Bologna Workshop on:
CFT AND INTEGRABLE MODELS
and their applications from gauge/gravity dualities to statistical mechanics and quantum information

Contribution ID: **155** Type: **Talk (30 min)**

Integrability tools for gauge theory and black holes physics

Wednesday, 6 September 2023 10:20 (30 minutes)

In this talk, I will explain how to apply some integrability tools like QQ-system , TQ-relation or Thermodynamic Bethe Ansatz to some 4D N=2 gauge theories and realistic black holes models. In fact, those theories mathematically are completely characterised by some shared Ordinary Differential Equation (ODE) which we study through the celebrated ODE/IM correspondence with 2D Integrable Models (IM). We showed for example how integrability structures like QQ or TQ are naturally solved in terms of the N=2 gauge prepotential. In this way ODE/IM also sheds light on the recently found relation between N=2 SU(2) gauge theory and black holes physics, especially concerning the computation of quasinormal modes of gravitational waves through the gauge prepotential. We also found the Thermodynamic Bethe Ansatz to be a new convenient computational tool to this end. Based on arXiv:1908.08030, arXiv:2112.11434, arXiv:2208.14031 and arXiv:23.*** .

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