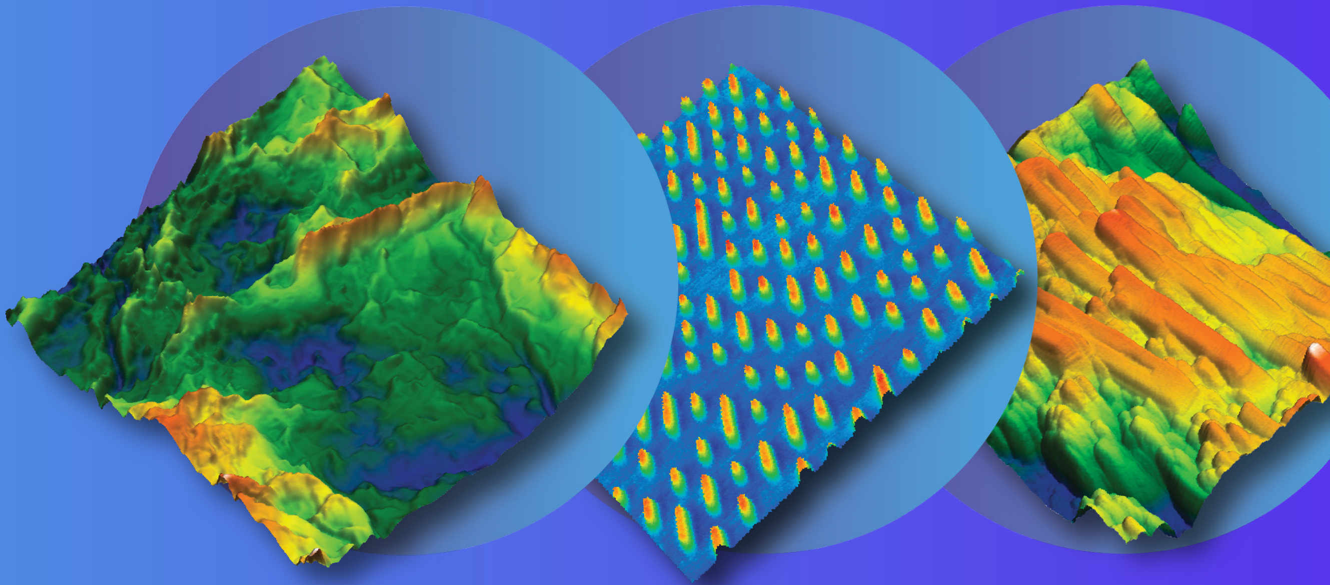
icspi

3D nanoscale images in 3 clicks

Capture 3D images with 1,000,000x magnification on your benchtop with the nGauge AFM



icspicorp.com sales@icspicorp.com

Our Mission

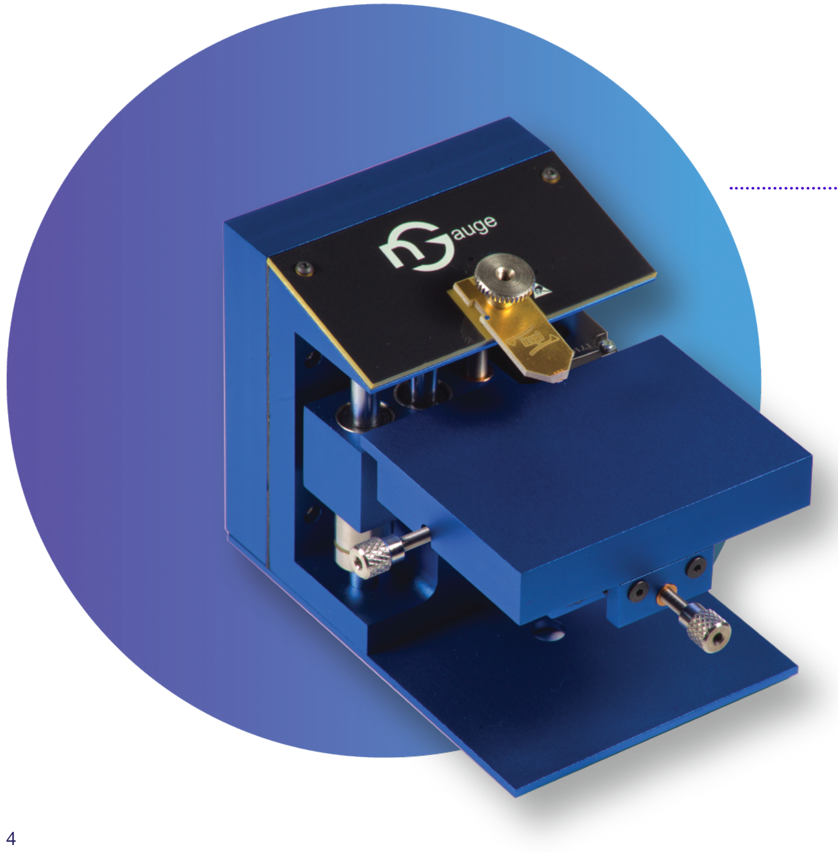
ICSPI is on a mission to bring robust, easy-to-use, nanoscale metrology to your benchtop.

"I can attest that this technology is extremely reliable and can produce images that rival much larger and more expensive AFM systems."

Professor Michael Cullinan
University of Texas at Austin, USA

What we do

ICSPI designs, manufactures and sells atomic force microscopes (AFMs) for research, industry and education. We push the limits of what is possible in nanoscale metrology with our team of engineers of the highest calibre working on our patented CMOS-MEMS technology. ICSPI is headquartered in Kitchener-Waterloo, Ontario, Canada.



nGauge AFM

- ✓ Fast
  Collect data in 2 minutes
- ✓ Easy to use
  Scans in 3 clicks
- ✓ Benchtop
  System weighs 500 g

Our Story

ICSPI was founded in 2007 with the goal of bringing robust, easy-to-use, nanoscale metrology to everyone. Although technology continues to shrink faster than ever, nanoscale imaging has remained relatively inaccessible. Frustrated by the poor versatility, complexity and high costs of traditional nanoscale imaging systems, ICSPI sought to revolutionize nanoscale imaging and bring the technology to every laboratory, student and researcher.

After nearly 10 years of research and development at the University of Waterloo, Canada, with funding from DARPA and the Ontario Research Fund, ICSPI commercialized the world's first single-chip atomic force microscope (AFM). Launched in 2017, our flagship product—the nGauge AFM—has reset the expectations for AFM and nanoscale metrology: all of the scanners and sensors have been integrated onto a single 1 mm x 1 mm MEMS chip, dramatically simplifying the operation of nanoscale metrology instruments.

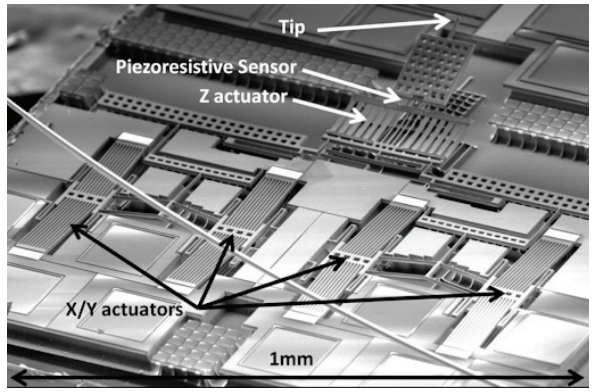
The nGauge AFM is trusted by researchers, scientists and engineers at universities, government institutes, and by companies of all sizes, from startups to the largest companies in the world. The nGauge is also used by educators for teaching the next generation of students from high school to graduate school in over 30 countries.

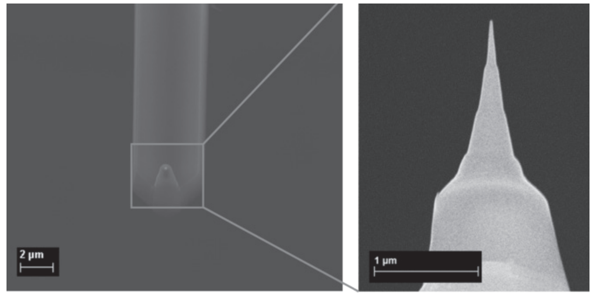
Patented AFM-on-a-chip Technology

AFM-on-a-Chip

The nGauge AFM is a laserless system: the integrated piezoresistive sensor allows for alignment-free operation and a fully automatic approach – so you can collect your data effortlessly.

All of the sensors and scanners of traditional AFM instruments have been integrated onto a single 1 mm x 1 mm chip.





> “We have been blown away by its performance, ease of use and portability. The tool easily saves us several thousand dollars a month in AFM usage fees at third-party labs.”

Dr. Michael Helander, CEO
OTI Lumionics, Canada

Long Lifetime

ICSPI AFM tips are made of hard, durable materials like diamond-like carbon and aluminum oxide, with 1000+ scan lifetime.

nGauge Specifications

Scanning

Scan types	Topography, Phase
Min scan size	300 nm × 300 nm
XY scanner resolution	<0.5 nm
Vertical scan range	10 µm
Noise floor	<0.5 nm

Resolution and Speed

Quick scan	16 sec
Routine scan	80 sec
High-resolution scan	5 min
Max resolution	1024 × 1024 pixels

Samples

Max sample size	100 mm × 50 mm × 12 mm
Max sample weight	1 kg

XY Stage (Optional accessory)

Sample Positioning Range (XY)	± 6.0 mm (X), ± 5.0 mm (Y)
Sensitivity	<1 µm

Optical Microscope (Optional accessory)

FOV	1 mm × 0.75 mm
Resolution	2560 × 1920 QHD Video output
Sample illumination	Integrated LED Lighting

System Dimensions and Weight

Dimensions (L x W x H)	9 cm × 7 cm × 7.5 cm
Weight	500 g

Software and I/O

Communication	USB
Operating System	Windows 10, 11
Data Output	gsf, tsv, png

Power

Power supply	Class II (two prong)
Input	100-240 VAC ~ 50/60 Hz
Output	12 VDC, 5 A

Comparison

	nGauge AFM	Traditional AFM	SEM
Operations in air	✓	✓	X
Automatic approach	✓	X	N/A
Install time	5 min	1–2 weeks	1–2 weeks
Time to data	2 min	1 hr	30min–1hr
Cost	$	$ $ $	$ $ $ $
Cost per scan	$	$ $	$ $
Benchtop operation	✓	X	X
Training time	1 hr	12+hrs	12+hrs
Laser/beam alignment-free	✓	X	X
Regular power and USB	✓	X	X
Easy to handle probes	✓	X	N/A
Maintenance-free	✓	X	X
3D images	✓	✓	X
Sub-nanometer resolution	✓	✓	X
Non-conductive samples	✓	✓	X

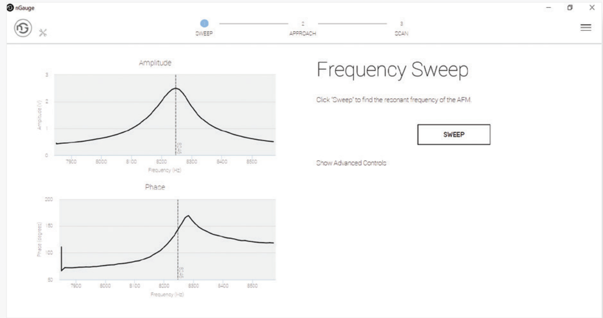
Trusted by hundreds of researchers worldwide

3M
ThermoFisher SCIENTIFIC
UNIVERSITY OF WATERLOO
TOSHIBA
TEXAS The University of Texas at Austin
SEAGATE
Berkeley UNIVERSITY OF CALIFORNIA
BOEING
rigetti
BAM Bundesanstalt für Materialforschung und -prüfung
大阪大学 OSAKA UNIVERSITY

3D nanoscale scans in 3 clicks

1. Automatic Sweep

One-click automatic frequency sweep completes in five seconds

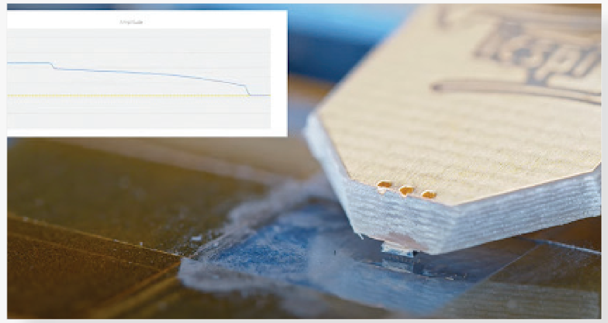


Frequency Sweep

Click "Sweep" to find the resonant frequency of the AFM.

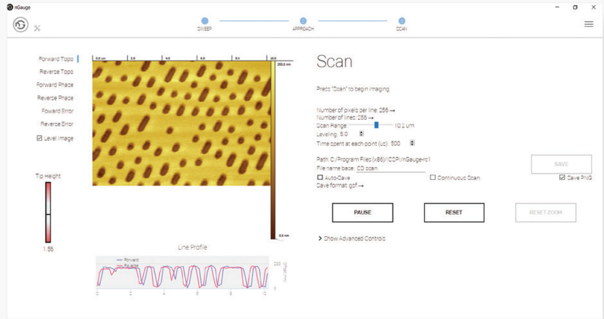
2. Automatic Approach

One-click automatic tip-sample approach completes in ten seconds



3. Fast Scanning

Capture routine scans in 80 seconds



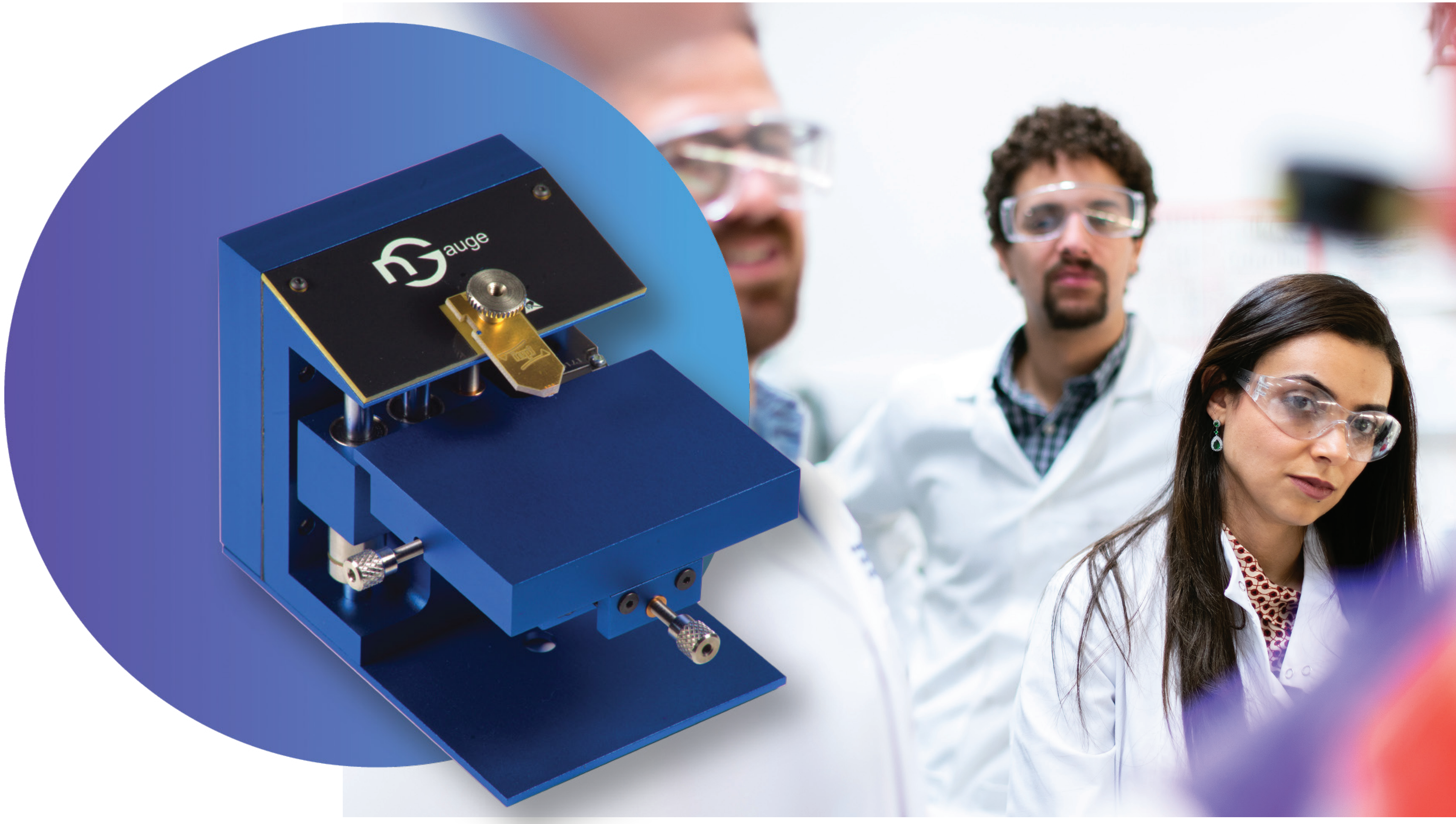
Scan

Press "Scan" to begin imaging

Number of pixels per line: 256
Number of lines: 256
Scan Range: 10.2 um
Leveling: 5.0
Time spent at each point (us): 500
Path: C:/Program Files (x86)/ICSPI/nGauge-rc1
File name base: CD scan
☐ Auto-Save
☐ Continuous Scan
☑ Save PNG
Save format: gsf

nGauge AFM

Reveal insights at the nanoscale on your benchtop.



icspi

icspi

icspicorp.com sales@icspicorp.com