Séminaire commun

Microstates of a 2d Black Hole in string theory

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Résumé

I will first introduce the duality between the singlet sector of Matrix quantum mechanics (MQM) and the c=1 Liouville String Theory. Then, I will review various descriptions of the 2d Black Hole. Afterwards, I will analyse models of MQM in the double scaling limit that contain non-singlet states. The finite temperature partition function of such systems contains non-trivial winding modes (vortices) and is expressed in terms of a group theoretic sum over representations. Subsequently, I will focus on the model of Kazakov-Kostov-Kutasov when the first winding mode is dominant. In the limit of large representations (continuous Young diagrams), and depending on the values of the parameters of the model such as the compactification radius and the string coupling, the dual geometric background corresponds either to that of a long string (winding mode) condensate or the 2d (non-supersymmetric) semi-classical Black Hole competing with the thermal linear dilaton background. In the matrix model one is free to tune these parameters and explore various regimes of the phase diagram. I will show how this construction allows one to identify the origin of the microstates of the long string condensate/2d Black Hole arising from the non trivial representations. Finally, I will present some future directions.