

Preface

Mechanics of Composite and Multifunctional Materials represents one of ten volumes of technical papers presented at the 2016 SEM Annual Conference & Exposition on Experimental and Applied Mechanics organized by the Society for Experimental Mechanics and held in Orlando, FL, June 6–9, 2016. The complete Proceedings also includes volumes on *Dynamic Behavior of Materials*; *Challenges In Mechanics of Time-Dependent Materials*; *Advancement of Optical Methods in Experimental Mechanics*; *Experimental and Applied Mechanics*; *Micro and Nanomechanics*; *Mechanics of Biological Systems and Materials*; *Fracture, Fatigue, Failure and Damage Evolution*; *Residual Stress, Thermomechanics & Infrared Imaging*, *Hybrid Techniques and Inverse Problems*; and *Joining Technologies for Composites and Dissimilar Materials*.

This volume presents early findings from experimental and computational investigations in an important area within Composite, Hybrid, and Multifunctional Materials.

Composites are increasingly the material of choice for a wide range of applications from sporting equipment to aerospace vehicles. This increase has been fueled by increases in material options, greater understanding of material behaviors, novel design solutions, and improved manufacturing techniques. The broad range of uses and challenges requires a multidisciplinary approach between mechanical, chemical, and physical researchers to continue the rapid rate of advancement.

New materials are being developed from recycled source materials, leading to composites with unique properties and more sustainable sources. Existing materials are being used in new and critical applications, requiring deeper understanding of their behaviors and failure mechanisms on multiple scales. In addition, the unique properties of composites present many challenges in manufacturing and in joining them with other materials. Testing needs to be performed on these materials to characterize their properties and new test methods, and technologies must be developed in order to perform these studies and to evaluate parts during manufacture and use.

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