

## Colloquium : Some aspects of Horn's problem

*vendredi 30 juin 2023 14:00 (1 heure)*

Horn's problem deals with the following question: what can be said about the spectrum of eigenvalues of the sum  $X+Y$  of two Hermitian matrices of given spectrum? The support of the spectrum of  $X$  is now well understood, after a long series of works from Weyl (1912) to Horn (1952) to Klyachko (1998) and Knutson and Tao (1999). The problem has also amazing connections with group theory and the decomposition of tensor product of representations. Comparison with the same problem for real symmetric matrices and the action of the orthogonal group reveals similarities but also unexpected differences. In this talk, after a short introduction to the problem, I'll sketch the computation of the probability distribution function of the eigenvalues of  $X$ , when  $X$  and  $Y$  are independently and uniformly distributed on their orbit under the action of the group. I'll also review some aspects of the connection with representation theory and combinatorics.

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