

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:			
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Code d'identification :	UMR 8552	Organisme :	SU, CNRS, ENS, Collège de France
Site Internet / web site:	http://www.lkb.upmc.fr/metrologysimplesystems/		
Adresse / address:	4 place Jussieu, case 74 75005 Paris		
Lieu du stage / internship place:	Université P et M Curie, Paris Vème		

Titre du stage / internship title: Proton radius from high resolution spectroscopy of hydrogen atom at low temperature
Résumé / summary
<p>High resolution spectroscopy of the hydrogen atom makes it possible to test the predictions of quantum electrodynamics (QED) on a simple atomic system, while determining the value of fundamental constants. We are currently studying the 1S-3S two-photon transition at 205 nm on an atomic beam, using an original method to compensate for the 2nd order Doppler effect. The hydrogen atoms are cooled by thermalization on an aluminum nozzle cooled to the temperature of the liquid nitrogen.</p> <p>The continuous laser source tunable at 205 nm is obtained by sum of two frequencies at 266 nm (532 nm frequency doubled) and 894 nm (home made titanium-sapphire laser). The measurement of the transition frequency, deduced from the comparison of the two frequencies above with those of a femtosecond frequency comb, requires controlling all the systematic effects that can displace the line. The internship will consist of participating in a measurement campaign alongside Simon Thomas (PhD student) and interpreting the results obtained. The objective is to obtain an uncertainty of 2-3 kHz on the transition frequency and thus to bring an element of response to the "proton puzzle" which bears for several years on the value of the charge radius of the proton.</p> <p>The work proposed during this internship will be mainly experimental. The candidate is expected to have some expertise in techniques used in atomic physics (laser, vacuum, electronics,...). Theoretical knowledge of the basics of atomic physics is also necessary to interpret the results.</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:			
Financement ANR acquis			
Lumière, Matière, Interactions	X	Lasers, Optique, Matière	X

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