Representation categories of compact quantum groups and some applications

by Michael Brannan

In these lectures we will study compact quantum groups from the perspective of their representation categories. The goal of these lectures will be twofold. The first goal is to explain how the representation category of a compact quantum group captures its algebraic and analytic structure, while the second goal will be to see how representation categories of certain compact quantum groups arise naturally in problems coming from quantum information theory. Topics to be covered will include: Rigid C*-tensor categories, unitary fiber functors, monoidal equivalence, Tannaka-Krein reconstruction, the Temperley-Lieb category and free orthogonal quantum groups, Temperley-Lieb quantum channels, non-local games and bigalois extensions of compact quantum groups.