HOPFISH ALGEBRAS

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Abstract

Multiplication on a group $G$ may be encoded as a coproduct in a suitable algebra $A(G)$ of (continuous, smooth, algebraic, etc.) functions on $G$, i.e. as a homomorphism from $A(G)$ to $A(G) \otimes A(G)$. The resulting structure on $A(G)$ is that of a Hopf algebra. When $G$ is the quotient of a circle by a dense cyclic subgroup, the only continuous functions are constants, but the methods of noncommutative geometry suggest an alternative: the so called crossed product, or irrational rotation, algebra. This algebra, also called a quantum torus algebra, is not a Hopf algebra, but we can encode the group structure on the ”bad quotient space” as a bimodule, giving rise to what we call a hopfish algebra.

In this talk, I will explain how bimodules play the role of generalized homomorphisms between algebras, in particular with reference to the notion of Morita equivalence. I will present the general notion of hopfish algebra and show, when applied to the irrational rotation algebra, how it gives rise to an interesting tensor product structure on a nice class of representations.

(Joint work with Christian Blohmann, Xiang Tang, and Chenchang Zhu.)

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Room 380-W

http://math.stanford.edu/coll/0607/