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Nonlinear large deviations

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Consider the problem of counting the number subsets of positive integers less than n that contain a certain number of three-term arithmetic progressions, when n is large. This is a particular example of a class of problems that fall within the purview of large deviations theory. However, the classical theory of large deviations does not have the requisite tools for handling such questions, because they are inherently "nonlinear" whereas the classical theory is linear in nature. In this talk I will present a nonlinear version of large deviations theory that has the ability to handle such matters.

This is based on joint work with Amir Dembo.

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