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Editorial

In every decade, there are scientific or technological advances that attract the imagination of large segments of the scientific community. High temperature superconductors are a particularly well known example. Nanostructured materials are another such topical field which has attracted growing attention within the 1990s. There are many possible reasons. The particle size range of between 1 and IO-100 nm represents the transition from atomic to bulk-like characteristics allowing for the study of the corresponding effects on electrical and optical properties (quantum confinement), mechanical modulus, catalytic activity and mass transport. Improved analytical methods such as high resolution electron microscopy and scanning probe microscopy finally allow for detailed interrogation of structure and properties on this fine a scale. The drive towards ever greater miniaturization by the microelectronics industry continues to create challenges to fabricate ever smaller structures and to understand their performance characteristics.

While a broad consensus exists that nanostructured materials (and from our perspective, ceramics in particular) should exhibit a wealth of interesting characteristics, few sources exist which analyze and clearly spell out what might be the most interesting implications of such materials from the perspectives of new science and technology.

We are thus fortunate to be able to publish this special issue on *Nanostructured Materials for Energy Applications* edited by Prof. Yet-Ming Chiang of MIT which not only summarizes recent progress in this rapidly developing field, but perhaps more importantly, identifies important future trends. We hope, in this manner, that our readers are stimulated to examine such materials and phenomena in light of their own interests.

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