14th International Conference on Fracture (ICF14)
Rhodes, Greece, June 18-23, 2017

Mini-Symposium Announcement:
Damage and Fracture in Nuclear Fission and Fusion Materials

Organized by Prof. Robert Ritchie (University of California, Berkeley, USA)

With 444 fission nuclear reactors operating in 30 countries worldwide and about 63 new power plants under construction in 15 countries, the integrity of the existing structural components and new designs of optimized materials have to be evaluated to ensure safe generation of energy. Future GenIV designs of fission reactors working at much higher temperature and the ambition to harness fusion nuclear power require an advanced understanding of the fracture and damage of relevant materials. The incentive of this mini-symposium is to bring world-leading experts on nuclear materials to contribute towards the following areas:

1. Fracture mechanics of materials under extreme conditions: experiments and simulation of the mechanical behavior of nuclear materials under conditions similar to service such as elevated temperatures, neutron/ion/plasma irradiation damage and mixed-mode loading; *ex situ* and *in situ* (SEM, TEM, EBSD, XRD, neutron, etc.) microstructural and mechanical characterization methods.

2. Fracture mechanics at multiple length-scales: multi-scale modeling and simulations of mechanical behaviour of nuclear materials from atomic-scale to component size; size effects; theory of deformation behavior and failure mechanisms.

4. Degradation and time-dependent deformation: fatigue, thermal / irradiation creep, irradiation-induced changes in microstructure and mechanical properties.

5. Life prediction, fuel cycle, waste management and decommissioning: scaling up from experimental outcomes to the reactor scale for the evaluation of integrity and lifetime; fuel cycle facilities, the reliability in waste containment and issues related to decommissioning and its interactions with surrounding environment.

6. Development, quantification and implementation of advanced nuclear materials: optimised designs and processing of new materials with improved properties.

If there is sufficient interest, selected papers will be published in special issues of appropriate journals. If you would like to participate, I would appreciate if you could send me a brief email of your interest with a tentative title, before Sept. 30, 2016; my email address is: *roritchie@sbcglobal.net*.

All two-page abstracts, however, must be submitted through the ICF-14 website (*http://www.icf14.org*) by October 31, 2016, with indication to this specific mini-symposium.