

New Directions in Nanomanufacturing and Enabling Factors

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Abstract

Nanomanufacturing holds immense intellectual and economic potential for stakeholders who pursue it with a vigorous, long-term strategy. Although numerous nanomaterials are already in production and use, the full breadth of possible applications and societal benefits has only begun to be realized. The last 10 years saw the rapid development of new processing methods that utilize the physics of self-assembly, bio-inspired synthesis, and other advances. Unique issues have emerged in the area of nanomanufacturing process development, scale-up, metrology, integrated nanosystems design for manufacturing, nanoinformatics, sustainable manufacturing, standards, and multiple issues associated with a robust nanomanufacturing system. To help nucleate and support communities of practice in the area of nanomanufacturing, the US National Science Foundation provides funding for the National Nanomanufacturing Network (NNN), which facilitates cooperative activities between nanomanufacturing centers and projects in academia, industry and government, and provides a web-based information resource, InterNano. Ultimately research, development, education and commercialization are all essential components of a robust nanomanufacturing value chain.