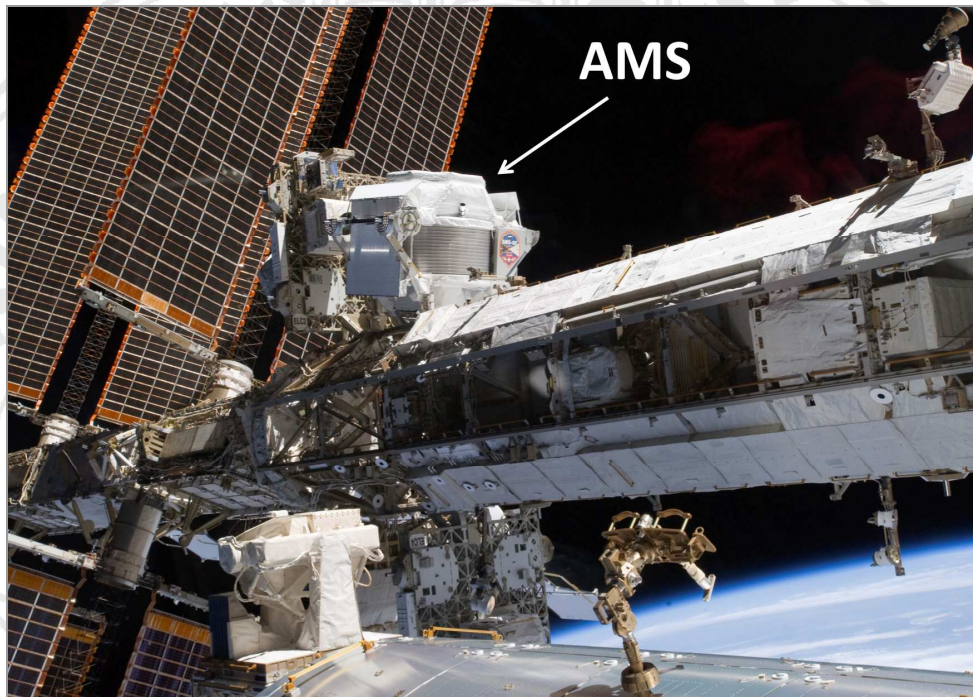


PHYSIKALISCHES KOLLOQUIUM

AM 23. JUNI 2014 UM 17 UHR C.T.

IM GROßEN HÖRSAAL



THE FIRST RESULTS FROM THE AMS EXPERIMENT ON THE INTERNATIONAL SPACE STATION

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The Alpha Magnetic Spectrometer, AMS, is a general purpose high energy particle physics detector. It was installed on the International Space Station, ISS, on 19 May 2011 to conduct a unique long duration mission of about 20 years of fundamental physics research in space. The first AMS results are based on the data collected during the initial 2 years of operations on the ISS. The positron fraction, that is, the ratio of the positron flux to the combined flux of positrons and electrons, is presented in the energy range from 0.5 to 350 GeV. Over the last 2 decades, there has been strong interest in the cosmic ray positron fraction in both particle physics and astrophysics. Since we live in a matter dominated universe, anti matter particles like the positron are very rare in cosmic rays and hence a very sensitive probe for new phenomena like the annihilation of dark matter particles in our galaxy. A sharp cut off in the positron fraction spectrum would be a clear signal for dark matter annihilation. The very accurate data show that the positron fraction is steadily increasing from 10 to about 250 GeV, but, from 20 to 250 GeV, the slope decreases by an order of magnitude, which is observed for the first time. The positron fraction spectrum shows no fine structure. Perspectives for the future and possible implications for dark matter models will be discussed.