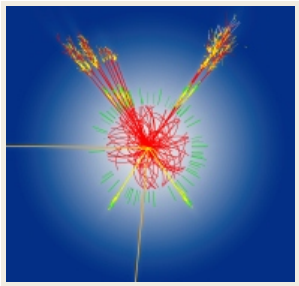
Wits part of CERN announcement

3 July 2012



Wits scientists participate in one of the largest science experiments in the world to determine what happened just after the Big Bang.

A scientific seminar to deliver the latest update in the search for the Higgs boson will be held at CERN on **Wednesday, 4 July 2012 at 09:00 to 11:00 South African time**. Scientists will reveal the preliminary results of the ATLAS and CMS experiments, on the eve of the 2012 particle physics conference, ICHEP, which will take place in Melbourne. The announcement will be followed by a press conference and both will be available via webcast at http://webcast.cern.ch.

The Wits team, compromising of lead physicists Dr Trevor Vickey and Dr Oana Boeriu (who both relocated to South Africa to lead this world-class project), has a permanent presence in Geneva, Switzerland, and conducts and observes experiments on ATLAS. The team also consists of several Wits staff members and postgraduate students and post-doctoral scholars.

For more information, images or to interview the Wits scientists, kindly contact them after the announcement (from 11:00 South African time onwards) on Wednesday, 4 July 2012:

Dr. Trevor Vickey

Senior Lecturer in the Wits School of Physics

trevor.vickey@cern.ch

41-76-487-2500

Dr. Oana Boeriu
Senior Lecturer in the Wits School of Physics

oana.boeriu@cern.ch

41-76-204-9140

Wits University is part of the South African cluster of the European Organization for Nuclear Research (CERN), one of the world's leading laboratory for particle physic and one of the largest and most respected 'knowledge factories' for the generation of scientific research.

Background

According to CERN, maximum data combined with refined analysis techniques has improved the efficiency to pick out Higgs-like events from the millions of collisions occurring every second. If and when a new particle is discovered, ATLAS and CMS will need time to ascertain whether it is the long sought Higgs boson, the last missing ingredient of the Standard Model of particle physics, or whether it is a more exotic form of the boson that could open the door to new physics. The Standard Model gives an extraordinarily precise picture of the matter that makes up the entire visible universe, and the forces that govern its behaviour, but there are good reasons to believe that this is not the end of the story. For example, we know from observation that the visible universe is just 4% of what seems to be out there.

How it works

The instruments used at CERN are particle accelerators and detectors. Accelerators boost beams of particles to high energies before they are made to collide with each other or with stationary targets. Detectors observe and record the results of these collisions.

The Higgs Boson is a key component of the Standard Model, a highly successful theory that provides a very precise description of matter. Identification of the Higgs Boson would be a major accomplishment, providing physicists with a better understanding of the mechanism that gives mass to elementary particles and opening the door to a variety of new physics searches.

Large Hadron Collider

One of the specialist facilities located at CERN on the border of Swiss-French border is a large, advanced particle accelerator known as the Large Hadron Collider (LHC), which is used to study the smallest known particles. Located in a 27km circular underground tunnel, the LHC can be described as the largest machine in the world (contains 9 300 magnets), the fastest racetrack on the planet (trillions of protons race around the ring at 11 245 times a second, travelling at 99.99% the speed of light), the emptiest space in the Solar System (particles travel in an ultra-vacuum) the hottest and coldest spot in the galaxy (when particles collide they create temperatures 100 000 times hotter than the Sun but the accelerator ring is cooled at -271.3°C), the most sophisticated detectors ever built (samples and records the results of up to 600 million proton collisions per second) and the most powerful supercomputers in the world (the data recorded by each of the big experiments at the LHC will fill around 100 000 dual layer DVDs every year). *Source: www.cern.ch*

Funding

Funding from Wits University, the Department of Science and Technology and the SA-CERN consortium, has enabled South Africans to participate in the generation of cutting edge science and technology. “Investment in basic science is a fundamental characteristic of any future knowledge economy and we are proud of this international association that puts South Africa on the map,” explains Prof. Joao Rodrigues, Head of the Wits School of Physics. “This is the breeding ground for innovation, for generating new discoveries and for training future scientists to work in global intellectual communities on the most sophisticated equipment in the world. More importantly, our participation at this level puts South Africa on the scientific map globally.”

WITS UNIVERSITY

Tel: +27 (0)11 717 1000

1 Jan Smuts Avenue
Braamfontein 2000
Johannesburg, South Africa

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