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Preface to the Special Issue in Honor of Professor George J. Weng, the 2013 Prager Medalist

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This special issue contains some papers on the topics of “Micromechanics, composites and multifunctional materials.” Most articles were presented at “The Prager Medal Symposium in Honor of Professor George Weng,” at the Joint 50th Society of Engineering Science Annual Technical Meeting and ASME-AMD Summer Meeting, Brown University, Providence, RI, USA, July 28–31, 2013. The symposium included 55 oral presentations focusing on a wide range of topics in solid materials: It covered nano-to-micro transitions, interface effects, thermodynamics, phase transition, effective properties of composites, shape memory alloys, ferroelectric crystals and thin films, magnetoelectric coupling of multiferroic composites, nanodielectrics for energy storage, energy harvesting, thermoelectric properties, metamaterials, biomaterials, geomaterials, nanocrystalline materials, and mechanical and transport properties of carbon nanotube- and graphene-based composites.

William Prager Medal is awarded by the Society of Engineering Science for outstanding research contributions in either theoretical or experimental solid mechanics or both. Since the first recipient—Daniel C. Drucker—received it in 1983, a total of 21 individuals have been awarded this honor. Professor George J. Weng, the twenty-first Prager medalist, was selected for his “outstanding research contributions in theoretical solid mechanics” and according to the citation “in recognition of his fundamental contributions to the theory of inclusions, micromechanics of composites, multifunctional materials, and coupled behavior in solids.”

For over three decades, Professor Weng has been working on the micromechanics theory that is deeply rooted in Eshelby’s solution of an ellipsoidal inclusion. His highly cited paper “Some elastic properties of reinforced solids, with special reference to isotropic ones containing spherical inclusions” (*Int. J. Engng. Sci.*, 22, 845–856, 1984) provides a simple, clear explanation and derivation of effective elastic properties of composites using the Eshelby–Mori–Tanaka approach, and it has become a classic and must-read article on micromechanics. Many young researchers have benefited from his works and have been able to apply the knowledge they learned to their own research. In recent years, Prof. Weng has extended his micromechanics study into the constitutive behavior of multifunctional materials such as SMAs, ferroelectrics, and multiferroics.

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In this special issue, we first present Professor Weng's brief biography and then include his Prager medal plenary lecture entitled "Micromechanics and some aspects of phase fields in ferroelectric crystals," followed by 34 contributed research papers. All articles have been peer-reviewed following the review policy of *Acta Mechanica*.

Finally, I would like to express my appreciation to all the presenters at the Prager symposium and all the authors who submitted their manuscripts in time to secure the on-time publication for this special issue. I would also like to thank my co-organizers of the symposium, Prof. Dimitris Lagoudas of Texas A&M University, and Prof. Abhijit Bhattacharyya of the University of Arkansas at Little Rock for their continuous support throughout this process. Without their supports, we would not have been able to have such a wonderful symposium and a valuable special issue. Congratulations to Professor Weng, the 2013 William Prager medalist.