



SPEAKER: **Jasper Kirkby (CERN)**

TITLE: **Cosmic rays and climate**

DATE: Thu 04/06/2009 16:30

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ABSTRACT

The current understanding of climate change in the industrial age is that it is predominantly caused by anthropogenic greenhouse gases, with relatively small natural contributions due to solar irradiance and volcanoes. However, palaeoclimatic reconstructions show that the climate has frequently varied on 100-year time scales during the Holocene (last 10 kyr) by amounts comparable to the present warming - and yet the mechanism or mechanisms are not understood. Some of these reconstructions show clear associations with solar variability, which is recorded in the light radio-isotope archives that measure past variations of cosmic ray intensity. However, despite the increasing evidence of its importance, solar-climate variability is likely to remain controversial until a physical mechanism is established.

Estimated changes of solar irradiance on these time scales appear to be too small to account for the climate observations. This raises the question of whether cosmic rays may directly affect the climate, providing an effective indirect solar forcing mechanism. Indeed recent satellite observations - although disputed - suggest that cosmic rays may affect clouds. This talk presents an overview of the palaeoclimatic evidence for solar/cosmic ray forcing of the climate, and reviews the possible physical mechanisms. These will be investigated in the CLOUD experiment which begins to take data at the CERN PS later this year.