CONFÉRENCE

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Quantitative nanoscopy of neuronal plasticity with deep learning

LE JEUDI 21 JANVIER 2021 À 12 H 30

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Understanding of the molecular mechanisms underlying neuronal communication is challenging in part because synapses are tiny, they exhibit a wide range of shapes and molecular structures, combined with their dynamics and activity-dependent plasticity. To understand communication in the brain, we must be able to observe the synaptic molecular dynamics and protein interactions at their scale: the nanoscale. Super-resolution optical microscopy (optical nanoscopy) allows the study of molecular interactions inside living cells with a resolution down to a few tens of nanometers. Probing synaptic structure and function using multi-modal optical nanoscopy results in complex multidimensional data that need to be analysed with quantitative approaches. We combine high-end microscopy techniques with machine learning to develop novel high throughput imaging and analysis of neuronal remodelling and plasticity at the nanoscale.

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