



INTERNSHIP PROPOSAL 2014

Complex nanoparticles for materials with new optical functions

LP2N (Institut d'Optique d'Aquitaine) – PSA Peugeot-Citroën

One of the main challenges nowadays in nanophotonics is being able to control the interaction of light with nanometric objects. Although light scattering by small particles has been investigated for more than a century, progress in nanotechnology continuously opens new opportunities. The last decade has hence assisted to a proliferation of electromagnetic nanoparticles of various shape and composition, and possessing completely new optical properties, such as a tunable directivity of the scattered light or a controllable absorption efficiency depending on the frequency, angle and polarization of the incident wave.

We believe that a clever use of exotic nanoparticles, self-assembled in dielectric films, could lead to the realization of thin film stacks with new optical functions. Due to their potentially low cost of fabrication, these new films could have an important impact onto the industry. Examples of applications include surfaces that would diffuse light in specific directions, or films that would be either completely transparent or opaque depending on frequency.

The scope of this project, which stems from a partnership between the Institut d'Optique d'Aquitaine and PSA Peugeot-Citroën, is to explore the possibilities offered by assemblies of complex nanoparticles for the realization of such advanced materials. The student will be involved into the development of a numerical tool required to model the light interaction with the nanoparticles and will use it to design new optical materials for applications in car industry.

Supervisors:

Philippe Lalanne (IOA, philippe.lalanne@institutoptique.fr, 0557017201 or 0621616392)

Kevin Vynck (IOA, kevin.vynck@institutoptique.fr)

David Barat (PSA Peugeot-Citroën, david.barat@mpsa.com)

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(Remunerated intership, possibility to continue with a CIFRE thesis)