



# CERN Colloquium

**SPEAKER:** Christer Fuglesang (European Space Agency)  
**TITLE:** **Physics Research on the International Space Station**  
**DATE:** Thu 24/05/2012 16:30  
**PLACE:** Council Chamber

## ABSTRACT

The International Space Station (ISS) is orbiting Earth at an altitude of around 400 km. It has been manned since November 2000 and currently has a permanent crew of six. On-board ISS science is done in a wide field of sciences, from fundamental physics to biology and human physiology. Many of the experiments utilize the unique conditions of weightlessness, but also the views of space and the Earth are exploited. ESA's (European Space Agency) ELIPS (European Programme Life and Physical sciences in Space) manages some 150 on-going and planned experiments for ISS, which is expected to be utilized at least to 2020.

This presentation will give a short introduction to ISS, followed by an overview of the science field within ELIPS and some recent results. The emphasis, however, will be on ISS experiments which are close to the research performed at CERN. Silicon strip detectors like ALTEA are measuring the flux of ions inside the station. ACES (Atomic Clock Ensemble in Space) will provide unprecedented global time accuracy and perform tests of Einstein's general theory of relativity. SpaceQUEST is proposed to test Bell inequalities for distances over 1000 km and a possible de-coherence effect due to gravity. Q-WEP aims at an atom interferometry test of the weak equivalence principle to a few parts in 10<sup>15</sup> by using samples of ultra-cold atoms, possibly different isotopes of Rb. JEM-EUSO will study the ultra-high energy cosmic rays from space ( $E > 7 \times 10^{19}$  eV) by measuring the fluorescence and Cherenkov radiation they create in the atmosphere. Although AMS was largely built in Europe and tested at an ESA's facility, it is not part of ELIPS and will only be briefly mentioned.

Organised by: Ignatios Antoniadis/PH-TH & James Gillies/DG-CO.....\*\*Tea and coffee will be served at 16h00\*\*