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*Combinatorics of the bi-free Segal-Bargmann transform*

The Segal-Bargmann transform provides an isomorphism between the  $L^2$  space of a real Gaussian random variable and the holomorphic  $L^2$  space of a complex one. It was adapted to the free setting by Biane; an adaptation to the setting of bi-free probability is the subject of an ongoing project of mine with Ching Wei Ho and Todd Kemp. There are a number of peculiarities in this setting arising from the fact that a central limit object in bi-free probability is a pair of variables, specified by two variances and a covariance, leading to a family of transforms with more parameters. In this talk I will give a brief overview of our results, highlighting in particular a combinatorial argument based in context free grammars as a tool for enumeration.