An interface between Physics and number theory

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Abstract : In this talk are studied the polylogarithms and the harmonic sums at non-positive (*i.e.* weakly negative) indices. General results about these objects in relation with Hopf algebras are provided. The technics are based on the combinatorics of noncommmutative generating series relative to the Hopf φ-shuffle algebra. Our work here will also propose a global process to renormalize the divergent polyzetas.

Finally, we will apply these ideas to non-linear dynamical systems with singular inputs.

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