Algebra Seminar

Mitja Mastnk,
Saint Mary's University

November 10, 2021

1:00pm - 2:00pm,
HH-3017

Universal measurings and related constructions

Abstract

If C is a coalgebra and A, B are algebras, then we say that a map $f : C \otimes B \to A$ is a measuring (or that (C, f) measures B to A) if it corresponds to an algebra map from B to the convolution algebra $Hom(C, A)$, i.e., if $f(c, xy) = f(c_1, x)f(c_2, y)$ and $f(c, 1_B) = \varepsilon(c)1_A$ for $c \in C$ and $x, y \in B$. Measurings are needed for constructing smash products and unify the concepts of homomorphism and derivations. As Grunenfelder and Paré explained in the 1980's (about two decades after Sweedler initiated a systematic study of measurings), they can be thought of as C-indexed families of homomorphisms.

Sweedler showed that given algebras B, A there exists the universal measuring coalgebra $M(B, A)$ and the universal measuring $\theta : M(B, A) \otimes B \to A$ with the property that every other measuring of B to A factors through it. In the presentation we will revisit Sweedler's universal construction and will also discuss some related constructions for the cases when we assume additional structure on A, B, C.