Measuring success

Advancing laser interferometry techniques from fundamental science to commercial reality is a huge achievement – and exemplifies the Department of Physics' commitment to industrial collaborations.

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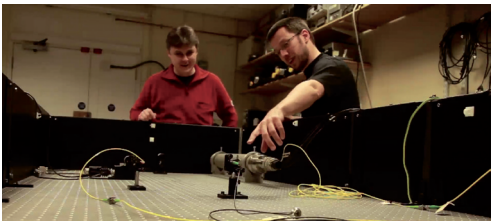

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Academics in the Department of Physics understand that collaborative success comes from each partner understanding the other's needs – and Dr Armin Reichold's recent industrial involvement demonstrates a fine example of the department's unique ability to turn fundamental research into commercial success.

Dr Reichold led the Linear Collider Alignment and Survey (LICAS) project – an international collaboration developing the Rapid Tunnel Reference Surveyor (RTRS) to help build the next generation of linear accelerators. The RTRS was to ensure that accelerator components deviated from their nominal positions by less than a few hundreds of microns over 1km lengths, a problem the team solved by using and improving Frequency Scanning Interferometry technology originally developed in Oxford. The result was a revolutionary technique capable of measuring large absolute distances accurately, without the need for constant line-of-sight conditions.

Sadly, LICAS was cancelled due to the STFC funding cuts – but through collaborative work with the National Physics Laboratory in the UK and the Physikalisch-Technische Bundesanstalt (PTB) in Germany, Dr Reichold was aware of a potential commercial use for the technology, by a PTB spin-out called Etalon AG.

Etalon AG produces laser tracers: devices that use self-tracking laser interferometers to measure distance with extreme accuracy. But the fundamental science developed through LICAS, Dr Reichold realised, could massively improve their performance. So, through the NPL/EPSRC Research Partnership Scheme, a collaborative research project was established, providing £600,000 to take the basic science to a commercial level.

That has required academics to not only create the best technology possible, but also ensure the devices are commercially practical. By spinning in laser technologies developed by the communication industry, for example, the team introduced new ideas while keeping the costs low. Soon, Etalon's devices will be more accurate, able to measure absolute distance, and still be of a similar cost to the originals.

A continuing commitment to the interplay between fundamental science and R&D fosters more effective collaborations. Key to the success of the project is that the academics involved do not merely focus on industry-specific R&D work. Researchers draw on their fundamental science and apply it to the industrial collaboration – in this case, ideas from the ongoing MONALISA project.

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http://www.etalon-ag.com/

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