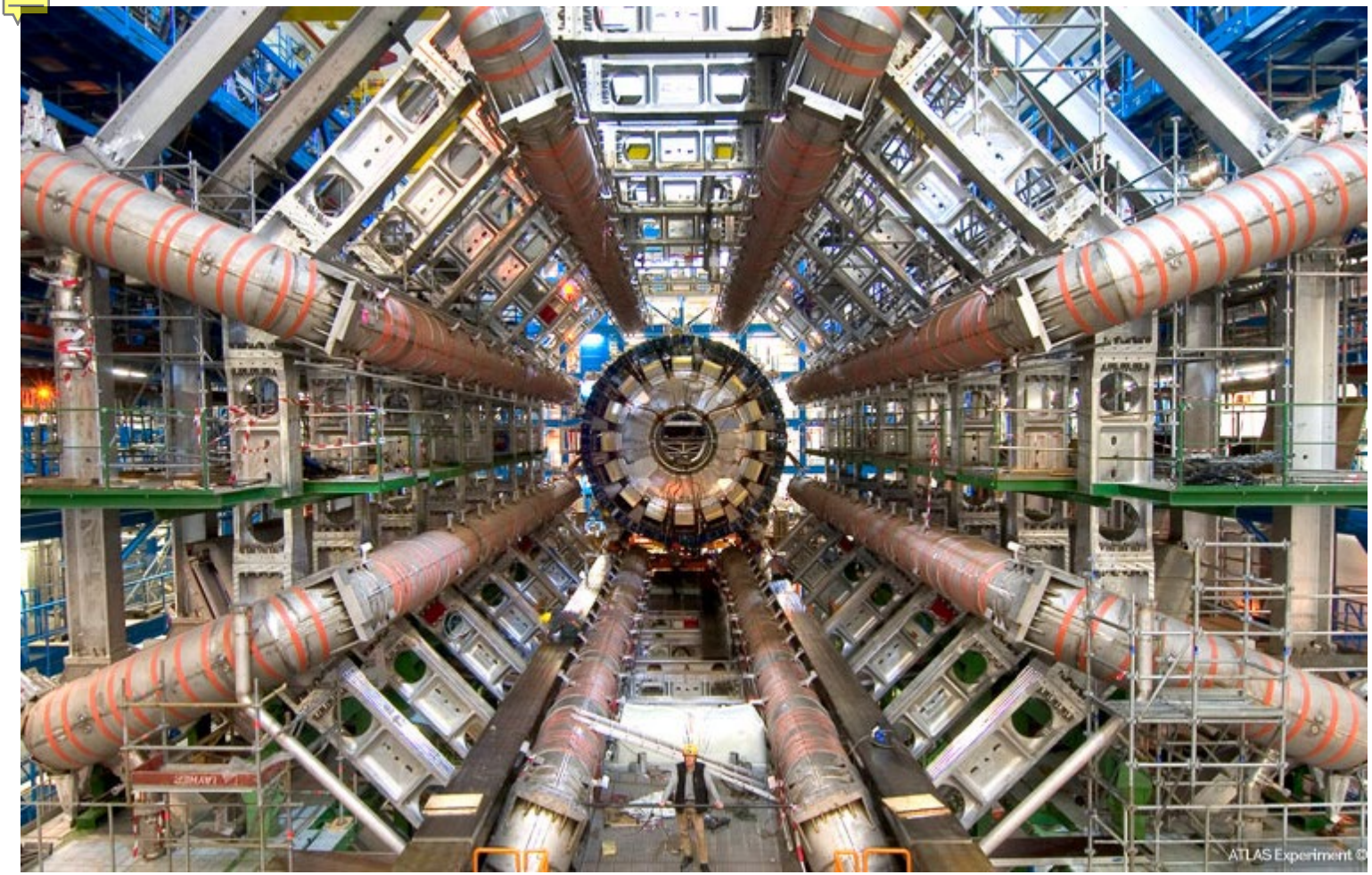
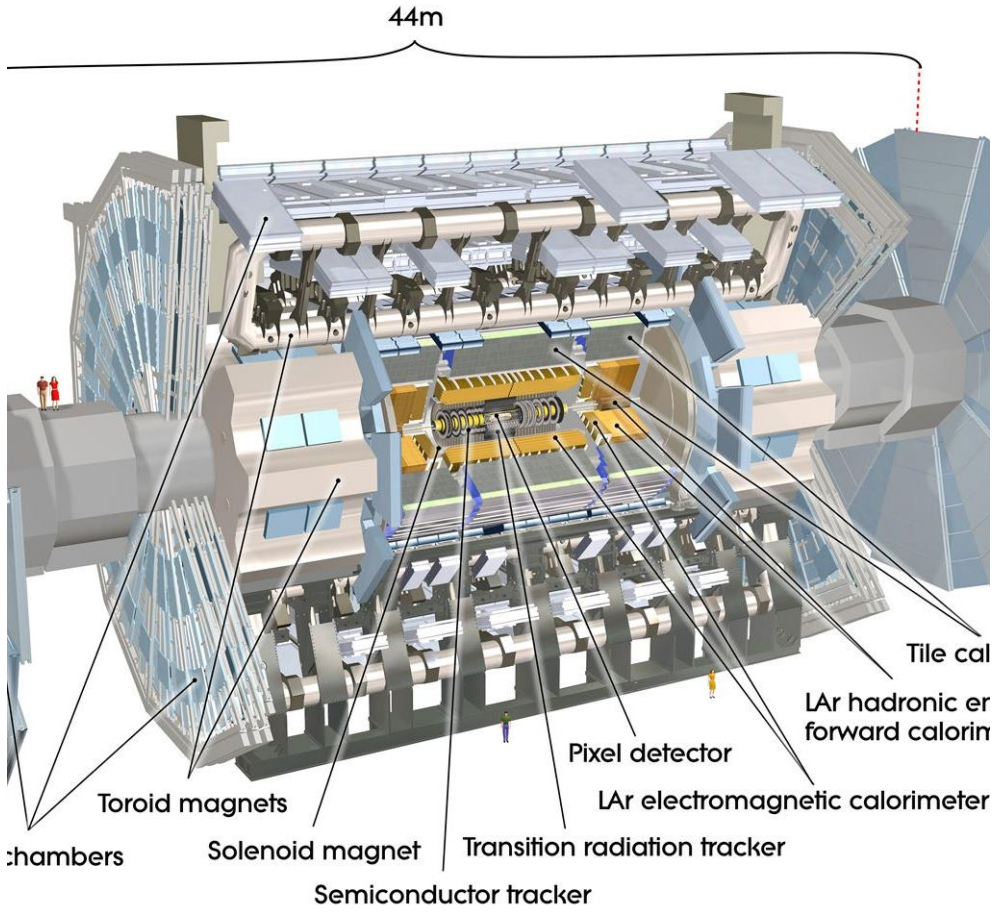
Particles: A Study of The Hidden Forces

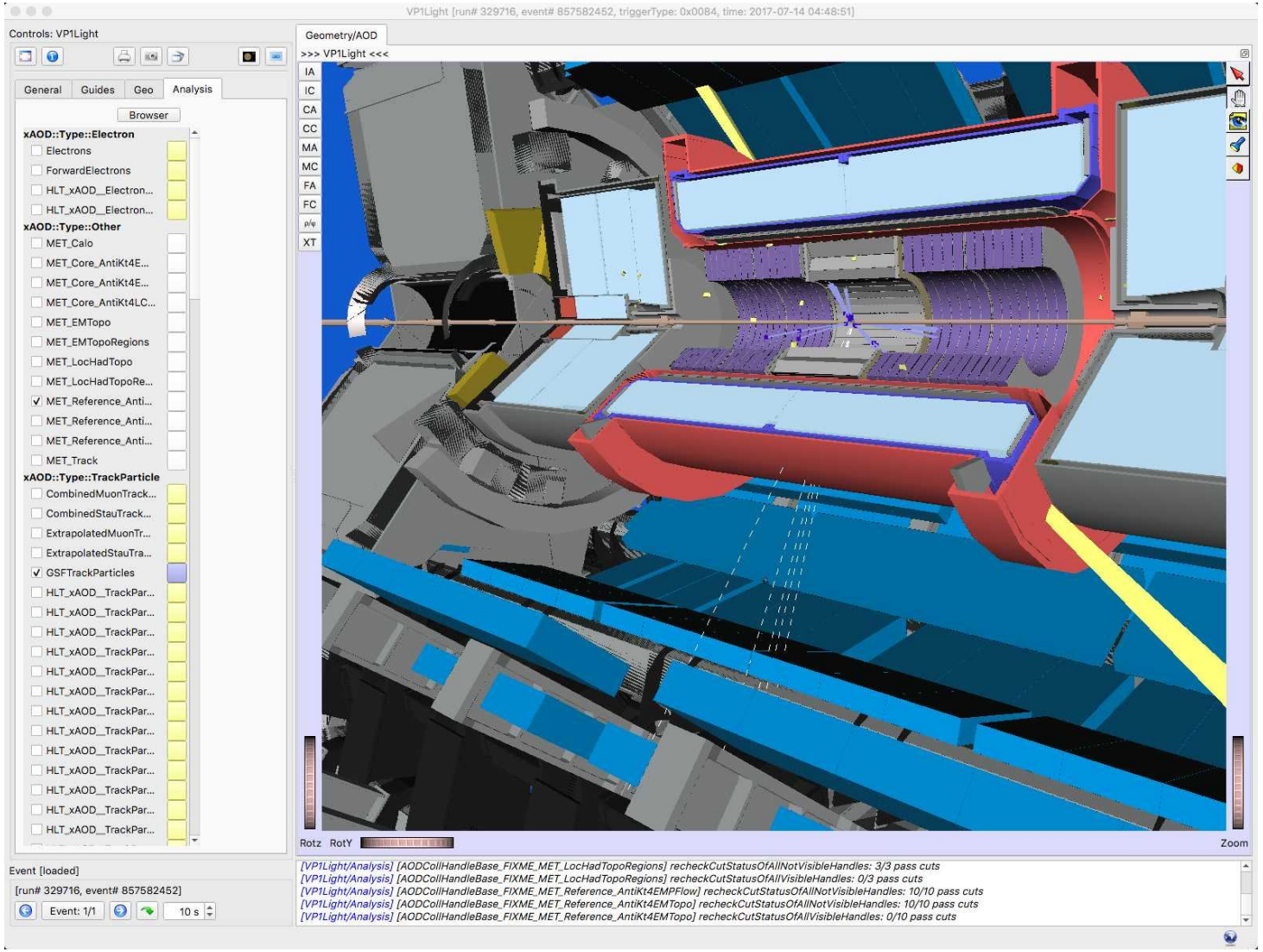
ALEX MCDONOUGH

ACKNOWLEDGEMENT PROFESSOR JOE BOUDREAU


ATLAS Experiment

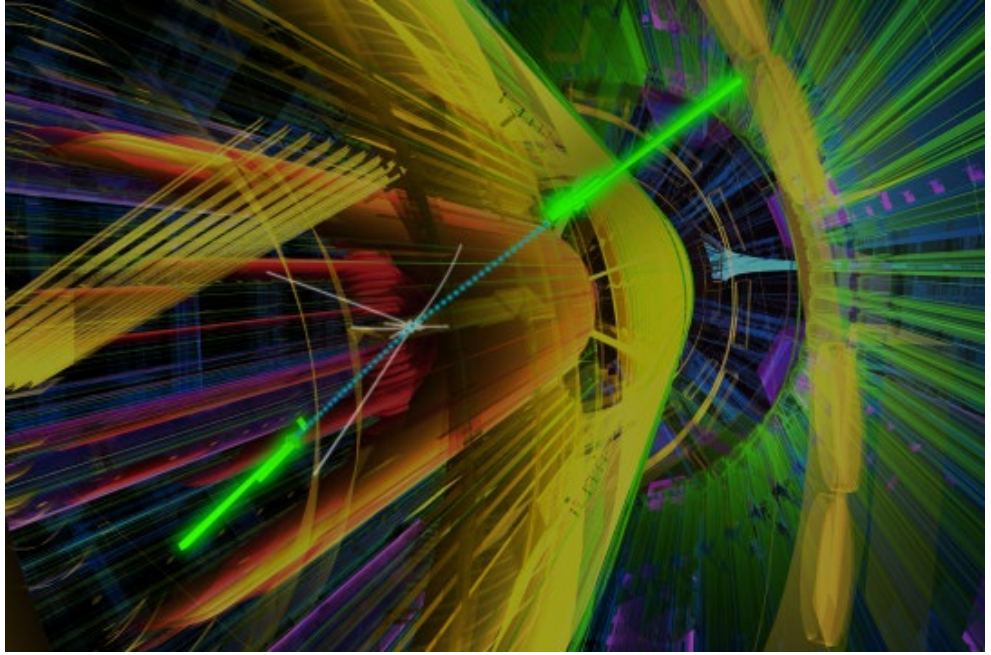

44m
Tile cal
LAr hadronic en
forward calorim
Pixel detector
LAr electromagnetic calorimeter
Toroid magnets
chambers
Solenoid magnet
Transition radiation tracker
Semiconductor tracker

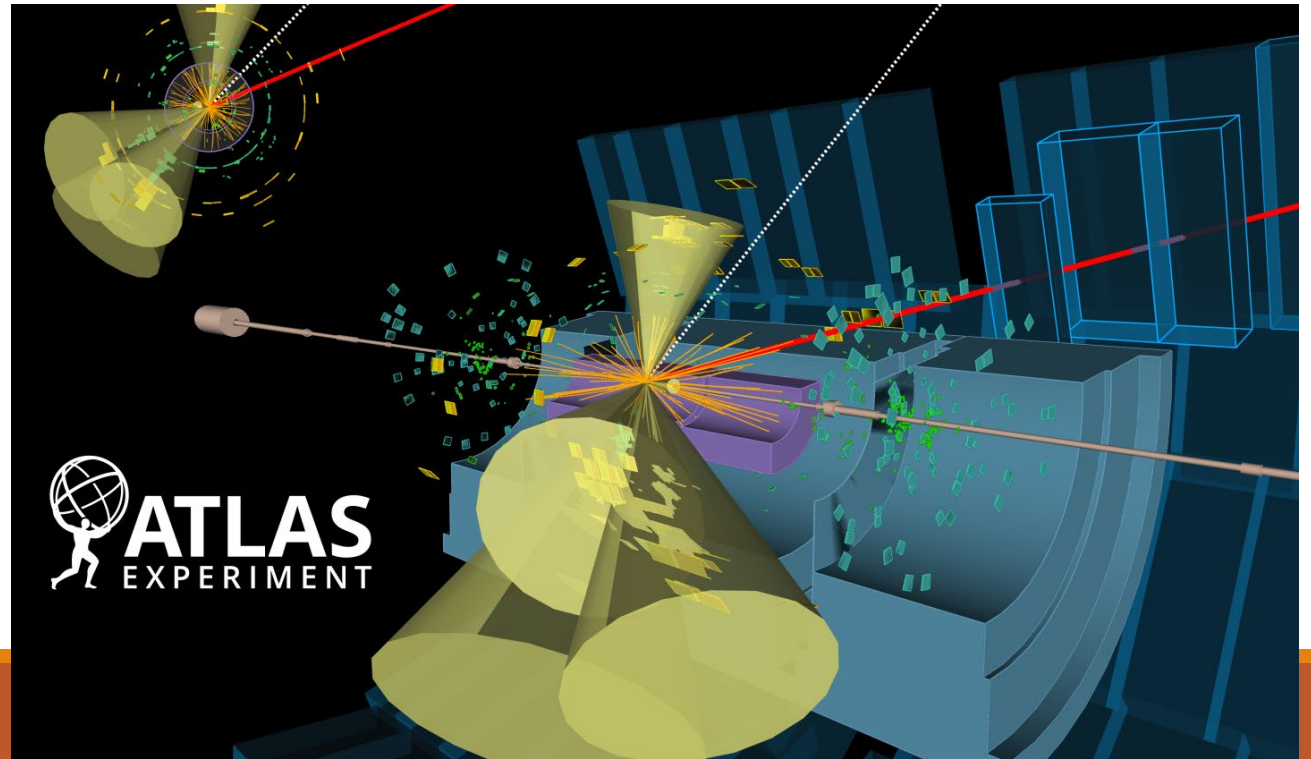
ATLAS



Event Displays & Physics Plots


ATLAS
EXPERIMENT
Run: 286665
Event: 419161
2015-11-25 11:12:50 CEST
first stable beams heavy-ion collisions




ATLAS
EXPERIMENT

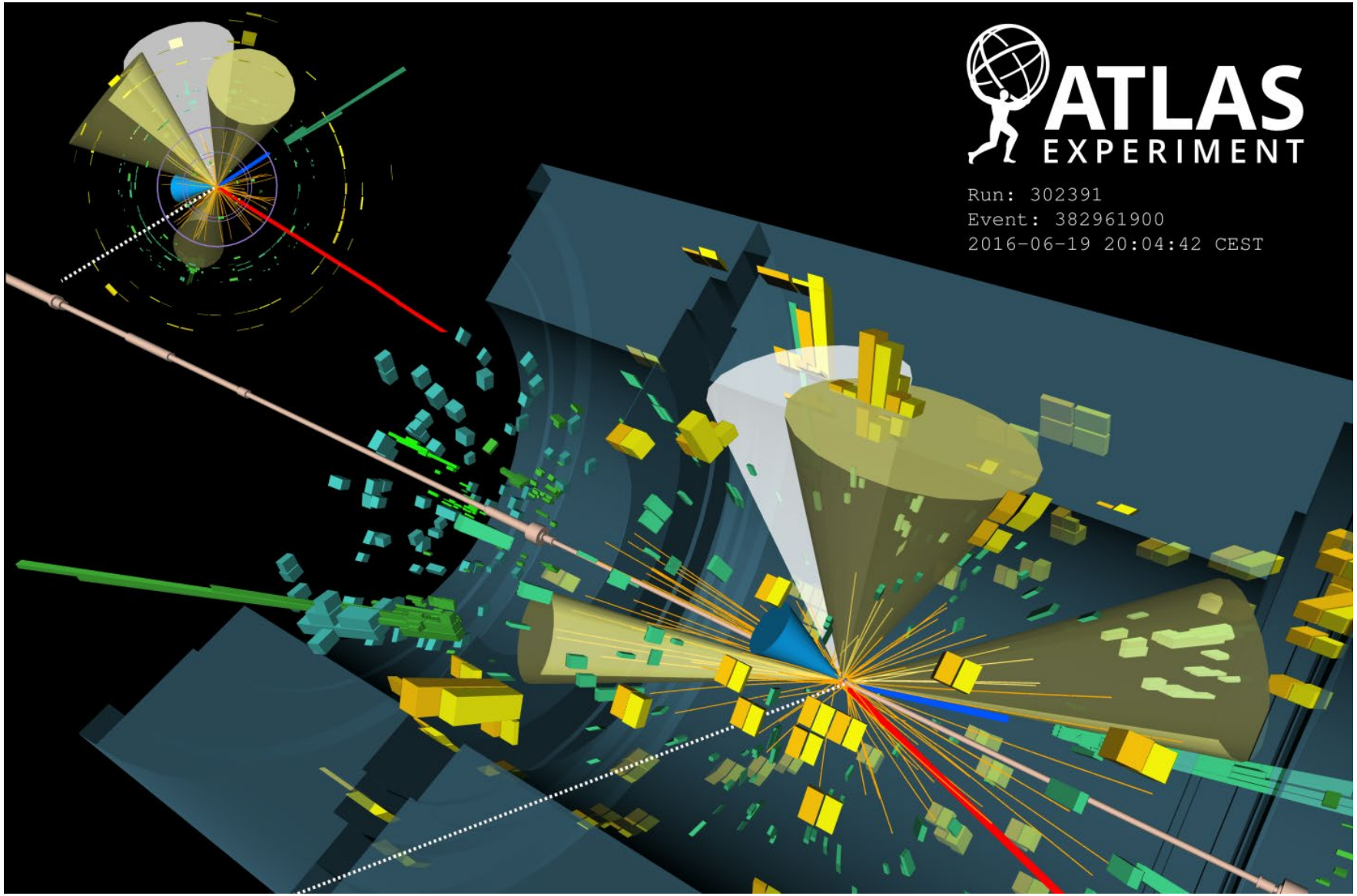
Physics

- Law of Conservation
  - Energy can neither be created nor destroyed; rather, it can only be transformed or transferred from one form to another.
- Kinetic Energy in Relations to the Law of Conservation
  - "Increasing the kinetic energy of the colliding particles increases the mass of the particles that may be created in the collision and thus opens up the possibility of creating previously undiscovered forms of matter" (OpenLearn).
- Quarks and Antiquark
- Jets
- "Hidden" Forces

$$E_{\text{mass}} = mc^2.$$

$$E_{\text{tot}} = \frac{mc^2}{\sqrt{1 - \frac{v^2}{c^2}}}.$$

$$E_{\text{trans}} = \frac{mc^2}{\sqrt{1 - \frac{v^2}{c^2}}} - mc^2.$$


ATLAS
EXPERIMENT
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Event: 382961900
2016-06-19 20:04:42 CEST

Process of Piece

- Medium of acrylic paints on mdf canvas
- Influence from the cross section data
- Vectors, particles, electrons, etc. represented in different shades
  - Color palette
  - Electron pathways
- Moving beyond the data
  - Cross sections
  - Interpretation of energy
  - Electrons
- Set of Perpendicular Lines

Work Cited

- Atlas. "https://cds.cern.ch/record/1459502." CERN Document Server, ATLAS. Accessed 12 Apr. 2019.
- “Collisions and Conservation Laws.” OpenLearn, www.open.edu/openlearn/science-maths-technology/collisions-and-conservation-laws/content-section-7.2.