The 4-sample theorem on planar graphs

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The famous 4-color theorem from graph theory says that any planar graph is 4-colorable. The 4-sample theorem from algebraic statistics, proven by Gross and Sullivant in 2018, says that the maximum likelihood estimator (MLE) for the Gaussian graphical model of a planar graph exists with probability one if one has at least four samples. This number of necessary samples, the maximum likelihood threshold (MLT), is a graph invariant not only connected to parameter estimation, but also to matrix completion and rigidity theory. We will revisit this connection along the lines of a recent Oberwolfach snapshot joint with Thomas Kahle, and ask whether the link between algebraic statistics and rigidity theory persists in the case of extremal graphical models.