

Frontiers of Electron Microscopy in Materials Science

Technical Program (Version 2009.9.9)

28 September (Mon)

Opening Address

S-01 Session 1-1 Current advances in instruments (1)

(N. D. Browning and K. Furuya)

Benefits of C_c -corrected imaging for high-resolution and energy-filtered TEM

B. Kabius

Single atom spectroscopy by STEM-EELS with the DELTA corrector at low accelerating voltage

K. Suenaga, Y. Sato, Z. Liu, H. Kataura, T. Okazaki, K. Kimoto, H. Sawada, T. Sasaki, K. Omoto, T. Tomita, T. Kaneyama, Y. Kondo

Coffee Break

S-02 Session 1-2 Current advances in instruments (2)

(N. D. Browning and K. Furuya)

Quantifying Transient States in Materials with the Dynamic Transmission Electron Microscope

G. H. Campbell, N. D. Browning, T. LaGrange, B. W. Reed, J. S. Kim

50pm resolution TEM/STEM by an aberration corrected 300kV-R005 microscope with cold-field emission gun

K. Takayanagi, Y. Tanisiro, Y. Oshima, T. Tanaka, H. Sawada, Y. Kondo

EELS in (C_s corrected) CFEG-STEM(s)

A. Gloter, O. Stéphan, M. Kociak, M. Walls, M. Tencé, K. March, D. Imhoff, A. Zobelli, L. Bocher, F.-T. Huang, S. Mazzucco, F. Javier de la Pena, C. Colliex

Lunch

S-03 Session 2-1 Ultra-high resolution TEM (1)

(D. J. Smith and N. Tanaka)

High-resolution electron microscopy of nano-carbon materials

S. Iijima

Cs corrected microscopy study of nanoparticles and oxide ferroelectrics

J. Zhu

Combined Analyses of Cs-corrected STEM and Atom Probe Tomography in Materials Research

S.- H Oh, C.- G. Park

Coffee Break

S-04 Session 2-2 Ultra-high resolution TEM (2)

(D. J. Smith and N. Tanaka)

TEAM at the transition from a project to a research facility

U. Dahmen

Toward quasi-atomic resolution tomography

F.-R. Chen, R. Kilaas, C. Kisielowski, D. Van Dyck

High-resolution imaging and structure analysis by using aberration-corrected electron diffraction

J. Yamasaki, S. Morishita, N. Tanaka

Poster Session (1) *Odd-numbers*

Dinner

29 September (Tue)

S-05 Session 3 Novel detectors & high sensitive recording

(T. LaGrange and G. H. Campbell)

CMOS direct-detection active pixels for electron microscopy

P. Denes

Development of microcalorimeter-type energy-dispersive spectrometer for transmission electron microscope

T. Hara, K. Watanabe, X. Yu, K. Tanaka, K. Maehata, K. Mitsuda,
N. Y. Yamasaki, M. Ohsaki, S. Ohta

Cathodoluminescence in scanning transmission electron microscopy: Direct correlation between optical and structural properties on the nanoscale

S. Keun, L. M. Brewster, S. Gradečak

Coffee Break

S-06 Session 4-1 Materials science and engineering (1)

(J. Bentley and Y. Ikuhara)

Recent studies of heteroepitaxial semiconductors

D. J. Smith

Characteristic defects induced by hydrogenation process in hydrogen-storage La-Ni compounds

E. Abe, J. Yamamoto, R. Ishikawa

Why are GaN LEDs so bright? The key role of HREM in imaging monolayer interface steps in InGaN/GaN quantum wells

C.J. Humphreys, M.J. Galtrey, R.A. Oliver, S. Bennett, M.J. Kappers,
D. Parris, P. Dawson, M. Godfrey, P. Clifton, D. Larson, R. Ulfing,
D. Saxey, A. Cerezo

Lunch

S-07 Session 4-2 Materials science and engineering (2)

(J. Bentley and Y. Ikuhara)

New materials applications of aberration-corrected STEM

S. J. Pennycook, M. F. Chisholm, M. Varela, J.-C. Idrobo, M. P. Oxley, H. J. Chang, A. Borisevich, S. Kalinin, V. Nicolosi, M. F. Murfitt, Z. S. Szilagy, N. Dellby, O. L. Krivanek

Mapping strain by inline electron holography

C.T. Koch, V. B. Özdöl, F. Phillipp, P. A. van Aken

Atomic-scale imaging of surfaces and interfaces by aberration-corrected STEM

N. Shibata, S. D. Findlay, T. Mizoguchi, A. Goto, S. Azuma, K. Matsunaga,
T. Yamamoto, Y. Ikuhara

Coffee Break

S-08 Session 4-3 Materials science and engineering (3)
(J. Bentley and Y. Ikuhara)

Structure and composition of materials for magnetic recording

J. Bentley, J.E. Wittig, J.F. Al-Sharab, J.D. Risner, R. Sinclair, C.M.
Lukehart, L.F. Allard

**An astonishing sub-angstrom spatial resolution in secondary-electron imaging
achieved with an aberration corrected electron microscope**

Y. Zhu, H. Inada, Nakamura, J. Wall

Frontiers of electron tomography in materials science

P. Midgley

Poster Session (2) *Even-numbers*

Dinner

30 September (Wed)

S-09 Session 5-1 In-situ & ultra-fast analysis (1)

(I. M. Robertson and H. Mori)

Probing plasticity at small length scales: New insights by in situ TEM

G. Dehm

In-situ aberration-corrected electron microscopy and applications

P. L. Gai, K. Yoshida, E. D. Boyes

Atomic scale in-situ observation of metal nanoparticle catalysts by environmental transmission electron microscopy

S. Takeda, H. Yoshida, T. Uchiyama, H. Kohno, S. Ichikawa

Coffee Break

S-10 Session 5-2 In-situ & ultra-fast analysis (2)

(I. M. Robertson and H. Mori)

In-situ high spatial/temporal resolution imaging of nanoscale catalysts

N. D. Browning, G. H. Campbell, J. E. Evans, B. C. Gates, A. Kulkarni, T. B. LaGrange, D. J. Masiel, S. Mehraeen, N. L. Okamoto², V. Ortolan, B. W. Reed, A. Uzun

Studies on electron-irradiation produced lattice defects in metals with HVEM

K. Arakawa, T. Nagase, H. Mori

Ext

Extra session

Disclosing the secrets of the exit wave

G. van Dyck, A. Wang, S. Van Aert, F. Chen

Free-Time

1 October (Thu)

S-11 Session 6 Advanced Application of SEM

(A. J. Wilkinson and K. Sato)

Electron channelling contrast imaging of defects in nitride semiconductor thin films

C. Trager-Cowan, N. Kumar, F. Sweeney, P. R. Edwards, A. J. Wilkinson, A. P. Day, G. England, T. Wang, P. J. Parbrook, I. M. Watson.

Variations in contrast of scanning electron microscope images for microstructure analysis of Si-based semiconductor materials

M. Itakura, N. Kuwano, K. Sato, S. Tachibana

Precise and accurate measurement of residual elastic strain using the EBSD technique

D. J. Dingley, A. J. Wilkinson, G. M. Meaden

Coffee Break

S-12 Session 7 New stage of development in HVEM

(S. A. Song and Y. Tomokiyo)

Instrumentation and application of cryo-HVEM in the Korea basic science Institute (KBSI)

J.-M. Jeong, S.-G. Lee, S.-W. Nam, S.-W. Lee, K. Song, J.-G. Kim, Y.-M. Kim, Y.-J. Kim

New environmental HVEM in Nagoya University

N. Tanaka

Newly developed energy-filtering HVEM at Kyushu University

S. Matsumura

Lunch

S-13 Session 8-1 Novel techniques of analytical EM (1)

(N. J. Zaluzec and H. Kurata)

Limits to high spatial resolution of EDS and EELS in an aberration-corrected (S)TEM

A. Genç, S. Rajagopalan, G. Thompson, R. Banerjee, C. Kiely, D. McComb, H. Fraser

Electron holography and its application to studying nanomaterials and nanodevices

T. Hirayama

In-situ analysis of optical properties of nanostructures in TEM

Y. Ohno

Coffee Break

S-14 Session 8-2 Novel techniques of analytical EM (2)

(N. J. Zaluzec and H. Kurata)

Energy-loss spectroscopy and near-edge structures with aberration-corrected transmission electron microscopes

G.A. Botton, S. Lazar, M. Couillard, L. Gunawan, Y. Shao

High spatial-resolution analysis using STEM-ADF and EELS; Limit of incoherent imaging approximation

K. Kimoto, K. Ishizuka, Y. Matsui

Plenary Talk by Distinguished Lecturer

(K. Furuya)

Observation of magnetic fields based on the AB effect

A. Tonomura

Banquet

2 October (Fri)

S-15 Session 9-1 3D-analytical techniques for materials science

(C. Kisielowski and H. Jinnai)

High-resolution bright-field electron tomography for the lattice-scale and atomic-scale study of inorganic nanostructures

L. Houben, M. Bar-Sadan

Towards atomic resolution in three dimensions with aberration corrected STEM

A. Bleloch

A novel method of reconstructing a tomogram by convergence of an innumerable dots map without the “Missing-Wedge” effect

N. Baba, E. Katayama

Coffee Break

S-16 Session 9-2 3D-analytical techniques for materials science

(C. Kisielowski and H. Jinnai)

Multi-dimensional characterizations of materials by TEM

K. Kaneko

Annular dark field – scanning transmission electron microscopy (ADF-STEM) tomography of polymer systems

J. Loos, E. Sourty

A new specimen holder for TEM/STEM tomography and its application to crystalline materials

S. Hata, H. Miyazaki, M. Mitsuhashi, M. Tanaka, K. Ikeda, H. Nakashima, K. Higashida, M. Nishida, S. Matsumura

Closing Address

Optional tour to HVEM Lab. Kyushu University