CRC 1624 HIGHER STRUCTURES, MODULI SPACES AND INTEGRABILITY

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On the large charge/matrix models duality

Strongly coupled regimes of quantum field theory remain notoriously difficult to access with standard analytic tools. However, certain aspects of these theories become more manageable when focusing on sectors where specific quantum numbers are taken to be large. Well known examples include the large N limit, where N denotes the rank of the gauge group or the large spin limit. More recently, a new approach based on effective field theory has gained importance for studying sectors of a theory where a given global charge is considered to be very large. In this talk, I will show how a dual description in terms of matrix models emerges in such large-charge regimes, with the matrix size directly related to the underlying global charge. I will show how this framework provides a powerful tool not only to demonstrate the predictions of effective field theory, but also to go beyond them.