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Hong, Y., Susmel, L. orcid.org/0000-0001-7753-9176, Berto, F. et al. (2 more authors) (2019) Editorial : special issue for celebrating the 40th anniversary of FFEMS. *Fatigue & Fracture of Engineering Materials & Structures*, 42 (9). pp. 1847-1848. ISSN 8756-758X

<https://doi.org/10.1111/ffe.13111>

This is the peer reviewed version of the following article: Hong, Y. , Susmel, L. , Berto, F. , Neu, R. W. and Endo, M. (2019), Editorial: Special issue for celebrating the 40th anniversary of FFEMS. *Fatigue Fract Eng Mater Struct*, 42: 1847-1848., which has been published in final form at <https://doi.org/10.1111/ffe.13111>. This article may be used for non-commercial purposes in accordance with Wiley Terms and Conditions for Use of Self-Archived Versions.

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Editorial: Special Issue for Celebrating the 40th Anniversary of FFEMS

Youshi Hong, Luca Susmel, Filippo Berto, Rick Neu and Masahiro Endo

Fatigue & Fracture of Engineering Materials & Structures (FFEMS) was founded in 1979 by Professor Keith Miller in Sheffield, UK. This year we are proud to celebrate the 40th anniversary of FFEMS. For this celebration, an International Symposium on Advances in Fatigue and Fracture – Celebrating the 40th Anniversary of FFEMS was organized from the 18th till the 20th of September 2019 in Sheffield, i.e., in the city where the journal was launched 40 years ago. The Editorial Board members, the honorary members, and some invited guests participated in this symposium, sharing their cutting edge achievements in the research fields of fatigue and fracture, and prospecting the future developments in these key technological area. This Special Issue contains the full-length papers that were presented at this Symposium, with the 25 contributions covering various frontier topics in the fatigue and fracture research discipline.

When the journal was launched in 1979, the initial title was Fatigue of Engineering Materials & Structures and in the Editorial Comment of the inaugural issue, Keith states: “*A principal task of the journal is to focus attention on the fact that the study of fatigue now calls for a truly interdisciplinary approach involving mechanics, mathematics, metallurgy, materials science, computer science, physics and chemistry.*”¹ In 1985, “Fracture” was added to the title that became Fatigue & Fracture of Engineering Materials & Structures, with Keith again emphasising that FFEMS is “*a journal of an interdisciplinary nature ...*”² As the Editor-in-Chief, Keith “guided” the journal successfully and effectively until the end of 2000 and “*put FFEMS on the list of top scientific journals in mechanical engineering*”³. Ten years ago, in the Editorial for celebrating the 30th anniversary of the journal, the editors reiterated how “*Keith ... captured the scope of the work needed to understand the physical processes of failure mechanisms and their useful application to the real, large scale problems facing engineers.*”⁴ At the beginning of 2012, the new editorial team took over the torch in the long relay of serving the community. In the past 40 years “*FFEMS has played a vital role in creating a bridge between scientists and engineers from fundamental research to engineering applications in the structural integrity community, and has shown itself to be unique as an international journal, especially for publishing papers presenting state-of-the-art achievements in fatigue and fracture research on engineering materials and components.*”⁵

As we wrote two years ago, “Like other subjects, the driving force for scientific and technological research in fatigue and fracture, that is, structural integrity, originates from the development of society and its civilization. The growing tide of industrialization, informatization and digitalization has brought about new challenges to fatigue and fracture research, which not only adds fresh elements to the traditional topics of surface/interface, biaxial/multi-axial, size effect, LCF/HCF, cracking behavior, and so on but also causes the emergence of cutting edge themes of MEMS/NEMS, thin film, nanomaterials, additive materials, VHCF, multiscale

problems, and so on. For FFEMS, there is an exciting journey ahead to respond to *these challenges within society and our community.*”⁶

We would like to express our sincere gratitude to the participants for actively supporting the Symposium, to the authors for their technical articles and to the reviewers for their insightful comments: without these co-joined efforts, this Special Issue would not have been possible.

We do hope this Special Issue is capable of well reflecting the uniqueness of FFEMS and our commitment to the authors and the readers. As Keith said at the very beginning of this adventure “*this journal will be of benefit to the community at large.*”¹

Finally, support for the organisation of this Symposium from Wiley (www.wiley.com), 3ds Dassault Systemes (www.3ds.com) and the Italian Group of Fracture (www.gruppofrattura.it) is gratefully acknowledged.

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