LECTURE COURSE IN THE QUANTUM UNIVERSE RESEARCH SCHOOL

Winter Term 2019/2020

Hopf Algebras, Quantum Groups and Topological Field Theory

C. Schweigert

Course Description:

We present an introduction to Hopf algebras over a field and their applications to topological field theories. The study of Hopf algebras (sometimes also known as quantum groups) is a very active field, relating algebra, representation theory and mathematical physics. Hopf algebras and topological field theories have applications in representation theory, topology, string theory, quantum gravity and quantum information theory.

For more information refer to:
http://www.math.uni-hamburg.de/home/schweigert/ws19/hopf.html

Prerequisites:

Good knowledge of linear algebra (in particular vector spaces, their duals, linear maps, bilinear maps and tensor products). Some notions from algebra (in particular about groups and algebras) or the theory of Lie algebras are helpful, but not indispensable.

Literature:
- S. Dascalescu, C. Nastasescu, S. Raianu, *Hopf Algebras. An Introduction.* Marcel Dekker (2001)
- C. Kassel, *Quantum Groups*, Springer (1995)
- C. Kassel, M. Rosso, Vl. Turaev, *Quantum groups and knot invariants*, Soc. Math. de France (1993)
- S. Montgomery, *Hopf algebras and their actions on rings*, Am. Math. Soc. (1993)
- Hans-Jrgen Schneider, *Lectures on Hopf algebras*, FaMAF (1995)

Date and Place:	Mon, 16:15–17:45, Hörsaal H2, Geomatikum
	Wed, 8:15–9:45, Hörsaal H5, Geomatikum
Problem Classes:	Wed, 12:15 – 13:45, SR 430, Geomatikum
	Starting on: 23 October 2019
Starting on:	14 October 2019