



# The traxSTM

## A Scanning Tunneling Microscope for Hands-on STEM and Nanotechnology Education



“The STM gives students an opportunity to **visualize** the quantum mechanical concepts they learn about in lectures.”

Dr. J. Batteas, Texas A&M University

### Features and Benefits

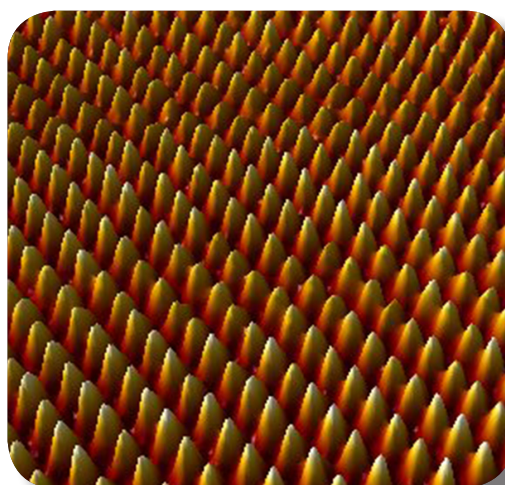
- Explore at the atomic level
- Robust all-in-one design
- Easy to use
- Simple tip and sample exchange
- Integrated controller, airflow shielding, and vibration isolation
- User-friendly software
- Operate in constant current or constant height mode

### The traxSTM Scanning Tunneling Microscope

Expand your classroom into the quantum world with the Nanoscience Instruments traxSTM. The traxSTM is the ideal scanning tunneling microscope (STM) for introduction to physics, chemistry and nanoscience. Our STM combines ease of use with imaging performance to give students a hands-on experience to view the atomic scale world.

The traxSTM integrates control electronics with the scanner, reducing the instrument footprint and overall size of the system. Our traxSTM is an all-in-one STM that is easy to use anywhere.

The traxSTM fits into advanced labs for physics, chemistry, engineering and general nanotechnology introduction. High schools, community colleges, and universities use the system for classroom instruction and teaching laboratories.



Visualize local density of states for carbon atoms by imaging HOPG with STM  
Scan size: 5 nm

## The traxSTM for Nanotechnology Education and Outreach

### An STM for Your nanoScience Classroom

The traxSTM is ideal in the classroom setting. The system has a robust design with simple connection to a PC. No other setup is required. The traxSTM is vibrationally stable and does not need additional infrastructure. The user interface is student-friendly for ease of use in the classroom laboratory.

### Measure Atomic Steps

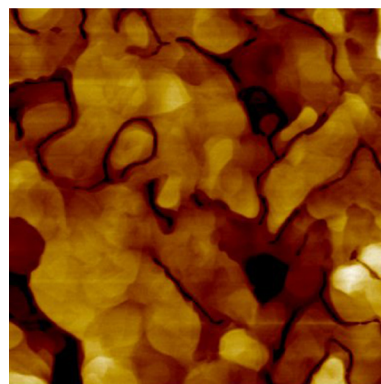
In addition to imaging carbon atoms in highly oriented pyrolytic graphite (HOPG) or graphene, STM can measure atomic steps. Use the traxSTM to investigate step heights and localized defects on gold, graphite or other smooth surfaces.

### Investigate Surface Chemistry and Physics

The traxSTM can image self-assembled monolayers like alkanethiols. Such samples are easy to prepare and image with molecular resolution. Investigating the integrity and assembly of thin organic films is a quick study with the traxSTM.

### Teach Quantum Mechanics

Demonstrate the dependence of current on distance or voltage with tunneling spectroscopy. The tunneling current depends exponentially on the distance between the tip and sample. Barrier height can be calculated using current-distance data. Current vs voltage spectroscopy data can also be acquired.

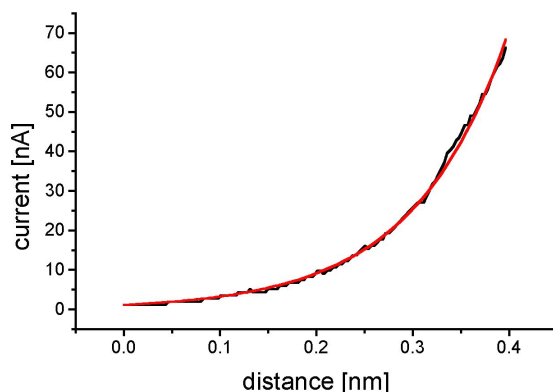
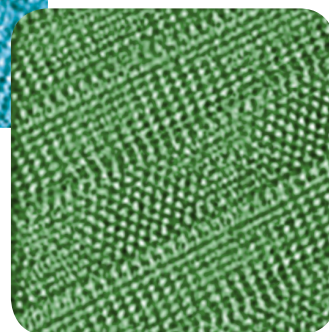


Gold on mica. Island dimensions and step heights can be measured with traxSTM  
Scan size: 10  $\mu\text{m}$



Organic layer of  
dotriacontan on HOPG  
Scan size: 13 nm

Octadecanol on HOPG  
Scan size: 16 nm



Current vs distance curve for  
scanning tunneling spectroscopy



Nanoscience Instruments provides surface science, microscopy and nanotechnology solutions to customers in academia, research, and industrial markets. Our customers benefit from our products' ease of use, user-friendly interface, and low cost of ownership. Our team of scientists and engineers have backgrounds in chemistry, biochemistry, materials science, physics, and engineering in a diverse combination to provide support and service to help our customers find the solutions they need.