

## Special Colloquium/ Analysis & Probability Seminar

Tuesday, November 4, 2014 at 2:45 p.m. in Yost 306

**Speaker:** Prof. Manfred Denker, Mathematics Department, Penn State University

**Title:** Averaging multivariate functions

**Abstract:** Let  $X_i$  be a strictly stationary and ergodic time series and  $h(x_1, \dots, x_d)$  be a measurable function, considered as an element in some  $L_p$  space. We are interested in

$$\sum_{i_1, \dots, i_d=1}^n h(X_{i_1}, \dots, X_{i_d})$$

whenever this sum is well defined as an element of the corresponding  $L_p$  space. The talk will give sufficient conditions that this sum is well defined. Then it will be shown that the ergodic theorem holds when normalizing by  $n^d$  and a central limit theorem will be derived when the normalizing is given by  $n^{d-1/2}$ . In case  $d = 2$  a limit theorem to generalized Chi-square distribution will be obtained as well.

This is joined work with M. Gordin in Probability and Related Fields 2014.