Friday, April 26th (at 4.00pm, UK time)

Juan Carlos Morales Parra (Heriot-Watt University)
Title Three dimensional gravity and dynamical r-matrices.

ABSTRACT

The phase space of Chern-Simons theory could be described as a constrained system with Poisson structure fully defined in terms of a compatible classical r-matrix. After gauge fixing the constraints, the obtained (Dirac) Poisson structure is now defined in terms of a compatible classical dynamical r-matrices.

In this talk, using the Chern-Simons formulation of three-dimensional gravity, we describe this gauge-fixed Poisson structure for the local isometry groups of the possible spacetimes and present a complete classification of all the compatible classical dynamical r-matrices for the associated Lie algebras. Finally (if time allows) we discuss how the quantization of this classical dynamical r-matrices, in the spirit of the combinatorial quantization programme developed by Fock-Rosly and Alekseev-Grosse-Schomerus, leads to a quantum description of the theory.

This talk is partially based in results presented in arXiv:2403.02184 (joint with Bernd Schroers).