GMN Theory and HyperKähler geometry.

Mario García-Fernández

École Polytechnique Fédérale de Lausanne

In `arXiv: 0807.4723` and `arXiv: 0907.3987`, Gaiotto, Moore and Neitzke proposed a conjectural description of the HyperKähler metric on suitable moduli spaces of (meromorphic) higgs bundles, based on the physics of supersymmetric gauge theories. This description is obtained via a closed formula for a set of holomorphic Darboux coordinates for the metric, that ultimately depends on a physical quantity known as the BPS spectrum. A mathematical interpretation of the BPS spectrum in terms of DT invariants has been recently obtained in work of Bridgeland and Smith.

In this talk, we describe GMN coordinates in the case of the Ooguri-Vafa metric, where the construction is completely rigorous. Roughly, this provides a toy model for the metric on a neighbourhood of a singular fibre of the Hitchin fibration. Time permiting, we will also describe an example, "the pentagon", where the construction of the coordinates is conjectural.

Useful references:
http://www.ma.utexas.edu/users/neitzke/expos/gmn-1.pdf
http://arxiv.org/abs/math/0008018