Scientific computing for geophysical problems

Niveau d'étude
Master 2

ECTS
6 crédits

Volume horaire
52h

Période de l'année
Semestre 3

Présentation

DESCRIPTION

I Good practices in scientific programming / computing and an introduction to high-performance computing
II Scientific computing for seismology (observational seismology, passive interferometry)
III Scientific computing for planetary magnetism (processing of magnetic timeseries, global models of the geomagnetic secular variation)
IV Tutored project

Notebooks and codes will be deployed on the in-house S-CAPAD supercomputing facility (https://www.ipgp.fr/en/research/research-platforms/dante/).

OBJECTIFS

This class aims at providing students with a sense of how one can use theory and computers together to test hypotheses regarding the working of a geophysical system.

The testing may involve the derivation of a theory with predictive power, that ought to be checked against observations.

Both theory and observations are impacted by uncertainty; one skill that students will acquire is the capability of assessing and propagating uncertainty in the analysis chain.

Skills in scientific programming will be gained through a series of dedicated computer labs that will be run on the in-house supercomputer.

Skills in scientific writing will be gained through the writing of a short (12 page long) report of the tutored project.

HEURES D'ENSEIGNEMENT

Scientific computing for geophysical problems	Cours Magistral	14h
Scientific computing for geophysical problems	Travaux Pratiques	38h

Pour en savoir plus, rendez-vous sur > u-paris.fr/choisir-sa-formation

PRÉ-REQUIS OBLIGATOIRES

linear algebra, calculus, Fourier analysis; inverse problem theory; programing with the python language