

Nanotechnology Frontiers at 20 years of NNI
Proceedings, December 1, 2020
<http://www.nseresearch.org/2020/>

20 Years of Nanotechnology Innovation: Powering the Digitization of Our World

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Abstract

Bold advances in fundamental physics, chemistry, and materials have consistently provided the scientific underpinnings behind the development of innovative processes for manufacturing of novel semiconductor devices. Together with heroic engineering and scaling efforts, they have propelled the development of successive generations of technology for the acquisition, processing, and storage of digital information. The past 20 years exemplified this trend, with nanotechnology research spearheading the extension of Moore's Law past prophecies of its demise.

Tremendous strides in science have also been made using scanning probe methods, enabling the manipulation of matter at the level of single atoms. Here, the ultimate limits of materials, physics and chemistry are being interrogated, and may inspire promising new technological opportunities.

This talk will explore developments in nanoscale science and technology that have transformed the digital world over the past two decades and forecast how today's nanotechnology discoveries are likely to impact the next 20 years.