MARTHA PRECUP, Washington University in St. Louis

A generalization of the Springer resolution

The Springer correspondence relates irreducible representations of the symmetric group to a subset of simple perverse sheaves on the nilpotent cone. The Springer resolution $\mu : \widetilde{\mathcal{N}} \to \mathcal{N}$ of the nilpotent cone and its fibers play an essential role in this result. In the 1980's, Lusztig proved that each simple perverse sheaf on the nilpotent cone corresponds to an irreducible representation of a relative Weyl group. This series of results is known as the generalized Springer correspondence.

The focus of this talk will be a map $\psi : \widetilde{\mathcal{M}} \to \mathcal{N}$ defined by Graham. The space $\widetilde{\mathcal{M}}$ is constructed using affine toric varieties, and the rich theory of these varieties can be used to obtain detailed information about $\widetilde{\mathcal{M}}$. We will discuss the relationship between Graham's construction and the generalized Springer correspondence for $SL_n(\mathbb{C})$, and describe the fibers of ψ using the combinatorics of standard tableaux. This talk is based on joint work with William Graham and Amber Russell.