

## From Vision to Action

In 1959, Nobel laureate Richard Feynman delivered a talk to the American Physical Society titled “There’s Plenty of Room at the Bottom—An Invitation to Enter a New Field of Physics” (available at <http://www.its.caltech.edu/~feynman/plenty.html>). In this talk, he discussed the opportunities and promises of manipulating and controlling things on a very small scale, outlining what was to become the field of nanotechnology. And he talked about how interesting it would be to explore this nanoscale world.

In the course of his lecture, Feynman made this prediction: “In the year 2000, when they look back at this age, they will wonder why it was not until the year 1960 that anybody began seriously to move in this direction.”

But there’s a simple reason people didn’t immediately begin working at the nanoscale. They didn’t have the tools.

The scanning tunneling microscope and the atomic force microscope were the two most important tools at the beginning of the nanoscale revolution, but now there’s an expanding toolkit of devices used to observe, measure, and manipulate nanoscale structures. And as we learn more about the nanoscale world, we’ll be able to make even better tools.