Fuglede's tiling-spectrality conjecture for convex polytopes

Nir Lev, Bar-Ilan University

The unit cube in 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.