An arithmetic count of lines meeting four lines in $P^3$.

Given four general lines in 3-dimensional space, a classical enumerative problem asks for the number of lines that intersect all four lines. Over an algebraically closed field the answer is 2. In this talk, we will work over arbitrary fields and show how to enrich this classical count to an equality in the Grothendieck-Witt group of the field. We will show how this enriched count imposes restrictions on the field of definition of the two lines and on certain arithmetic-geometric invariants attached to the configurations of the lines. This is joint work with Kirsten Wickelgren. (Received July 16, 2019)