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Illuminating Impossible Objects

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In 1992, Roger Penrose published a short, enigmatic paper connecting the famous impossible triangle to cohomology. The paper contains a second, stranger figure – a septagonal ring of Schroder stairs – with a cohomological interpretation. He closes with a cryptic hint: “I believe that considerations such as these may open up intriguing possibilities for further exotic types of impossible figure.” Are there any genuinely novel impossible objects that can be illustrated or classified? What makes an impossible figure mathematically impossible, rather than merely a visual trick?

This talk will describe a cohomological framework that addresses these questions with novel and surprising examples involving Necker cubes, mechanical devices, tilings, and a curious set of staircases where the order you climb matters. We will also present a novel animation technique that reveals paradoxical structures that hide within both paradoxical and solvable systems. In all these, the illustrations and animations are more than visual artefacts of the impossible objects they represent: they are a form of proof.

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