

ATOMIC FORCE MICROSCOPY
NANOWIZARD® PURE

Streamlined design for imaging and nanomechanical analysis
Seamless combination with advanced optical techniques

NanoWizard PURE Performance in its Essence

Renowned Quality

Bruker's **NanoWizard® PURE** atomic force microscope combines functionality and performance in a high-value instrument. Based on the renowned NanoWizard technology platform, it delivers high-resolution imaging and nanomechanical analysis capabilities that can be seamlessly combined with advanced optical microscopy techniques.

NanoWizard PURE delivers state-of-the-art functionality:

- Unique 3D tip-scanning with capacitive sensor technology
- PeakForce Tapping® and QI modes for high-resolution imaging and advanced force control on delicate samples
- Intuitive operation and automated routines, analysis, and data processing capabilities provided by latest V8 software environment

“ NanoWizard PURE is a powerful system that can be seamlessly integrated with optical techniques. Its versatility makes it ideal for the routine and advanced nanomechanical analysis of our samples as diverse as hydrogels, soft tissues, bone, and exoskeletons. ”

Asst. Prof. Meisam Asgari

University of South Florida, Tampa, USA

Unrivalled Excellence in its Class

Equipped with innovative hardware and software features, the NanoWizard PURE is ideal for laboratories wishing to expand their research capabilities with cutting-edge correlated microscopy techniques, whether for experienced users or those new to AFM.

The unparalleled modularity of the NanoWizard platform provides outstanding versatility. Its easy handling and user-friendliness make it ideal for multi-user imaging facilities.

- Discover attractive default configurations for biological and standard applications that offer best value solutions and capabilities
- Keep abreast of technological advances with new modules and features that match your research requirements
- Upgrade paths to Bruker BioAFM premium NanoWizard product lines

Superior Flexibility

NanoWizard PURE provides innovative research capabilities across a range of scientific fields, from the investigation of highly delicate biological samples, living cells, single molecules, and tissues, to the quantification of nanomechanical properties and study of polymers, soft matter, and advanced materials.

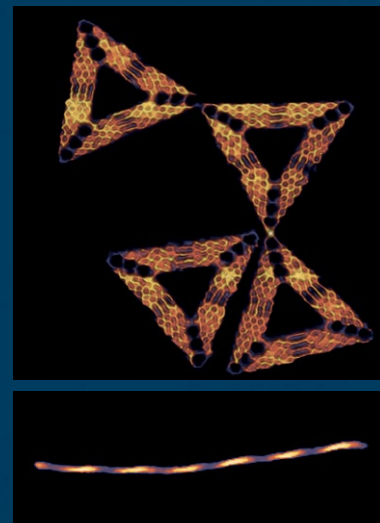


Image top

DNA nanostructures imaged with PeakForce Tapping in buffer using Bruker PEAKFORCE-HIRS-F-B probe.

Scan size: 300 nm × 300 nm
Height range: 2 nm

Image middle

PeakForce Tapping image of amyloid fiber A β (1-42) on mica in PBS with Bruker FASTSCAN-D probe.

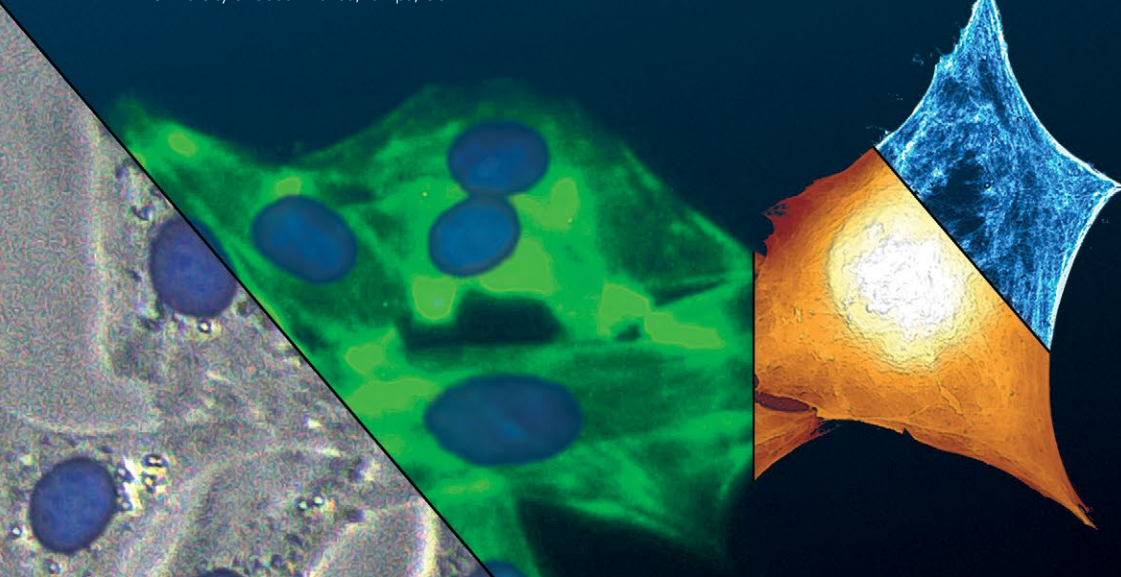
Scan size: 650 nm × 240 nm
Height range: 10 nm

Image bottom

Correlated QI and optical images of live 3T3 fibroblast cells in cell culture medium at 37°C. Cell nuclei and actin fluorescently labelled with Hoechst 33342 and CellMask™ Green Actin Tracking, respectively. DirectOverlay semi-transparent superimposition of fluorescence images with optical phase contrast and QI scan.

Scan size: 50 μ m × 70 μ m
Height range: 4 μ m (brown)
Young's modulus range: 20 kPa (blue)

Sample courtesy of Dr. Wedepohl, Freie Universität Berlin, Germany.



Outstanding Versatility and Range of Accessories

Maximum Functionality

An extensive choice of modes, add-ons, and accessories provide additional capabilities over a wide variety of applications. NanoWizard PURE can be seamlessly combined with advanced optical techniques, such as confocal and super-resolution microscopy, and structured illumination techniques (SIM) for precise correlated measurements and enhanced analysis capabilities.

NANO WIZARD PURE

Explore a broad spectrum of features and options, such as:

- Extensive optical integration options, e.g., DirectOverlay 2, DirectTiling, and accessories for operation on inverted optical microscopes
- PeakForce QNM® and QI advanced options for quantitative nanomechanical analysis
- Force spectroscopy ramp designer
- ExperimentPlanner
- Nanolithography and Nanomanipulation
- MFM, EFM
- Latest ease-of-use features

Enhanced Adaptability

NanoWizard PURE can be customized to meet the specific demands of individual users, samples, and applications. It is ideal for interdisciplinary research facilities and collaborative scientific environments. Extend your research capabilities with options, such as:

- Kelvin Probe Microscopy
- Conductive AFM
- Piezoresponse Force Microscopy
- Cytosurge FluidFM® technology
- Contact Resonance AFM
- Scanning Tunneling Microscopy
- Scanning Thermal AFM
- Electrochemistry and SECM with temperature control and full optical access
- Micropipette capabilities

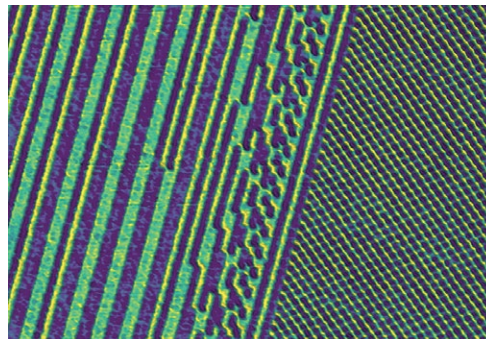


Image left

Piezoresponse Force Microscopy (PFM) of a ferroelectric polymer thin film (P(VDF-TrFE)) on a gold back electrode on silicon. A sequence of voltage pulses was generated from a bitmap template (black = +20 V, white = 0 V) to write the logo into the piezoelectric polarization of the sample. Scan size: 45 μm \times 10 μm Vertical PFM-amplitude range: 150 pm

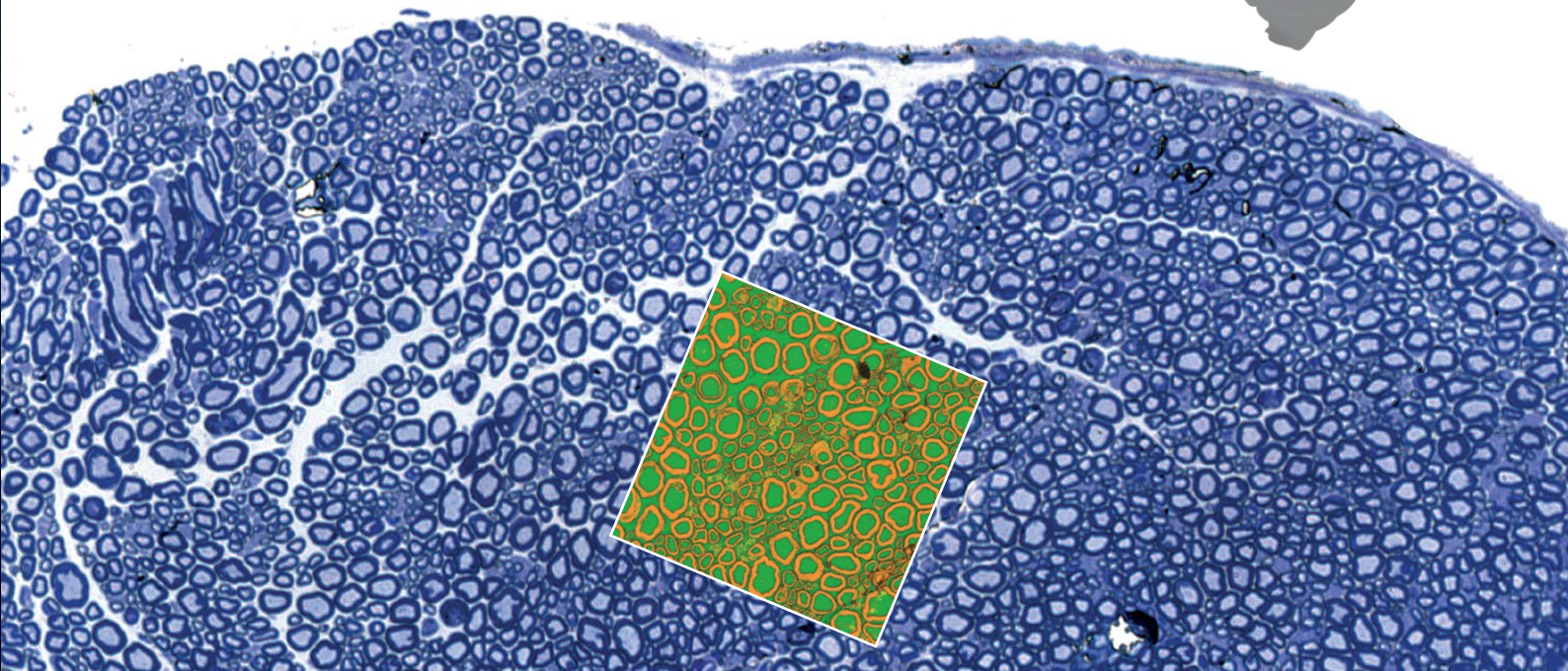
Images middle

Magnetic Force Microscopy (MFM) scan of different magnetic domain patterns on a hard disc close to an intersector gap. Scan size: 8.5 μm \times 5.8 μm MFM phase range: 2 deg

Image bottom

Stained peripheral nerve tissue from Mus musculus. DirectTiling of optical images superimposed with QI scan using DirectOverlay. Scan size: 100 μm \times 100 μm Height range: 50 nm Sample courtesy of Dr. Macgregor-Fairlie, Charité Berlin, Germany, & R. Doherty and C. Griffiths, University of Southampton, UK.

New easy to use cantilever holder with hinge clip option, biocompatible and multi-compartment compatible





NanoWizard PURE AFM Specifications

System specifications	<ul style="list-style-type: none"> • 3D tip-scanning, stand-alone system, rigid low-noise design, and drift-minimized mechanics • SPM Controller PURE, based on Vortis 2 • Atomic lattice resolution on inverted microscope, in closed-loop 	<ul style="list-style-type: none"> • Liquid-safe AFM with integrated vapor barrier, specialized encapsulated piezo drive • 100×100×15 μm³ scan range with closed-loop scan control in all axes using capacitive sensors
Software V8	<ul style="list-style-type: none"> • Fully automated sensitivity and spring constant calibration using thermal noise or Sader method • Powerful batch processing of force curves and images, including WLC, FJC, step-fitting, JKR, DMT model, and other analysis methods • User guidance, ideal for multi-user imaging facilities 	<ul style="list-style-type: none"> • DirectOverlay 2 option for combining optical and AFM datasets • Powerful Data Processing (DP) with full functionality for data export, fitting, filtering, edge detection, 3D rendering, FFT, cross section, video creation etc.
Stages and sample holders	<ul style="list-style-type: none"> • Stages available for all major inverted optical microscope manufacturers, e.g., Zeiss, Nikon, Evident/Olympus, and Leica • Motorized Precision Stage with 20×20 mm² travel range, with joystick and/or software control • Manual Precision Stage with 20×20 mm² travel range 	<ul style="list-style-type: none"> • Holders for petri dishes, coverslips, microscope slides, and metal SPM discs • Large Ø140 mm free sample area, up to 13 mm sample height (16 mm in petri dish, 21 mm with extender, and 121 mm with Head-Up stage options)
Widest range of accessories and probes (see accessories handbook)	<ul style="list-style-type: none"> • Numerous temperature and environment control options (ambient, liquid, and gas) and liquid cells (also for aggressive solvents) 	<ul style="list-style-type: none"> • Complete range of probes for all operating modes • Vibration and acoustic isolation from leading suppliers
Optical configurations	<ul style="list-style-type: none"> • Simultaneous AFM operation with commercially available transmission optical modes, e.g., brightfield, optical phase contrast, and DIC using standard condensers • Combination of AFM with advanced commercial confocal microscopes and fluorescence techniques, e.g., FCS, FRET, TIRF, FLIM, FRAP, STED, STORM/PALM, SIM, and more 	<ul style="list-style-type: none"> • Large range of cameras supported • Upright Fluorescence kit for combination of AFM with upright optical fluorescence microscopes • TopViewOptics – video optics for opaque samples with 12× zoom • BioMAT option for combination of AFM with high-NA upright fluorescence optics for investigation of opaque samples
Standard Operating Modes	<ul style="list-style-type: none"> • Contact mode with lateral force microscopy (LFM) • TappingMode™ with PhaseImaging™ • PeakForce Tapping and QI Imaging modes • Static and dynamic force spectroscopy 	<ul style="list-style-type: none"> • Force Mapping • ExperimentControl feature for remote monitoring of experiments • MFM and EFM
Optional Modes	<ul style="list-style-type: none"> • Advanced spectroscopy mode with various customised ramp designs • QI Advanced mode for quantitative data, ideal for soft samples • PeakForce QNM • ScanAsyst® for automated adjustments in PeakForce Tapping • SmartMapping • Microrheology in CellMech Package • Kelvin Probe Microscopy • ExperimentPlanner for customized design of experiment workflow, including control of external equipment • Conductive AFM 	<ul style="list-style-type: none"> • Electrochemistry & Scanning Electrochemistry with temperature control and full optical access • NanoLithography and NanoManipulation • Piezoresponse Microscopy (PFM) • STM • Cytosurge FluidFM technology • NanoIndentation • Scanning Thermal AFM • Electrical spectroscopy modes • QR code reader for improved cantilever handling and management



Selected Publications using NanoWizard PURE predecessor systems:

1. Louros et al., Local Structural Preferences in Shaping Tau Amyloid Polymorphism. *Nat Commun* 2024, 15 (1), 1028.
2. Desroches et al., Biphasic Nanocomposite Films of Polypyrrole and Poly(3,4-Ethylene Dioxathiophene) Using a Surface-Tethered Dopant Strategy. *Electrochimica Acta* 2024, 489, 144227.
3. Newman et al., Programming of Multicellular Patterning with Mechano-Chemically Microstructured Cell Niches. *Adv. Sci.* 2023, 10 (15), 2204741.
4. Zhang et al., Mechanistic Formulation of Inorganic Membranes at the Air-Liquid Interface. *Nature* 2023, 616 (7956), 293–299.
5. Nekoie Marnany et al., Glucose Oxidation Drives Trunk Neural Crest Cell Development and Fate. *J. of Cell Sci.* 2023, 136 (16), jcs260607.

Visit www.bruker.com/bioafm/nanowizard-pure for more literature.

NanoWizard PURE Bio (right) and Standard (left) configurations at attractive rates – see price list (Bio configuration shows optional accessories)

JPK BioAFM Business Nano Surfaces and Metrology Division Bruker Nano GmbH

Am Studio 2D · 12489 Berlin, Germany
tel.: +49 30 670990 7500 · fax: +49 30 670990 30

www.bruker.com/bioafm

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