Meeting: 1002, Pittsburgh, Pennsylvania, SS 8A, Special Session on Graph Polynomials

1002-05-85 **Joanna Anthony Ellis-Monaghan*** (jellis-monaghan@smcvt.edu), St. Michael's College, 1 Winooski Park, Colchester, VT 05439, and **Irasema Sarmiento**. *Properties of the interlace polynomial.*

The interlace polynomial of a graph, described in [R. ARRATIA, B. BOLLOBÁS, G. SORKIN, The Interlace Polynomial: a New Graph Polynomial, *Proceedings of the Eleventh Annual ACM-SIAM Symposium on Discrete Algorithms*, San Francisco, CA, Jan. 2000, 237-245.] as evolving from problems in DNA sequencing, evokes many open questions. By exploiting the machinery of Tutte-Martin polynomials of isotropic systems and a recent paper of Bouchet [A. BOUCHET,Graph Polynomials Derived from Tutte-Martin Polynomials, *in press.*] that realizes the interlace polynomial of a graph as a special case of a Tutte-Martin polynomial of an isotropic system, we are able to resolve several open questions presented by Arratia, Bollobás and Sorkin. These include the relation between the interlace polynomial and the Tutte polynomial, the computational complexity of the interlace polynomial, and perhaps most importantly, an interpretation of exactly what the interlace polynomial of a graph counts. We conclude by presenting a class of graphs on which the interlace polynomial is polynomial time to compute and which is characterized by an invariant γ analogously to the way series parallel graphs are characterized by the β invariant. (Received September 02, 2004)