



**COLLOQUIUM**  
**DEPARTAMENTO DE MATEMÁTICAS**  
**UNIVERSIDAD CARLOS III DE MADRID**

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*The Theories of Nonlinear Diffusion*

**Abstract**

*Populations diffuse, substances (like particles in a solvent) diffuse, heat propagates, electrons and ions diffuse, the momentum of a viscous (Newtonian) fluid diffuses (linearly), there is diffusion in the markets, ...*

*Scientists begin by asking some basic questions, like: what is diffusion? how to explain it with mathematics? A main question today is the following:*

*how much of it can be explained with linear models, how much is essentially nonlinear? In our talk we will start with a general review of diffusion represented by linear or nonlinear parabolic equations, and then concentrate on explaining the main features of the theory of one particular nonlinear degenerate case, the Porous Medium Equation. Time permitting, some of the many new developments will be sketched.*

*Reference: J.L. Vázquez, The porous medium equation. Mathematical theory.*

*Oxford Mathematical Monographs. The Clarendon Press, Oxford University Press, Oxford, 2007.*

**Hora: 15:30**

**Lugar:** Seminario del Departamento de Matemáticas

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