ATLAS is a general-purpose detector that will exploit the full potential of the LHC p-p collision programme. The basic design concept includes:

- An inner detector with semi-conductor pixel and strip detectors for accurate measurements of the charged particle trajectories, followed by a straw tube detector giving many hits per track and independent electron identification using transition radiation. A thin superconducting solenoid coil provides a 2 T magnetic field for the inner detector.
- A calorimeter with an inner cylinder using lead-LAr technology with its high resolution, calibration precision and stability, followed at large radius by an iron-scintillator tile calorimeter providing good jet energy resolution and complete coverage for measuring the missing transverse energy $E_{T}^\star$.

A high-precision stand-alone muon spectrometer optimised for the requirements and environment at LHC, surrounding the calorimeter. All systems have a large solid-angle coverage. In particular, precision measurements will be performed down to $\eta \leq 0.5$ and calorimeter measurements down to $\eta = 1.5$.

The initial information flow from the ATLAS detectors is reduced by a dedicated selection system, the trigger, based on hierarchical decision-making. A data-acquisition system merges the information from the different systems and stores it for further processing and analysis.

An object-oriented software system will reconstruct the stored detector signals, so as to access the physical properties of the produced particles. It will also simulate ATLAS in all relevant details.

The ATLAS detector is 22 meters high, 44 meters long, and the overall weight is about 7000 tons.