Microscopy TODAY

Volume **26** Number **4** 2018 **July**

Microscopy Society of America

www.microscopy-today.com

CAMBRIDGE
UNIVERSITY PRESS

https://doi.org/10.1017/S155192951800055X Published online by Cambridge University Press

https://doi.org/10.1017/S155192951800055X

HITACHI
Inspire the Next

ETHOS

Focused Ion and Electron Beam System

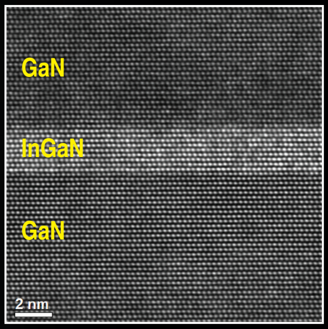
...Aspire to Excellence

The *All-New* Hitachi ETHOS SEM-FIB combines ultra-high resolution imaging and elemental analysis at low voltages with ion optics for nm-scale precision processing.

Designed with a variety of applications in mind
- Large analytical specimen chamber for numerous accessories
- Automated operation including macro processing
- Time sharing mode for dual simultaneous live imaging and processing
- Real-time analytical 3D segmentation capability

Advanced Microsampling
- Sample orientation control with Anti Curtaining Effect (ACE) technologies
- 4-axis lift-out function for advanced TEM specimen preparation

Triple-beam system yielding highest-quality results
- Low acceleration voltage processing with noble gas ion beam
- Selectable ion species (argon/xenon)



200 kv ADF STEM Image of processed lamella by Triple Beam Ar Ion at 1kV

For more information, visit www.hitachi-hightech.com/us/fib

Science for a better tomorrow

Hitachi High Technologies America, Inc.
www.hitachi-hightech.com/us
Tel. 800-253-3053

© 2018 Hitachi High Technologies America, Inc. All rights reserved.

PAPER SUBMISSION PORTAL:
Opens December 2017

SUBMISSION DEADLINE:
February 15, 2018

M&M 2018
MICROSCOPY & MICROANALYSIS
August 5-9, 2018 • Baltimore, MD

MSA Microscopy Society of America
MAS Microanalysis Society
MSC SMC

www.microscopy.org/MandM/2018

500 poster presentations over 4 days

>120 companies in the largest microscopy-related exhibit hall in the world

70 FREE Vendor Tutorials

35 named symposia in Physical, Biological, and Analytical Sciences

7 traditional day-long Sunday Short Courses

3 in-depth, pre-meeting Congresses on featured topics, featuring platform and poster presentations and networking

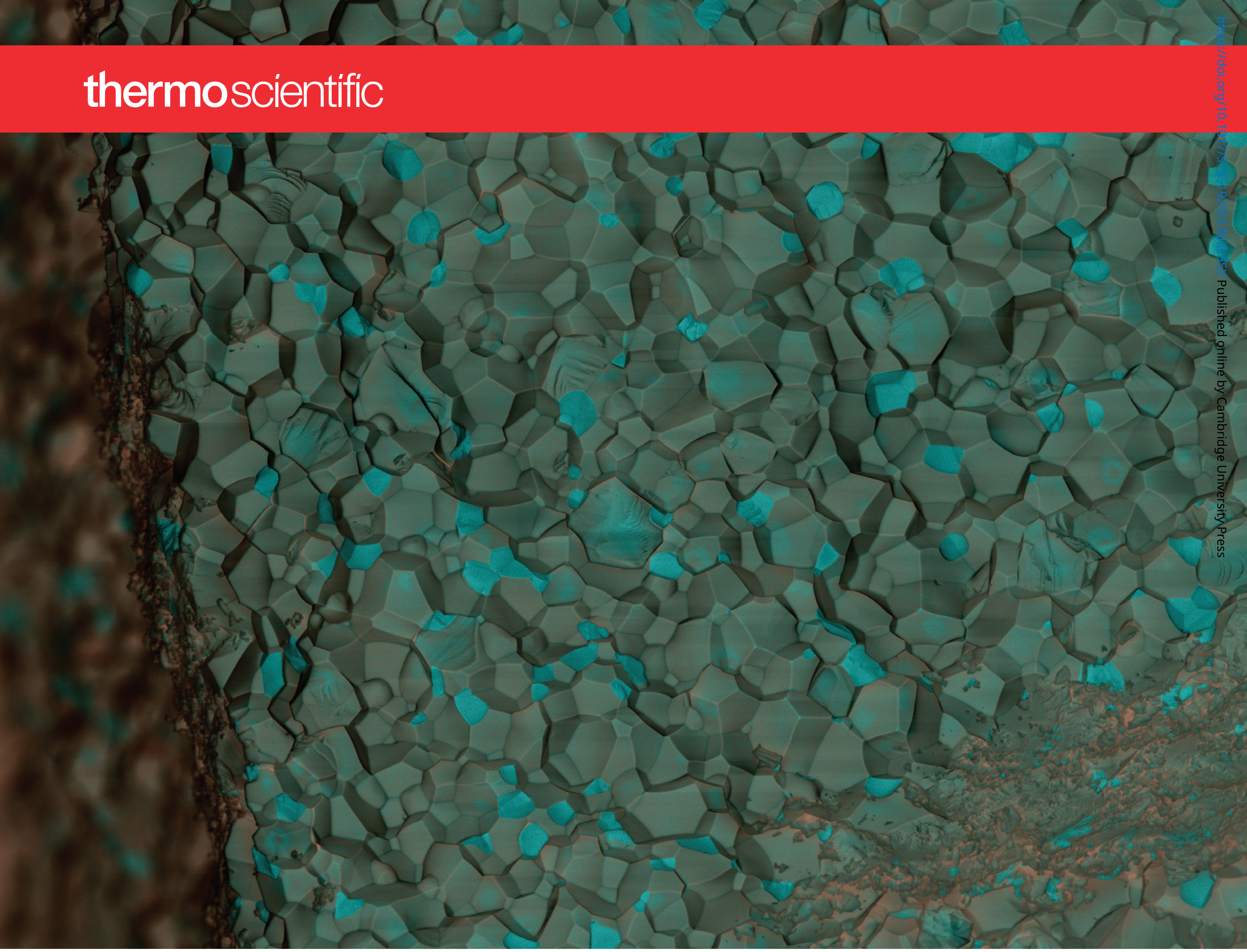
2 fascinating Plenary Session speakers (on 50-cent microscopes, and finding micrometeorites on your roof!)

+1 vibrant, historic, waterfront city (with 650 daily flights from 70 destinations)

= M&M 2018 in BALTIMORE!
DON'T MISS OUT!

https://doi.org/10.1017/S155192951800055X Published online by Cambridge University Press

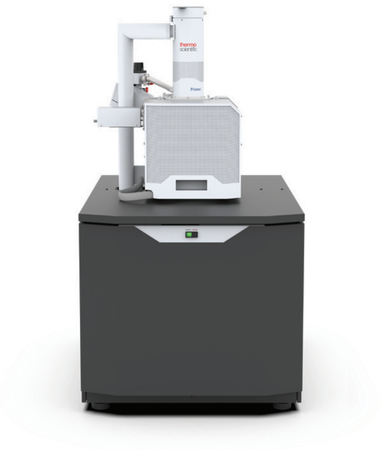
thermoscientific



Aluminum nitride ceramic with yttrium inclusions.

Prisma E SEM for Materials Science

The new Prisma E scanning electron microscope (SEM) combines a wide array of imaging and analytical modalities with new advanced automation to offer the most complete solution of any instrument in its class. It is ideal for industrial R&D, quality control, and failure analysis applications that require high resolution, sample flexibility and an easy-to-use operator interface. Prisma E SEM succeeds the highly successful Quanta SEM.



Find out more at **thermofisher.com/EM-Sales**

ThermoFisher
SCIENTIFIC

© 2018 Thermo Fisher Scientific Inc. All rights reserved. All trademarks are the property of Thermo Fisher Scientific and its subsidiaries unless otherwise specified.

https://doi.org/10.1017/S155192951800055X Published online by Cambridge University Press

Volume **26** Number **4** 2018 **July**

Microscopy TODAY

Contents

Light Microscopy

12 *Artemia*: A Model Specimen for Educational Microscopy Projects in Biological and Ecological Fields
Jörg Piper

20 Guidelines for Understanding Magnification in the Modern Digital Microscope Era
James A. DeRose and Michael Doppler

Electron Microscopy

34 Stereoscopic Effects from Single SEM Images
Robert Sturm

Meeting Preview

40 IMC19: 19th International Microscopy Congress in Australia
Nicola Thomas

Pioneers of Microscopy

44 Cryosectioning and Immunolabeling: The Contributions of Kiyoteru Tokuyasu
Gareth Griffiths, Jan-Willem Slot, and Paul Webster

Highlights from *Microscopy and Microanalysis*

56 Assessing Soft-Tissue Shrinkage Estimates in Museum Specimens Imaged With Diffusible Iodine-based Contrast-Enhanced Computed Tomography (diceCT)

56 Characterization of Lithium Ion Battery Materials with Valence Electron Energy Loss Spectroscopy

57 Electron source brightness and illumination semi-angle distribution measurement in a transmission electron microscope

Departments

7 Editorial
8 Carmichael's Concise Review
50 Industry News
52 Product News
60 NetNotes
68 Calendar of Meetings
72 Dear Abbe
74 Index of Advertisers

About the Cover

Morphological differentiation of *Artemia franciscana* during development from birth to full adult. Top: day 1 (left) and day 13 (right), bottom: day 22 (left) and day 35 (right). Various magnifications.

See article by Piper.

https://doi.org/10.1017/S155192951800055X Published online by Cambridge University Press

Providing microscopy supplies and specimen preparation equipment to our valued customers for half a century.

Visit us August 3–5 in Balitimore, MD

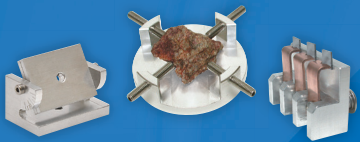
M&M 2018 | BOOTH #1012

NEW SBEM Tools & Supplies

FEI VolumeScope Pin Stub, Storage,
Tweezers & Colloidal Silver Paint

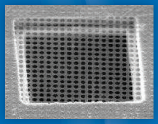
Cryo-EM Tools & Accessories

Large Dewars, Foam Dewars,
Grid Boxes & Grippers



PELCO® Modular SEM Holders & Mounts

NEW Products for Specimen Thinning in Preparation for Electron Microscopy



NEW Quantifoil®

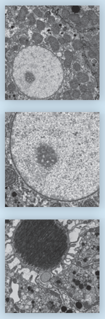
TEM Substrates

Cressington Coating Systems

Carbon Evaporation & Metal Sputtering

PELCO BioWave® Pro+

Microwave Tissue Processor



M&M 2018 Vendor Tutorial

Join us Tuesday, August 7 at 5:45pm, Booth #1012

PELCO BioWave® Pro+ Assisted Serial Block-Face SEM (SBEM)

Using the PELCO BioWave® Pro+, the entire SBEM process can now be completed in under a day with identical results to the standard long protocol.

Images: Rick Webb, University of Queensland

WIN $50 OFF YOUR NEXT ORDER!

Visit us at M&M 2018, and enter to win one of fifty gift certificates for $50 off your next order.

TED PELLA, INC.

Microscopy Products for Science and Industry

www.tedpella.com sales@tedpella.com 800-237-3526

https://doi.org/10.1017/S155192

Published online by Cambridge University Press