

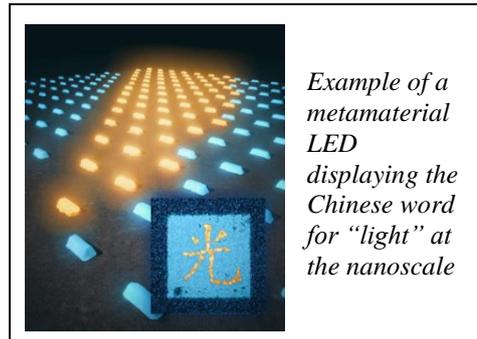
## Postdoctoral offer at CNRS, position available now Transient studies on Optoelectronic Metamaterials

**Employer:** Centre National de la Recherche Scientifique (CNRS)

**Host institute:** Laboratoire Matériaux et Phénomènes Quantiques (MPQ), Paris, France. Website: <https://www.mpq.univ-paris-diderot.fr/>

**Contact:** Aloyse Degiron, [aloyse.degiron@univ-paris-diderot.fr](mailto:aloyse.degiron@univ-paris-diderot.fr)

Recently, we have introduced a way to transform basic LEDs into versatile multifunctional devices [1,2]. Our strategy is to replace the standard active medium by an artificial composite (i.e. a metamaterial) made of colloidal quantum dots coupled with a metallic nanostructured pattern. The hybridization makes it possible to control all aspects of the electroluminescence at the nanoscale (electrical injection, polarization, color) and to weave light-emitting surfaces of unprecedented complexity.



*Example of a metamaterial LED displaying the Chinese word for “light” at the nanoscale*

Beyond the potential of these devices for applications (we have engaged in collaborations with major industrial players), it turns out that the physics at play in such artificial composites is new [3] and quite unlike anything found in the literature and textbooks on nanophotonics. However, our understanding of this new regime of interactions at the nanoscale is still very limited.

The goal of this postdoctoral fellowship is to elucidate this new physics. Using time-resolved fluorescence measurements and transient absorption spectroscopy, the successful candidate will probe the dynamic of the carriers, their thermalization, their lifetime, and the thermodynamics of the structures at the nanoscale. **This is a rare opportunity to make pioneering contributions in a nascent field, with experimental results that will serve as the foundations of many developments for years to come.**

We are looking for a highly motivated individual with a strong experimental background in ultrafast optical techniques. A PhD training involving transient absorption spectroscopy would be welcome. At the very least, applicants should be proficient in manipulating and aligning femtosecond optical parametric amplifiers, as well as performing basic TCSPC measurements. At the same time, they should be open to collaborate with (and mentor) the students of the team and participate to the nanofabrication effort. A good level of English is also a requisite. The successful candidate will join a dynamic team, with collaborations with top researchers around the planet—and will work in a world-class environment in the heart of Paris.

**Funding for this postdoctoral position is provided by an ERC Consolidator Grant.**

### References

- [1] Q. Le-Van, X. Le Roux, A. Aassime and A. Degiron, *Nature Commun.* 7, 12017 (2016).
- [2] H. Wang, Q. Le-Van, A. Aassime, X. Le Roux, F. Charra, N. Chauvin and A. Degiron, *Advanced Optical Materials* 6, 170058 (2018).
- [3] H. Wang, A. Aassime, X. Le Roux, N.J. Schilder, J.-J. Greffet and A. Degiron, *Physical Review Applied* 10, 034042 (2018).