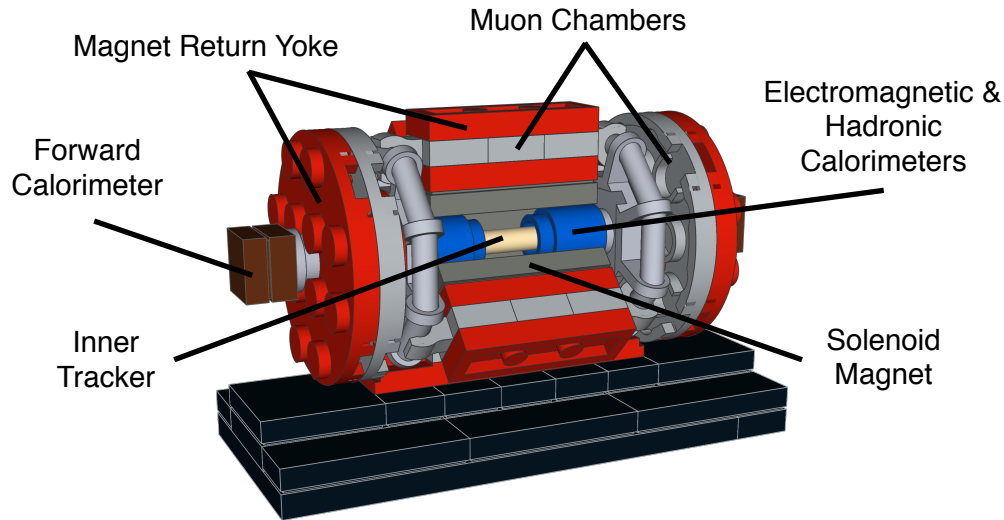


The CMS Detector

Model Designed by Nathan Readloff



The CMS detector is a general-purpose particle detector at the Large Hadron Collider in CERN, with a broad physics programme ranging from studying the Standard Model and the Higgs boson to searching for supersymmetry and extra dimensions. Measuring almost 22m long and 15m tall, the cylindrical detector weighs around 14,000 tonnes and sits in a cavern almost 100m underground.

The detector is built around a huge superconducting solenoid, which can generate a magnetic field over 100,000 times stronger than that of the Earth. This bends the paths of all charged particles into curves and allows physicists to accurately measure their properties.

The inner tracker uses several layers of silicon sensors to record the paths of charged particles, with each measurement being accurate to less than the width of a human hair. This is completely surrounded by the electromagnetic calorimeter, which measures the energy of photons and electrons using 80,000 lead tungstate crystals that emit flashes of light as particles pass through them. Additional hadronic calorimeters, built of alternating layers of plastic scintillators and brass, measure the energy of showers of hadrons that are made up of quarks and gluons.

Finally, the iron return yoke of the solenoid is interleaved with a series of muon chambers. The magnetic field reverses direction and bends muons (a heavy type of electron) in the opposite direction, making them travel in a unique s-shaped path featured in the CMS logo.

