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Snowflakes, Stress and Semiconductors: Do You See a Pattern Here?

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Fractals are patterns that repeat at many magnifications. These intricate patterns are found throughout nature, ranging from clouds, rivers and lightning through to our brains, blood vessels and lungs. Due to their prevalence in nature and their growing impact on cultures around the world, fractals have assumed a rapidly expanding role across the sciences and arts. In this talk, I will explore some of the intriguing properties of fractals by taking a meandering walk through the research disciplines I have worked in. These will include nano-electronic circuits, Antarctic ice-shelves, brain structure and artworks. I hope to show a common theme - that quantification of their underlying fractal geometry provides an enhanced understanding well beyond the traditional qualitative views of these diverse systems.