MATH 649B Nonstandard Analysis

Spring 2018
Day and Time: MWF 1:30-2:20, Keller 314
Professor: David Ross, PSB 319, ross@math.hawaii.edu

> *Nonstandard analysis is the art of making infinite sets finite by extending them.*
>
> — Michael Richter

Description:

Nonstandard analysis is an area of mathematics which lives at the interface of mathematical logic (especially model theory) and classical mathematics. Originally introduced as a way to make it possible to work with infinitesimals in a rigorous fashion, it has developed into a powerful methodology with applications in many areas of mathematics. It is especially useful when the concept of limit is central, or when an infinitary or continuous situation has a natural discrete or combinatorial intuition.

This course will be an introduction to the subject, with an eye to getting into 'real' applications as quickly as possible. The choice of applications will depend a bit on the background and interests of the students in the class, and might include a bit of topology, probability, measure theory, geometric groups, and additive number theory.

Prerequisites:

The course will be entirely self-contained, though mathematical training and experience at the early graduate level is assumed. In particular, some background in the applications areas won't hurt.

Text:

The course will mainly be out of lecture notes.