Geometry and combinatorics of Springer fibers

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Springer fibers are a family of subvarieties of the flag variety that are the foundation of a classic example of a geometric representation. Springer first described the symmetric group action on the cohomology of Springer fibers that bears his name, though many others followed with very different constructions, including Borho-MacPherson, Lusztig, and Garsia-Procesi.

We will describe key features of the geometry, topology, and combinatorics associated with Springer fibers. We will then discuss the recent result that Springer fibers have the Betti numbers of a (specific) union of Schubert varieties. We will describe some geometric and topological context for this result and, time permitting, some open questions.