Probabilistic Operator Algebra Seminar

Organizer: Dan-Virgil Voiculescu

July 7 Gal Maor, Tel Aviv University

Title: Graph Constructions as Free Random Variables

The zig-zag product is a fundamental operation in theoretical computer science, central to the construction of strongly explicit expander graphs. In this talk, we revisit this and related graph operations - including the replacement product, derandomized squaring, and the rotated random walk - through the lens of free probability theory. This perspective allows us to establish bounds on their spectral and combinatorial properties . Our approach is motivated by the framework of finite free probability introduced by Marcus, Spielman, and Srivastava. We conclude with several open problems. Based on joint work with Gil Cohen, Itay Cohen and Yuval Peled.