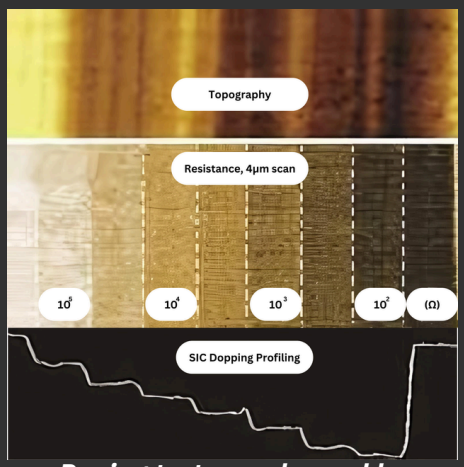
ResiScope III™
Advanced Electrical Measurements for AFM

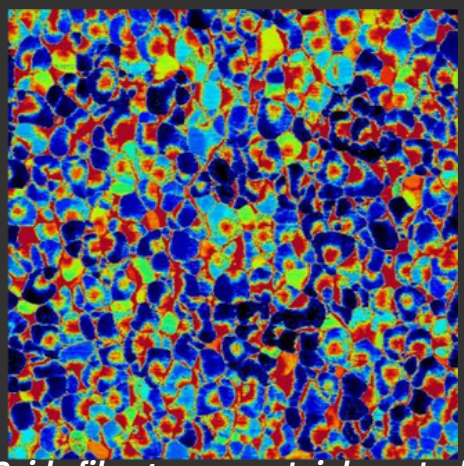
ResiScope III™ represents the pinnacle of electrical measurement technology for Atomic Force Microscopy (AFM). This cutting-edge module for the Nano-Observer II AFM offers unparalleled range and sensitivity in resistance and current measurements, revolutionizing nanoscale electrical characterization. ResiScope III provides quantitative results of local electrical properties across an exceptionally wide range, making it an indispensable tool for various fields of research and development.

Key Features and Advantages

- **Wide Measurement Range:** ResiScope III operates across an unprecedented range, measuring resistance from 10^2 to 10^{12} ohms and current from 100 fA to 1 mA in a single module.
- **Fast Auto-Ranging:** Processor-driven auto-ranging allows for real-time adjustment of the measurement range, enabling accurate measurements across diverse sample conductivities without manual intervention.
- **Real-Time Current Control:** Active current control prevents sample damage and ensures measurement accuracy, especially crucial for sensitive or delicate samples.
- **High Sensitivity:** Maintains high sensitivity across the full measurement range, ideal for characterizing a wide array of materials from highly conductive to near-insulating.
- **Versatile Compatibility:** Works with various AFM modes including contact, oscillating, and spectroscopy modes. Can be combined with other advanced techniques like HD-KFM and MFM/EFM for comprehensive sample analysis.
- **Simultaneous Measurements:** Captures topography and electrical properties simultaneously, allowing for direct correlation between physical structure and electrical characteristics.

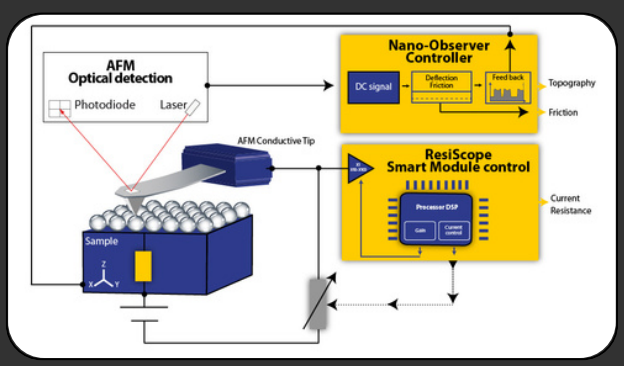


Doping test sample used by semiconductor industry to improve doping concentration process

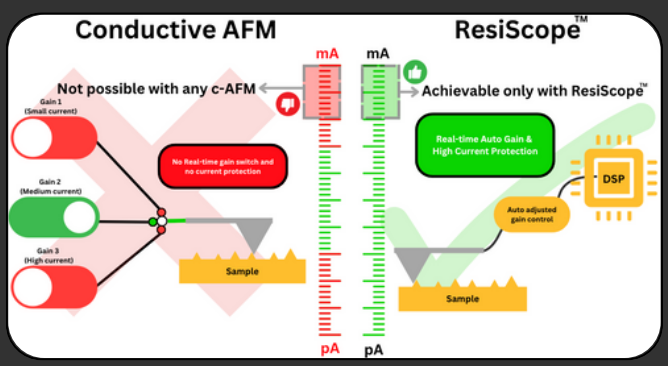


Oxide film grown on stainless steel Scan Size:1x1 micron

Schematics



C-AFM vs ResiScope



Nano-Observer II ResiScope III™

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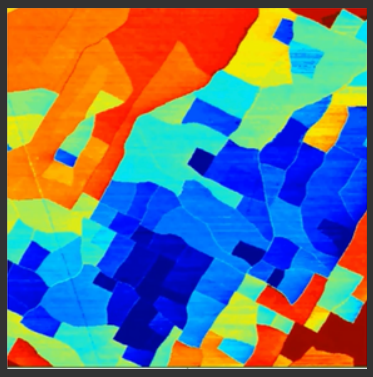
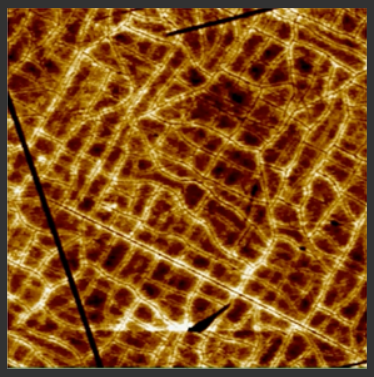
CSI Concept Scientific Instruments

Application fields & Results

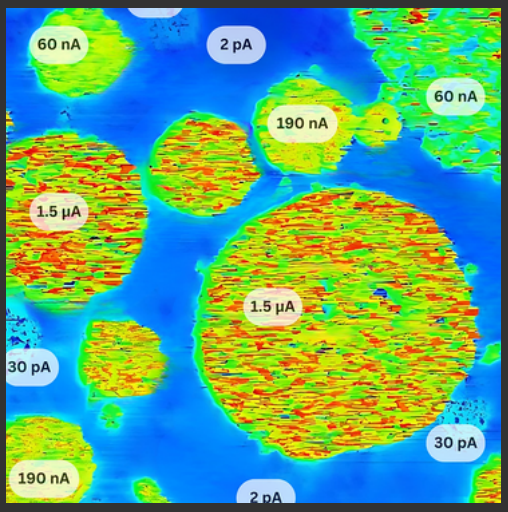
Inorganic Materials



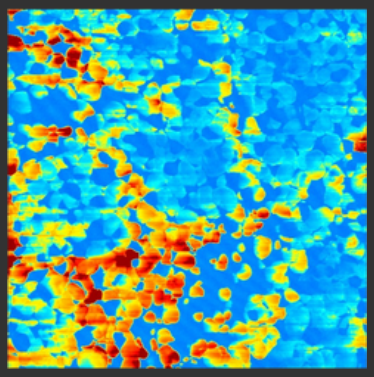


The 10 µm scan of a VO_2 sample shows surface features such as grain boundaries in the topography, while the current map reveals variations in conductivity. These maps highlight VO_2's phase transition behavior, offering insights into its electrical properties crucial for electronics and energy applications.

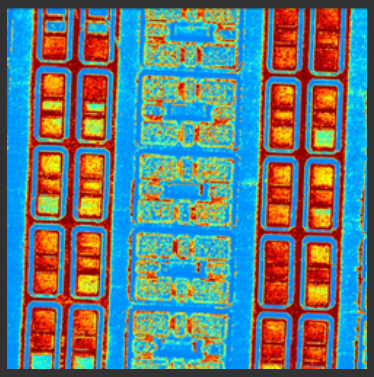
Energy



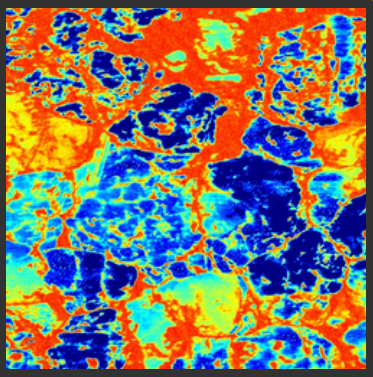
A 60x60 µm ResiScope scan on battery material revealed varied conductivity levels from pA to µA. This precision highlights the ResiScope's effectiveness in identifying microscale electrical variations, essential for enhancing battery technology and performance. The scan illustrates distinct regions with varying electrical conductivity, providing critical insights into the pathways of electron flow and identifying areas of potential failure due to high resistance.



Semiconductors
Grains structure
5x5 µm scan



Microelectronics
SRAM sample
50x50 µm scan



Solar Cells
Perovskite sample
2x2 µm scan