Hessenberg varieties and the geometric modular law

The modular law of Guay-Paquet is a relation among certain symmetric functions associated to Dyck paths. This talk concerns a geometric version of the modular law that applies in all Lie types. The geometric version expresses a relation among the cohomology of the fibers of certain maps to a simple Lie algebra that generalize the Springer resolution of the nilcone or the Grothendieck-Springer resolution of the whole Lie algebra. The fibers of these maps are called Hessenberg varieties. We also discuss a decomposition of the Hessenberg varieties that leads to a proof of a conjecture of Brosnan.

This is joint work with Martha Precup.