Postdoctoral position in Semiconductor plasmonics

The Near-field Optics Group at Université de Bourgogne Franche-Comté invites applications for a postdoc. The focus of the project is on semiconductor plasmonics and is detailed hereafter. Only candidates with related experience should apply. We are looking for a motivated researcher to join our young and dynamic team on an innovative research project funded by the LABEX ACTION (http://www.labex-action.fr/). You must hold a PhD in an experimentally related area, ideally in time resolved Raman spectroscopy or in semiconductor plasmonics. Analytical and programming skills (Matlab, Comsol, Labview…) are a strong added-value.

Please send your application to olivier.demichel@u-bourgogne.fr

Submission documents:

(a) a cover letter where you introduce yourself, your past research achievements and your career goals.

(b) a full CV including undergraduate and postgraduate details.

(c) details of at least two academic referees we can contact.

The position is for 1 year with possible extension. Starting date: Mid-2017.

Deadline: We will continue to advertise until a suitable candidate is found.

Positionning of the project: The project aims at employing semiconductors as the host materials for plasmonic resonances. Indeed, semiconductors authorize to modulate the free carrier density by several orders of magnitudes from 10^{16} to 10^{21} cm^{-3} carriers corresponding to plasma resonances ranging from the THz to near-IR. Doping, electrical or optical pumping of semiconductors offer various way to tune such resonances. The project aims at generating and managing a dense population of charges within Silicon or GaAs nanostructures to open avenue towards a tunable plasmonics within materials that are intrinsically CMOS compatible. Femtosecond pulsed optical excitations are particularly interesting for this purpose since they produce carrier populations as dense as $10^{20}cm^{-3}$ that then decreases within few picoseconds to nanoseconds due to electron-hole pair recombinations. The project aims at demonstrating that such dense plasmas sustains tunable plasmonic resonances.

Job profile: The candidate will have to control the femtosecond optical generation of dense plasmas within silicon and GaAs nanostructures. He will benefit from the femtosecond laser chain of the group that is coupled to an inverted microscope designed for single nanostructures analysis. The first task will be to quantify the time-dependency of the plasma frequency in a semiconductor nanostructure. For this purpose, the candidate will have to implement a time-resolved Raman spectroscopy setup that will probe plasma properties. In parallel, the plasmonic resonances of such plasma will be investigated through pump-probe nonlinear spectroscopy techniques.

The team: The candidate will join the young and dynamic Near-Field Optics group of the Photonics Department at the Université de Bourgogne-Franche-Comté (Dijon, France). The team has a very active world-wide network of collaborations which provides samples and devices required for the project and will allow to the postdoct to develop his own scientific network.