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Toric ideals in algebraic statistics and phylogenetics

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Algebraic statistics is one of the maturing aspects of applied algebraic geometry. It is a field at the intersection of computational algebraic geometry, combinatorics, tropical geometry, statistics, and has recently had quite a few applications in other fields such as computational biology. Many interesting families of statistical models correspond to classical families of algebraic varieties. In particular, toric ideals play a special role in the field.

For some families of models that are widely used in social sciences, Markov bases can be understood via the defining relations of the special fiber ring of bipartite graphs. For others arising in biology, the underlying toric varieties are well-studied but not completely understood.

This talk will survey some recent work in the area.
