



INVITATION

as part of the Mathematical Physics Theory Seminar

to the talk by

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on

“S-duality, Black Holes and Integrability”

Abstract:

The study of supersymmetric partition functions plays a central role in the holographic evaluation of the Black Hole(BH) entropy via the AdS/CFT correspondence. In this talk I will discuss recent results on the study of the superconformal index for an infinite class of four dimensional $N=2$ necklace models. The superconformal index admits an exact evaluation in terms of solution to a set of transcendental equations, known as Bethe Ansatz equations. It has been argued in the literature in the first case of the class, namely, $N=4$ $SU(N)$ super Yang-Mills (SYM), how an intriguing connection between such solutions and the vacua of certain Elliptic Calogero-Moser systems emerges. Such contributions to the superconformal index seem to organize according to orbits of the underlying S-duality group of the theory. In this talk I will shed some light into this direction.

At first I will review what is known for the case of $N=4$ $SU(N)$ SYM, and then I will discuss new results which provide evidences of a more general correspondence between solutions to the Bethe equations, the S-duality group and vacua of associated generalizations of integrable systems, known as spin Calogero-Moser system. I will also discuss generalizations to B,C and D gauge algebras and how S-duality manifests in such cases.

Time: Tuesday, 25 November 2025, 2:00 p.m.

Location: Erwin-Schrödinger Lecture Hall, 1090 Vienna, Boltzmannngasse 5, 5th floor