Nano — a measurement of a billionth of a meter or about the size of a single atom. The letter "I" printed in this sentence is about one million nanometers wide. ... Faculty, staff and students from disciplines across campus will join visitors from academia and industry at the Birck Nanotechnology Center to conduct research and explore the unique features of nanoscale.

Just as antibiotics, the silicon transistor, and plastics affected nearly every aspect of society in the second half of the past century, nanoscale science, engineering, and technology will transform the 21st century. The Birck Nanotechnology Center is advancing the frontiers of nanoscale research.

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[www.purdue.edu/dp/nanotechnology](http://www.purdue.edu/dp/nanotechnology)
The Emerging Field of Nanotechnology

Nanotechnology involves the building of new materials, structures, and devices with dimensions in the range of 1 to 100 nanometers – a range spanning from the diameter of carbon nanotubes through protein molecules to viruses. A sheet of paper is about 100,000 nanometers thick.

The physical properties of nano-size pieces of material differ in fundamental ways from the properties of larger pieces of the same material.

Encompassing nanoscale science, engineering, and technology, the Birck Nanotechnology Center seeks understanding of nanoscale phenomena and the design and manufacture of improved materials, structures, devices, and systems that employ valuable nanoscale properties.

- **Laboratories**
  The Birck Nanotechnology Center includes the Scifres Nanofabrication Laboratory, the William B. and Mary Jane Elmore Advanced Concept Validation Center, the Kevin G. Hall Nano-Metrology Laboratory, and many other laboratories. The facility is comprised of six types of laboratory space.

- **Cleanrooms**
  The fabrication cleanroom provides a particle-free environment for constructing micro- and nano-scale devices. The biological/pharmaceutical cleanroom supports work in biological nanotechnology in a sterile environment. These two cleanrooms are linked, yielding unique nano-bio research capability.

- **Chemistry and Biology**
  In proximity to the cleanrooms and the Bindley Bioscience Center, these labs facilitate the handling, preparing, and processing of experimental materials and apparatus for nanoscale chemistry and biology research.

- **Epitaxy**
  In these labs crystals are grown one atomic layer at a time, enabling precise layer-by-layer construction of new materials and devices.

- **Metrology**
  These labs allow investigators to perform physical measurements on nanoscale materials and devices at dimensions as small as a fraction of an atom's diameter.

- **Instructional**
  The instructional laboratories provide space for training undergraduate and graduate students in state-of-the-art nanotechnology.

- **Incubator**
  The nanotechnology incubator lab provides a site to support and conduct technology transfer and entrepreneurship.

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