Particle physics

CERN director-general set his sights on linear collider

The director-general of CERN wants the next big experiment in particle physics after the Large Hadron Collider (LHC) to be built at the Geneva lab. Speaking in an exclusive video interview with *Physics World*, Rolf-Dieter Heuer says that CERN should host the experiment, which would collide electrons and positrons in a linear accelerator. Although a design for the machine has not been finalized by the international particle-physics community, Heuer is keen to bring the collider to CERN.

"I would be a bad director-general if I did not push for CERN at least bidding for the next global project," Heuer told *Physics World*. "CERN is a fantastic place. [It] has proven that it can host such a project and therefore I think CERN should do it." However, Heuer is aware that it is far from certain that the Geneva lab will host the facility – Fermilab in the US is likely to be a contender – and the CERN chief is looking forward to bids from rival labs. "Competition is always welcome," he says.

Heuer's desire to host the linear collider is part of his plan to make CERN a much more global laboratory. Although CERN was set up in 1954 as a European facility, its convention does not prevent countries from outside Europe from becoming members. Several thousand physicists from the

Planning ahead
CERN boss Rolf-Dieter Heuer hopes to land the next big experiment in particle physics – an electron-positron linear collider – for the lab.

US have already helped to build the LHC and its detectors, and Heuer is keen for links with non-European nations to become more permanent.

"Why not involve some of the nations from the Americas or Asia as members [of CERN]?" he asks. "This would enable us to start the next global project as a global project from the very beginning – be it at CERN or elsewhere." CERN is already developing a blue-print for a future linear collider, known as CLIC, while a rival design known as the International Linear Collider is being drawn up by a team led by Barry Barish of the California Institute of Technology. The precise energy at which such a collider should operate will depend in part on

what the LHC discovers.

Heuer also confirmed the timetable for switching the LHC back on following the electrical fault that occurred on 19 September last year and led to 53 magnets having to be repaired or replaced (*Physics World* September p7). Beams will be injected into the 27 km circumference circular accelerator in mid-November, with collisions taking place a few weeks later. "I am pretty confident that we will have the first collisions this year," says the CERN boss.

CERN engineers will begin by colliding protons at an energy of 450 GeV per beam, before attempting collisions at 3.5 TeV per beam. "We will stay [at that energy] for several months, depending on what experiments find and on running experience," says Heuer. "Then in the course of the next year we will go up to 10 TeV in the centre of mass [i.e. 5 TeV per beam]." The LHC will be kept online until the end of 2010 before it is shut down to prepare the way for collisions at a maximum energy of 14 TeV (i.e. 7 TeV per beam) at some point during 2011. "But if we find something interesting at 10 TeV, then we will continue running at 10 TeV," Heuer adds.

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● Watch the Heuer interview in full at physicsworld.com/cws/channel/multimedia

Astronomy

Cash shortfall spells trouble for Chinese space probe

The launch of China's first satellite designed for astronomy has been delayed because money for the project, promised by the government, has not been allocated. The 1-billion-yuan (\$147m) Hard X-ray Modulation Telescope (HXMT) was due to be launched in 2010, but will now be delayed until 2012 at the earliest.

"As a scientist, I feel ashamed, as the plan has been widely announced by the Chinese government," HXMT's chief scientist Li Xipei told the Beijing-based magazine *Science News Bi-weekly*. The HXMT satellite aims to study the physical characteristics of areas surrounding black holes. A space-based probe is

needed as X-rays emitted from space cannot reach the Earth's surface as they are absorbed by the atmosphere.

The HXMT was selected in 2000 as a civil science satellite project for the 11th five-year (2006–2010) Space Science Plan. Li complains that disputes between the Ministry of Finance, the State Administration of Science Technology and Industry, which governs the country's space industry, and the Chinese Academy of Sciences (CAS) are the main reason for the funding delay. However, he says that if the budget can be allotted within this year, then the launch could take place by 2012.

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"China's space technologies are said to be world leading, but the space-based scientific discoveries are shamefully zero," says Chen Xuelei, a scientist at the CAS's National Astronomical Observatories. Chen explains that the Chinese space programme is dominated by military officials, who do not give attention to civil space science. Meanwhile, Li Xueyong, vice-science minister, announced on 17 September that China will increase its investment in space science and technologies, particularly manned space programmes. Yuan Yue and Jia Hepeng
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