

## Workshop Venue

### Forum am Park Heidelberg

Poststraße 11

D-69115 Heidelberg

<http://www.heidelberg-kongresse.de/en/venues/forum-am-park.html>

Heidelberg ([www.heidelberg.de](http://www.heidelberg.de)) is a world-renowned beauty spot in an idyllic setting on the river Neckar. The picturesque ensemble of the castle, the Old Town, and the river Neckar surrounded by hills has inspired poets and artists. First mentioned in 1196, Heidelberg was planned and built, together with the castle, in the 13th century. Heidelberg's heyday as the capital of the Electoral Palatinate began with the foundation of the university – today the oldest in Germany – in 1386.



## Accommodation

- Leonardo Hotel Heidelberg City Center  
[www.leonardo-hotels.com/leonardo-hotel-heidelberg-city-center](http://www.leonardo-hotels.com/leonardo-hotel-heidelberg-city-center)
- Holiday Inn Express Heidelberg City Centre  
[www.holidayinn.com](http://www.holidayinn.com)
- Mille Stelle Hotel Heidelberg  
[www.millestelle.de](http://www.millestelle.de)
- More:  
[www.heidelberg-marketing.de/en/search-book/accommodation.html](http://www.heidelberg-marketing.de/en/search-book/accommodation.html)

## ➤ Registration

A registration fee of 125€ will be charged to each delegate attending the workshop.

To register as well as to download the booking forms please visit the website of the Italian Group of Fracture:

<http://www.gruppofrattura.it>

## ➤ Workshop Papers

Submitted conference papers will be peer reviewed for publication in a special issue of *Frattura ed Integrità Strutturale (Fracture and Structural Integrity)*, the International Journal of the Italian Group of Fracture (indexed in Scopus).

Special issues of *International Journal of Fatigue* and *Fatigue & Fracture of Engineering Materials & Structures* are planned to contain selected papers which have been extended to take into account the workshop discussions and then peer reviewed.

## ➤ Deadlines

Abstracts: 1 November 2018  
Conference Papers: 1 March 2019

Announcement  
of the

Fifth IJFatigue & FFEMS  
Joint Workshop

# Characterisation of Crack Tip Fields

Heidelberg, Germany  
8-10 April 2019

[www.gruppofrattura.it](http://www.gruppofrattura.it)



GRUPPO  
ITALIANO  
FRATTURA (IGF)



## Workshop Chairs

Michael Vormwald (local Chairman)  
M. Neil James (Editor-in-Chief of IJFatigue)  
Youshi Hong (Editor-in-Chief of FFEMS)  
Francesco Iacoviello (IGF President)  
Luca Susmel (IGF Secretary)

## Workshop Secretariat

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## Aim

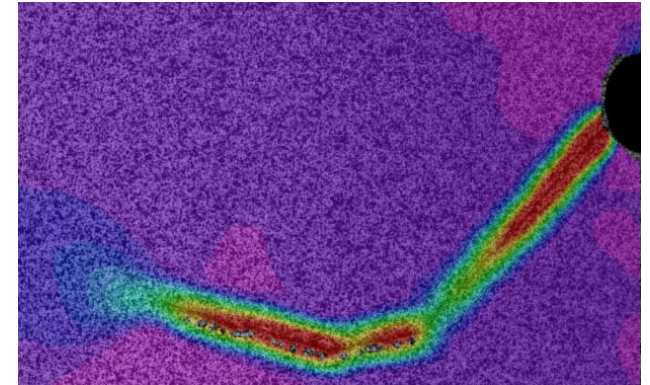
This research workshop is intended to promote discussion and the free exchange of ideas in an area of considerable interest to the fields of fracture and fatigue; namely the characterisation of crack tip fields and, in particular, to consider the issue of more accurate multiparameter characterisation, often using a number of simultaneous sophisticated experimental techniques to validate analytical advances.

Invited participants will be expected to prepare a 20 minute presentation on a topic of close relevance to the workshop theme, and significant time will be devoted to discussing the ideas presented to identify fruitful avenues for future work and collaboration.

## Background

Single parameter characterisation of the crack/notch tip field using fracture mechanics parameters like  $K$ ,  $J$  or  $CTOD$  has been extremely powerful in advancing predictive technologies for critical or sub-critical crack growth. It has also become clear over the last 40 years that single parameter approaches have limitations particularly in dealing with crack growth phenomena arising from crack tip shielding, often resulting from the plastic enclave surrounding a crack. Influences of this enclave on the crack tip stress field ahead of the crack are maximised during cyclic loading. In the case of a parameter like stress intensity factor,  $K$ , which characterises the crack tip field via an elastic approximation, it is not surprising that any set of plasticity-induced circumstances which perturb the size of the plastic enclave and its associated strain field lead to predictive difficulties. Over the last 40 years, notable areas of activity related to such difficulties include short cracks, plasticity-induced closure, variable amplitude and multiaxial loading and notch effects.

Thus an increasing number of authors and research groups, particularly in Europe, are working on the topic of characterisation of crack tips using more than one fracture mechanics parameter. Attention has been directed, for example, towards incorporating the  $T$ -stress into life prediction methods. The  $T$ -stress is the second term in a Williams-type expansion of the crack tip stresses and it affects the extent and shape of crack tip plasticity.



It would therefore be expected to be influential in plasticity-related crack growth phenomena and a number of publications have demonstrated this to be true. The situation is further complicated where a crack experiences multiaxial loading and Mode II and III fracture mechanics parameters are also necessary. Alongside this, new analytical models have been proposed and advanced experimental techniques allow greatly improved measurement of 2D and 3D fields associated with the crack tip zone.

Very successful workshops on this topic have been held in Forni di Sopra, Udine, Italy in 2011, Málaga, Andalusia, Spain in 2013, Urbino, Italy in 2015 and Bonifacio, Corsica, France in 2017. The organisers of this unique workshop believe that crack tip characterisation under load will benefit from opportunities for invited research scientists and engineers to present and exchange new data and cutting edge ideas related to characterisation of crack/notch tip fields in an informal, interactive format at a conference venue in a beautifully scenic German city.