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Maximizing Information-Extraction from Next-Generation Surveys

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I will present a suite of new algorithms for measuring higher-point statistics from large-scale structure surveys. I will begin with a transformatively-fast algorithm that enables computation of the isotropic 3-point correlation function scaling as the number of galaxies squared. This algorithm was applied to BOSS data to make the first high-significance detection of the Baryon Acoustic Oscillations as well as to constrain novel forms of biasing. I will then present a generalization of the algorithm allowing computation of the anisotropic 3PCF. I'll close by showing how the fundamental kernel of these algorithms enables measurement of N-point functions for any desired N scaling as the square of the number of galaxies.

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