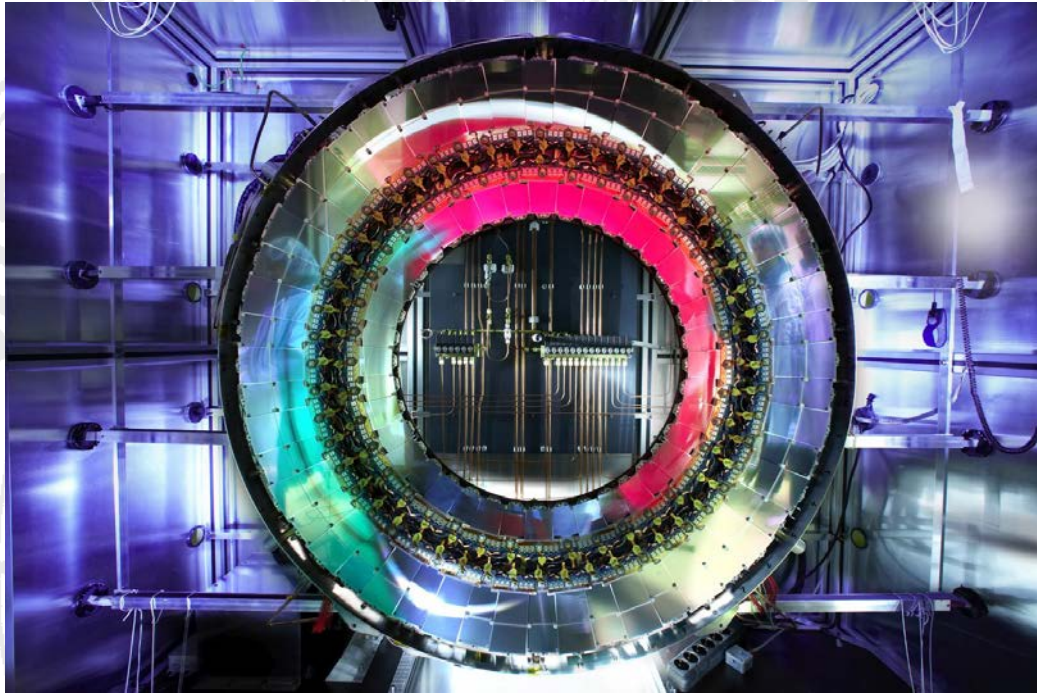


PHYSIKALISCHES KOLLOQUIUM

AM 30. JANUAR 2017 UM 17 UHR C.T.

IM GROßEN HÖRSAAL



A DISK WITH SILICON SENSORS FOR AN ENDCAP OF THE ATLAS SILICON STRIP DETECTOR BEFORE INSTALLATION,
COURTESY P. GINTER.

SILICON DETECTORS IN PARTICLE PHYSICS

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In collisions of particles in accelerators the fundamental interactions are probed at highest energies and searches for new states of matter are performed. The detection of particles and their decay products requires huge yet sophisticated detectors with an extremely complicated multi-technology structure. In the 1980s, highly segmented silicon detectors were introduced in particle physics to precisely measure the tracks of charged particles in a magnetic field and thereby their momenta. Meanwhile, they have become a key component of particle detectors worldwide. An overview on the use of silicon tracking detectors in current major particle physics experiments is given. Several large experiments are planning an upgrade of their silicon detectors. The technology used today needs to undergo a major evolution to be able to meet the extremely challenging conditions expected in future experiments. New developments and possible solutions are highlighted. It is illustrated how silicon detectors will remain a crucial detector technology in particle physics enabling further ground-breaking discoveries.