PLABIC GRAPHS AND THE TOTALLY NONNEGATIVE GRASSMANNIAN

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Abstract

In this talk, I will introduce the Grassmannian $Gr(k, n)$, which is the space of $k$-dimensional subspaces in $\mathbb{R}^n$, or the space of all $k \times n$ matrices of rank $k$ modulo row operations. The totally nonnegative Grassmannian is the subset of elements from $Gr(k, n)$ which have nonnegative Plücker coordinates. I will also introduce a special type of planar bicolored graph called the plabic graph. This graph is drawn in a disk, with boundary vertices numbered 1, \ldots, $n$ and internal vertices colored either black or white. Through an example, I will demonstrate how several fun little games on a plabic graph reveal a fascinating link to the totally nonnegative Grassmannians.