

FEYNMAN INTEGRALS AND ALGEBRAIC GEOMETRY

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Computational evidence suggests that residues of Feynman integrals in perturbative quantum field theory should be periods of mixed Tate motives. There are two different approaches to understand this mysterious relation between quantum fields and motives: a top-down approach based on comparing Tannakian category (based on my earlier joint work with Connes) and a bottom-up approach developed by Bloch-Esnault-Kreimer based on algebraic varieties (graph hypersurfaces) associated to the parametric form of Feynman integrals. I will introduce both approaches and then focus on recent joint work with Aluffi on the motives of graph hypersurfaces.