

**Irfu**Institut de recherche  
sur les lois fondamentales  
de l'Univers**Séminaire  
SPP****Lundi 20/03/2017, 11h00**

CEA-Saclay Bât. 141, salle André Berthelot

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## Observation of the 1S-2S transition in trapped antihydrogen by the ALPHA experiment

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Since the first trapped antihydrogen in 2010 [1] and observing its long lifetime in the 0.5 K deep neutral atom trap [2], experiments have been performed on the anti-atom resulting in the observation of resonant transitions between the hyperfine states of the ground state [3], experimental limits on the ratio of the gravitational mass to the inertial mass of antimatter [4] and an experimental limit on the charge of antihydrogen [5,6]. Recently, we have been able to observe the 1S-2S transition in antihydrogen [7]. I will give an overview of the ALPHA experiment [8] and present some of the results originating from recent experiments on trapped antihydrogen.

- [1] G. B. Andresen et al. (ALPHA collaboration), Nature 468 (2010) 673
  - [2] G. B. Andresen et al. (ALPHA collaboration), Nature Phys. 7 (2011) 558
  - [3] C. Amole et al. (ALPHA collaboration), Nature 483 (2012) 439
  - [4] C. Amole et al. (ALPHA collaboration), Nature Communications 4 (2013) 1785
  - [5] C. Amole et al. (ALPHA collaboration), Nature Communications 5 (2014) 3955
  - [6] M. Ahmadi et al. (ALPHA collaboration), Nature 529 (2016) 373
  - [7] M. Ahmadi et al. (ALPHA collaboration), Nature 541 (2017) 506
  - [8] C. Amole et al. (ALPHA collaboration), Nucl. Instr. and Meth. in Phys. Res. A 735 (2014) 319
- ALPHA collaboration : <http://alpha.web.cern.ch>

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Le café sera servi 10 minutes avant.

NB : La présentation d'une pièce d'identité est exigée à l'entrée du centre. Tous les auditeurs extérieurs sont priés de prévenir à l'avance Martine Oger, tél. 01 69 08 23 50, e-mail : [martine.oger@cea.fr](mailto:martine.oger@cea.fr). (U.E. : délai de 24 h, hors U.E. : délai de 4 jours).