

Commuting versus noncommuting variables in the chromatic symmetric function

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Based on joint work with Stephanie van Willigenburg

Richard Stanley in 1995 introduced the chromatic symmetric function X_G of a simple graph G , an algebraic encoding of all possible proper colorings with colors $\{1, 2, 3, \dots\}$ and a generalization of the chromatic polynomial. In 2001 Gebhard and Sagan introduced Y_G the chromatic symmetric function in noncommuting variables. In this talk we will discuss how the properties of X_G and Y_G compare and contrast. We will also present how some classical questions about X_G have been easily answered for Y_G including a complete classification for the e -positive graphs of Y_G .