1139-20-116 **John Rhodes** and **Anne Schilling*** (anne@math.ucdavis.edu). *Unified theory for finite Markov chains.*

We provide a unified framework to compute the stationary distribution of any finite irreducible Markov chain or equivalently of any irreducible random walk on a finite semigroup S. Our methods use geometric finite semigroup theory via the Karnofsky–Rhodes and the McCammond expansions of finite semigroups with specified generators; this does not involve any linear algebra. The original Tsetlin library is obtained by applying the expansions to $P(n)$, the set of all subsets of an n element set. Our set-up generalizes previous groundbreaking work involving left-regular bands by Brown and Diaconis, extensions to $\mathcal{R}$-trivial semigroups by Ayyer, Steinberg, Thiéry and the second author, and important recent work by Chung and Graham. (Received February 04, 2018)