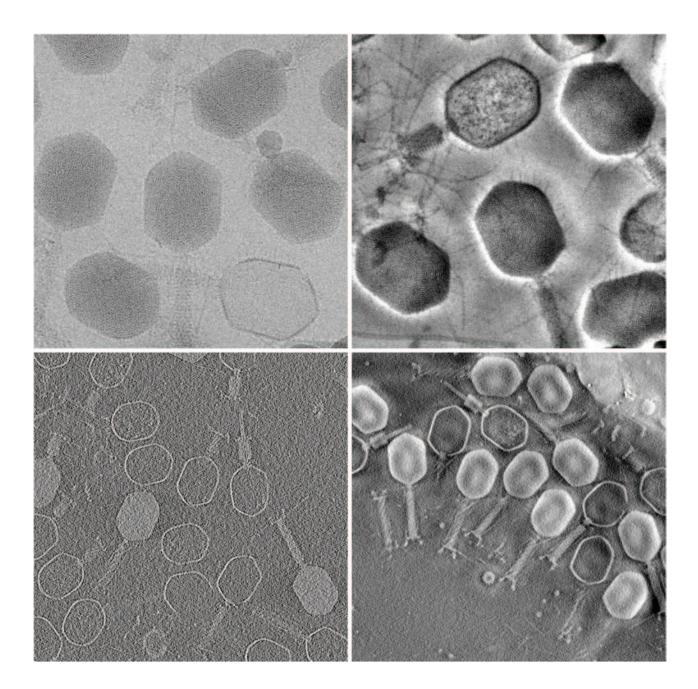
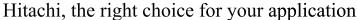
# Volume 18 Number 4 2010 July Volume 18 Number 4 2010 July TODAY Volume 18 Number 4 2010 July Volume 18 Number 4 2010 July





## So Many Applications, So Many Choices Hitachi – the Right Choice

The nano world is more diverse than ever before, so why limit your choices? Hitachi offers more choices than any other manufacture of Ultra High Resolution Field Emission SEM. From the world's highest resolution S-5500 UHR FESEM, guaranteed at 0.4nm resolution, to the SU-70 Analytical FESEM, capable of producing greater than 200nA beam current, Hitachi's choices are better than ever. Our field proven S-4800 and newly designed SU8000 UHR FESEM with the worlds first triple detection system, provide unsurpassed resolution, ease of operation, and the most reliable instruments in the industry.





S-5500 UHR FESEM



S-4800 High Resolution FESEM



SU8000 Triple Detector FESEM



**SU-70 Analytical FESEM** 





### Contents

#### Feature Article

10 Phase Contrast Enhancement with Phase Plates in Biological Electron Microscopy

Kuniaki Nagayama, Radostin Danev, Hideki Shigematsu, Naoki Hosogi, Yoshiyuki Fukuda, Koji Nitta, and Yasuko Kaneko

#### Instrumentation and Methods

- 14 Enhanced Detection Sensitivity with a New Windowless XEDS System for AEM Based on Silicon Drift Detector Technology P. Schlossmacher, D.O. Klenov, B. Freitag, and H.S. von Harrach
- 22 Selected Area Electron Diffraction and its Use in Structure Determination

William F. Tivol

#### Microscopy Education

30 Introducing Students to Research: Electron Microscopy of Bacteriophages

Jorge E. Sanchez, Erica L. Jacovetty, Bridget Carragher, Clinton S. Potter, and Rebecca E. Taurog

#### Microscopy Pioneers

**34** Some Personal Memories of Otto Scherzer
Dieter Typke, Harald Rose, Erich Plies, and Max Haider

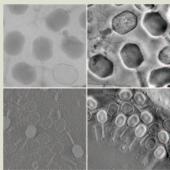
#### Microscopy Protocols

**40 A "Clean" TEM**Graham J.C. Carpenter

#### Your Point of View

**44 It's YOUR Point of View . . . on Social Media**Barbara Foster

#### About the Cover



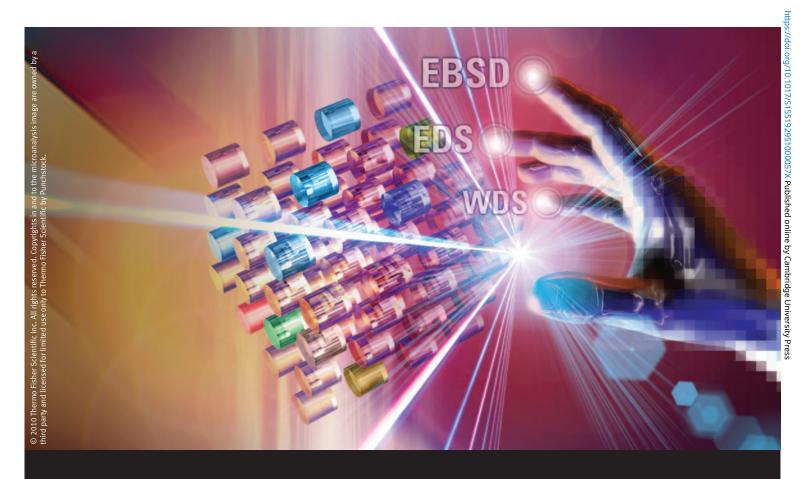
TEM images of T4 bacteriophages by defocus phase contrast (left) and Zernike phase contrast (right).

See article by Nagayama.

#### Departments

- 5 Editorial
- 6 Carmichael's Concise Review
- **48** Industry News
- **50** Product News
- **52** NetNotes

- 62 Calendar of Meetings
- 68 Dear Abbe
- 70 Contest
- 74 Index of Advertisers



Truly integrated microanalysis at the tip of your fingers.

The Thermo Scientific NORAN System 7 delivers the ultimate in seamless integration of EDS, WDS and EBSD with a single system interface for all your data acquisition and processing.

NORAN System 7 speeds you to answers with blazing fast data acquisition and processing. UltraDry silicon drift detector EDS, MagnaRay WDS and QuasOr EBSD detector technologies provide virtually instant results. Advanced time saving features such as automated quantitative mapping, Direct-to-Phase, Point and Shoot analysis and guided acquisition setup help increase your analytical productivity without sacrificing control.

Our integrated suite of acquisition and processing software is unparalleled in the industry. Analyze your sample data at the microscope or at your desk. Produce your reports at the click of a button.

Visit us at M&M 2010, booth 436 www.thermoscientific.com/microanalysis



**Thermo Scientific EDS, WDS and EBSD**The optimal integration of detectors, analyzer and software for all your microanalysis needs.

