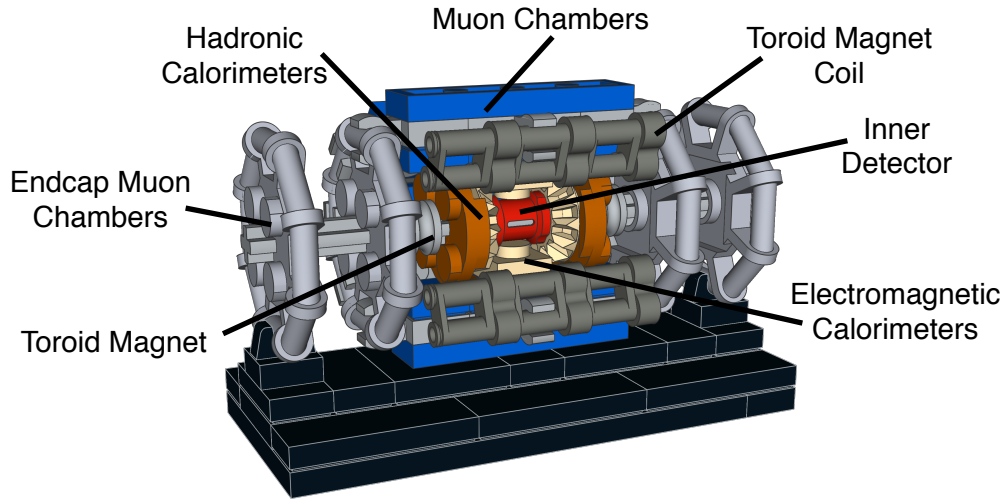


The ATLAS Detector

Model Designed by Nathan Readioff



ATLAS is a general-purpose particle detector at the Large Hadron Collider (LHC) at CERN, with a broad physics programme ranging from studying the Higgs boson to searching for supersymmetry and extra dimensions. Measuring 46m long and 25m tall, it is the largest of the four detectors and sits in a cavern almost 100m underground.

The LHC accelerates protons to almost the speed of light and smashes them together in the heart of ATLAS. The collision creates a melting pot of energy, producing rare and unstable particles that rapidly decay into lighter ones. ATLAS' superconducting magnets - three toroids, which give it its characteristic shape, and a solenoid - curve the path of charged particles. The multiple layers of subdetectors record the trajectory, momentum, and energy of the particles.

ATLAS' inner detector is made up of silicon sensors that track the paths of charged particles as they pass through. It also includes a layer of gas-filled straw tubes to identify electrons and positrons. Wrapped around this is the electromagnetic calorimeter, which uses layers of lead separated by liquid argon to measure the energy of electrons and photons. Additional hadronic calorimeters, built of iron and plastic scintillators, measure the energy of particle jets. The outermost layer is a spectrometer that measures massive charged particles called muons.

Only the ghost-like neutrinos pass through ATLAS unobserved. Physicists measure the energy found in the calorimeters to deduce the properties of these mysterious particles.

