

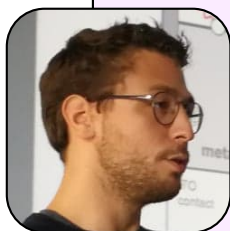
What research in ICB?

The association of PhD students (ATCPB) organises sessions of Flashtalks, where students and researchers can briefly present and discuss their research!

Romain Hernandez - 2nd year PhD student

Romain works in ICB in the OCP team. He spoke about the plasmonic-based hot-electrons generation for photodetection application.

Plasmons are collective oscillations of electrons under an electromagnetic field and it locally confines light under sub-wavelength scales. When an electromagnetic field is strongly enhanced, energy exchange occurs from plasmons towards electrons: electrons with high energy are generated within a metallic nanoparticle (hot-electrons). Nowadays, photodetectors are mainly made out of semi-conductors. A strategy to enhance their efficiency, responsivity and speed, is to use hot-electrons generation by plasmonic enhancement.



Arnaud Lemière - 3rd year PhD student

Arnaud works on the fabrication and characterization of optical fibers in the SLCO team.

Supercontinuum Absorption Spectroscopy (SAS) is a new method developed in Arnaud's team to detect greenhouse pollutants. SAS is a fast, waste-free method for detecting every chemical species in the atmosphere. Arnaud has described the several steps that must be achieved to reach the detection of gases by this method. Losses of the fiber is measured by the Cut-Back method and finally, spectral broadening called "supercontinuum" (SC) is generated in the fiber by incoupling a femtosecond laser pulse. Their SC broads from 1 to 5 μ m or 1 to 14 μ m, depending of the glass. This SC is used to measure the absorption of gases by spectroscopy.



Gang Xu - Postdoc

Gang is a postdoc in the SLCO team, working on nonlinear optics. In his flashtalk, he discussed analogies between water flows and light in optical fibers.

The analogies between water wave dynamics and the nonlinear propagation of optical waves are important subjects in the SLCO team. Gang focuses on the emergence of nonlinear localized structures in water-tanks and optical fiber experiments. In the normal dispersion regime (shallow-water regime), he investigates the emergence of dispersive shock waves. While in the anomalous dispersion regime (deep-water regime), he studies the generation of bright solitons and rogue waves.



Vincent Dorier - 3rd year PhD student

Vincent works in ICB in the DQNL team. He studies the theoretical description of quantum light.

Photons are exotic objects. Despite its quantum feature, i.e., the fact that they are emitted and detected as whole quanta of energy, some experiments highlight surprising classical properties carried by the photons. Vincent presented such experiments using individual photons associated with broad temporal profiles, showing that observations would be very paradoxal if explained with classical particles. He then extended simple interferometer experiments to plasmonics structures, which raises theoretical and conceptual difficulties to describe quantum light.

