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Abhijnan Rej* (rej@mpim-bonn.mpg.de), Max-Planck-Institut für Mathematik, Vivatsgasse 7,
53111 Bonn, Germany. *Hopf algebras of graphs, multiple zeta values and motives.*

Computations in perturbative quantum field theory (pQFT) reveal that a certain class of Feynman graphs evaluate to multiple zeta values (MZVs). Furthermore, it is known that the space of Feynman graphs of a given pQFT has a Hopf algebra structure (due to Kreimer and Connes-Kreimer.) Recently Bloch-Esnault-Kreimer have tried to describe the MZVs arising from Feynman graphs algebro-geometrically by showing that pieces of certain cohomology groups of hypersurfaces arising from Feynman graphs are mixed Tate motives. By a general conjecture of Goncharov, it is known that periods of mixed Tate motives are MZVs and indeed, for a certain class of Feynman graphs, the evaluation of the corresponding correlators yields the “correct” period. Furthermore, Goncharov has recently constructed a Hopf algebra of (n -framed) mixed Tate motives which, in turn, is related to a Hopf algebra of iterated integral representations of MZVs.

In this survey talk, I report on the interplay of the Connes-Kreimer Hopf algebra and the Goncharov Hopf algebra of mixed Tate motives by constructing a broader conjectural picture of how various coproducts arising in these and related constructions might interact. (Received August 23, 2006)