The Betti numbers of
parabolic Hessenberg varieties

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Parabolic Hessenberg varieties are subvarieties of the flag variety indexed by a partition of n and a parabolic subgroup. Schubert varieties are subvarieties of the flag variety parametrized by permutations. In this talk, we'll prove that the Betti numbers of a parabolic Hessenberg variety are equal to the Betti numbers of a union of Schubert varieties. This characterization combinatorially connects two well-studied subvarieties of the flag variety, and is especially notable since their geometric descriptions differ greatly. We will also discuss some geometric conjectures that arise from these combinatorial results.