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The Totally Nonnegative Tropical Flag Variety

The flag variety of rank $r = (r_1, \dots, r_k)$ has points corresponding to collections of subspaces (V_1, \dots, V_k) with V_i of dimension r_i such that V_i is contained in V_{i+1} . We explore two nonnegative versions of this variety: First, we study the nonnegative flag variety, which corresponds to a subset of the flag variety consisting of flags that can be represented by totally positive matrices. Second, we study the tropicalization of the flag variety and, more specifically, its nonnegative part. In both cases, we provide equivalent descriptions of these spaces for flag varieties of rank $r = (a, a + 1, \dots, b)$, where r consists of consecutive integers. This talk is based on joint work with Chris Eur and Lauren Williams.