Leslie Comrie Seminar Series 2023/24

Wednesday 20 March 2024, 15:00-16:00

Speaker: Dr Isaac Oppong, University of Greenwich

The derivations of a quantum deformation of the first Weyl algebra

Abstract

By a theorem of Dixmier, primitive quotients of enveloping algebras of finite-dimensional complex nilpotent Lie algebras are isomorphic to Weyl algebras. In view of this result, it is natural to consider simple quotients of positive parts of quantized enveloping algebras as quantum analogues of Weyl algebras. In this talk, we study the Lie algebra of derivations of the simple quotients of U_q^+(B2) of Gelfand-Kirillov dimension 2. For a specific family of such simple quotients, we prove that all derivations are inner (as in the case of Weyl algebras) whereas all other such algebras are quantum Generalized Weyl Algebras over a commutative Laurent polynomial algebra in one variable and have a first Hochschild cohomology group of dimension 1.

Bio

Isaac is a Lecturer in the School of Computing and Mathematical Sciences. He completed his PhD study at the University of Kent in 2022. His PhD research work investigates a quantum deformation of the second Weyl algebra: its derivation and Poisson derivations. He also holds a master's degree in mathematical sciences from the African Institute for Mathematical Sciences and a bachelor's degree in mathematics and economics from the University of Ghana. He has worked as a Teaching Assistant (University of Ghana, Ghana), Graduate Teaching Assistant/Tutor (University of Kent, UK), Lecturer (Colchester Institute, UK), and Postdoc Research Associate (University of Kent).

His research interests lie in quantum and Poisson algebras. His current research work focuses on studying the first Hochschild cohomology group of the quantized enveloping algebras and their simple quotients (i.e., quantum Weyl algebras) and the first Poisson cohomology group of the semiclassical limits of these quantum algebras. Besides algebra, Isaac enjoys data science and is trying to interconnect his research area with data science.