A Wrinkle in Space-Time: Math Shows How Shockwaves Could Crinkle Space

ScienceDaily (July 19, 2012) — Mathematicians at UC Davis have come up with a new way to crinkle up the fabric of space-time -- at least in theory.

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"We show that space-time cannot be locally flat at a point where two shock waves collide," said Blake Temple, professor of mathematics at UC Davis. "This is a new kind of singularity in general relativity."

The results are reported in two papers by Temple with graduate students Moritz Reintjes and Zeke Vogler, respectively, both published in the journal *Proceedings of the Royal Society A*.

Einstein's theory of general relativity explains gravity as a curvature in space-time. But the theory starts from the assumption that any local patch of space-time looks flat, Temple said.

A singularity is a patch of space-time that cannot be made to look flat in any coordinate system, Temple said. One example of a singularity is inside a black hole, where the curvature of space becomes extreme.

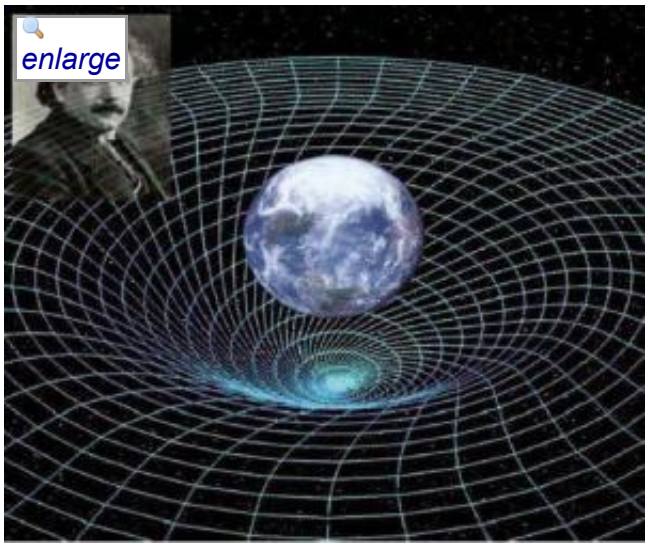

Illustration of twisted space-time around Earth. (Credit: NASA)