

Friday, November 11, 2016, 4:10 pm

COLLOQUIUM TALK

Speaker: Andy Parrish (EIU)

Old Main 2231

## Pointwise convergence of ergodic averages and perturbation

### Abstract:

Suppose we have a measure-preserving system  $(X, \mathcal{B}, m, T)$ , where  $(X, m)$  is a probability space,  $\mathcal{B}$  is a  $\sigma$ -algebra on  $X$ , and  $T$  is a measure-preserving transformation ( $m(T^{-1}A) = m(A)$  for all  $A \in \mathcal{B}$ ), and consider  $\{a_n\} \subseteq \mathbb{N}$ . Then the ergodic averages

$$A_N[f, a_n](x) = \frac{1}{N} \sum_{n=0}^{N-1} f(T^{-a_n}x)$$

involve the interaction of the underlying space and its associated measure, the function  $f$ , the transformation, and the sequence  $\{a_n\}$ .

Through the application of transference principles, it is possible to separate the measure and the transformation from the picture, leaving the interaction of the function and the sequence for examination. Following this, we find that the convergence (both pointwise and in norm) of the averaging operator for functions in a particular Banach space is dependent on the sequence  $\{a_n\}$ . In the case of pointwise convergence, the method of *perturbation*, pioneered by Alexandra Bellow, is a powerful tool to examine this dependence.

We will discuss the classical perturbation results of Bellow and Karin Reinhold for the ergodic averages as well as later results extending the technique to  $\mathbb{Z}^d$  and more general group actions.

SNACKS IN FACULTY LOUNGE AT 3:30 PM.  
EVERYONE WELCOME (EVEN IF YOU ARE UNABLE TO ATTEND THE TALK)

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