



MINERVA



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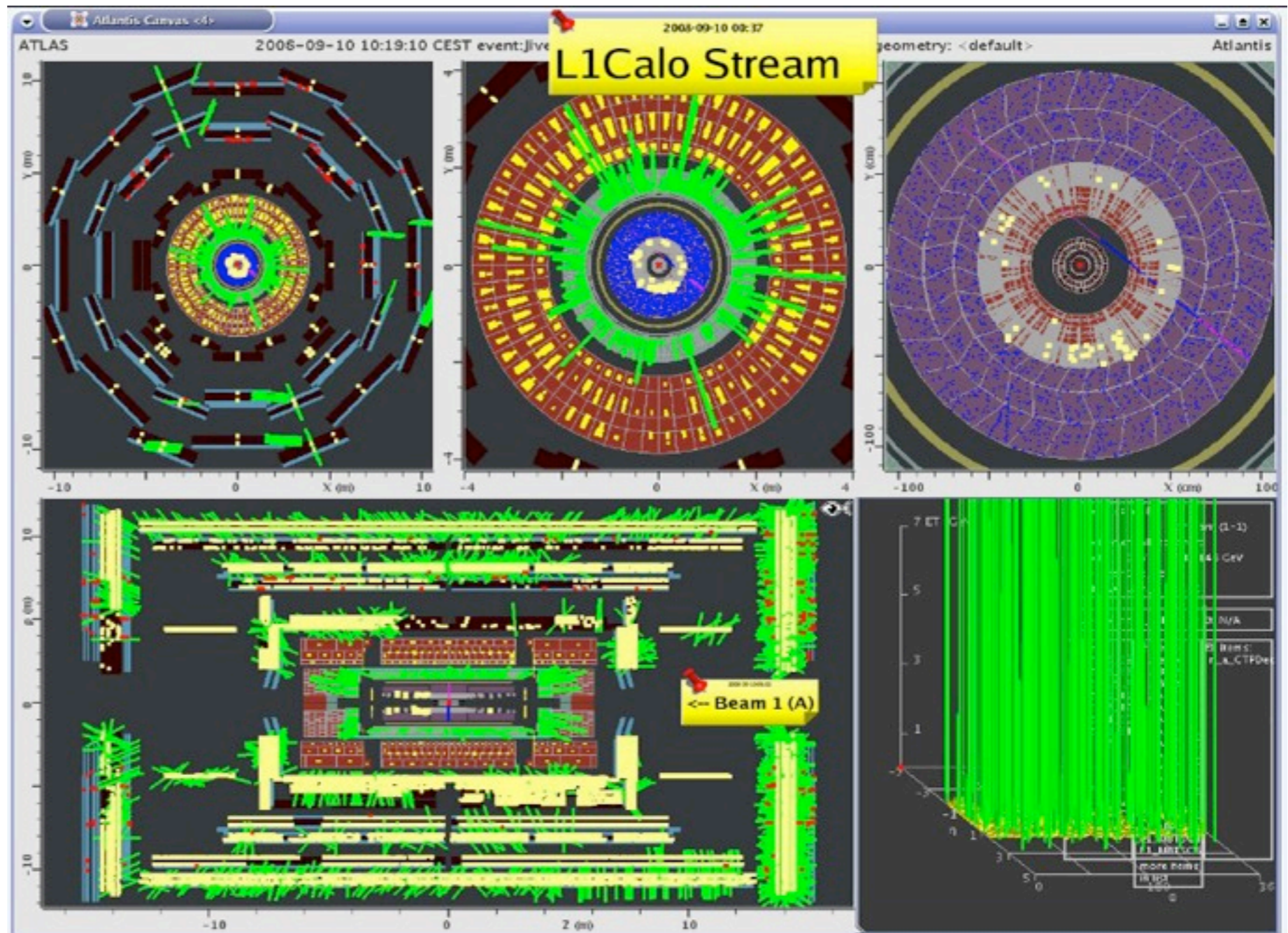
# Your Analysis

- So far you have looked at simulated  $Z \rightarrow ee$ ,  $W \rightarrow e\nu$ ,  $W \rightarrow \mu\nu$ ,  $Z \rightarrow \mu\mu$  and background events
- Perhaps you have also spotted the Higgs boson!
- Now we will look at some real data from ATLAS...



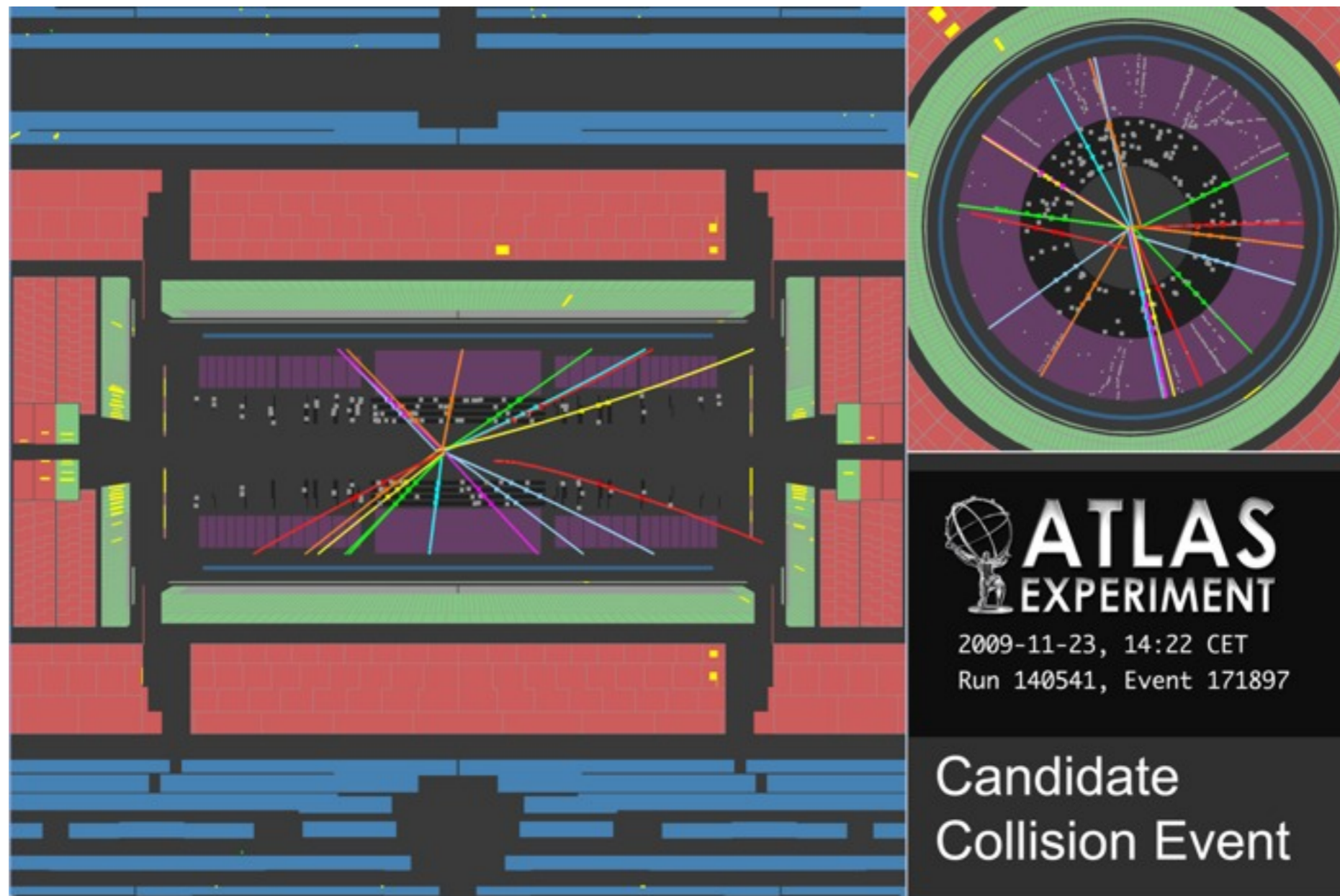
# September 2008

- The LHC circulated a beam of protons successfully around the tunnel
- The beam was then directed to hit a collimator, producing a stream of particles which can be seen by ATLAS...
- This is called a 'Splash Event'





# November 2009



<http://atlas.web.cern.ch/Atlas/public/EVTDISPLAY/events.html>

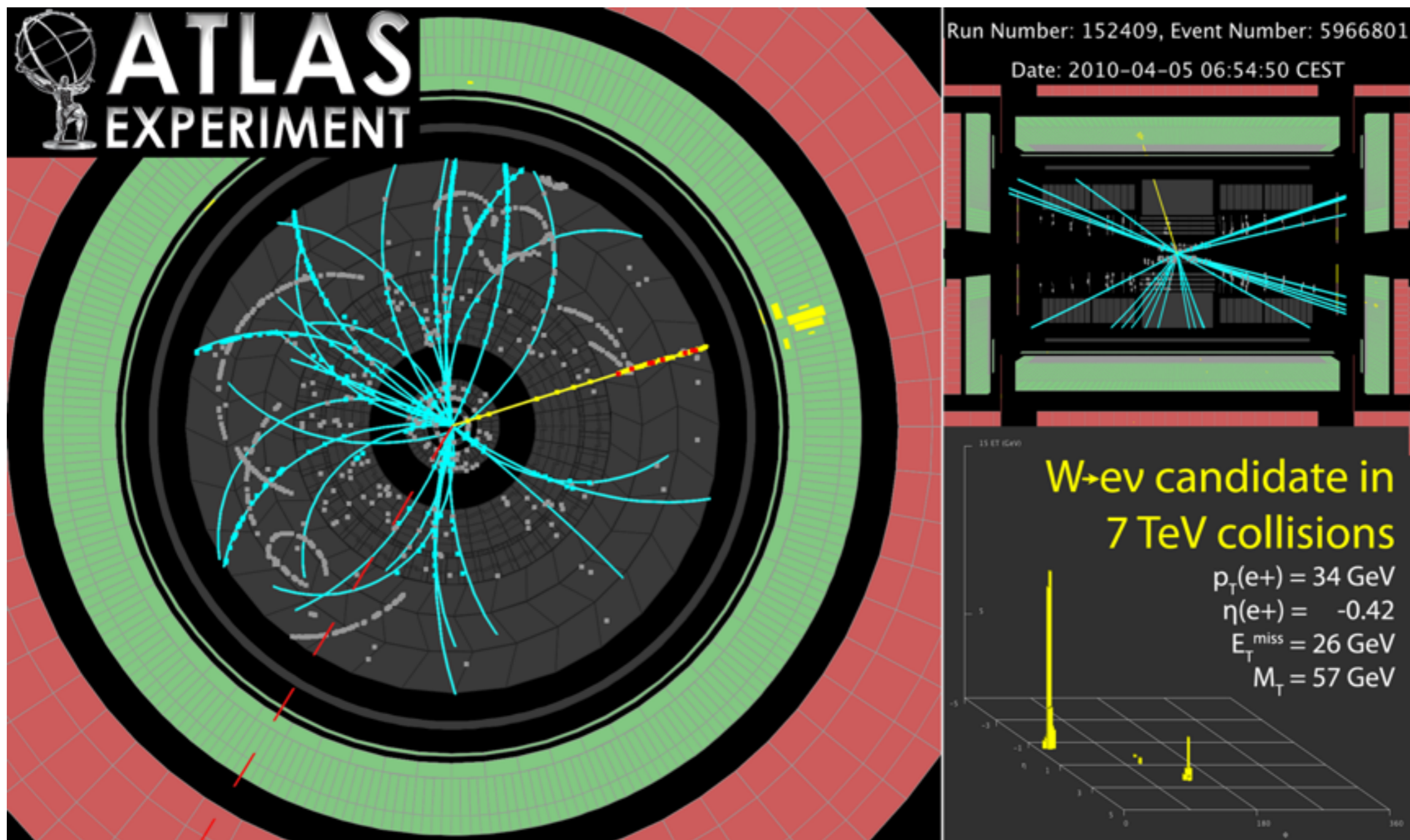
- A collision of 2 protons with energy of 450 GeV each in ATLAS

# April 2010

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- After several successful runs, the energy of the proton beams was ramped up further and further, breaking world records along the way
- Recently, ATLAS has been recording proton collisions with an energy of 3.5 TeV per beam...

# A Real W Decay in ATLAS

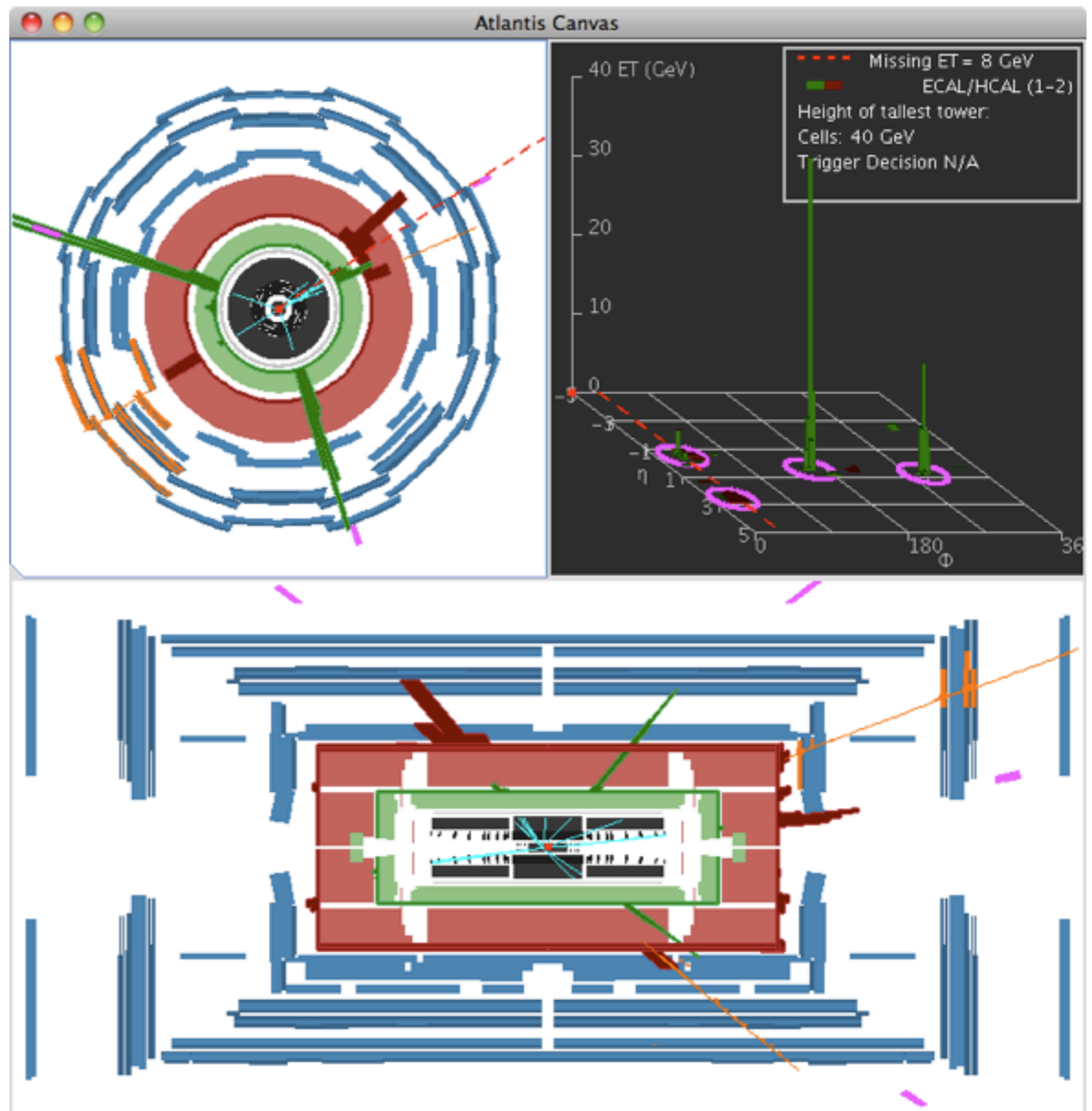


- The yellow track is an electron, the red dotted line represents missing energy carried away by a neutrino



# The Higgs Boson

- Here's the event you were all looking out for...



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# Prizes

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- Now we will award prizes to the groups of students who performed the best at identifying Ws, Zs and, of course, the Higgs Boson...



# Credits

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- MINERVA is developed by staff and students at RAL and the University of Birmingham
- Atlantis is developed by staff and students at Birmingham, UCL and Nijmegen