PIERRE-OLIVIER PARISÉ, Université Laval

The Impossibility of Polynomial Approximations in Some de Branges-Rovnyak Spaces

In 1993, D. Sarason wrote a book in which he summarized the results of a fruitful topic relating operator theory and complex analysis: the so-called de Branges-Rovnyak spaces $\mathcal{H}(b)$. These spaces are parametrized by a holomorphic function b bounded by 1 on the unit disk and are sub-Hilbert spaces of the Hardy space H^2.

In this talk, we introduce the de Branges-Rovnyak spaces. Our goal is to present a criterion on the function b which is necessary and sufficient for the set of polynomials to be dense in the space $\mathcal{H}(b)$. When b does not satisfy the criterion, most polynomials are not even in the space. In this situation, the theory of de Branges-Rovnyak spaces differs from the theory of the classical spaces of holomorphic functions in the unit disk such as the Hardy space, the Dirichlet space and the Bergman space. Indeed, the set of polynomials belongs to these classical spaces and forms a dense subset.