

MASTER de PHYSIQUE

Proposition de sujet de stage

Année 2018-2019

Parcours Optique, Physique Atomique et Moléculaire

Nom du Laboratoire : Institut Lumière Matière

Groupe : Spectrométries des Biomolécules et Agrégats (en collaboration avec ONLI)

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Intitulé du stage :

Enhanced linear and nonlinear optical properties of graphene oxide –noble metal nanoclusters hybrid nanomaterials. Playing with charge and energy transfers.

Résumé du travail demandé :

Research on nanoclusters has recently gained tremendous interest due to their highly attractive physical–chemical properties induced by the quantum confinement effect. However, the various correlation between the metal nanoclusters and quantum dots have been rarely investigated. The size, shape and composition of such hybrid system and the properties of the environment greatly influence their functionalities. In this propose, it is proposed to undertake the design of different types of nanoclusters and nanoparticles of different noble metals such as Ag and Au of varying morphology and sizes which are anchored on the surface of 2 dimensional Quantum dots (QDs) such Graphene oxide QDs (GOQDs) using laser assisted and chemical syntheses routes. Nonlinear optical properties will be addressed in solution by measuring their hyperpolarizabilities as well as their and two-photon absorption and fluorescence (TPA and TPE) cross sections. Lifetime measurements and transient absorption will be conducted to better address the energy transfer arising in such hybrids nanomaterials. These systems will be further investigated for their potential applications in the fields of sensors and optical limiting.

Indication éventuelle d'ouverture vers un sujet de thèse : Oui. **Type de financement envisagé** : Bourse ministère.