

Keynote: Computational design of lightweight structures and materials for crashworthiness

Keynote speaker: Prof. Qing Li, University of Sydney

Abstract: Structural safety and energy efficiency signify two important yet competing aspects for modern vehicles in aerospace, automotive, railway and nautical engineering. Computational design provides an effective approach for developing crashworthy lightweighting materials and structures. This talk depicts a range of novel computational algorithms for deterministic and/or nondeterministic optimisation with crashing and blast criteria. A variety of innovative designs are presented for metallic, fibre-reinforced polymer (CFRP) composite and hybrid materials and structures under different crashing/impact load cases. The design methodology is anticipated to be applicable in range of new developments, such as electric vehicle, drone, protective devices etc.

Prof. Qing Li received his PhD in aerospace engineering with a Golden Jubilee Prize from the University of Sydney in 2000. He was a postdoc fellow at Cornell University USA 2000-01, an Australian Research Council (ARC) Australian Postdoctoral (APD) Fellow in 2001-03 and a Future Fellow in 2013-17. Professor Li's research has focused on computational design and multidisciplinary optimisation. He has been contributing on computational optimisation of highly nonlinear and time-dependent multifunctional materials and structures mainly for mechanical and biomedical applications. Professor Li is named as a Clarivate "Highly Cited Researcher" and top 50 Australia's Research Leaders in Engineering and Computer Science in 2020. He has served in the editorial boards for several leading journals in his field, including Structural and Multidisciplinary Optimization, Biofabrication, International Journal of Mechanical Science, etc. Professor Li is the Vice President of International Society of Structural and Multidisciplinary Optimization (ISSMO), the Executive Committee of International Society of Biofabrication (ISBF), and the General Council of International Association for Computational Mechanics (IACM). He is the Secretary of Australian Association for Computational Mechanics (AACM).

