Title:
Understanding structure: using support and cosupport to classify subcategories

Abstract:
In commutative algebra, an important property is the "support" of a module, which is a subset of the topological space Spec(R). One use of support is to classify "nice" subcategories of the category of all modules over a ring, done by using a topology on Spec(R). In fact, support gives a bijection between these subcategories and unions of closed subsets of Spec(R). These ideas can be translated to more general settings, such as triangulated categories, where classifying all "nice" subcategories remains an open question. In many situations, support is still helpful in this classification; more recently, a dual notion of "cosupport" has also played a role. We will mention Neeman's work classifying (co)localizing subcategories of the derived category of a commutative noetherian ring, and also Benson, Iyengar, and Krause's work classifying (co)localizing subcategories of the stable module category of a finite group. If there's time, I will mention some work of mine on computing cosupport in a commutative noetherian ring, and how this connects to a conjecture of Gruson and Jensen from the 1970s.