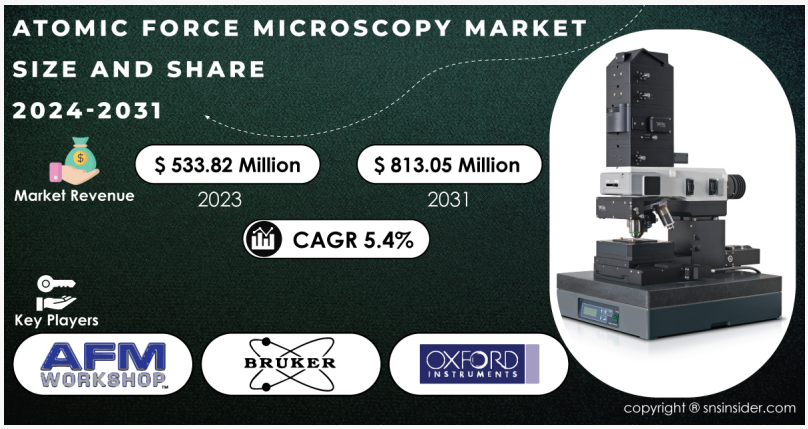
Atomic Force Microscopy Market to Cross USD 813.05 Million by 2031, Due to Demand for Advanced Microscopy Techniques

Atomic Force Microscopy Market Size, Share, Growth Drivers and Regional Analysis, Global Forecast 2024 - 2031



Atomic Force Microscopy Market Size and Growth Report

AUSTIN, TEXAS, UNITED STATES, June 11, 2024 /EINPresswire.com/ -- According to the SNS Insider report, the atomic force microscopy market size stood at USD 533.82 million in 2023. Over the forecast period of 2024-2031, it is expected to grow at a healthy Compound Annual Growth Rate (CAGR) of 5.4%. This growth signifies a rising demand for AFM technology across Various sectors.

Growing Demand Driven by Technological Advancements

AFM is a powerful technique that enables high-resolution imaging and characterization of various materials, including polymers, ceramics, composites, and biological samples. It goes beyond imaging, measuring and localizing forces such as adhesion strength, magnetic forces, and mechanical properties. This versatility makes AFM a critical tool in numerous fields. The Increasing demand for high-resolution microscopy in biology and pharmaceuticals is a major driver for the AFM market. Increased research and development activities in life sciences, particularly in bioprocessing, agriculture, energy, and medicine, are Drive the adoption of AFMs. The development of 3D integrated circuits in telecommunication and semiconductor applications, coupled with growing investments in nanotechnology, presents lucrative opportunities for market vendors. The complexity of AFM instrumentation Creates a challenge. Skilled personnel are required to operate and interpret data from these advanced microscopes. A survey by the National Association for Business Economics (NABE) revealed that 35% of participating economists reported a shortage of skilled professionals in the US, potentially hindering the widespread adoption of AFM technology.

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KEY PLAYERS:
- Bruker
- Oxford Instruments
- NanoMagnetics Instruments
- AFM Workshop
- Concept Scientific Instruments
- Park Systems
- Hitachi High-Tech
- Nanonics Imaging
- Semilab
- Nano Scan Technologies

Recent Developments

-In October 2022, Oxford Instruments Asylum Research introduced a new high voltage accessory for its Jupiter XR AFM, enabling nanoscale time-dependent dielectric breakdown (nanoTDDB) measurements.
-Park Systems (South Korea) unveiled the groundbreaking Park FX40 in June 2021, the first fully autonomous atomic force microscope capable of performing all setup and scanning processes independently.
-In March 2023, Park Systems AG, a leading provider of nano-metrology solutions, launched the Park NANOstandard product line.

KEY MARKET SEGMENTS:

BY TYPE
- Research Grade AFM
- Industrial Grade AFM

by type, the Industrial-grade AFM segment is anticipated to exhibit a higher CAGR during the forecast period. This dominance can be attributed to the superior precision offered by industrial AFMs compared to research-grade ones. They excel at detecting and visualizing even the most minute surface structures, which is Important for quality control in various industries. For example, the semiconductor industry heavily relies on AFMs for quality control and imaging of silicon-integrated circuits.

BY OFFERING
- Probes
- Atomic Force Microscopes
- Software

by Offering, An atomic force microscope is a highly versatile and potent tool for examining samples larger than nanoscales. Its ability to produce three-dimensional topographical images caters to diverse needs across scientific and engineering fields. It provides high-resolution imaging at the atomic level with minimal sample preparation, offering crucial height information at the Angstrom scale. Additionally, AFMs can determine various material properties, including friction, electrical force, capacitance, magnetic force, conductivity, viscoelasticity, surface potential, and resistance.

BY APPLICATION
- Material Science
- Life Sciences
- Academics
- Semiconductors and Electronics
- Others

Impact of Global Disruptions

Russia-Ukraine War led to price fluctuations of critical materials used in AFM manufacturing. This can potentially impede market growth in the short term. A global economic slowdown can lead to reduced research and development budgets, impacting the demand for advanced microscopy techniques such as AFM. However, the long-term growth potential of the market remains promising.

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Regional Developments

North America currently holds the dominant revenue share in the global AFM market. However, the Asia Pacific (APAC) region is expected to witness the fastest growth rate due to factors such as Growing government support for nanotechnology research in countries Such as China, Japan, and India is Drive the adoption of AFM in these regions. The burgeoning industrial sector in APAC creates a high demand for quality control and material characterization, propelling the use of AFM technology.

Key Takeaways

- The report highlights the growing demand for AFM across various sectors, including semiconductors, life sciences & pharmaceuticals, nanotechnology, and high-resolution microscopy.
- The industrial-grade AFM segment is projected to experience the highest growth rate due to its superior precision in detecting minute surface structures, crucial for quality control in industries like semiconductors.

• The rise of 3D integrated circuits and increasing investments in nanotechnology research present lucrative avenues for AFM vendors.
• The development of user-friendly, autonomous AFMs such as the Park FX40 can address the skilled workforce challenge and broaden market reach.
• North America currently dominates the market however, the Asia Pacific (APAC) region is anticipated to exhibit the fastest growth.

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