



# DEPARTAMENTO de MATEMÁTICAS

## SEMINARIO

### 21st Century Mathematics in the Classroom Analysis using ultrasmall numbers

**http://www.matematicas.um.es/**

#### Richard O'Donovan

Collège André-Chavanne (Ginebra, Suiza)

Richard O'Donovan, profesor de secundaria en Suiza, define su trayectoria profesional como "no estándar". Tras haber sido carpintero y fabricante de instrumentos musicales, inició estudios en Matemáticas en la Universidad de Ginebra. Graduado en 1998, y doctorado por la Universidad Blaise Pascal de Clermont-Ferrand (Francia) en la axiomática del Análisis No Estándar, es un activo impulsor de estas técnicas en la enseñanza del Cálculo en la educación secundaria.



#### Resumen

Can a new version of nonstandard analysis be used at introductory level to improve students' understanding?

Most difficulties in teaching mathematics are met with pedagogical innovations which have little to do with mathematics – sometimes at the price of losing rigour and real proofs. In this talk we show how a *mathematical* innovation helps to answer a pedagogical challenge.

The presentation will start by outlining the original historical issues of analysis and their limitations. After a brief discussion of the classical answer we present, in an expository manner, the bases of nonstandard analysis: how it is possible, some of its drawbacks and how improvement on earlier work has made it possible to develop what we now call *Ultracalculus*.

The second part of the presentation will show how it is presented in some high schools in Geneva, with examples of proofs by students.

This talk can be of interest to those who want a very light introduction in nonstandard analysis, to those who are curious about new ways to describe familiar objects and to those who are aware of students mathematical difficulties in high school. No previous knowledge of nonstandard analysis is required.

Jueves 20 de febrero de 2014

17:00 horas, Salón de Actos

A las 16:30 se servirá un café en la Sala Euler