Families of labyrinth fractals and their magic

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An $n \times n$ *pattern* is obtained by dividing the unit square into $n \times n$ congruent smaller subsquares and colouring some of them in black (which means that they will be cut out), and the rest in white.

Sierpiński carpets are planar fractals that originate from the "classical" Sierpiński carpet. They are constructed in the following way: one starts with the unit square, divides it into $n \times n$ congruent smaller subsquares and cuts out m of them, corresponding to a given $n \times n$ pattern (also called the generator of the Sierpiński carpet). This construction step is then repeated with all the remaining subsquares ad infinitum. The resulting object is a self-similar fractal of Hausdorff and box-counting dimension $\log(n^2 - m)/\log(n)$, called a *Sierpiński carpet*.

By using special patterns, which we called "labyrinth patterns", we created and studied a special class of carpets, called labyrinth fractals. Labyrinth fractals are self-similar dendrites and unter certain conditions on the patterns one obtains objects with some "magic" properties. As a next step, we introduced and studied mixed labyrinth fractals, that are not self-similar. It is interesting to see which properties are inherited from the self-similar case, and which are not. Wild labyrinth fractals are a further generalisation...

During this talk we will see how, by an appropriate choice of the labyrinth patterns, one can obtain ... almost everything.

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