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- ## Cours de M2 intitulé

Computational Methods in Physics: a Primer

Période : **du 7 au 11 Septembre 2009 de 15h45 à 17h45 Amphi C (ENS Lyon)**

Objectif

Most problems in physics cannot be solved analytically and well known high level languages to solve problems numerically are either too slow or inaccurate. These set of lectures provide a set of basic tools to deal with problems related to calculus, ordinary differential equations and elliptic partial differential equations. In specific cases it will be shown how to deal with problems on N real variables. A collection of algorithms will be described, in several cases full programs, ready to be run, will be distributed, analyzed and tested in the class.

Plan du cours

1. Recurrence, fixed points and zeros.

2. Derivation and integration, including divergent integrands and infinite domains.

3. Ordinary differential equations, three methods: Runge-Kutta, predictor-corrector (Adams-Bashford-Moulton) and Verlet.

4. Eigenvalues and eigenfunctions on the 1D Schrodinger problem.

5. Integration of elliptic differential equations.

http://www.cec.uchile.cl/cinetica/pcordero/lyon09/

- ## <u>Séminaire de recherché intitulé</u>

Phase separation in excited shallow granular systems

Le Jeudi 10 Septembre 2009 à 11h en Salle 117 de l'ENS Lyon.