Cristina Ruiz (Binghamton)

A Stratification of the Middle-level MacPhersonian

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The *MacPhersonian* MacP(k,n) is the partially ordered set of all oriented matroids of rank k on the ground set {1, 2, ..., n}, ordered by $M_1 \geq M_2$ if there is a weak map from M_1 to M_2. MacP(k,n) can be viewed as a combinatorial analog of the Grassmann manifold G(k,n) of k-planes in $\mathbf{R}^n$.

The Grassmannian G(k,n) has a type of cell decomposition called a *Schubert cell decomposition*. To define the cells we need to fix some subspaces of $\mathbf{R}^n$. It is known that for a special Schubert cell decomposition of G(k,n), we can give an explicit combinatorial definition of ``cells for a ``cell decomposition of MacP(k,n). This combinatorial analog of a Schubert cell decomposition of G(k,n) is called a *Schubert stratification* of MacP(k,n).

In studying spectral structures on MacP(k, infinity), I found that another stratification of MacP(n, 2n), based on a different Schubert cell decomposition of G(n, 2n), looks promising. I will show the ideas behind this work in progress.