MECHANICAL TESTING OF THE ITK PIXEL MODULE WITH THE MAGIC BOX

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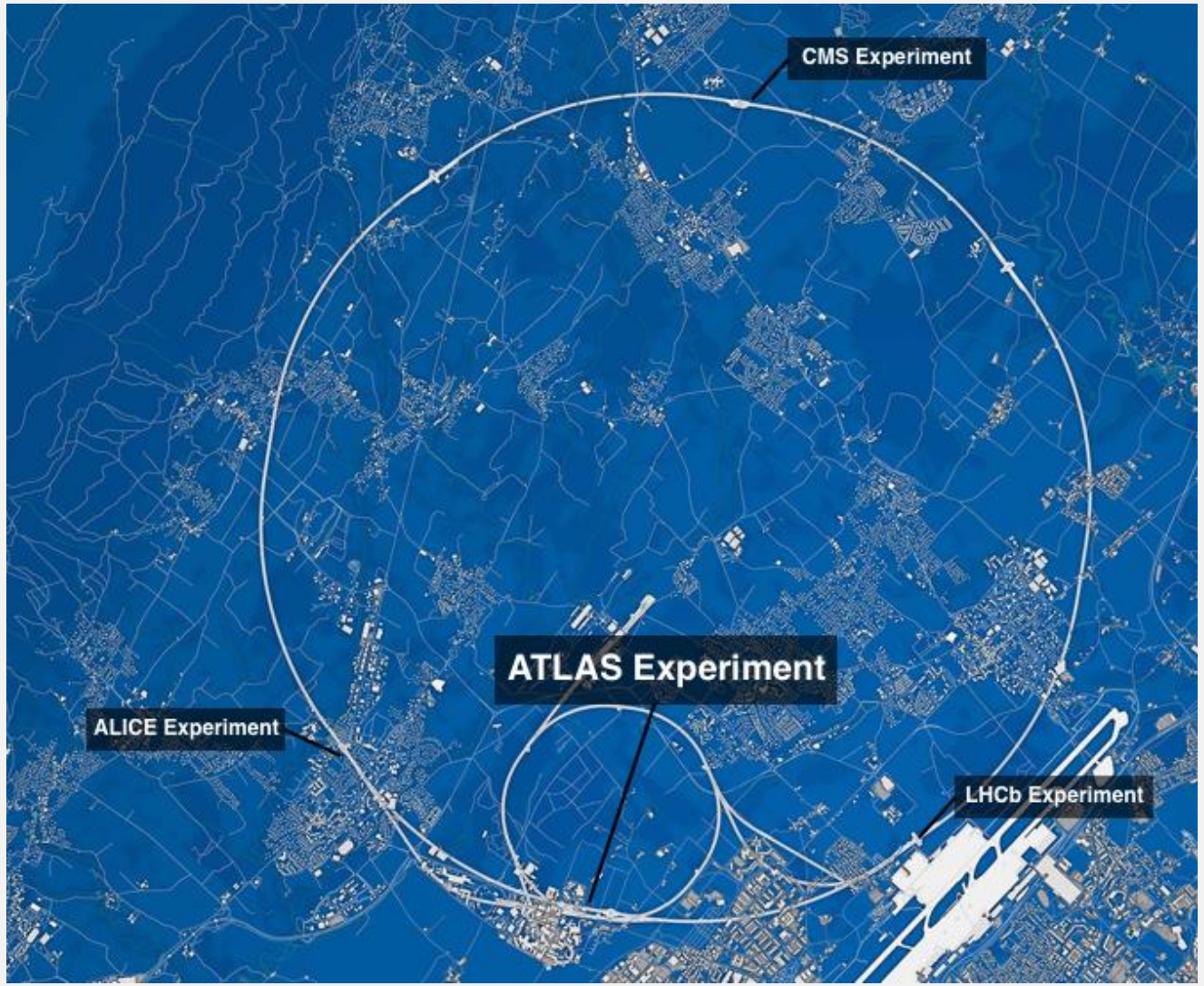
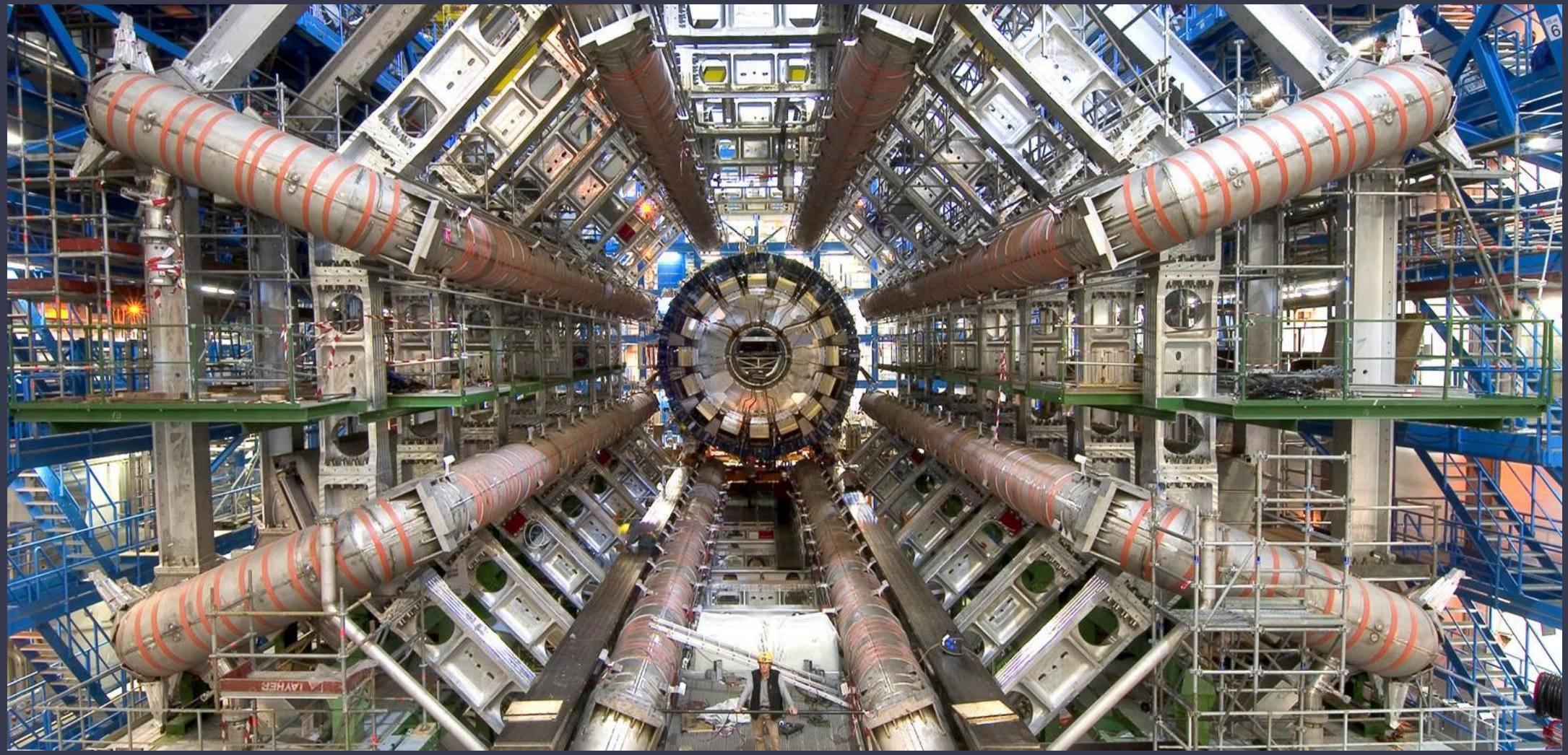
ATLAS AND THE IMPORTANCE OF PARTICLE PHYSICS

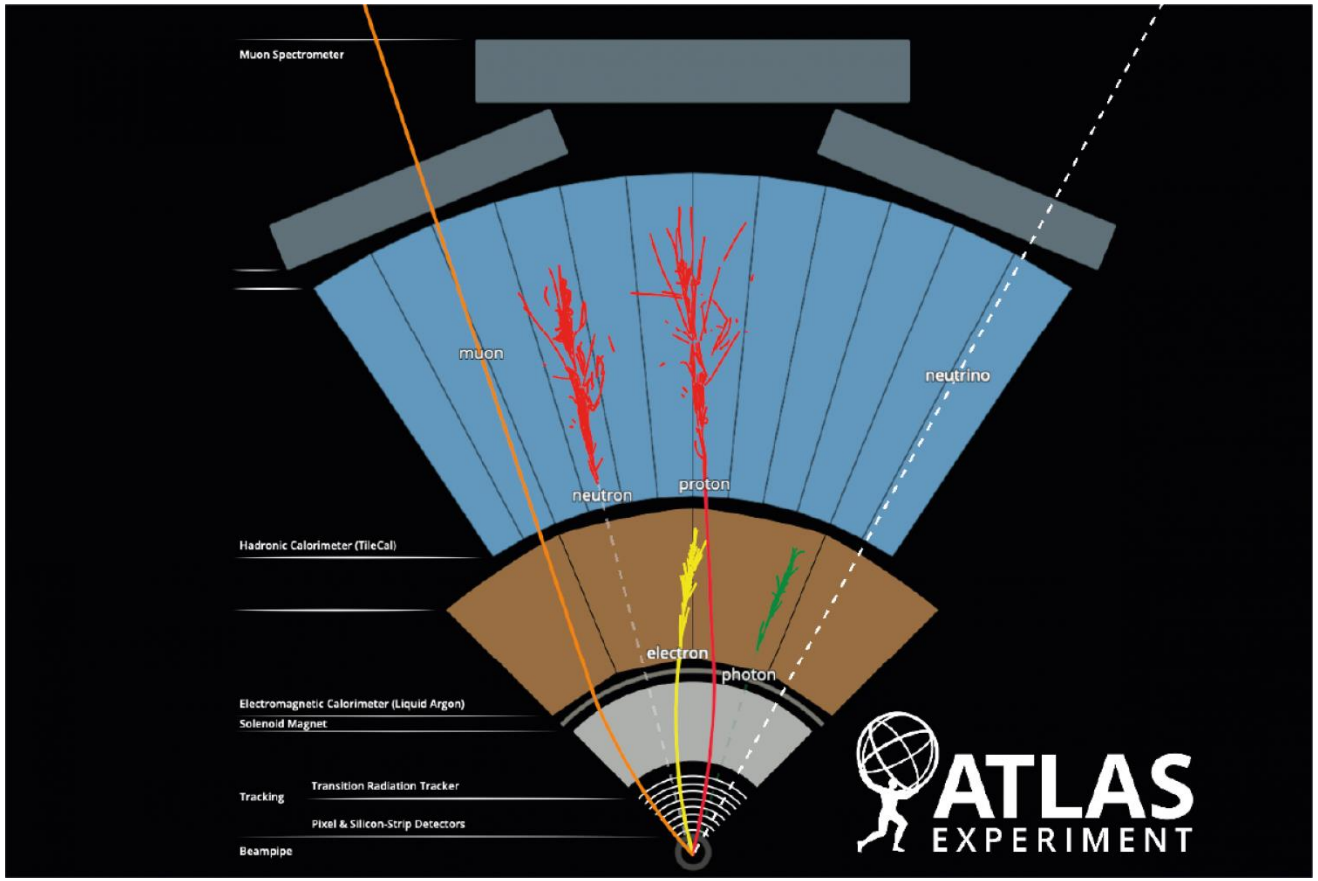
- Experiments at LHC have scrutinized the standard model
- Recent results led to:
  - Discovery of the Higgs Boson
  - Confirmation of light-on-light interaction
    - A long-predicted phenomenon, now confirmed by ATLAS experiments





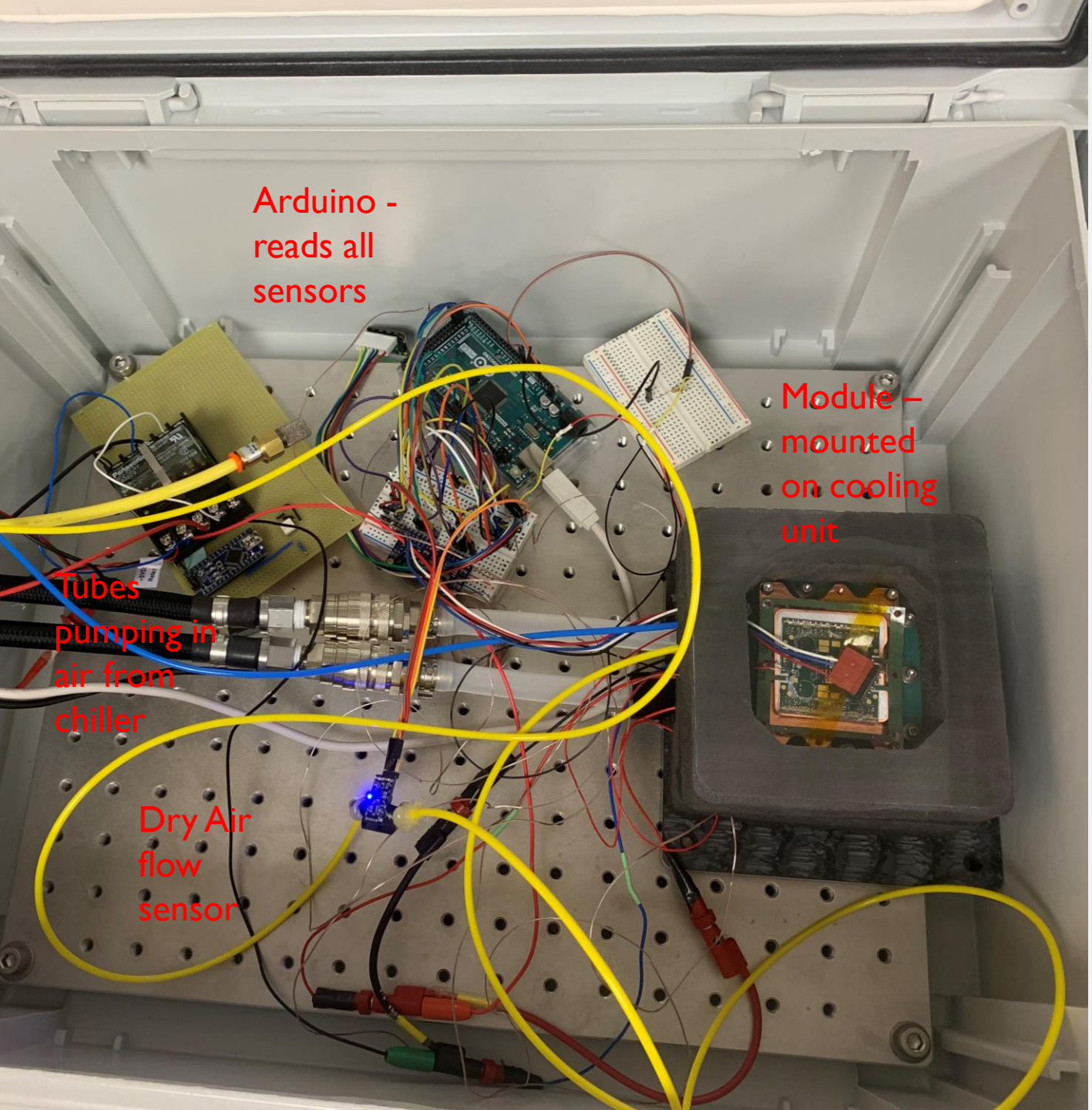
HOW DO WE GET DATA?

- The less fun half of particle experiments is collecting and organizing data
- This partially done with highly technical sensors that are designed to:
  - Trackers: Pinpoint the particles' location at various locations, which leads to calculating momentum
  - Calorimeters: Detects the energy of the particles



ENSURING THE QUALITY OF MODULES

- Other labs and universities collaborate with CERN to test sensors and ensure their quality meets certain requirements before being used
- The tests include:
  - Thermal Cycling
  - HALT/HASS
  - Electrical Tests



INTRODUCING: THE MAGIC BOX

- The magic box is used for thermal cycling
- This means chilling the pixel module to -50 ˚C and heating it back to room temperature
- The box is equipped with a cooling unit capable of doing this and other equipment responsible for ensuring that other factors are measured and, in some cases, controlled
- My work is specifically on continuing to modify this test, and get it to work remotely

QUESTIONS?