

# Plenary Speakers



## Guillaume SCHULL

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### BIOGRAPHY

Guillaume SCHULL is a CNRS researcher at the IPCMS in Strasbourg. He is a specialist in scanning probe microscopy in combination with optics measurements. He has contributed to the development of a novel experimental approach that uses electrons rather than photons as the source of excitation of molecules, and has demonstrated that it is possible to probe and control the fluorescence properties of single emitters with sub-nanometric resolution.

### SUB-MOLECULAR FLUORESCENCE MICROSCOPY WITH STM

The electric current traversing the junction of a scanning tunneling microscope (STM) may lead to a local emission of light that can be used to generate sub-molecularly resolved fluorescence maps of individual molecules. Combined with spectral selection and time-correlated measurements, this hyper-resolved fluorescence microscopy approach allowed us to scrutinize the vibronic structure of individual molecules [1] in a very similar way than in the recent TERS reports, without requiring an optical excitation. We used this approach to characterize the photonics properties of charged species [2], to track the motion of hydrogen atoms within free-based phthalocyanine molecules [3], and more recently to follow resonance energy transfers between individual pigments, exploring processes occurring in photosynthetic complexes with sub-molecular spatial resolution [4].

These results constitute an important step towards photonic measurements with atoms-scale resolution [5].

### KEYWORDS:

Single molecule fluorescence; Energy transfer; Electronic structure of atoms and molecules; Optoelectronics; Scanning tunneling spectroscopy

### REFERENCES

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