Probabilistic Operator Algebra Seminar

Organizer: Dan-Virgil Voiculescu

March 19 **Todd Kemp**, UCSD

Title: *Zero Bias in the Free World*

In sampling theory, bias plays an important role. Transforms to compensate for bias have wide use, with applications to normal approximation, waiting-time paradoxes, tightness, Skorokhod embedding, concentration of measure, and many other far-flung ideas. In the 1990s, Goldstein and Reinert introduced zero bias, an "infinitesimal" bias transform which connects to Stein's method. It is an elegant tool for sharp approximation methods, thanks to a (non-linear) relation to independent sums. Recently, it has been shown to have an interesting connection to infinite divisibility. In this talk, I will discuss my current work (joint with Goldstein) to develop the free probability version of the zero bias transform. Using tools from complex analysis and subordination theory, we show interesting analogs of all the classical zero bias properties, and use the free zero bias to give a new and enlightening perspective on free infinite divisibility. Along the way, we discover a collection of surprisingly new results on combining Cauchy transforms that are of independent interest