



Universidade da Coruña

Facultad de Informática
Departamento de Matemáticas



Grupo M2NICA

Curso

*“Monte-Carlo methods for linear and nonlinear PDEs
and financial applications”*

Prof. Emmanuel Gobet

École Polytechnique de Paris

Lugar: Seminario 2.1 de la Facultad de Informática (UDC)

Horario:

26 de mayo de 11:00 a 13:00 y de 16:00 a 18:00 horas

27 de mayo de 11:00 a 13:00 y de 16:00 a 18:00 horas

Créditos : El curso se reconoce como **1 crédito ECTS** para los alumnos inscritos en el programa de doctorado *“Métodos matemáticos y simulación numérica en ingeniería y ciencias aplicadas”*

Información: Carlos Vázquez Cendón (carlosv@udc.es). Aunque la asistencia es gratuita se agradece comunicar asistencia.

Tentative program schedule

Monday, May 26th morning, 2h:

- Feynman-Kac representations of linear parabolic PDEs using Stochastic Differential Equations
- Applications to finance
- Euler scheme for SDE: strong and weak errors

Monday, May 27th afternoon, 2h:

- Treatment of boundary conditions and simulation of exit times/positions (Brownian bridges techniques, boundary corrections)
- Variance reduction and acceleration techniques (non-asymptotic confidence intervals, control variates, importance sampling, multi-level methods)

Tuesday, May 27th morning, 2h:

- Introduction to Backward Stochastic Differential Equations (BSDE), financial applications
- Numerical schemes based on empirical regression schemes

Tuesday, May 27th afternoon, 2h:

- Empirical regression schemes: error controls, impact of the function basis, the number of simulations
- Other nonlinear processes: branching process, non-linear diffusion in the Mc-Kean sense, and financial applications