The Optimal Fourth Moment Theorem

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Abstract. I will explain how to compute the exact rates of convergence in total variation associated with the celebrated Fourth Moment Theorem by Nualart and Peccati, stating that a sequence of random variables living in a fixed Wiener chaos verifies a central limit theorem if and only if the sequence of the corresponding fourth cumulants converges to zero. If time permits, I will also provide an explicit illustration based on the Breuer-Major CLT for Gaussian-subordinated random sequences. This will be based on several joint works with Giovanni Peccati.