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Instrumentation, Metrology, and Standards for Nanomanufacturing III

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Introduction

The U.S. Federal Government has invested over $10 billion cumulatively between 2001–2009 in nanotechnology related research, and if you include the 2010 budget request the number swells to almost $12 billion. In addition, U.S. companies have invested at least an equivalent amount, if not more. Worldwide, similar levels of investment have been made. Manufacturing is the primary bridge between the discoveries in nanoscience and the real world nano-enabled products. Nanomanufacturing is the vehicle by which the nation and the world will realize the promise of major technological innovation across the spectrum of products that is expected to affect virtually every industrial sector.

In order for nanomanufactured products to achieve the broad impacts envisioned, they must be manufactured in market-appropriate quantities in a reliable, repeatable, economical, and commercially viable manner. In addition, they must be manufactured so that environmental and human health concerns are met, worker safety issues are appropriately addressed and handled, and liability issues are addressed.

The 2009 SPIE conference, Instrumentation, Metrology, and Standards for Nanomanufacturing III, addresses issues critical to the effective development of a robust nanomanufacturing environment. This includes the necessary production instrumentation, metrology, and standards, as well as the integration of the instruments, their interoperability, and necessary data management. The development of advanced instrumentation, metrology, and standards will allow the accurate measurement of physical dimensions, properties, functionality, purity, and emissions that will constitute nanomanufacturing being measured and characterized.

The goal is to enable production to be scalable, controllable, predictable, and repeatable to meet the ever varying market needs. Further, if a nano-enabled product cannot be made safely, it should not be manufactured. This conference and proceedings supports the development of the required instrumentation, standards, and metrology. The goal of this conference is to become the leading forum for the exchange of foundational information and discussion of instrumentation, metrology, and standards which are key elements for the success of nanomanufacturing and to reap the benefits of the investments in this new technology.

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