

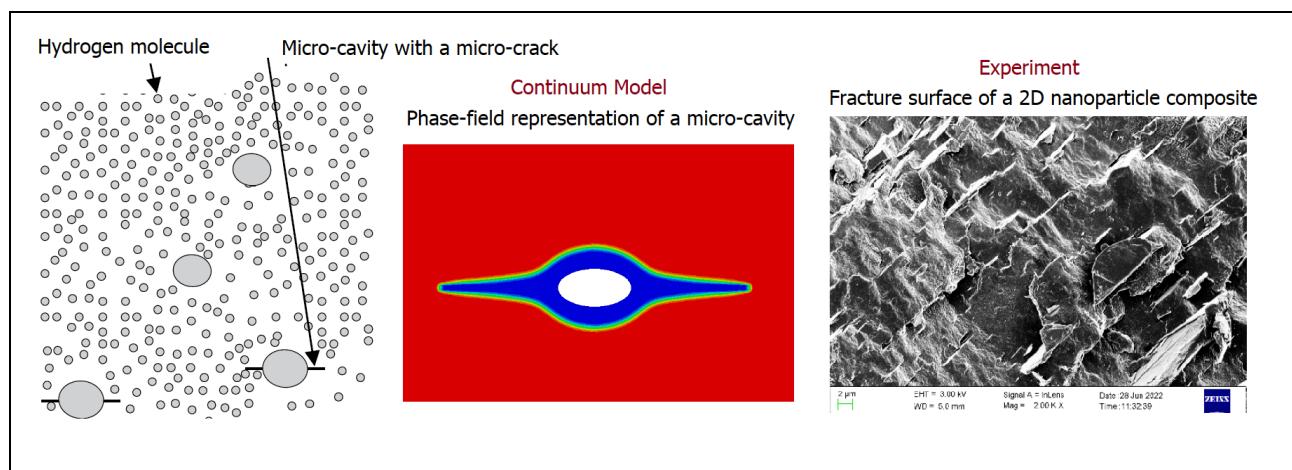
PhD studentship at the University of Warwick, UK

Title: *Resisting the pressure: phase-field approach for composites under hydrogen environment*

Supervisors: Lukasz Figiel (WMG), Mohad Mousavi-Nezhad (School of Engineering)
University of Warwick

Summary

When exposed to pressurized gaseous environments, composite materials can exhibit microscale damage phenomena such as micro-cavitation. Understanding of those damage phenomena in the presence of tiny gas molecules such as H_2 is critical for future applications of composites for H_2 storage. Here, we aim to develop a new chemo-mechanical phase field model that will enable predictions of hydrogen gas transport and microscale damage onset and propagation as a function of material composition, hydrogen concentration/pressure, and loading conditions. In turn, this will help to optimize material for a given hydrogen and loading environment. The model will be experimentally informed (e.g. microscopy, mechanical behaviour) using the Bayesian paradigm. An experimentally parametrized chemo-mechanical phase field model will be subsequently implemented within a finite-element framework to enable predictions of hydrogen-induced initiation and evolution of micro-damage processes as a function of material composition, hydrogen pressure, and temperature.



Application process

Due to funding restrictions this PhD position is for UK residents, but some outstanding international candidates will also be considered.

If you are interested in applying for this position, head over to our Study with Us page (<https://warwick.ac.uk/fac/sci/hetsys/apply/>) for further information on the application process, funding and the HetSys training programme.

Informal enquiries can be directed to Lukasz Figiel (l.w.figiel at warwick.ac.uk).