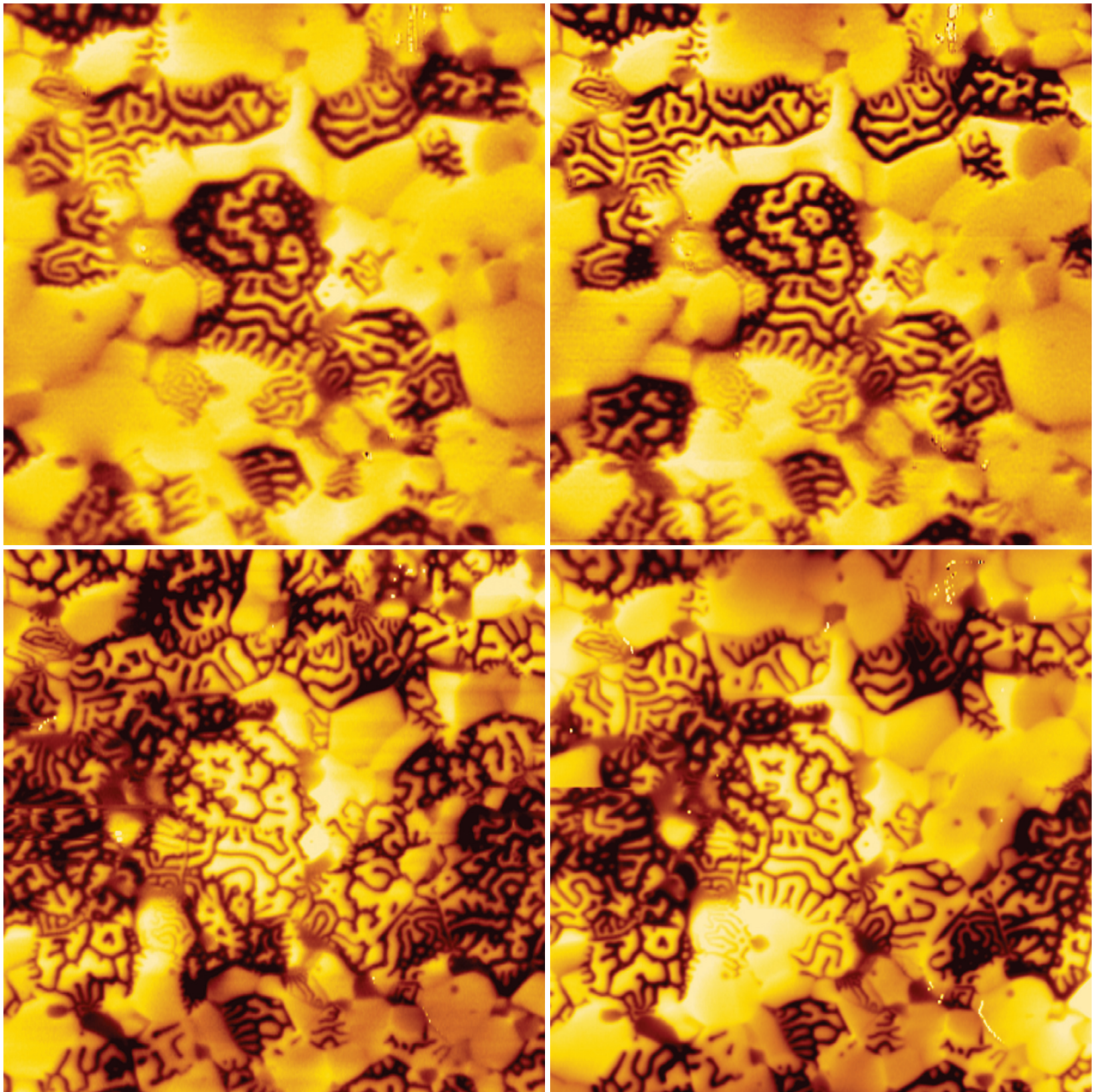


# Microscopy TODAY

Volume 22 Number 6 2014 November

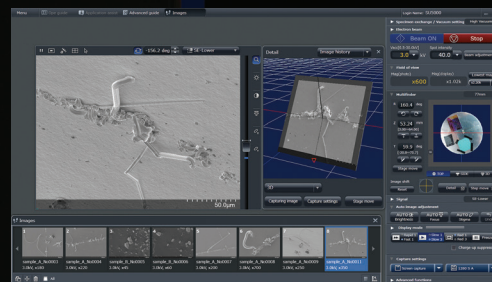


# Revolutionary SEM Control Debuts from Hitachi

## EM Wizard Changes the Game

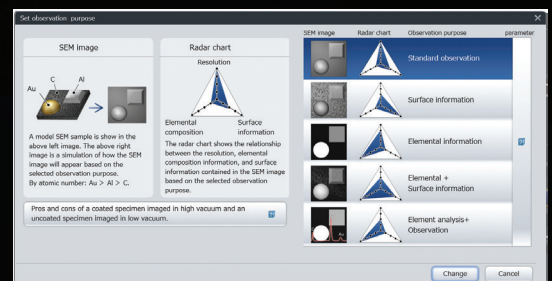
SEM operation, as you currently know it, is about to change. Groundbreaking computer-assisted technology from Hitachi, referred to as EM Wizard, offers a new level of SEM operation and control. Expert or novice, the result is now the same: Highest quality nano-scale images at everyone's fingertips!

- With EM Wizard, beginners become experts overnight.
- Automated, intuitive on-demand image optimization on the fly.
- Visual and interactive guide offers 'pick and choose' SEM modes to ensure best operating conditions.
- Tilting and rotating the sample is simple; the image stays centered and in focus with the 3D MultiFinder tool.



With 3D MultiFinder the sample can rotate and tilt, and the image and field of view remain centered and in focus.

The interactive guide allows 'pick and choose' imaging mode. EM Wizard optimizes the image for you.



# Inspire Innovation through Collaboration

PAPER SUBMISSIONS:  
**Open December 1, 2014**

SUBMISSION DEADLINE:  
**February 9, 2015**



# MICROSCOPY & MICROANALYSIS

*August 2-6 • Portland, OR*

Visit the website often for details on Symposia, Exhibits, Biological and Physical Sciences Tutorials, In-Week Intensive Workshops, Posters, Sunday Short Courses and Pre-Meeting Congress!



<http://microscopy.org/MandM/2015>



Program Information | Information for Students | Meeting Awards (*apply when you submit your paper!*) | Exhibitor List & Floor Plan | Online Registration (*opens February 2015*) | Portland Hotel Information (*reservations available February 2015*)



**Thermo**  
SCIENTIFIC

# Raise your confidence

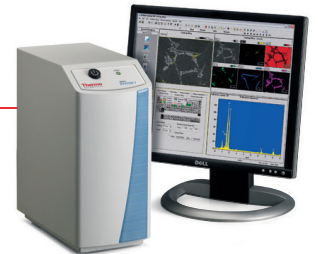
Spectral imaging on the **Thermo Scientific NORAN System 7** creates new opportunities to discover what is truly in your sample. Our UltraDry detector and analyzer electronics ensure that you collect as much data from the sample as possible. Go beyond simple elemental EDS map analysis; our exclusive COMPASS™ software processes spectral imaging data using principal component and statistical analyses to reveal unique phases and enrich your understanding of materials.

## See what's really in your sample

• Discover more: [thermoscientific.com/microanalysis](http://thermoscientific.com/microanalysis)



**UltraDry EDS Detector**  
Fastest Collection, Most Accuracy



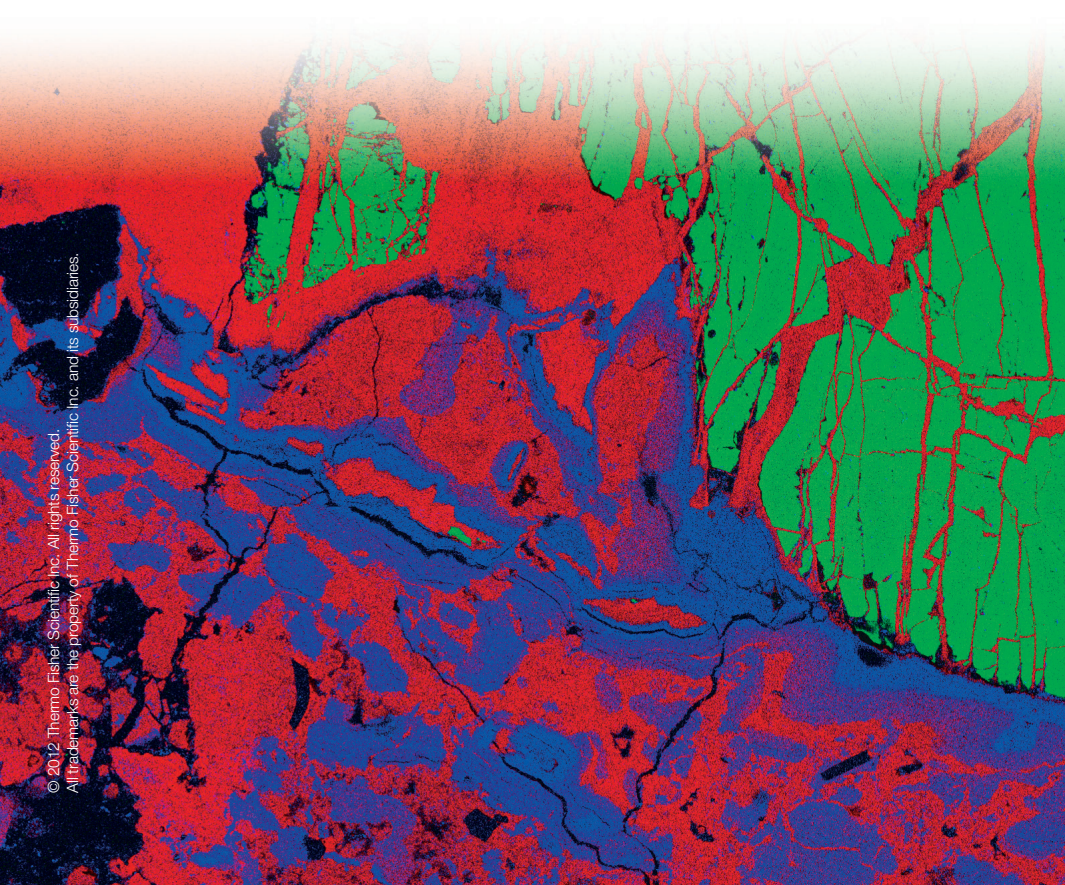
**NORAN™ System 7**  
Integrated X-ray Microanalysis System



**QuasOr EBSD**  
Simultaneous EDS. Better data.



**MagnaRay WDS**  
Resolution with EDS Ease of Use



# Contents

## Scanning Probe Microscopy

**12 Vacuum Magnetic Force Microscopy at High Temperatures: Observation of Permanent Magnets**

Takehiro Yamaoka, Hana Tsujikawa, Satoshi Hasumura, Kazunori Andou, Masatsugu Shigeno, Akira Ito, and Hiroshi Kawamura

**18 Automated AFM Boosts Throughput in Automatic Defect Review**

Ryan YK Yoo

**24 Tiny Crystals Located and Identified by Infrared Nanoscopy**

Clemens Liewald and Fritz Keilmann

## Correlative Microscopy

**30 Integration Without Compromise**

Lenard M. Voortman

**36 RISE Microscopy: Correlative Raman-SEM Imaging**

Olaf Hollricher, Ute Schmidt, and Sonja Breuninger

## Specimen Preparation

**40 Fabrication of a Novel Rotating Sample Holder to Eliminate the “Curtaining Effect” in FIB-Prepared TEM Specimens**

Nathan Wang and George Perreault

## Microscopy 101

**46 Making Your Own Hair Probe: A Simple Guide**

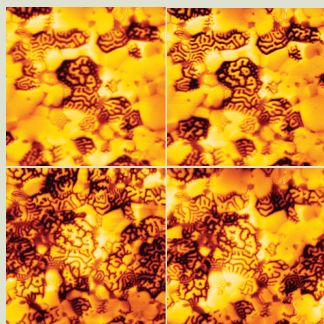
Bob Chiovetti

## Microscopy Pioneers

**48 Pioneers in Optics: René Descartes and Jan Albertus Magnus**

Michael W. Davidson

### About the Cover



Magnetic force microscopy of thermal demagnetization in a sintered Nd-Fe-B magnet. Clockwise from upper left: 67°C, 96°C, 140°C, and 180°C. Image width = 50 μm.

See article by Yamaoka et al.

## Departments

**7 Editorial**

**8 Carmichael’s Concise Review**

**50 Industry News**

**52 Product News**

**54 NetNotes**

**62 Calendar of Meetings**

**65 Dear Abbe**

**66 Index of Advertisers**

# it's here!

EMS is happy to announce our new

## Full Line Catalog XVII

loaded with hundreds of new products...  
loaded with helpful technical tips...  
loaded with techniques and applications...

The most comprehensive source for all fields of microscopy and general laboratory research

It is with great pleasure we continue to offer to you our outstanding selection of Chemicals for Electron Microscopy, Light Microscopy and Histology; the industry-leading line of Aurion ImmunoGold Reagents; the highest quality, most precise sectioning and incomparable durability DiATOME Diamond Knives line, our superb line of EMS Sputter and Carbon Coaters, world-renowned Technovit® embedding resins, and the list goes on. Most of these lines have been enhanced with new options. We hope that this catalog exceeds your expectations and we look forward to working with you.



**NEW: EVOS Digital Microscopes**

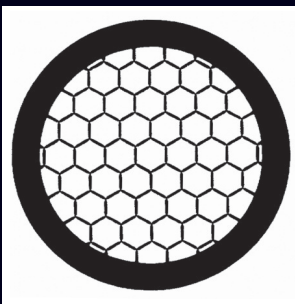


**NEW MODELS: Vibrating Microtomes**

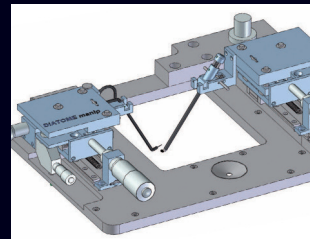
**NEW: HistoPro® 200**



**NEW: Athene Grids**



**NEW: FLOWMI™ Cell Strainers**



**NEW: DiATOME manipulator**

**NEW: EMS High-End Medical Tweezers**



**CryoJane Workstation**



**NEW: Rotary Diamond Micro-Engraver Pen**



**NEW: Turbo-Pumped Sputter/Carbon Coater for Glove Box**

**NEW MODELS: Branson Ultrasonic Benchtop Cleaners**



**NEW: INFINITY 3-3UR Research-Grade Microscopy Camera**



REQUEST YOUR COPY AT

[www.emsdiasum.com](http://www.emsdiasum.com)

**Electron  
Microscopy  
Sciences**

P.O. Box 550 • 1560 Industry Rd. • Hatfield, Pa 19440  
Tel: (215) 412-8400 • Fax: (215) 412-8450  
email: [sgkck@aol.com](mailto:sgkck@aol.com) or [stacie@ems-secure.com](mailto:stacie@ems-secure.com)

look for us...

