Fuglede's tiling-spectrality conjecture for convex polytopes
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The unit cube in $\mathbb{R}^d$ is a classical example of a domain which has an orthogonal basis of exponential functions. Which other domains admit such a basis? Fuglede conjectured (1974) that these so-called "spectral domains" could be characterized geometrically as the domains which can tile the space by translations. I will survey the subject and then discuss some recent results, joint with Rachel Greenfeld, where we focus on the conjecture for convex polytopes.