Joint with C. Procesi and M. Vergne.

Given a sequence X of elements in a lattice Λ, we introduce new spaces of functions on Λ. These generalize the space $DM(X)$ of functions satisfying the cocircuit difference equations associated to X, introduced by Dahmen–Micchelli in the context of the theory of splines in order to study vector partition functions. We use these spaces to give a new proof of the local quasi–polynomiality of vector partition functions.

If G is the torus having Λ as character group M the complex linear representation of G, whose list of weights is X these spaces allows us to determine the range of the index map from G-transversally elliptic operators on M to generalized functions on G and to prove that the index map is an isomorphism on its image. This is a setting studied by Atiyah-Singer which is in a sense universal for index computations.