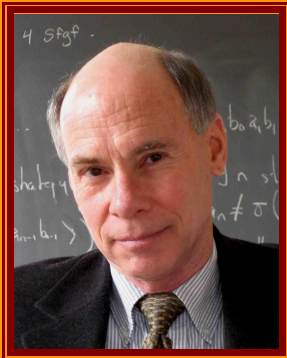


National Mathematics Awareness Month Seminar:

“A peculiar connection between the axiom of choice and predicting the future”



Presented By:
Professor Alan Taylor
7:30 PM, April 3, 2008
Murdoch 201

ABSTRACT. In the February issue of the Monthly, Chris Hardin and I had an article with the above title. There we showed that the axiom of choice implies that there is a strategy for predicting the values of an arbitrary function defined on the reals $\sim V$ based on its previous values $\sim V$ that is almost always correct. Specifically, given the values of f on $\{x: x < t\}$ the strategy produces a guess for $f(t)$, and for all $t \sim V$ except those in a countable, nowhere dense set $\sim V$ it is correct. This suggests the more general question: To what extent is a function's value at a point x of a topological space determined by its values in an arbitrarily small (deleted) neighborhood of x ? For continuous functions, the answer is typically “always” and the method of prediction of $f(x)$ is just the limit operator. With C. Hardin, we've generalized this to the case of an arbitrary function mapping a topological space to an arbitrary set. We show that the best one can ever hope to do is to predict correctly except on a scattered set. Moreover, we obtain a predictor whose error set is always scattered.