

Spécialité de Master « Optique, Matière, Paris »

Stage de recherche (4 mois minimum, à partir de début mars)

Proposition de stage

Date de la proposition : 28/09/2017

Responsable du stage / *internship supervisor:*

Nom / *name:* Loumaigne Prénom / *first name:* Matthieu
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Nom du Laboratoire / *laboratory name:*

Code d'identification : UMR 6200 Organisme : MOLTECH-Anjou
Site Internet / *web site:* <http://moltech-anjou.univ-angers.fr/>
Adresse / *address:* 2 boulevard Lavoisier 49000 ANGERS
Lieu du stage / *internship place:* Université d'Angers – laboratoire Moltech-Anjou

Titre du stage / *internship title:* Spectroscopy of single AIE aggregates inside microfluidic channels.

"*United we stand, divided we fall*". For a long time, this adage didn't apply to luminophores. Actually, it was the exact opposite, luminophores became weaker or even completely quenched in concentrated solutions or in the solid state : the so-called aggregation-caused quenching or ACQ. Although the ACQ effect can be useful if it is cleverly used, from the viewpoint of real-world applications, it does more harm than good in most cases. In 2001, the exact opposite effect, called Aggregation Induced Emission (AIE) was observed for the first time by Ben Zhong Tang et al. This game-changer phenomenon has led to new exciting applications.

AIE is an extremely competitive field of research. Looking at the literature it appears that the AIE mechanisms have more or less come to a consensus without systematic studies at the *single aggregate level*.

The SAMSON team of the Moltech-Anjou lab is specialized in innovative spectroscopic technics at the single particle level. Within the framework of the SIPAIE¹ project, which has recently been financed with a young researcher ANR grant, our research aims at bringing new insights on the AIE mechanisms, in particular, the aggregation process, that could lead to even more efficient AIE materials.

In this internship, the candidate will be in charge of upgrading an already existing optofluidics (optics + microfluidics) platform in order to detect and analyze single aggregates of AIE molecules.

More precisely:

- We will improve the microfabrication of our microfluidic devices.
- We will upgrade the microfluidic setup with flow sensors and use feedback loops in order to perform stop-flow experiments.
- We will upgrade the actual optical setup with a new pulsed continuum source also known as "white laser".
- We will improve our home-made software (based on micromanager) in order to automate the most recurrent measurements made with our microscope.

Keywords : AIE (Aggregation Induced Emission), single particle spectroscopy, optofluidics (optics + microfluidics).

For applications or inquires about the internship, please contact :

M. Loumaigne at matthieu.loumaigne@univ-angers.fr

¹ Aggregation Induced Emission at SIngle Particle level : characterization and nanofabrication inside microfluidic devices

Ce stage pourra-t-il se prolonger en thèse ? Possibility of a PhD ? : Yes

Si oui, financement de thèse envisagé/ financial support for the PhD: ANR-JCJC (already obtained)

Lumière, Matière, Interactions

X

Lasers, Optique, Matière

X