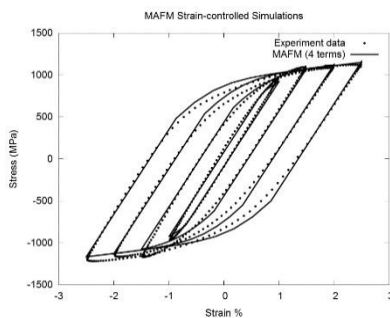
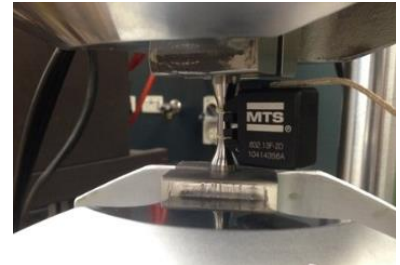


PhD Studentship (4 years)

Cyclic Plasticity of Additively Manufactured (AM) Metals: Experimental Investigation & Constitutive Modelling

Background & Research Objectives

To date, most of the published research work on the mechanical properties of additively manufactured (AM) metals has been on the observed monotonic and fatigue performance. Very limited attention has been placed on the cyclic elastoplastic response of this class of metals, despite the significance of this area for many aerospace and mechanical engineering applications. Further investigation in this area can assist in characterising the AM metals' macroscopic mechanical behaviour (e.g. stress and strain hardening), as well as assess the influence of microscopic characteristics (microstructure) and manufacturing parameters (e.g. built orientation) on their mechanical behaviour, including low and high cycle fatigue.



This 4 year research project will investigate experimentally the elastoplastic behaviour of metallic materials produced via commonly used AM methods (e.g. selective laser sintering, selective laser melting), under cyclic loading, in the ultra-low, low and high cycle fatigue regime. The study will cover an array of different materials, loading cases and histories, both in the uniaxial and multiaxial stress space. Moreover, the experimental results obtained will be utilised to develop and validate constitutive plasticity models capable to predict the cyclic elastoplastic behaviour and performance of the various AM metals, under ultra-low, low and high cycle fatigue loading.

Studentship Terms and Conditions

- Four (4) years Full Time study (start: September 2016) in the [Structured PhD in Engineering](#) of the University of Limerick (UL) Department of Mechanical, Aeronautical & Biomedical Engineering;
- Tax free stipend of €16,000 per year;
- EU Tuition Fees Waiver.

Selection Criteria

- EU citizenship;
- Highly qualified and motivated Engineers, preferably holders of a Master's Degrees in mechanics of materials, computational mechanics, cyclic plasticity or other relevant field;
- Entry Requirements applicable to the UL Structured PhD in Engineering.

Application Material & Process

- Full Curriculum Vitae (CV), including research publications, accompanied by a Cover Letter;
- Research Proposal (2 pages maximum), including the following headings: 1) Background; 2) Objectives; 3) Work to be done; 4) Methods to be used; 5) Novel aspects; 6) Engineering theoretical issues addressed;
- Applications should be emailed, by the **6th of May 2016**, to:

Dr Kyriakos I. Kourousis, CEng

Senior Lecturer

Department of Mechanical, Aeronautical & Biomedical Engineering

University of Limerick

kyriakos.kourousis@ul.ie