

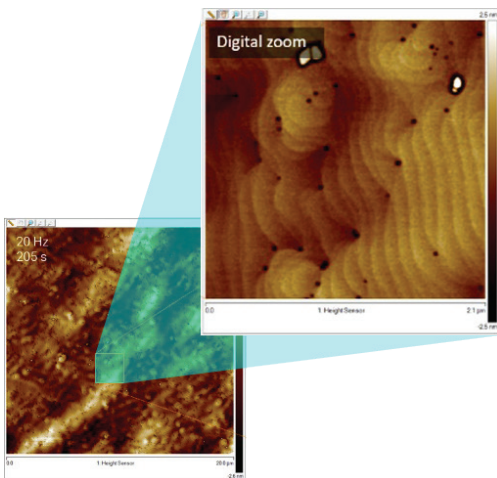
ATOMIC FORCE MICROSCOPY

FastScan Probes

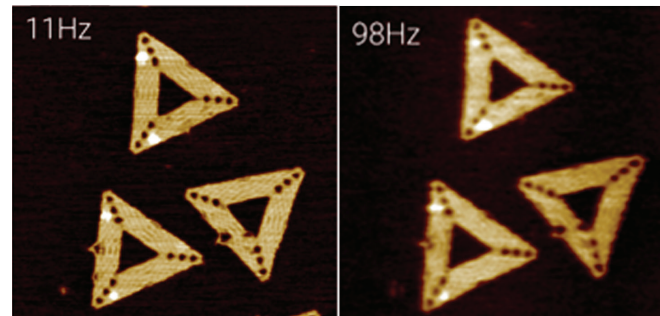
Quality Data Collection at Extremely High Imaging Speeds

FastScan® probes are specifically for high imaging speeds in air and fluid. Primarily designed for the Dimension FastScan AFM, they can also be used on other AFM systems with small laser spot sizes. They deliver extreme imaging speed without loss of resolution or force control. With the ability to perform order of magnitude faster scans than with conventional probes, these probes provide users with more high-quality data at a considerably faster rate, with little added operational cost. FastScan probes also take the fullest advantage of the FastScan AFM system's capabilities in a wide variety of advanced applications.

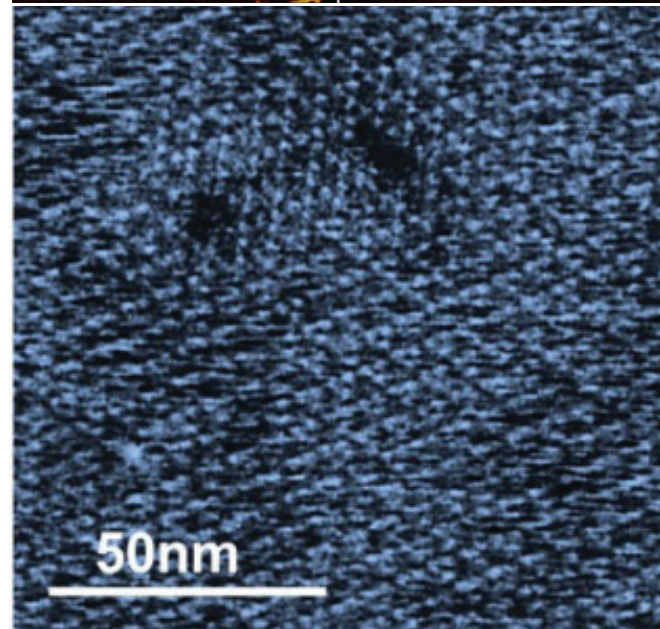
GaN on SiC was imaged using FastScan-A at a 20 Hz line rate for a 4K pixel image. The acquired image clearly shows even the atomic terraces and dislocations.



DNA origami triangles were imaged in liquid with a FastScan-D probe at up to 98 Hz line rate. Sample courtesy of Dr. Lulu Qian (Caltech).



Bacteriorhodopsin was imaged in fluid using FastScan-C and PeakForce Tapping® mode with 8 kHz frequency, 2 nm amplitude, and a 9 Hz line rate.



Choose the Right FastScan Probe for Your Requirements

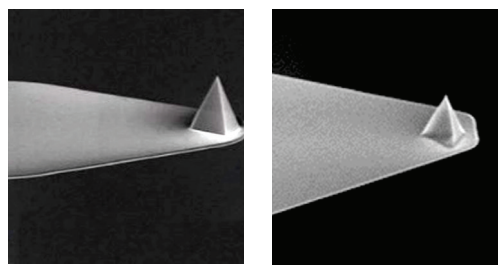
There are four different primary probe geometries for the FastScan line. All are manufactured with a reflex coating to ensure optimal laser reflectance while maintaining $<3^\circ$ cantilever bend.

FastScan-A utilizes a novel 27 μm triangular SiN cantilever length to achieve a 1400 kHz resonant frequency with only a 17 N/m force constant. This frequency and medium spring constant combined with a 5 nm tip radius make it ideal for imaging a wide variety of hard and soft samples in air. FastScan-A is Al-coated, and FastScan-A-G is Au-coated.

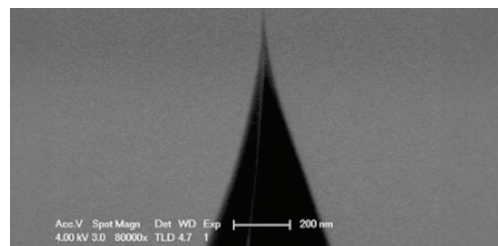
FastScan-B is designed for imaging in air or fluid and is Au reflex-coated. It utilizes a 30 μm triangular SiN cantilever to achieve a 450 kHz resonant frequency with a 1.8 N/m force constant. It has a sharp 5 nm tip radius and is also available in a supersharp variant (FastScan-B-SS) with a 1 nm tip radius for highest resolution.

FastScan-C is designed for operation in fluid, with a 5 nm tip radius that enables high-resolution imaging. It has a 40 μm long triangular Au reflex-coated cantilever to achieve a 300 kHz resonant frequency with only a 0.8 N/m force constant.

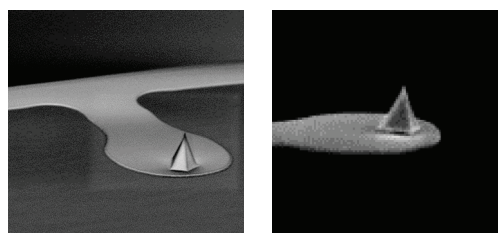
FastScan-D is also designed for use in fluid and has a supersharp (1 nm) variant on the standard 5 nm tip radius. It has a unique paddle-shaped Au reflex-coated cantilever that provides a balance of high resonant frequency (110 kHz in fluid) and low spring constant (0.23 N/m), enabling imaging of the most fragile biological samples without deforming them.



FastScan-A/B/C probes have a triangular cantilever.



The supersharp FastScan probe variants (FastScan-B-SS and FastScan-D-SS) have a 1 nm tip radius.



FastScan-D probes have a unique paddle-shaped cantilever.

FastScan Probe Specifications

Tip	
Material	Silicon
Type	Pyramidal
ROC	5 nm (1 nm for B-SS and D-SS)
Height	2.5–8 μm (1.5–4.5 μm for D)
Front Angle	15°
Back Angle	25°
Side Angle	17.5°

Cantilever Options

	FastScan-A	FastScan-B	FastScan-C	FastScan-D
Material	SiN	SiN	SiN	SiN
Frequency (kHz)	1400	450	300	110 (in fluid)
Length (μm)	27	30	42	16
Width (μm)	33	33	40	4
Spring Constant (N/m)	18	1.8	0.8	0.25
Thickness (nm)	580	300	300	145
Reflex Coating	Al (Au available)	Au	Au	Au

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