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Week in CERN

Our academic **Dr David Evans (/staff/profiles/physics/evans-david.aspx)** is one of the lead researchers at the Large Hadron Collidor (LHC) experiment being undertaken in the CERN laboratory. Dr Evans has already been involved in demonstrating that the **early universe behaved like a liquid (/research/our/news/items/liquid-universe.aspx)** , and has overseen some of the first **mini Big Bangs (/research/our/news/items/big-bangs.aspx)** ever created.

Dr Evans will be providing regular updates regarding his 'ALICE week' in the CERN laboratory on this blog page.

Final day - 24 July 2011 14:54 GMT+1

I had a quick café au lait and pain au chocolat in the CERN restaurant and checked the status of the LHC. There are large flat-screen monitors placed around CERN, including the restaurants, which display the status of the particle beams in the LHC. Unfortunately, there were currently no stable collisions as the local storms disagree somewhat with the LHC. However, the accelerator has already delivered as many particle collisions as was expected for the whole year, it's really working well. This should give the ATLAS and CMS experiments enough statistics to close in on their search for the Higgs although not enough to discover it, they will have to wait until next year for that I suspect.

After breakfast, it was straight to the 9am Collaboration Board meeting which is made up of heads of group from each institution in ALICE who vote on recommendations made by the management board. Today, we also had elections to replace two vacancies on the management board and four candidates to choose from. Fortunately, we have just changed our voting system; the previous system involved eliminating the candidate with the lowest vote and then having another round of voting by secret ballot. This process would continue until we were left with a winning candidate (or candidates in this case). Sometimes we would have to go through three or four rounds of voting, taking up most of the morning. Now we have the first past the post system meaning there is just the one ballot.

Straight after the collaboration board meeting, one of my colleagues gave me a lift to the airport and, again I had to fly back via Amsterdam. At least it gave me time to finish the thesis I was reading. I arrived home at about 6pm feeling exhausted but my wife Laura had dinner on and a nice glass of wine waiting for me.

Too many committees! - 21 July 2011 22:39 GMT+1

I've just heard that ATLAS and CMS will be presenting their latest results on Monday. Will they finally see a hint of the elusive Higgs particle or evidence of dark matter? They are certainly keeping very quiet about their latest results. To my mind, it would actually be more interesting if they don't see any evidence of the Higgs as this could point to completely new physics but I'll have to wait until Monday it seems.

The morning was dedicated to presentations by young researchers which give PhD students an excellent chance to show their work. Unfortunately I was still feeling the effects of the previous night's bbq, maybe too much networking can be a bad thing.

I spent the afternoon in the management board meeting, discussing everything for physics, computing issues, finance and new rules for collaboration membership. At least it gave me the opportunity to give some good news for a change. In spite of our research council, STFC, announcing in December 2009 that they were pulling out of the ALICE experiment, we've managed to get a new grant for the next three years. This means we can continue to meet our commitments of maintaining the vital trigger electronics (the electronic brain of the experiment) and play a leading role in the exciting physics from ALICE.

The management board meeting didn't finish until 18:30 and was immediately followed by a meeting of the finance board to discuss funding for future detector upgrades. Even though the LHC only started last year, all the experiments are starting R&D work on upgrading their detectors as it takes many years to produce the new technologies required to cope with the high intensity beams planned for the future. The meeting finally finished at 19:30. I think I'm on too many committees!

Presentations and bbqs over the border - 20 July 2011 12:54 GMT+1

After a quick breakfast in the CERN restaurant, I went to the already packed meeting room where the latest ALICE physics results were being presented. It seems there are hundreds of different physics analyses going on in parallel with every aspect of every particle (and anti-matter particle) being studied. It's almost impossible to keep up with all the work that's going on. The meeting went on all day with presentation after presentation and, as usual, we over-shot the schedule by a long way and some talks had to be rescheduled. I managed to escape for a meeting with my Birmingham colleagues at 13:00 followed by a 14:00 meeting with the ALICE technical coordinator over lunch.

Fortunately, the afternoon session of the physics presentation had to stop at 18:30 as there was an ALICE collaboration barbecue at 19:00. This was held just across the border, in France where the ALICE experiment is situated. It was great to have an informal gathering with colleagues from all over the world, with an ample supply of wine and beer, maybe slightly too much wine in my case!

The journey begins - 19 July 2011 22:43 GMT+1

I managed to get a little work done from home before leaving for the airport to catch my 11:20 flight. Unfortunately, there's no longer a direct flight from Birmingham to Geneva so I have to go via Amsterdam. Although time consuming, this gives me the chance to read a draft version of a PhD thesis from one of my research students.

I arrived in Amsterdam with an hour or so to kill before my connecting flight. Fortunately, I have a frequent flyer card so can pop in to the KLM lounge for some bread and cheese and a glass of wine. It also gives me a chance to check my emails which have already accumulated since this morning. In particular, there one from the ALICE technical coordinator asking if we could meet for a chat on Wednesday and one from the ALICE spokesman, Paolo Giubellino, asking if we could meet today. After arranging the meetings and answering the other emails, I just have time for a quick coffee before making my way to the gate for the Geneva flight.

After arriving at Geneva and taking a taxi, I arrive at CERN at about 4:45pm local time, show my ID card to the security guard on the gate and make my way to the Birmingham ALICE offices - we have three small interconnecting offices which are very close to the main restaurant. CERN is built on a large site which actually spans the

Swiss-French boarder. It was established in 1954 so the site consists of an ad hoc mixture of offices and experimental halls ranging from attractive modern buildings to some very ugly monstrosities dating back to the 50s. Our offices are most certainly in the ugly section but in a very convenient location. In spite of all the buildings, CERN is still a pleasant site with many trees and green spaces. On a clear day, one can sit outside, on the large terrace outside the main restaurant, and face stunning views of Monte Blanc and the French Alps.

After catching up with the latest news from my colleagues and getting a bit of work done, I had dinner with the spokesman, Paolo in the CERN canteen, not my ideal place for dinner but it was the only time we were both free to meet and we both had work to do this evening. It was an important meeting but I can't tell you about it - Top Secret! Had a chat and a glass of wine with some of my team this evening and then back to work.

It's the all day Physics Forum tomorrow where the latest results will be presented - should be interesting.

Week at CERN
with Dr David Evans

Before heading off - 18 July 2011 18:08 GMT+1

The ALICE experiment at the CERN LHC is a collaboration of some 1000 physicists, engineers and research students. As you can imagine, such a large collaboration lends itself to a lot of meetings. There are meetings to discuss the dozens of different physics analyses, detector upgrades, computing requirements, outreach, management, etc. In fact, I believe it's possible to spend every working day in a meeting of some kind, if your sanity could take it. However, three times a year we have a main week of meetings, called ALICE Weeks, where hundreds of my fellow collaborators gather at CERN for an intense week of meetings (and usually many other discussions over coffee or lunch).

This week is one of these ALICE Weeks and, with the exception of some of our PhD students who are busy writing their theses, the whole Birmingham ALICE team are at CERN. I've delayed my trip until tomorrow (Tuesday) as I'd already agreed to give a lecture about ALICE to a group of A-level physics teachers attending a summer school at Brunel University. Last week I was very busy with our own summer school for A-level physics students and with looking after eight work experience students so I spent most of the weekend writing my lecture for today.

The lecture went well and I got some very intelligent questions. The teachers certainly seemed fascinated that we collide nuclei of lead atoms at 99.99% the speed of light and create tiny fireballs which reproduce conditions that existed a millionth of a second after the Big Bang. Our latest measurements show these sub-atomic fireballs reach temperatures of about 3 trillion degrees (200,000 times hotter than the centre of the Sun) and are 50 times denser than a neutron star. In this extreme environment, nuclear matter like protons and neutrons 'melt' forming the primordial soup - called a quark-gluon plasma - which the Universe was born from just 10 millionths of a second after the Big Bang.

Even more interesting is that this quark-gluon plasma behaves like an almost perfect liquid - closer to a perfect liquid than anything else we know of (although it's almost impossible to imagine a 3 trillion degree liquid 50 times denser than a neutron star). So in ALICE, we are creating the highest temperatures, the highest densities and the most perfect liquid ever produced in an experiment. If we don't find exciting new physics in this most extreme of environments, I'll eat the vice-chancellors hat!

Tomorrow (Tuesday), I'm catching a flight to Geneva to get the very latest update from ALICE.

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