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Akhlesh Lakhtakia
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Introduction

After the inaugural SPIE conference on Nanocoatings held in 2007, it was decided to rename the conference Nanostructured Thin Films in 2008. Nanostructured thin films have been produced and studied for several decades, but interest in the topic has skyrocketed in recent times, along with the general growth in all things labeled 'nano'. Nanostructured thin films underpin many emerging technologies and involve exciting and sometimes puzzling new science. Thin films whose properties depend on their nanostructure are of increasing interest for applications in solar energy, energy efficiency and storage, biosensors, medicine, photonics and telecommunications, and chemical processing. They can extend product lifetimes, self-clean, sterilize, or display novel decorative properties. Several applications are featured in the papers included in this volume.

Several papers in this volume provide useful details on how to deposit thin films and how to control their nanostructure and optical response. Controlled deposition processes directly lead to the desired nanostructures, thereby eliminating the need for expensive post processing, apart from, say, thermal annealing. The deposition processes are essential for large-area coatings, for example in solar cells, some photo catalysis and advanced windows, but of course they are also useful for any cost-sensitive device. Thin films whose plasmonic responses are unusual but useful and interesting are covered in several of these papers. Some of these thin films conduct, while some are insulating but contain conducting nanoparticles.

This volume testifies to the interdisciplinary and multidisciplinary nature of the field with contributions from physicists, chemists, engineers, materials scientists, and biotechnologists. This diversity is a hallmark of nanotechnology as well as of SPIE.

Geoffrey B. Smith
Akhlesh Lakhtakia

