

## SPM characterization of large samples

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Asylum Research, a division of Oxford Instruments and a manufacturer of the quietest AFM in the market, Cypher™, has introduced a novel instrument – **Jupiter XR**, the first and only large-sample AFM to offer both high-speed imaging and extended range in a single scanner. The novel instrument provides complete 200 mm sample access and delivers higher resolution, faster results, a simpler user experience, and the versatility to excel in both academic research and industrial R&D laboratories.

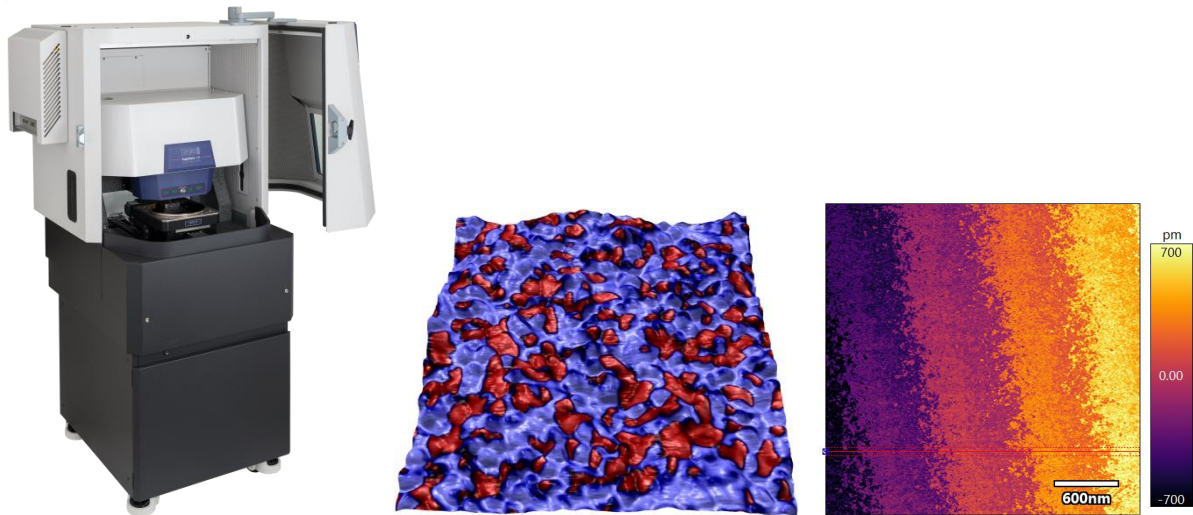


Figure 1. (Left) General view of Jupiter XR AFM; (Center) DART PFM image of a sol-gel piezoelectric film; (Right) Detailed AFM image of a SiC wafer surface with  $\approx 500$  pm steps.

The instrument offers higher resolution than any other large-sample AFM currently available in the market and implements the exclusive blueDrive tapping mode to improve the stability and ensure longer tip times, even with fast scanning. It also features a fully motorized laser and detector setup, sharp diffraction limited top-view optics to help locate precise regions of interest, and allows going from atomic resolution to large  $100 \mu\text{m}$  scans in any imaging modes. The concept of modular design implemented in this instrument makes it fast and simple to add accessories and future upgrades. Multisite imaging can be fully automated for both real-time measurements and subsequent offline analysis.

Jupiter XR has the lowest noise floor (below 25 pm) of any large-sample AFM and allows the researchers to routinely capture images in under 1 minute, at least 5x faster than most other AFMs. The instrument features unique LVDT position sensors that are inherently linear and never require recalibration. Low-noise X-Y sensors enable distortion-free closed-loop imaging, while ultra-low-noise Z sensor ( $<35$  pm noise) makes measurements more accurate and repeatable.

The basic instrument configuration includes multiple scanning, nanomechanical, nanoelectrical and electromechanical modes (over 40 various modes).