



# DEPARTMENT OF MATHEMATICS AND STATISTICS

## COLLOQUIUM

- Speaker:** Dr. Gexin Yu, College of William and Mary
- Title:** Permutations as product of parallel transpositions
- Date:** September 27, 2013
- Room/Time:** Refreshments: 2:30 p.m. Room 222 MM  
Talk: 3:00 p.m. Room 224 MM
- Host:** Dr. Xiangqian Zhou

### ABSTRACT:

Let  $G$  be a connected graph. Initially, each vertex  $v$  of  $G$  is occupied by a "pebble" that has a unique destination  $\pi(v)$  in  $G$  (so that  $\pi$  is a permutation of the vertices of  $G$ ). It is required that all the pebbles be routed to their respective destinations by performing a sequence of moves of the following type: A disjoint set of edges is selected, and the pebbles at each edge's endpoints are interchanged. Define  $rt(G, \pi)$  to be the minimum number of steps to route the permutation  $\pi$  and the routing number  $rt(G)$  of  $G$  to be the maximum of  $rt(G, \pi)$  over all permutation  $\pi$ .

We will investigate two conjectures related to the routing numbers of graphs: Strang's conjecture on decomposition of permutation matrix with bandwidth  $b$  and Li-Lu-Yang's conjecture on extremal permutations on cycles.

### ABOUT THE SPEAKER:

Dr. Yu is an associate professor at the College of William and Mary. He received his Ph.D degree at UIUC in 2006. His research area is graph theory. He has published over forty articles in peer-reviewed journals. His research has been supported by NSA and NSF.