sector in the broader economy. According to PCAST, citing Lux Research figures, global funding for nanotechnology in 2008 totaled $18.2 billion for research, 46 percent of which was supplied by government. In 2009, some $224 billion of products making some use of nanotechnology components were sold. But the value of these components was only $29 billion, $11 billion of which were manufactured in the United States. Of global products, the majority—some 55 percent—were in the materials and manufacturing segments of the auto, industrial equipment, building and construction sectors, and included coatings, composites, and electronic components. Another 33 percent were in the form of batteries, displays, and coatings in electronics and information technology, and 12 percent were in healthcare and medical sciences sectors. Only 1 percent were in environmental and power applications.

In the first decade of the 21st century, nanomanufacturing was one of the lowest of the NNI’s research priorities. Since 2008, annual spending in this area has averaged around $55 million out of total budgets averaging around $1.6 billion in that period. However, the NNI’s fiscal year 2011 budget did increase funding for nanomanufacturing research by $26 million, a 34 percent increase over 2009. In its 2010 review, PCAST emphasized the necessity of commercializing nanoscale science and engineering, recommending that five leading agencies in the NNI (Department of Defense, Department of Energy, National Science Foundation, National Institutes of Health, and National Institute of Standards and Technology) double spending on nanomanufacturing over the next five years, while maintaining or increasing the level of basic research funding in nanotechnology.

See Also: Carbon Nanotubes; Nanomaterials; National Nanotechnology Initiative (U.S.); Quantum Dots; Self-Assembly; Spintronics.

Further Readings


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Nanotechnology Institute (ASME)

The American Society for Mechanical Engineers (ASME) Nanotechnology Institute (NI) was established in 2001. ASME, founded in 1880, is a not-for-profit professional organization promoting the art, science, and practice of mechanical and multidisciplinary engineering and allied sciences. The aim of the ASME NI is to advance the art, science, and practice of nanotechnology. The ASME NI is entrusted to carry out ASME activities in nanotechnology and to arrange interdisciplinary programs and activities to bridge science, engineering, and applications. While the ASME NI contributes to the development of nanotechnology, the adoption of nanotechnology in ASME’s scope, in turn, provides the latter with the opportunity to modernize itself. ASME recognizes that
Nanotechnology, being highly interdisciplinary in nature, cuts across major divisions, including heat transfer, fluid engineering, applied mechanics, dynamics and controls, microelectro-mechanical systems (MEMS), and bioengineering, and hence the ASME NI draws representatives from each of these divisions. The activities of the ASME NI are organized through five committees. Each of the committees concentrates on specific activities:

- **Education Committee**: educational infrastructure and delivery in the area of nanoscale science, engineering, and technology.
- **Nanomanufacturing Committee**: manufacturing techniques related to nanotechnology such as synthesis and integration.
- **Devices & Systems Committee**: functional devices and systems that exploit nanoscale phenomena. Systems of interest: energy, information, and biomedical technologies.
- **Nanoscale Phenomena Committee**: fundamental understanding of nanoscale science that could have relevance in engineering: solid/fluid mechanics; heat transfer; thermodynamics.
- **Government/Venture/Social Impact Committee**: foster dialogue and interactions between the science/engineering communities and government, private investment and media.

Any individual, such as faculty, postdoctoral researcher, graduate student, personnel from industry, government, the media interested in any aspect of nanotechnology can become a member of the ASME NI committees. Members have the opportunity to shape ASME NI programs and to offer a collective voice to nano leaders in Washington, through ASME's Government Relations Operations. Since its inception, the ASME NI has been organizing numerous programs related to nanoscience and technology. These include major regular events such as the Integrated Nanosystems Meetings, two-day conferences that bring in participants from research, government, venture and media. Nano Training Bootcamps are also important ASME NI events. The Bootcamps are four-day training programs involving classroom and laboratory sessions.

They are designed to offer a detailed tutorial-based account of advances in fundamentals of nanoscience in different fields, and prospects for translating these advances into practical nanotechnologies. The ASME NI bootstrap topics include nanostructure properties, nanodevices, synthesis of nanostructures, nanostructural characterization, societal impacts, etc. Further ASME NI conferences/meetings organized so far include topics related to applications of nanotechnology in energy, medicine, electronics, and commercialization of nanotechnology. The ASME NI also organizes nanotechnology events overseas with international partners. The ASME NI arranges and participates in meetings with congress members and lawmakers updating them on nanotechnology.

The ASME NI Website provides a one-stop resource for intended researchers and practitioners about ASME nanotechnology activities, as well as links to other sites.

**See Also:** Nanomanufacturing; Nanoscale Science and Engineering; Nanoscale Undergraduate Education Program; Nanotechnology in Manufacturing; Social Movements and Nanoscience; United States.

**Further Readings**


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**Nanotechnology Issues Dialogue Group (UK)**

The Nanotechnology Issues Dialogue Group (NIDG) is a British nanoscience and nanotechnology organization. Its purposes are to coordinate British government activities involving the opportunities and challenges of nanotechnology; provide a platform from which to monitor the government's activities; and ensure that the government's activities and those of Research Councils are integrated with the Nanotechnology Research Co-