



**UNIVERSITÉ  
DE GENÈVE**

**FACULTÉ DES SCIENCES**  
Département de physique  
nucléaire et corpusculaire

## **SÉMINAIRE DE PHYSIQUE CORPUSCULAIRE**

- SUJET:** Search for dark matter with CAST
- PAR:** Prof. Dieter H.H. Hoffmann  
Technische Universität Darmstad
- DATE:** Mercredi 26 novembre, 2014, 11h15
- LIEU:** Science III, Auditoire 1S081  
Boulevard d'Yvoy, 1211 Genève 4

### **RÉSUMÉ:**

The CAST experiment is designed to search for solar axions which are produced in the interior of the sun via the Primakoff effect. The central part of the experiment, the helioscope is an LHC prototype magnet that has attached different types of sensitive detectors for x-rays in the regime of 1-10 keV. The experiment has been taking data since 2003 and provided the most restrictive limits on the axion-photon coupling in a broad mass range. Beyond  $0,02\text{eV}/c^{**2}$  the mass the sensitivity is degraded due to coherence loss. In order to restore coherence, the magnet can be filled with a buffer gas providing an effective mass to the photon. By changing the pressure of the buffer gas in steps, one can scan an entire range of axion mass values. The CAST experiment started this gas program entering its phase II at the end of 2005. From 2005 to 2007, the magnet bore was filled with  $4\text{He}$  gas extending the sensitivity to masses up to 0.4 eV. From March 2008 onwards the magnet bore has been filled with  $3\text{He}$ . With the end of the 2011 data taking in July, the CAST experiment has covered axion masses up to 1.18 eV surpassing the initial goal of the phase II which was to reach 1.16 eV. The results of the first part of the  $3\text{He}$ , with a sensitivity up to 0.64 eV, have been finalized.

An overview on the current status of CAST and the future perspectives will be given.

INFORMATION : <http://dpnc.unige.ch/seminaire/annonce.html>

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