

Title: Greedy algorithms for high-dimensional eigenvalue problem (joint work with Eric Cances and Tony Lelièvre)

Abstract: In this talk, I will present some new greedy algorithms in order to compute the lowest eigenstate of a linear eigenvalue problem operator defined on a high-dimensional Hilbert space. The principle of these numerical methods consists in expanding a tentative eigenvector associated to this eigenvalue as a sum of so-called tensor product functions and compute each of these tensor product function iteratively as the best possible, in a sense which will be made clear in the talk. The advantage of this family of methods relies in the fact that the resolution of the original high-dimensional problem is replaced with the resolution of several low-dimensional problems, which is more easily implementable. The convergence results we proved for our algorithms will be detailed, along with some convergence rates in finite dimension