ESI Erwin Schrödinger International Institute for Mathematics and Physics

universität wien

DVR 0065528

Simons Lecture Series

Prof. Catherine Meusburger

U Erlangen

Introduction to Poisson Lie-groups

I Monday, March 27, 2017
II Tuesday, March 28, 2017
III Wednesday, March 29, 2017
IV Friday, March 31, 2017

at 15:15 h

ESI, Boltzmann Lecture Hall

Abstract: A Poisson-Lie group is a Lie group that is also a Poisson manifold in such a way that the multiplication is a Poisson map. On the Lie algebra level, this implies that the dual vector space of its Lie algebra also has a Lie algebra structure, and the two Lie algebra structures satisfy a compatibility condition.

This is called a Lie bialgebra and can be viewed as the infinitesimal counterpart of a quantum group. Hence, we can interpret Lie-bialgebras as the infinitesimal counterparts and Poisson-Lie groups as the classical counterparts of quantum groups.

I explain these relations and then discuss Poisson actions of Poisson-Lie groups on Poisson manifolds. I explain why these structures can be expected to appear in gauge theory. If there is time, I also cover Drinfeld's classification of Poisson homogeneous spaces, i.e. Poisson manifolds with transitive Poisson actions of Poisson-Lie groups.

N. Carqueville

March 27, 2017