SEMINAIRE ISMO

Alexandra FRAGOLA

LPEM UMR 8213, ESPCI, CNRS, Sorbonne Université

Dynamic Structured Illumination Microscopy for enhanced resolution fluorescence imaging in living samples

Live cell studies at the molecular level strongly depend on imaging performances. Structured illumination microscopy (SIM) brings a significant gain, as an increase of a factor 2 in lateral resolution allows observation of many new phenomena. However its current use for biological applications still requires major technical improvements in order to combine lateral super resolution with video rate fluorescence imaging and optical sectioning in living samples.

We present a structured illuminated microscope by fringe projection together with an original and efficient reconstruction algorithm that only requires 4 acquired images (instead of 9) to obtain a super resolution one. We also combine SIM with direct optical sectioning allowing imaging of in depth phenomena inside thick samples. Using those improvements and a sliding recombination of the raw images, it is possible to create super resolution movies with a quarter of the information renewed in each reconstructed image. This unique approach allows realizing dynamic SIM movies of live samples with high temporal resolution.

Mardi 3 juillet 2018 à 11 h

Amphithéâtre du bât 520 (3ème étage)

Université Paris-Sud - 91405 ORSAY Cedex