

Convex sets of constant width, or why geometry can be of vital importance

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Abstract

When is the cross section of a pipe perfectly circular? When its width is independent of the direction in which I measure it, say, with a large caliper? The answer is no, and the fact that this answer was not known to some had tragic consequences, because it contributed to the Challenger disaster. In my talk I present two- and three-dimensional sets of constant width and some of their surprising properties. They can be used to construct drills which drill square holes, for instance, or buttons and balls that cannot roll away. I shall also report on progress in the proof of a mathematical conjecture related to these bodies. There are more pictures than formulas in the lecture. It is suitable for a general (undergraduate and graduate) audience.