Feynman Integrals, Associated Arrangements and Their Motives

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The connection between quantum field theory and Grothendieck's theory of motives aims at understanding the number theoretic aspects of Feynman integrals via their period interpretations. The arrangements of the smooth quadric hypersurfaces (a.k.a. the graph hypersurfaces) and the certain hyperplane arrangements (i.e., the configuration spaces) have been examined in order to understand the Feynman integrals respectively in momentum and position space formulations. I will discuss a new one in this talk; arrangements of singular quadrics. I will describe the motives of such arrangements associated to the Feynman integrals in ϕ^3 theory.

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