actually be making

things harder on yourself—a team at Tel Aviv University found that [skipping breakfast disrupts the 'clock genes' that regulate body weight](#), preventing proper glycaemic control.

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