Star-operations and torsion theories

The talk aims to show how a connection can be established between star-operations and torsion theories over an integral domain. After giving some basic results and properties concerning star-operations, I will introduce several classes of modules over R related to star-operations. These will be then used to show how each star-operation induces a torsion theory on R: this in turn will provide a characterization, in terms of torsion theories, of those star-operations which distribute over finite intersections of ideals, the so-called *stable* star-operations.

In the last part of the talk I will briefly describe how the above results can be applied to the study of irreducible decompositions of injective modules over $\star$-*Noetherian* domains (defined as satisfying the Ascending Chain Condition on $\star$-ideals), obtaining a generalization of the works by E. Matlis (1958), I. Beck (1971), L. Fuchs (2003) and H. Kim, E.S. Kim, Y.S. Park (2008).