Editorial

Guest Editor: Han Zhao

This special issue entitled *Cellular structures and energy absorption* of the *International Journal of Vehicle Design* is aimed at introducing recent developments of various aspects of energy absorption involving cellular materials. Indeed, solid cellular materials (foams, honeycombs, hollow sphere agglomerates, etc.) are attractive and have resulted in the creation of an active subject for both mechanical and material scientists in recent years. Significant achievements have been made in understanding their behaviour under static loading and the effects of dynamic loading are also a current subject of interest. In practice, constant progress in the manufacturing techniques is improving their properties and reducing their costs; and mass production and industrial applications are beginning. Hence, it is highly desired to resume its current state-of-the-art for both novice readers and scientists as well as engineers working in this domain. This special issue, authored by a number of leading scientists, provides such a state-of-the-art report.

The special issue contains invited papers written by eminent researchers working in leading institutions in this domain from seven countries at different corners of the globe. The issue is organised as follows: it begins with an overview by J. Banhart (HMI-Germany) on the manufacturing aspects of various metallic foams and the ongoing applications of those foams. Hanssen et al. (NUTU-Norway) focus their review on the foam filled hollow structures: practical design formulas on the basis of experimental studies as well as FEM simulation procedure for the crashworthiness are discussed. The paper by Abdennadher and Zhao (LMT-France) presents a review of possible causes of the macroscopic rate sensitivity of cellular materials. Experimental results of the rate sensitivity for honeycombs, foams as well as hollow sphere agglomerates are also provided. Li et al. (Umist-U.K) deal with the penetration resistance of aluminum Cymat foam. Experimental methods under impact loading for the foam-like material are reviewed by the paper of Chen et al. (University of Arizona-USA). With the aid of packed regular cells, T.X. Yu (HKUST-Hong Kong) and his co-workers present interesting analytical and numerical analyses on the behaviour of cellular material under impact. A study on the energy absorption by ductile tearing is addressed by Lu et al. (Swinburne Univ. Technol. – Australia) in the last paper.

Lastly, I would like to thank the authors for their valuable contributions and the reviewers for their time and efforts in providing many valuable comments.