



École doctorale de Physique en Île de France

ED564, PSL – UPMC – USPC – UPSaclay

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INTRODUCTION TO IMAGE PROCESSING WITH PYTHON

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Production of scientific images is ubiquitous in many scientific disciplines as they can capture phenomena in a broad range of lengthscales, from the stars to the atom.

Therefore, skills in image processing can be advantageous to perform and automate image analysis in many applications. This lecture will have a tutorial/workshop format and will mainly focus on the library scikit-image [1,2]. This course will be taught in English in case of non-French speaking attendees. The lecturer is one of the scikig-image developers.

Prerequisites: Even if a basic knowledge of Python and numpy is recommended (cf Sessions 1 & 2 of "Cours de «Python pour la physique»"), a reminder will be provided at the beginning of the session to ensure that attendees can step up easily.

A laptop with Python installed is highly recommended.

Outline:

- * Reminder (Containers in Python, numpy, scipy, matplotlib)
- * Jupyter, a notebook
- * Brief introduction to virtual environments
- * Presentation of image-related libraries available in Python
- * More detailed presentation of scikit-image (documentation, source-code, etc.)
- * Read and write (IO) images and their representations
- * Histogram and thresholding
- * Filters and peak finding
- * Feature detection and characterization
- * Image transformation and displacement detection
- * Image restoration
- * Image stitching

[1] <http://scikit-image.org/>

[2] <https://peerj.com/articles/453/>

-- 2 cours de 6h --

Mardi 28 Mars et Mardi 4 Avril 2017 – 9h-12h et 14h-17h

Salle 161 [Laboratoire de Physique des Solides, Orsay](#)

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