

Friday, March 23, 2018, 4:10 pm

COLLOQUIUM TALK

Speaker: Evgeny Gordon (EIU)

Old Main 2231

On Teaching Calculus on the Base of Nonstandard Analysis. I

Abstract:

In the sixties of the last century A. Robinson proved the possibility of introducing infinitesimal numbers (actual infinitesimals) into mathematical analysis at the modern level of rigor. So, many intuitively clear but non-rigorous formulations of the basic mathematical definitions and theorems that are widely used in the teaching of analysis have been given the status of rigorous mathematical statements. The proofs of theorems using actual infinitesimals are often much simpler and ideologically clearer, than classical proofs. The analysis using actual infinitesimals has received the name "Nonstandard analysis". In the first of two subsequent talks, the basic concepts of Non-Standard Analysis will be discussed. In the second one I will present a review of the textbook by Prof. H.J. Keisler:

Keisler H. J. Elementary Calculus, An Infinitesimal Approach. On-line Edition. Copyright 2000, revised August 2017. 992 c. <https://www.math.wisc.edu/~keisler/calc.html>

This is a standard university Calculus course that uses the approach based on infinitesimals in Nonstandard Analysis. The author used this course in teaching Calculus in the University of Wisconsin and one of his students used it for teaching Calculus in a High School in 70-th. Recently a new Calculus text was published:

Hrbacek K., Lessman O., O'Donovan R. Analysis with Ultrasmall Numbers. CRS Press: Taylor & Francis Group, Boca Raton, London, New - York 2015. 249 p.

The second and third authors of this text did also teach Calculus in a High School on the base of infinitesimal approach. The results of their teaching experiments will be briefly discussed in the talk.

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