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*Bi-Free Entropy with respect to Completely Positive Maps*

The theory of free entropy developed by Voiculescu found several applications in the world of von Neumann algebras and remains one of the most active research areas in the theory of free probability. In this talk, we shall provide an introduction to the non-microstate approach to free entropy and develop notions of bi-free entropy with respect to completely positive maps. This extends the notions of bi-free entropy recently developed by Charlesworth and Skoufranis and introduces a proper framework for the analytical investigation of bi-free entropy. In addition, peculiarities and questions that arise within this environment of bi-free entropy will be discussed. This is joint work with Paul Skoufranis.