

## Imaging life across scales with light, X-rays, electrons and ions

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**Amphithéâtre SOLEIL**

Imaging technology for the biosciences has taken huge leaps forward in recent times. Nobel prizes have been awarded for breaking the resolution barrier in light microscopy and cryo electron microscopy, revealing the cellular dynamics and atomic structure of molecules. In parallel, X-ray and chemical imaging are migrating from the physical to the life sciences, revealing the internal structure of tissues and metabolic pathways in exquisite detail. And in volume electron microscopy, a plethora of new microscopes are revealing the complexity of cells and tissues in three dimensions with nanometre resolution, thereby unravelling neuronal connections in the brain and the subcellular hiding places of pathogens. But the fundamental trade-off between sample size and resolution remains - the larger the sample, the lower the resolution will be. The solution is correlative multimodal imaging, where the same sample is imaged intact at low resolution, and then gradually trimmed to smaller sizes for imaging at higher resolution in different types of microscope. The trick is to retain and follow the structure of interest at each step, with optimal sample preparation for each microscope, using probes that are visible in different microscopes and software to overlay different image types. This is 'non-trivial'! In my talk, I will reveal how we approach this problem of finding and imaging the 'needle in the haystack', and how the general public are helping us train machines to analyse the resulting massive image data.



*Pause café*

**Formalités d'entrée :** accès libre dans l'amphi du pavillon d'Accueil.

Si la manifestation a lieu dans le Grand Amphi SOLEIL du Bâtiment Central merci de vous munir d'une pièce d'identité (à échanger à l'accueil contre un badge d'accès).

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