

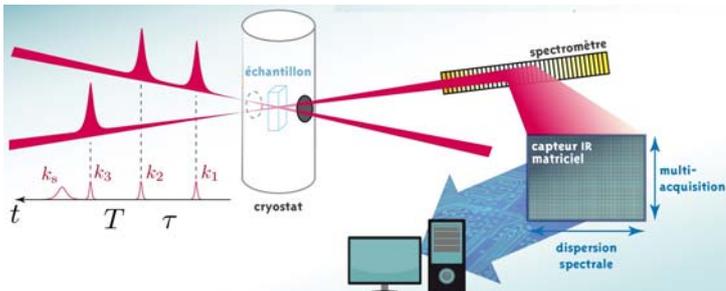
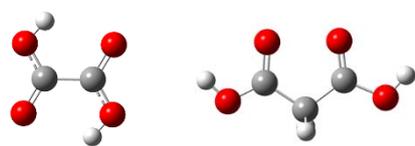
Spécialité de Master « Optique, Matière, Paris »

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

Proposition de stage (ne pas dépasser 1 page)

Date de la proposition :

Responsable du stage / internship supervisor:			
Nom / name:	CHIN	Prénom/ first name :	Wutharath
Tél :	01 69 15 75 08	Fax :	01 69 15 67 76
Courriel / mail:	wutharath.chin@u-psud.fr		
Nom du Laboratoire / laboratory name: Institut des Sciences Moléculaires d'Orsay (ISMO)			
Code d'identification :	UMR8214	Organisme :	CNRS/Université Paris Sud
Site Internet / web site:	http://www.ismo.u-psud.fr/spip.php?rubrique47		
Adresse / address:	rue André Rivière, Bât. 520, Université Paris-Sud, F-91405 Orsay, France		
Lieu du stage / internship place:	idem		

Titre du stage / internship title: Ultrafast dynamics probed by two-dimensional infrared spectroscopy /	
Résumé / summary	
<p>Two-dimensional infrared (2D-IR) spectroscopy is a powerful and unique tool that informs simultaneously on the structure and dynamics of a system. Information such as population time, vibrational couplings, relaxation processes can be retrieved. It is a four-wave mixing technique involving a temporal sequence of three pulses creating a 3rd order nonlinear polarization which is the fourth signal. By spectrally resolving the nonlinear signal through a monochromator in one dimension (so-called "t delay") and applying a Fourier-transform into space-frequency in the other dimension ("τ delay"), one gets a 2D frequency-frequency map containing all the spectral information. Evolution of the structural changes can be followed by monitoring the 2D map according to another delay "T".</p> <p>This project combines the great advantage of structural and temporal resolution of 2D-IR technique with that of cryogenic matrices (low temperature crystalline solids), which are the ideal media to isolate and study the intrinsic properties of molecular assemblies. At ISMO, we intend to study using 2D-IR spectroscopy from aqueous solution to controlled media such as cryogenic matrices, small clusters of organic acids which are relevant to atmospheric chemistry since they are present in aerosols. So far, this is the first study undertaken on atmospheric organic acids with these techniques.</p>	
	
Schematic of oxalic and malonic acids	
2D-IR scheme based on a pump-probe geometry combined with a cryostat.	
<p>During the internship the student will be asked to take part in optimizing the installation of the 2D-IR set-up. Test measurements will be run on organometallic complexes first in liquid phase, then in low temperature matrices. This step will be useful to evaluate and optimize optical alignments. The student will deal with linear and nonlinear IR spectroscopy, cryogenic techniques, analysis with Origin and Matlab. Knowledge in optics and basic physics is required. According to the progress during the internship, experiments on oxalic and malonic acids will be performed to determine their IR signatures and dynamics while varying their environment.</p>	
Toutes les rubriques ci-dessous doivent obligatoirement être remplies	

Ce stage pourra-t-il se prolonger en thèse ? Possibility of a PhD ? : oui			
Si oui, financement de thèse envisagé/ financial support for the PhD: bourse EDOM			
Lumière, Matière, Interactions	x	Lasers, Optique, Matière	x

Fiche à transmettre (fichier pdf **obligatoirement**) sur le site <http://stages.master-omp.fr>