

# 'String' theory offers insight into catastrophic failure

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What do a centuries old gambling puzzle, thread and catastrophic failure have in common" A simple experiment conducted by Kent State chemical physics professor Peter Palffy-Muhoray and graduate student Jake Fontana reveals the answer.

The team used the Petersburg Paradox, a game in which a gambler's winnings inevitably fall short of his reasonable expectations, to predict how the force required to break two types of string varied with its length. Their results showed that as the string length increases, the force required to break the string decreases in a particular way.

While others have probed how breaking strength varies with length, few have examined such a large data set (from 1mm to 1km). The researchers say the model could be used to gain insight into ubiquitous destructive events, such as sudden failure of cables on a suspension bridge, dielectric and superconductivity breakdown, tunneling resistivity and mechanical failure.

The researcher's findings were presented at the American Physical Society meeting in Denver and are currently under review for publication in a leading scientific journal.

Source: Kent State University

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