

Nano Devices

Mon, 2017-04-03 10:44 - [Dayen Jean-Francois](#) [1] **Website:**
http://www.ipcms.unistra.fr/?page_id=8499&lang=en [2]

Research Type: Experiment

Our research aims at studying nanoscale materials using electrical and optical probes, possibly combined, to get insight into **novel quantum properties** emerging when diminishing the size of the sample. Our multidisciplinary approach is at the frontier between physics, chemistry and materials science.

One of our main perspectives is to extend the concept of spintronics devices, or systems where the electrical properties are highly sensitive to the magnetic configurations of the circuit elements, to multi-stimuli or multifunctional devices, where several external parameter can be used to tune the electrical properties (for example, the electric, magnetic or electromagnetic fields, the temperature, the pressure, the (electro)chemical environment...).

Light-matter interaction is also of interest, beyond the use of photons as a stimulus, as it allows probing the intrinsic electronic and vibrational properties of low-dimensional materials (graphene, carbon nanotubes, semiconductor nanostructures...), as well as their interactions (through, e.g., energy and/or charge transfer) within more complex heterostructures. These phenomena are investigated using a broad palette of optical techniques (micro-Raman and luminescence spectroscopies, time correlated single photon counting...). We are particularly interested in probing the optical response of electrostatically gated nanodevices.

Our philosophy is to tackle **technologically relevant issues** with a rather fundamental approach. We aim at developing reliable and original methods for fabricating and characterizing devices, of relevance for applications, and possibly leading to new commercial products. This is why patents applications and valorisation projects are actively pursued in the group.

Leader: Stephane Berciaud, Jean-Francois Dayen, Bernard Doudin, Bohdan Kundys.

Location

Université de Strasbourg, CNRS, Institut de Physique et Chimie des Matériaux de Strasbourg
Strasbourg 67034 France

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