1106-05-2808 **Mary Allison** and **Bryan L Shader*** (bshader@uwyo.edu), 1000 E. University Ave, Math Department 3036, University of Wyoming, Laramie, WY 82071. *The minimum Kemeny constant problem.*

Let G is a connected graph on vertices, $1, 2, \ldots, n$. We study a new optimization problem over the family Mark(G) of all $n \times n$, symmetric, stochastic matrices $A = [a_{ij}]$, where the graph of A is an edge subgraph of G. More precisely, $a_{ij} \neq 0$ only if $i = j$, or $i \neq j$ and i is adjacent to j in G.

Boyd, Diaconis and Xiao in 2003 initiated the study of the Fastest Mixing Markov Chain on G, which corresponds to asking for the $A \in$ Mark(G) whose second largest eigenvalue modulus (SLEM) is smallest. It is known that the SLEM of A governs the rate of convergence of the corresponding Markov chain C.

The Kemeny constant, $K(A)$, of A is the expected number of steps for the chain C to start at a randomly selected state and first enter another randomly selected state. It provides some rough information about the short-term behavior of the Markov chain. If the graph of A is disconnected, then Kemeny constant is taken to be ∞.

In this talk we study the problem of determining the inf of $K(A)$ over all $A \in$ Mark(G). General results about properties of optimizing matrices are proven, and the inf is determined for several families of graphs. (Received September 16, 2014)