

Explorations of the Foundations of Calculus

Presented by

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Analysis is what happened to calculus in the 19th century as mathematicians discovered that their intuition of how to apply calculus was failing them, especially as their repertoire of infinite series expanded. The conceptual difficulties that they encountered are precisely where those first learning the subject also have trouble. Understanding how these controversies were resolved illuminates many of the definitions, axioms, and theorems that baffle students.

This talk will focus on three broad issues that arose during the 19th century and that caused both controversy and confusion as they were straightened out:

What do we mean by convergence of a series of functions and when, for the purposes of calculus, can we treat an infinite sum of functions as if it were a finite sum? How did our modern understanding of the Fundamental Theorem of Calculus arise, and what does it really say? How did we get the Heine-Borel Theorem?

**Wednesday,
October 3, 2007**

4:30–5:30 p.m.

115 Avery Hall

University of Nebraska–Lincoln

**Reception: 348 Avery Hall
4:00–4:30 p.m.**

Sponsored by the Department of Mathematics
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David Bressoud

Professor Bressoud is DeWitt Wallace Professor of Mathematics at Macalester College and President-Elect of the Mathematics Association of America. He has published extensively both in number theory and in math education. He is a frequent Project Next speaker, was an MAA Polya Lecturer from 2002-2004, and received the MAA Beckenback Book prize in 2000 for his book "Proofs and Confirmations". He is a past Chair of the MAA committee on Undergraduate Program in Mathematics and Chair of the MAA Special Interest Group on Teaching Advanced High School Mathematics. He has also published 3 other books, on computational number theory, real analysis, and Lebesgue's theory of integration, that have all received high praise.

