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**CDT-ACM PhD Project 2019**

**Project Title:** Development of characterisation methods for aerospace failure investigation

**Project Supervisors:**

Supervisor 1: Dr Ben Britton, ICL, [www.expmicromech.com](http://www.expmicromech.com)

Supervisor 2: Prof Angus Wilkins, Oxford, <https://omg.web.ox.ac.uk/home/>

**CDT Theme:**

Advanced engineering components can fail in service. Investigating their failure is critical to ensure that we have confidence in our components. In this project, you will develop electron microscopy methods (using electron backscatter diffraction) to understand evidence of fatigue damage in service-like components. This project is in collaboration with the University of Oxford (Professor Angus Wilkinson) and the Failure Investigation Team at Rolls-Royce plc (Eddie Saunders and colleauges), and will involve a secondment to Rolls-Royce during the project to understand how failure investigation works in a major company.

During this project, you will develop new analytical and numerical skills and be able to understand how materials deform in service and the impact of fatigue in titanium alloys used in aeroengines. Experimental results will be co-correlated with other methods, including striation counting, and there is potential to extend this with characterisation using major X-ray facilities (e.g. the Advanced Photon Source in the US and/or the diamond light source) to understand the stress state ahead of crack tips.

You will work in an interdisciplinary team, many of whom also conduct experiments and develop new characterisation tools, but a large number also develop computational methods and so you will learn how experiments can be used to inform models and improve our understanding of engineering materials.