

# Economic Impact

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## Introduction

This paper highlights the key economic impact activities undertaken in the CLF for FY15/16. Throughout the year there has been significant work in cementing existing collaborations and establishing new relationships with industry and in raising awareness of CLF technology, techniques and capabilities in both national and international arenas.

## Industry Engagement

This year we have continued to engage closely with industry and this has resulted in four companies gaining access to three of our facilities (Ultra, Gemini and Octopus). Three of these companies engaged through direct commercial contracts (proprietary access) and the fourth through peer review in collaboration with a University user group. Of particular note this year has been the establishment of a new PDRA scientist position in the LSF via joint funding through the Business and Innovations Department (BID) and Johnson Matthey. This important step forward will enable much stronger links to be forged with both Johnson Matthey and across wider industry.

## Spin Out Companies

To broaden their market reach and activities portfolio, CLF spin-out Cobalt Ltd. has recently started working with STFC and two UK Universities on research that could lead to medical-grade systems that provide on-the-spot diagnosis of breast cancer and bone diseases, such as osteoporosis, with funding from EPSRC. Scitech Precision Ltd. another CLF spin-out can now offer a laser micromachining service, after taking on two new members of staff and purchasing laser equipment from local company Micronanics.

## Intellectual Property and Know-How

This year has been particularly productive with regards to Intellectual Property generation and protection with a total of four patent applications filed. This new IP reflects the broad range of sectors CLF covers and includes nuclear waste imaging, characterising ultra-short pulses, new laser alignment methods and novel biomarkers. CLF staff are highly creative and continue to take the lead in terms of invention disclosures and patent ideas submitted to STFC Innovations for review.

## Proof of Concept Funding

The Proof of Concept (PoC) scheme is operated by the BID to develop new ideas and technology that have the potential to be commercialised either through future license deals or the formation of new spin-out companies. This year two new PoC proposals were funded. The first is focused on Laser Peening, a specialised surface treatment method for enhancing the fatigue life of engineering materials by

applying a compressive stress that penetrates up to a few mm into the material. The project will design, build and demonstrate a laser peening capability based around the 10J, 10Hz DiPOLE laser developed and built by the CALTA team. There is potential for significant new IP enabled by some of the spatial and temporal characteristics of the DiPOLE laser pulses whilst the project also demonstrates the capability of DiPOLE type systems for industrial applications and processes. The project allows for collaboration across a number of new University groups including Coventry, Cranfield and Liverpool John Moores and importantly opens up new contacts with industry across the aerospace, defence and medical sectors.

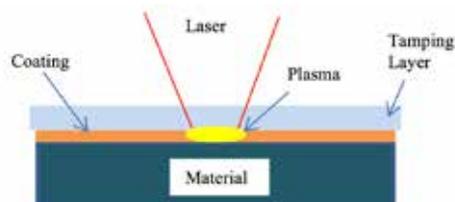


Figure1: Schematic of Laser Peening Process

A second PoC project builds on the knowledge and expertise of the plasma theory group at CLF and is funded to design and build a new, highly efficient vacuum ultraviolet (VUV) plasma source with potential applications in the processing of waste materials. The project allows the recruitment of a PDRA scientist to undertake the experimental work.

## International Engagement

Projects funded under the Newton Fund with China (Laser Driven Sources for Medical Treatment and Imaging), India (Ionising Radiation Sources for Treatment and Imaging) and South Africa (Characterising Antibiotics, Water Treatment, Disease Diagnosis) are now fully underway. A number of trips are planned under this fund to explore future commercial and innovation opportunities.

EC H2020 funding has been secured under phase 1 of the Widespread Teaming Programme to work with the HiLASE Centre in the Czech Republic. This is a one year project to build a detailed and compelling Business Case for the future operation of the HiLASE Centre of Excellence. Work includes rigorous consultation with industry to produce a "user requirements" document. Outputs from the project will be used to generate the full proposal which will request significant funding (up to €50M funded jointly by both the EC H2020 programme and the Czech Ministry). This will be submitted under phase 2 of Widespread Teaming next year. Particular opportunities for CLF will be in the research and development of higher repetition rate DiPOLE (up to 100Hz) and higher pulse energies (beyond 150J per pulse).