

**Fully Funded EPSRC PhD Case studentship.**

**Project Title: Investigating X-ray computed tomography for the characterisation of critical additively manufactured aerospace components**

Aerospace companies have been reticent to use metal additively manufactured (AM) components in critical applications because of the lack of consistency, repeatability and reproducibility in the manufacturing process. X-ray computed tomography (CT) is becoming a useful tool for evaluating surface texture, dimensions and internal defects of additively manufactured parts. These evaluations each present their own set of challenges, however there are common core factors that influence all these measurements. These include surface determination (binarisation of the CT volume voxel data based on grey-scale values), beam hardening, scatter and global scaling errors. For CT to be a valid tool for acceptance/rejection of production aerospace components, measurements need to be traceable to the relevant national metrology Institute (NMI) standards. Additionally, generating accurate predictions of the mean time between failures (MTBF) is vital if these components are to be considered. This project will include the use CT to evaluate a selection of aerospace components, to produce traceable measurement test artefacts designed specifically to aid evaluation of the measurement uncertainty for each component. Work will be performed to generate MTBF times for specific components.

**Eligibility:** The student must have a high-grade qualification, at least the equivalent of a UK 1st or 2:1 class degree or MSc with distinction in Physics, Engineering or related disciplines. The student must be proficient in both written and spoken English, and possess excellent presentation and communication skills.

**Salary:** £15,285 (2020/21 EPSRC Standard)

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