Graduate School Lectures by Alfredo Nájera Chávez (UNAM Oaxaca)

University of Cologne, Mathematisches Institut 2./3./7.11.2017

"Quivers with potentials in algebra and geometry"

Abstract: A quiver is a directed graph, possibly with loops and multiple arrows between two vertices. They have proved to be very useful objects in several areas of mathematics. For instances, in algebra, they provide a way to study the module category of any finite-dimensional associative algebra over an algebraically closed field. In geometry, they can be used to construct interesting moduli spaces and to analyze the derived category of coherent sheaves over algebraic varieties. Quivers also arise in various ways in quantum mechanics, mirror symmetry and other physical theories. Inspired by the physicists' insights, Harm Derksen, Jerzy Weyman and Andrei Zelevinsky endowed quivers with certain additional information called a potential. This construction created new perspectives on the representation theory of quivers and lots of new applications in other areas of mathematics and physics.

The purpose of this series of talks is to give a self-contained introduction to the theory of quivers with potentials and explain some of their applications related to the aforementioned contexts. In the first lecture, accesible to a general audience, we will present the foundations of the theory and some of the important problems that remain open. In the second lecture, we will discuss certain applications of quivers with potentials in algebra and geometry. In particular, we will elaborate on Calabi-Yau algebras and quivers with potentials associated to Riemann surfaces.

The lectures are addressed to interested undergraduate and graduate students of diverse mathematical background. Everybody is welcome! They will take place at

Thursday 2.11.2017 14:00 Seminar Room 3 (room 314)
Friday 3.11.2017 14:00 Seminar Room 2 (room 204)
Tuesday 7.11.2017 14:00 Stefan-Cohn-Vossen Room (room 313)
(Oberseminar Algebra)

All rooms are located at:

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