DISJOINT SEIFERT SURFACES AND COMPOSITION OF BINARY QUADRATIC FORMS

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I'll discuss joint work with Menny Aka, Peter Feller, and Andreas Wieser motivated by an example by Hayden-Kim-Miller-Park-Sundberg of two Seifert surfaces for the same knot that remain distinct even after being pushed into the 4-ball. We consider the natural family generalizing their example, which gives us a robust family of examples of knots with two disjoint Seifert surfaces. We use this to characterize the possible determinants for which there exists a genus one knot with two Seifert surfaces that remain distinct in the 4-ball. The heart of our proof is a result about pairs of binary quadratic forms, which also gives a new perspective on Gauss composition, with a connection to Bhargava's cube law.