KEITH TAYLOR, Dalhousie University, Halifax, NS, B3H 3J5
Wavelets with Crystal Symmetries

In [1], Baggett et al. introduced a general framework for multiresolutions and wavelets in a Hilbert space. Given a triple (H, Γ, δ), where H is a Hilbert space, Γ is a discrete group of unitary operators on H and δ is another unitary operator on H for which $\delta^{-1}\gamma\delta$ is an element of Γ for every $\gamma \in \Gamma$, they define both multiresolutions and wavelets. We investigate this situation when $H = L^2(R^2)$, Γ comes from the natural action of a two-dimensional crystal group (wallpaper group) and δ is defined by a dilation matrix compatible with the crystal group. The structure of the C^*-algebra of the crystal group appears to be useful.

Joint work with Josh MacArthur.

References

[1] Larry Baggett, Alan Carey, William Moran and Peter Ohring, *General existence theorems for orthonormal wavelets, an abstract approach.* Publ. Res. Inst. Math. Sci. **31**(1995), 95–111.