

AUDIENCE INSPIRED AT LASER AND ACCELERATOR SHOWCASE

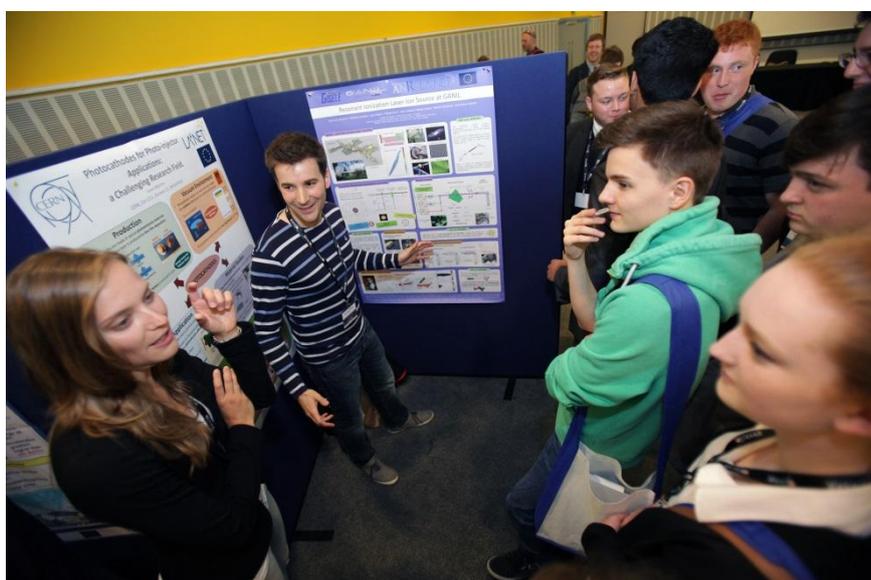
An international [Symposium on Lasers and Accelerators for Science & Society](#) took place on the 26th of June in the Liverpool Arena Convention Centre. The Symposium was coordinated by [Prof. Carsten P. Welsch](#) of the University of Liverpool and the [Cockcroft Institute](#) in Daresbury, an internationally renowned centre for accelerator science and technology. The event was a sell out with delegates comprising 100 researchers from across Europe and 150 local A-level students and teachers. The aim was to inspire youngsters about science and the application of lasers and accelerators in particular.

'Discovering the unknown', 'innovation', 'beating cancer', 'pioneering new technology', 'a possible career' – these were comments from sixth-formers, who among researchers, students and general public, attended the Symposium.

It is now possible to share their enthusiasm through [online presentations](#), which includes talks from renowned scientists such as Professor Victor Malka (LOA, France), Dr Ralph Aßmann (DESY, Germany) and Professor Brian Cox (University of Manchester, UK), best known to the public for his television programmes about the origins of the universe.



The Symposium also showcased a portfolio of projects from researchers at the forefront of this exciting field of science and engineering through an interactive poster session with questions and answers, giving young people the opportunity to see how scientists just a few years older than themselves are pushing back the boundaries of knowledge.



Accelerator science has applications across all sectors of industry and healthcare, allowing us to accurately target cancer tumours, understand the structure of biomolecules such as proteins and complex chemicals, measure strain in jet engines, create new materials and understand the secrets of the universe itself.



Organiser Professor Carsten P. Welsch, Head of the Liverpool Accelerator Physics Group at the Cockcroft Institute in Daresbury, leads two pan-European training networks which aim to address the skills shortage in accelerator science.

Prof. Welsch explains: “This discipline offers enormous opportunities for scientific discovery but also professional development.”

“Research Fellows from the training networks [oPAC](#) (optimization of particle accelerators) and [LA³NET](#) (lasers for applications at accelerator facilities) have in three years become experts in their discipline but also have developed skills in physics, engineering, IT, data analysis and project management.”

“The involvement of partners from industry and academia and the opportunity to work at research institutions across Europe has provided training that would be impossible by one company or one country alone.”

The training has been recognised by the European Commission as an international “success story” as part of formal project reviews and is amongst the very best research and training programmes in the world.

In addition to the Fellows' poster session top scientists gave presentations to demystify this area for more people.



Professor Grahame Blair, Executive Director of Programmes for the Science and Technology Facilities Council (STFC), explained how particle accelerators can be used as research tools. He explained that particle accelerators can recreate the conditions of the Big Bang, making it possible to test fundamental theories about the universe.

He says: “The Large Hadron Collider at CERN enables us to create unique conditions not seen

anywhere else on Earth and it was successful in allowing us to test many of the most advanced theories. In the process we are also learning about how to create high-energy particle beams and control them effectively. This is where beam diagnostics are important; by developing these tools the technology can be used in other applications.”

Prof. Blair explains that accelerators are used to create x-rays for use in material science, chemistry and biology and that the Diamond Light Source was used, for example, to fast-track the development of a new type of vaccine during the foot and mouth disease outbreak. Access to this technology and skills is creating a cluster of high-technology companies at Daresbury working in this field and creating exciting career opportunities for young people.



Paul Taylor, Head of Physics at Merchant Taylors' School, commented that the event had been inspiring for his students, many of whom are now considering studying physics at Liverpool or Manchester universities.

The presentations from the Symposium are now edited and available [online](#), providing a unique introduction to this fascinating area of science and technology.

Politecnico di Milano is an adjunct partner in LA3NET. Collaboration occurs through the Micro and Nanostructured Materials Laboratory of the Department of Energy. Politecnico's representative, prof. Marco Beghi, is providing the academic tutorship to one of LA3NET doctoral fellows. The Micro and Nanostructured Materials Laboratory is also working on ion acceleration by laser pulses, and this activity was presented by Dr. Matteo Passoni at the LA3NET Workshop on Novel Acceleration Techniques in Dresden, April 2014.