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Seminaires du LPTM , Universite de Cergy Pontoise

Mardi 4 Octobre 2016, 11 :00
LPTM, 4.13 St Martin II
Domaines : math-ph

Titre : *Lagrangian and Hamiltonian structures in an integrable hierarchy*

Orateur : **Vincent Caudrelier (School of Mathematics, University of Leeds, UK)**

Résumé : *The classical and quantum versions of the R matrix are the cornerstones in classical and quantum integrable systems, typically formulated in 1+1 dimensions. However, they traditionally concentrate all the attention on only one of the independent variables : the space one while time evolution is encoded more or less trivially. The latter point is in fact deeply related to the boundary conditions imposed on the system. A big success of the theory of classical integrable systems is the systematic Hamiltonian formulation of the corresponding PDEs. The essential object capturing the Hamiltonian properties (infinite number of conserved quantities, etc) is the so-called classical r-matrix. Motivated originally by the question of integrability of certain field theories in the presence of defects or (not necessarily integrable) boundary conditions, we will show how a dual Hamiltonian structure naturally emerges which gives a fully fledged r-matrix structure to the space variable. This is inspired and related to the notion of covariant field theory. The interplay between the standard classical r-matrix structure and the new one is what we call dual Hamiltonian structure. This raises many questions that we will mention at the end of the talk.*