1135-92-2869 **Zvi H. Rosen*** (zhrosen@berkeley.edu), Berkeley, CA 94703, and **Anand Bhaskar** and **Yun S. Song**. *The Geometry of the Sample Frequency Spectrum.*

The sample frequency spectrum (SFS) is a central tool in population genetics, used to infer historical population size, times to most recent common ancestor, and more. The SFS is the vector of probabilities of a given mutation being shared by k out of the n individuals in a sample, where n is fixed and k goes from 1 to $n-1$. Using the toolbox of algebraic and convex geometry, we analyze the geometry of the set of all possible expected SFS for sample size n, under neutral selection. Our main result: the expected SFS for any population size history can be obtained by a piecewise-constant population size history with at most $2n-2$ epochs. (Received September 26, 2017)