



Accelerate nanoscale materials analysis

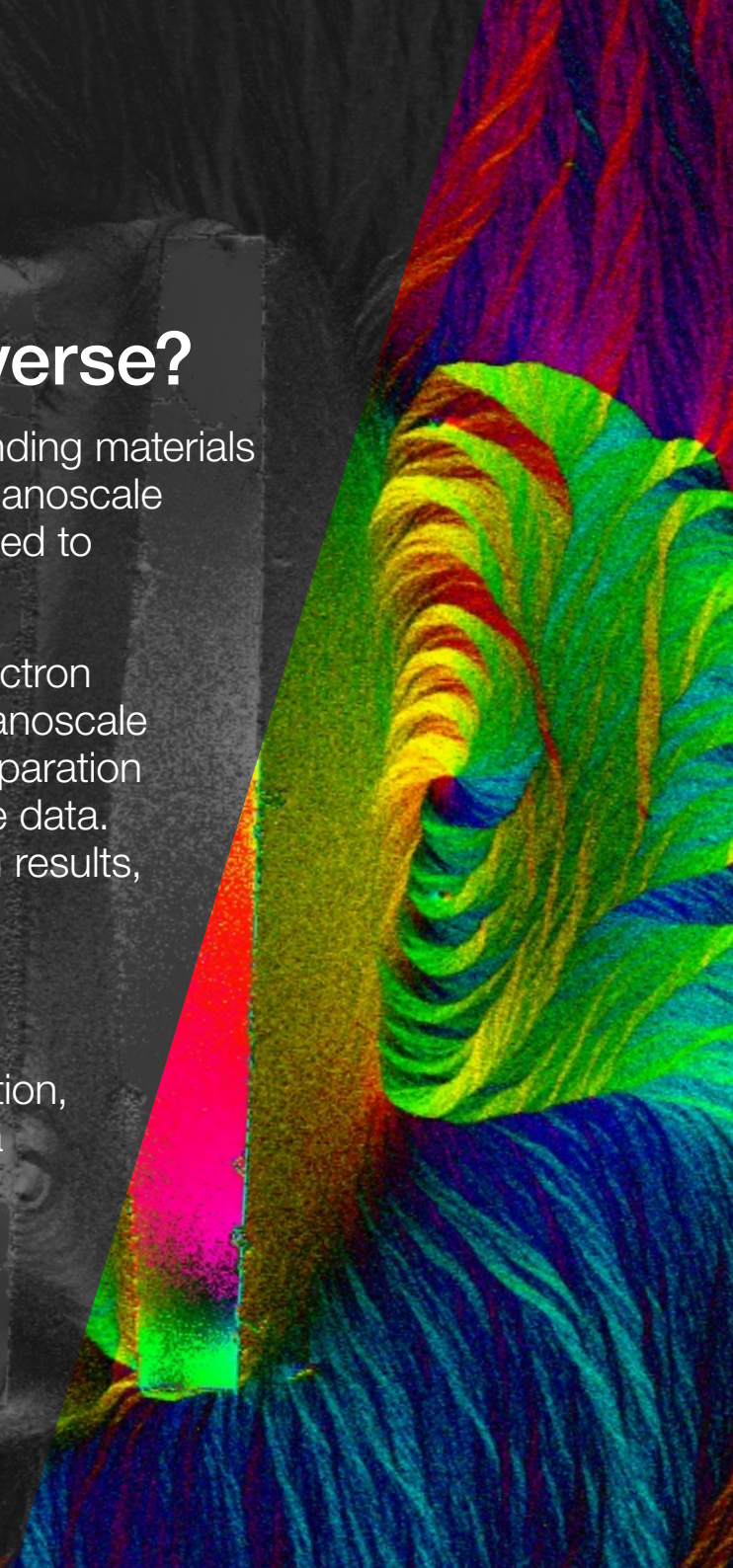
Combine the power of Thermo Scientific DualBeam FIB-SEMs and TEMs

What will you find in the nano-universe?

As you continue to push the boundaries of innovation, understanding materials at the nanoscale is becoming even more crucial. However, this nanoscale analysis requires specialized techniques that differ from those used to examine materials at larger scales.

Thermo Scientific™ DualBeam™ Focused Ion Beam Scanning Electron Microscopes and Transmission Electron Microscopes simplify nanoscale analysis. The reliable instruments deliver high-quality sample preparation with nanoscale imaging and analysis to help you collect accurate data. And the consistent software and user interfaces let you focus on results, not operation.

With these instruments, our dedicated and deeply experienced team has created a nanoscale workflow that offers cutting-edge technology with stringent quality control. No matter your application, we can help you collect accurate, reproducible, and reliable data that will help advance your work.



Empower your nano-vision

Explore the nano-universe with
DualBeam and Transmission
Electron Microscopes.

Sample journey

Prepare a range of samples

Versatile DualBeam Instruments automate TEM sample preparation for a variety of materials, including air-, moisture-, temperature-, and beam-sensitive samples.

Streamline your workflow

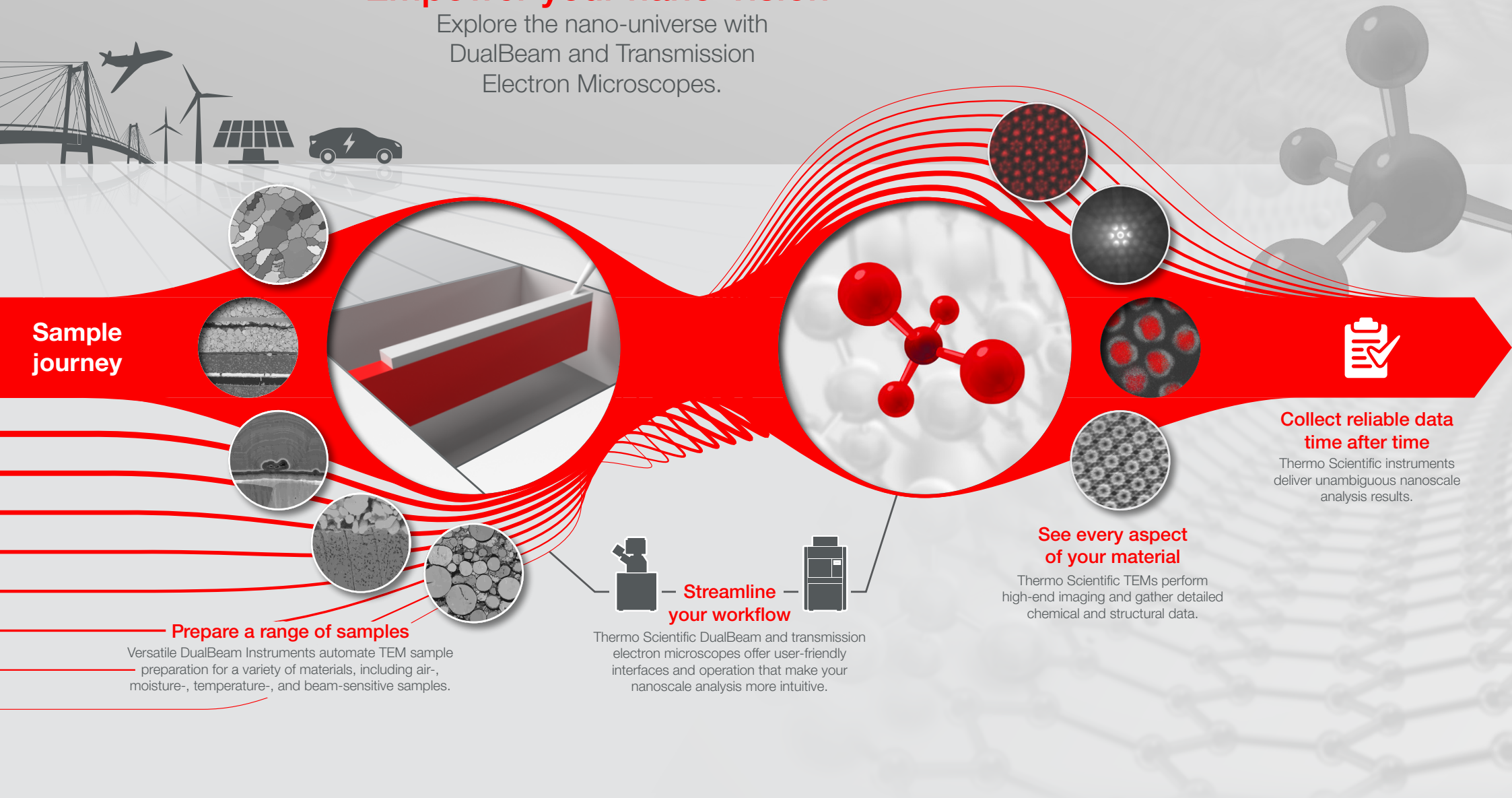
Thermo Scientific DualBeam and transmission electron microscopes offer user-friendly interfaces and operation that make your nanoscale analysis more intuitive.

See every aspect of your material

Thermo Scientific TEMs perform high-end imaging and gather detailed chemical and structural data.

Collect reliable data time after time

Thermo Scientific instruments deliver unambiguous nanoscale analysis results.



A real-world sample's journey from preparation to nanoscale analysis.

Better together



Quickly and consistently prepare high-quality TEM samples, characterize materials at nanoscale, and gather detailed chemical and structural data

“Thermo Fisher Scientific’s advanced S/TEMs are incredibly powerful, such that the limiting factor is not the microscope, but the sample quality. Fortunately, we are able (with superb control) to create excellent quality site-specific specimens with our Helios FIB-SEM.”



—Professor Bart J. Kooi, University of Groningen
Nanostructured Materials and Interfaces Research Group



Conduct credible nano-analysis using clean sample preparation, excellent electron sources, and enhanced detectors

“Through the combination of cryo-FIB and iDPC-STEM, we have unraveled the delicate structural defects in metal organic framework crystals for the first time.”



—Professor Yu Han, South China University of Technology,
King Abdullah University of Science and Technology



Get the most out of your investment with application expertise and localized service support from your trusted partner: Thermo Fisher Scientific

“We chose to go with a Thermo Scientific DualBeam FIB-SEM and TEM as it’s a sensational package and we considered these instruments to be the best systems for our needs.”



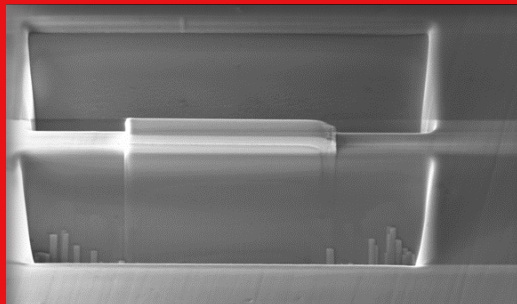
—Dr. Geoff West, University of Warwick
Advanced Manufacturing and Materials Centre

Make TEM sample prep easy with automated workflow

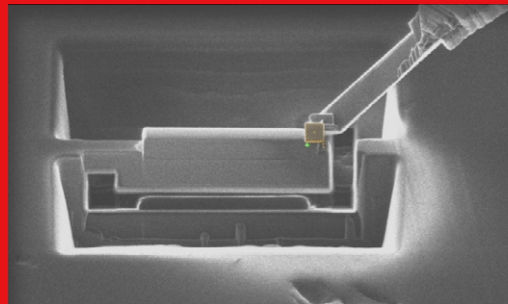
Sample preparation is one of the most critical tasks in nanoscale materials analysis.

Thermo Scientific Scios™ and Helios FIB-SEMs, when equipped with Thermo Scientific AutoTEM™ Software, automatically prepare a wide range of samples—including air-, moisture-, temperature-, and beam-sensitive materials—in as little as 45 minutes. With high-quality samples free of defects and contamination, you can be sure you will collect accurate, reliable nanoscale data.

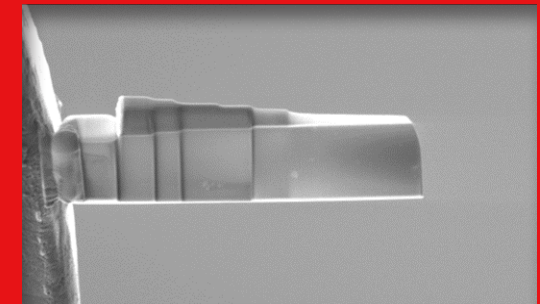
1

Protective Deposition and Trenching

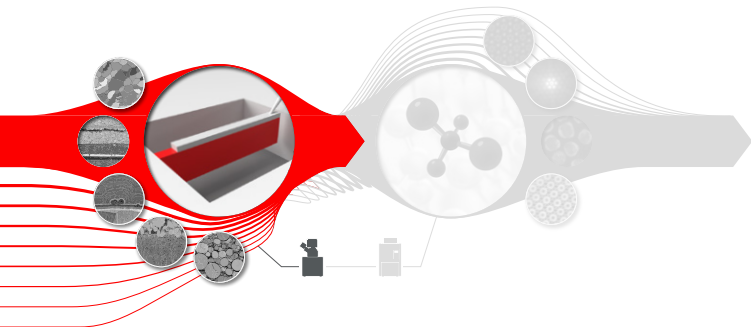
2

Undercut and Lift-out

3

Thinning and Final Polishing

S/TEM sample preparation workflow using focused ion beam.





Scios 2
DualBeam



Helios 5
DualBeam



Helios 5
PFIB DualBeam



Helios 5 Hydra
DualBeam



Helios 5 Laser Hydra
PFIB-SEM

Choose an optimum solution for your application from our versatile range of DualBeam instruments.

Thermo Fisher Scientific is the industry leader in FIB-SEM technology with more than 30 years of experience. The technology's unique ability to reveal subsurface structural detail by making precise cuts with a FIB and then imaging the exposed surface with a high-resolution SEM has led to its acceptance by researchers and engineers in a wide variety of applications.

With more than 2,000 Thermo Scientific systems installed around the world, our DualBeam FIB-SEMs continue to lead the market with cutting-edge capabilities built on technical innovation and a deep store of application knowledge gathered over years of collaborative development with our customers.

Milling	Ga ⁺	Ga ⁺	Xe ⁺	Xe ⁺ , N ⁺ , O ⁺ , Ar ⁺	Xe ⁺ , N ⁺ , O ⁺ , Ar ⁺ , Laser
Imaging	Ultra-high resolution, LoVac	Extreme high resolution, HiVac	Extreme high resolution, HiVac	Extreme high resolution, HiVac	Extreme high resolution, HiVac
Cross-sectioning and 3D volumes	≥ 10 μm	≥ 10 μm	≥ 100 μm	≥ 100 μm	≥ 1 mm
Automated TEM sample preparation	AutoTEM 5 Basic	AutoTEM 5 Auto	AutoTEM 5, Ga-free	AutoTEM 5, Ga-free	AutoTEM 5, Ga-free
Analytical capabilities	All DualBeam FIB-SEMs support energy dispersive spectroscopy (EDS), electron backscatter diffraction (EBSD), secondary ion mass spectrometry (SIMS), cathodoluminescence (CL), and Raman spectroscopy.				

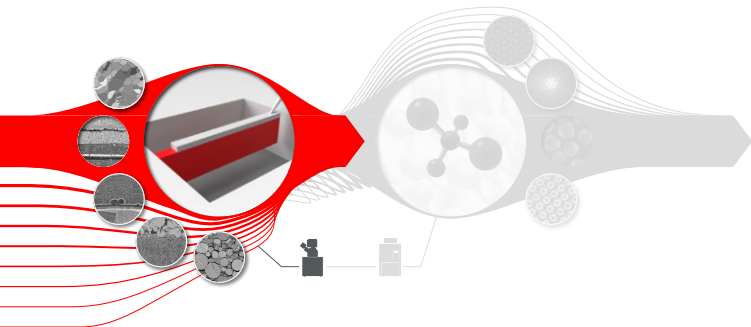
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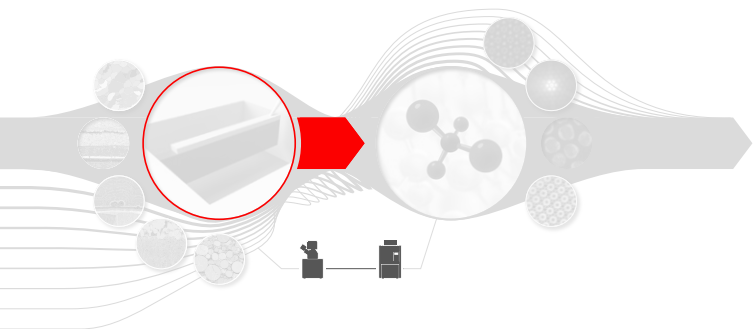
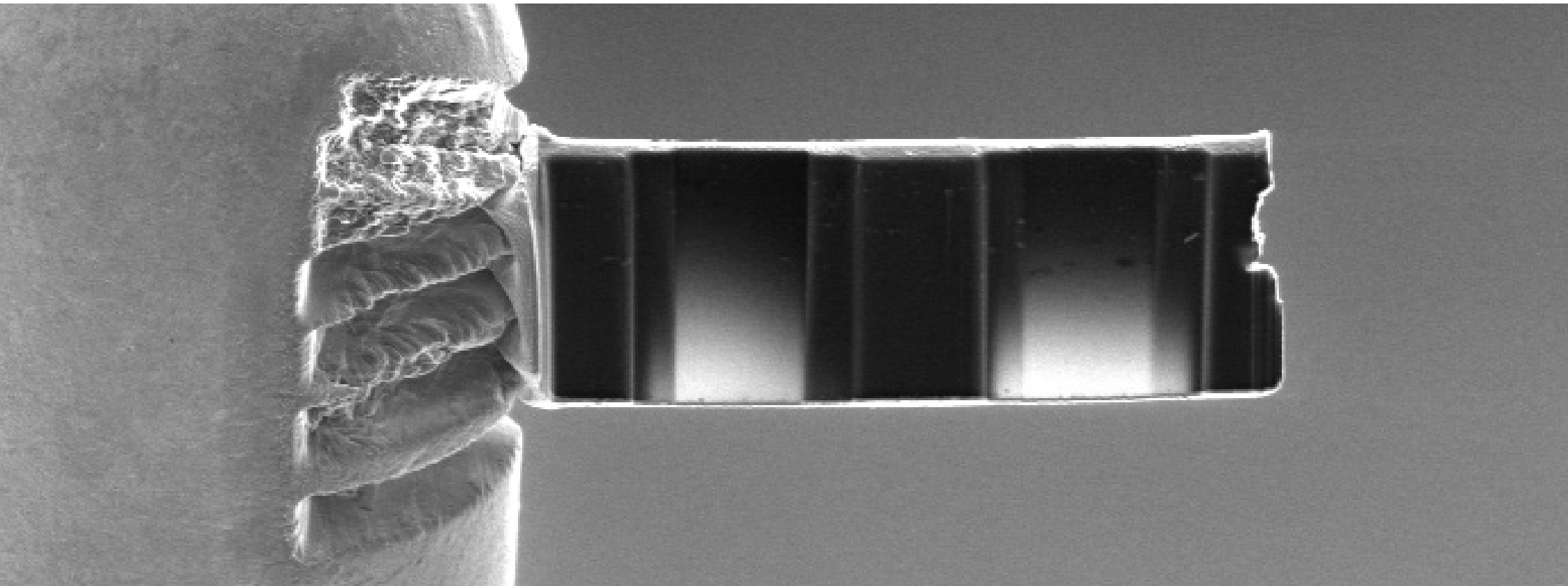
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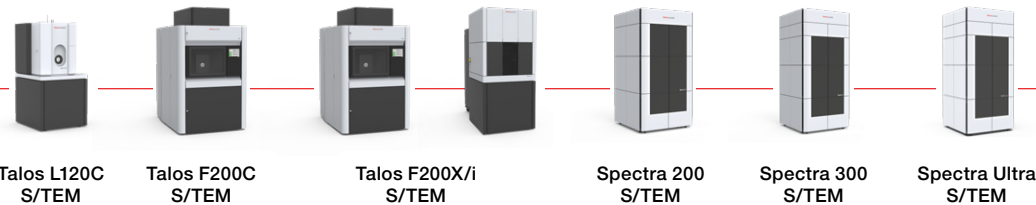
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Thinned TEM lamella ready for nanoscale analysis



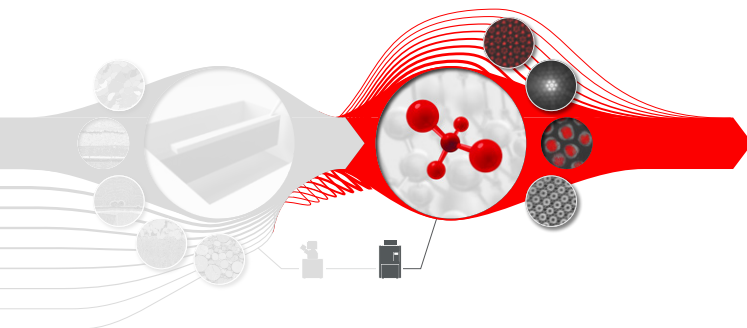
Make your next discovery with our latest innovations

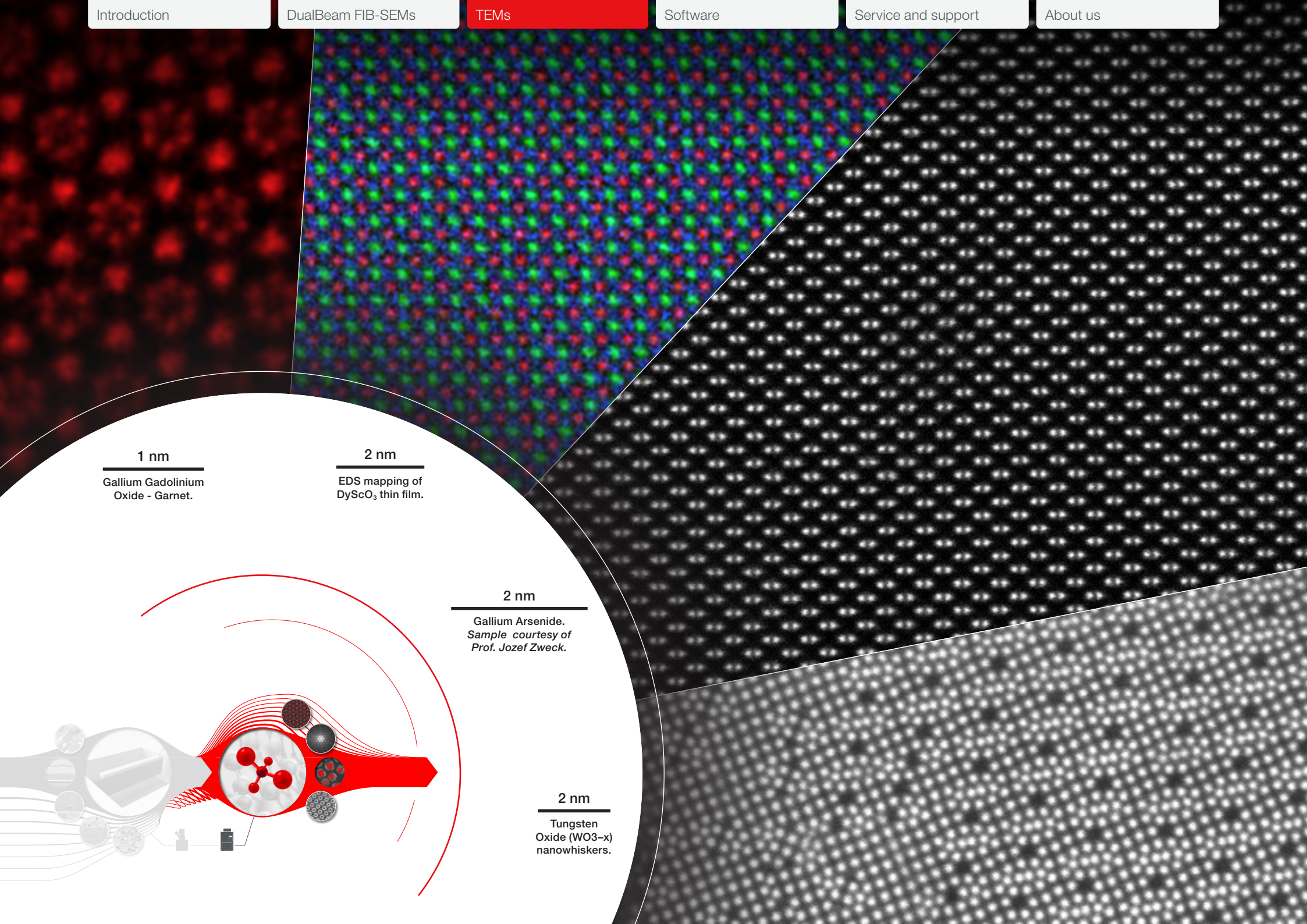


Transmission electron microscopes deliver unparalleled resolution to help you see nanoscale structures and chemical information within your materials.

Thermo Scientific™ Talos™ and Spectra™ TEMs include enhanced electron sources and advanced detectors that deliver accurate, high-quality images and unambiguous data. Choose an optimum solution for your application from our unmatched range of transmission electron microscopes.

	Talos L120C S/TEM	Talos F200C S/TEM	Talos F200X/i S/TEM	Spectra 200 S/TEM	Spectra 300 S/TEM	Spectra Ultra S/TEM
Electron gun	Tungsten, LaB ₆	S-FEG, X-FEG	S-FEG, X-FEG, X-CFEG	X-CFEG	X-CFEG, X-FEG Mono, X-FEG UltiMono	X-CFEG, X-FEG Mono, X-FEG UltiMono
Cs Correctors	No	No	No	S/TEM	S/TEM, TEM	S/TEM, TEM
HR STEM (nm)	1.0	0.2	0.16 / 0.14	0.06 (ST) / 0.07 (XT)	0.05 (ST) / 0.06 (XT)	0.05
Pole piece distance (mm)	11	11	5.5	5.4 (ST) / 6.4 (XT)	5.4 / 6.4	5.4
EDX capabilities (solid angle)	Bruker 30 / 100 (0.18 / 0.8)	Bruker 30 / 100 (0.18 / 0.8)	Super-X / DualX (0.9 / 1.65)	Super-X / DualX (0.7 / 1.76)	Super-X / DualX (0.7 / 1.76)	Ultra X (4.05)
EELS capabilities	No	Yes	Yes	Yes	Yes	Yes
Cryo capabilities	Cryo box	Cryo box	Cryo holders (XT)	Cryo holders	Cryo box (XT)	Cryo holders
Room dimensions (H x L x W)	2.3 m x 4 m x 3 m	3.03 m x 4.9 m x 3.9 m	X/i: 3.03/2.8 m x 4.9/4 m x 3.9/3.6 m	3/3.3 m x 6.5 m x 6.1 m	3/3.3/3.7 m x 6.5 m x 5.1 m	3/3.3/3.7 m x 6.5 m x 5.1 m
Additional capabilities	Thermo Scientific™ Velox™ Software for imaging and analysis across a variety of applications, oil-free vacuum systems that deliver pristine nanostructure analysis, Python scripting and remote control for enhanced flexibility, speed, and ease of use					

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1 nm

Gallium Gadolinium
Oxide - Garnet.

2 nm

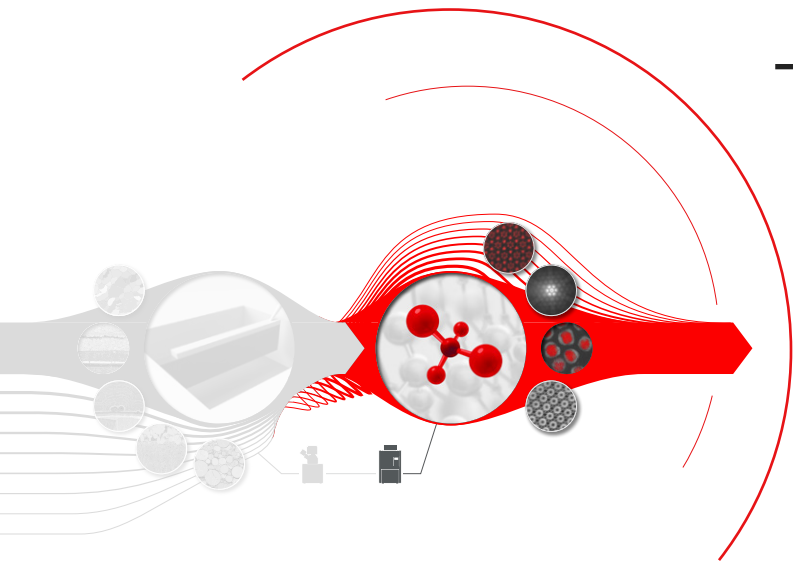
EDS mapping of
DyScO₃ thin film.

2 nm

Gallium Arsenide.
*Sample courtesy of
Prof. Jozef Zweck.*

2 nm

Tungsten
Oxide (WO_{3-x})
nanowhiskers.



Bring your data to life

Our additional cohesive software suites provide user-friendly interfaces and constantly improving automation features, helping you easily increase throughput and generate reliable results.



Velox Software

Obtain high-quality imaging and compositional mapping with advanced drift compensation methods.



Maps Software

Generate high-quality, multi-scale images and analytical results to correlate data from multiple microscopes.



Auto Slice & View Software

Acquire high-resolution 3D data and analytical EBSD and EDS maps.



AutoScript Software

Use Python to create experimental custom automation and data processing routines.



AutoTEM 5 Software

Automate site-specific, DualBeam FIB-SEM sample preparation for diverse materials and get results in under an hour.



Automated Particle Workflow

Quickly acquire statistically relevant, high-resolution nanoscale results for chemical analysis.

SEM
FIB-SEM
TEM



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How can we help?



NanoPorts

The teams at our four NanoPorts around the world provide tailored solutions for your applications and on-site or remote demonstrations, plus they act as research collaboration centers. The NanoPorts also help R&D, factory, and field service teams provide optimized outcomes and improved solutions.

[Learn more](#)



Global service logistics and field service assistance

We maintain an extensive network of central warehouses, regional hubs, and local stock locations to fulfill your needs more quickly. From installation services to on-site and remote maintenance agreements, our team of experts is here to support you at every step.

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Application support

After your system is installed, our team of applications experts can help you quickly get up to speed. From training and documentation to troubleshooting and more, we're with you every step of the way to help your research succeed.

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Need more information? [Please complete our form](#), and a sales representative will contact you shortly.

About Thermo Fisher Scientific

We are the world leader in serving science. Our Mission is to enable our customers to make the world healthier, cleaner and safer.



Step ahead. Step beyond. Duration 1.33

Our innovative solutions for electron microscopy, surface analysis, and microanalysis help materials science researchers advance their sample characterization to gain deeper insight into the physical and chemical properties of materials from the macroscale to the nanoscale. Our multiscale, multimodal solutions cover a broad range of applications across dozens of industries and research fields, serving customers in academia, government, and industry. Our TEMs, DualBeam™ FIB-SEMs, comprehensive portfolio of SEMs, XPS, and microanalysis solutions, combined with software suites, take customers from questions to usable data by combining high-resolution imaging with physical, chemical, elemental, mechanical, and electrical analysis across scales and modes.

Financial and Leasing Services

At Thermo Fisher Scientific, we will not let budgetary constraints stand between you and your next great discovery.

We are your one-stop partner for the best laboratory products and analytical technologies available, plus the unique financing options you need to accelerate success in science or industry.

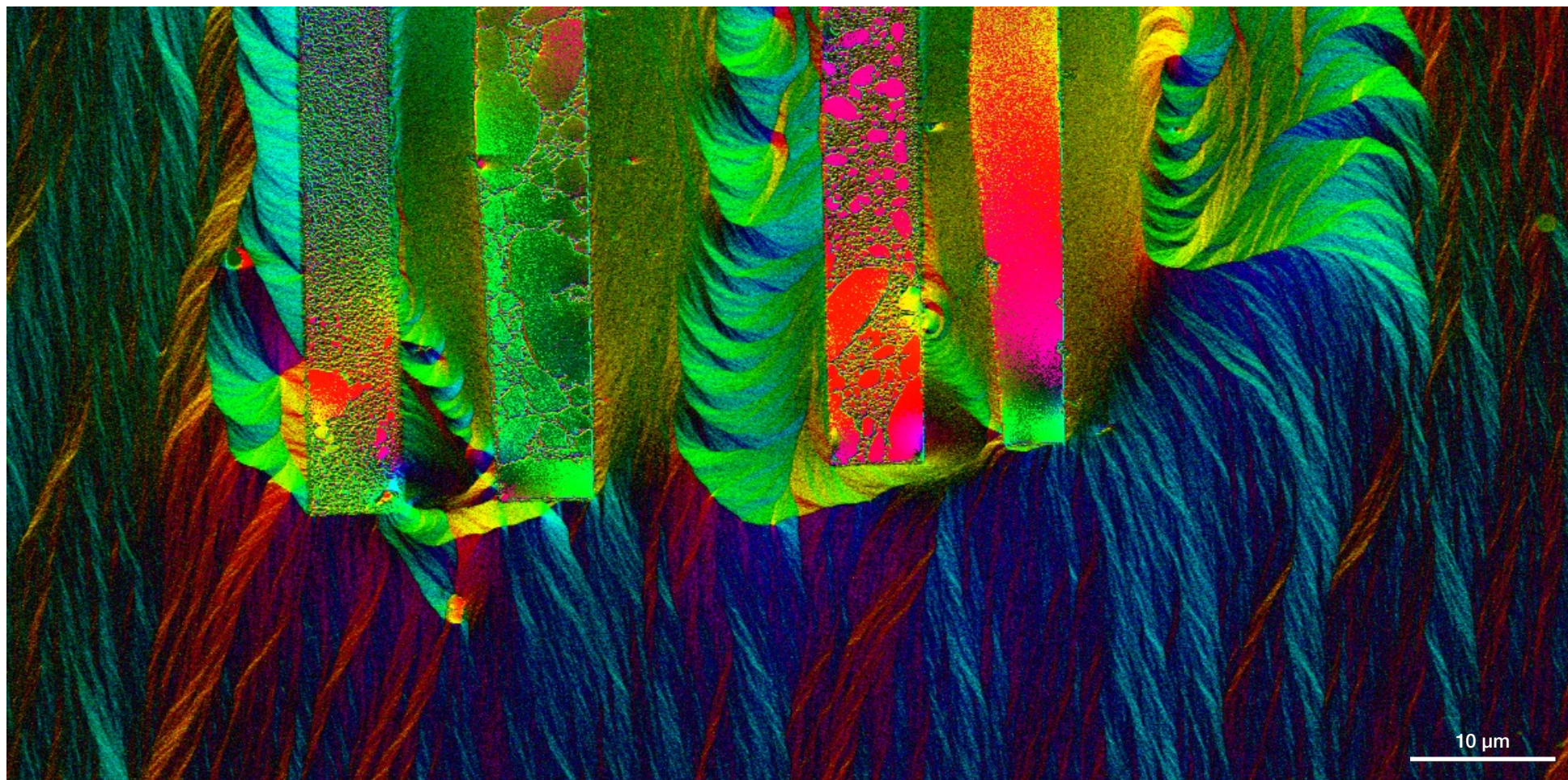
Cost-effective financing designed for each individual customer is key to any successful capital equipment solution.

We understand not just your advanced technology and application requirements, but the business challenges you face when financing your critical equipment assets. For decades, we have worked closely with businesses, hospitals, universities, and municipalities to provide flexible financing terms to support their successful operations.

If you are looking for off-balance sheet financing, accelerated ROI, technology protection, or cash flow management, our innovative financing options can help meet your company's budgetary needs and bottom-line goals.

We also offer instrument maintenance and training services.

**Explore equipment
leasing and
financing options**



Magnetic Field Visualisation on Co-Film Using DPC. *Sample courtesy of Prof. Jozef Zweck.*

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