Probabilistic Operator Algebra Seminar

Organizer: Dan-Virgil Voiculescu

August 2 **Tobias Mai**, University of the Saarland at Saarbrucken

Title: *The Fuglede-Kadison determinant of matrix-valued semicircular elements and the capacity of completely positive maps*

Over the last couple of years, it has become evident that matrix-valued semicircular elements establish strong links between free probability theory and noncommutative algebra. Another surprising connection of this kind was found in a recently finished project with Roland Speicher. We have shown that the Fuglede-Kadison determinant of an arbitrary matrix-valued semicircular element is essentially given by the capacity of its associated covariance map. In addition, we have improved a lower bound by Garg, Gurvits, Oliveira and Widgerson on this capacity, by making it dimensionindependent. In my talk, I will present these results, explaining also their relevance in the context of the authors' joint work with Johannes Hoffmann on the noncommutative Edmonds' problem.