



## **Xth International Conference on Frontiers of Electron Microscopy in Materials Science**

Kasteel Vaalsbroek  
25 - 30 September 2005

Conference Chairmen

Knut Urban (Research Centre Jülich)  
Joachim Mayer (RWTH Aachen University)

### **Oral Programme**

#### **Monday 26 September 2005**

- 0845-0855 WELCOME ADDRESSES  
Knut Urban and Joachim Mayer<sup>§</sup>, *Research Centre Jülich, Jülich, Germany, §RWTH Aachen University, Aachen, Germany*
- 0855-0900 OPENING REMARKS  
Burkhard Jahnen, *German Research Foundation (DFG), Bonn, Germany*
- SESSION A: INSTRUMENTATION**  
**Chair: Harald Rose**
- 0900-0945 **A1** IMPROVED RESOLUTION BY MEANS OF NOVEL ELECTRON OPTICAL DEVICES  
Max Haider, *CEOS GmbH, Heidelberg, Germany.*
- 0945-1030 **A2** ULTRAFAST ELECTRON MICROSCOPY AND DIFFRACTION  
Wayne E King, Michael Armstrong, Ken Boyden, Geoffrey H Campbell, William DeHope, Alan Frank, Thomas LaGrange, Bryan Reed, Richard Shuttlesworth, Benjamin Pyke, and Brent Stuart, *Lawrence Livermore National Laboratory, Livermore CA, USA.*
- 1030-1100 TEA & COFFEE

- 1100-1145      **A3**    DESIGN AND PERFORMANCE OF THE NION ULTRASTEM  
Ondrej Krivanek<sup>§</sup>, Neil Bacon<sup>§</sup>, George Corbin<sup>§</sup>, Niklas Dellby<sup>§</sup>,  
Petr Hrcirik<sup>§</sup>, Robert Keyse<sup>§</sup>, Matt Murfitt<sup>§</sup>, Peter Nellist<sup>†</sup>, Chris-  
topher Own<sup>§</sup>, and Zoltan Szilagy<sup>§</sup>, <sup>§</sup>*Nion Co., Kirkland WA, USA*,  
<sup>†</sup>*Trinity College, Dublin, Ireland.*
- 1145-1215      **A4**    ENERGY FILTERING TRANSMISSION ELECTRON MICROSCOPY  
WITH A CORRECTED 90° OMEGA-FILTER  
Helmut Kohl, A Putnis, R Reichelt, G Schmitz, and N Stolwijk,  
*Westfälische Wilhelms-Universität Münster, Münster, Germany.*
- 1215-1245      **A5**    SMART, AN ABERRATION-CORRECTED LOW-VOLTAGE ELEC-  
TRON SPECTRO-MICROSCOPE FOR EXTENDED SURFACE  
STUDIES  
Eberhard Umbach<sup>§</sup>, Thomas Schmidt<sup>§</sup>, Helder Marchetto<sup>†</sup>, Ulrich  
Groh<sup>§</sup>, Rainer Fink<sup>&</sup>, and the SMART collaboration, <sup>§</sup>*Universität  
Würzburg, Würzburg, Germany*, <sup>†</sup>*Fritz-Haber-Institut der Max-  
Planck Gesellschaft, Berlin, Germany*, <sup>&</sup>*Universität Erlangen, Er-  
langen, Germany.*
- 1245-1400      LUNCH
- SESSION B:**                      **PHASE CONTRAST**  
**Chair: Dirk van Dyck**
- 1400-1445      **B1**    ITERATIVE PHASE-RETRIEVAL OF COMPLEX INFINITE SPECI-  
MEN TRANSMISSION FUNCTIONS FROM DIFFRACTION PAT-  
TERNS  
J M Rodenburg and H M L Faulkner, *University of Sheffield,  
Sheffield, UK.*
- 1445-1530      **B2**    TOWARDS ATOMIC RESOLUTION BY ELECTRON TOMOGRAPHY  
ON A DISCRETE GRID  
C Kisielowski, *Lawrence Berkeley National Laboratory, Berkeley,  
USA.*
- 1530-1600      TEA & COFFEE
- 1600-1630      **B3**    A REVIEW OF PHASE CONTRAST IMAGING AND PHASE RE-  
TRIEVAL WITH ELECTRONS  
David M Paganin, *Monash University, Victoria, Australia.*



2120-2140 **CL5** ACQUISITION AND ANALYSIS OF COMPLETE SAED PATTERNS

Christoph Hülk and Michael Wibbelt, *Soft Imaging System, Münster, Germany.*

## Tuesday 27 September 2005

### SESSION C:

### PROBES

Chair: Stephen Pennycook

- 00830-0915 **C1** HIGH SPATIAL AND ENERGY RESOLUTION EELS  
N D Browning<sup>1,2</sup>, I Arslan<sup>3</sup>, R Erni<sup>4</sup>, L Fu<sup>1</sup>, J C Idrobo<sup>5</sup>, Q Ramasse<sup>2</sup>, and A Ziegler<sup>6</sup>, <sup>1</sup>University of California, Davis CA, USA, <sup>2</sup>Lawrence Berkeley National Laboratory, Berkeley CA, USA, <sup>3</sup>University of Cambridge, Cambridge, UK, <sup>4</sup>FEI Electron Optics, Eindhoven, The Netherlands, <sup>5</sup>University of Illinois at Chicago, Chicago, IL, USA, <sup>6</sup>Max-Planck Institut für Biochemie, Martinsried, Germany.
- 0915-1000 **C2** COMPLEX OXIDE CHARACTERISATION IN THE ABERRATION CORRECTED STEM  
M Varela<sup>a</sup>, K van Benthem<sup>a</sup>, A R Lupini<sup>a</sup>, S J Pennycook<sup>a</sup>, V Peña<sup>b</sup>, Z Sefrioui<sup>b</sup>, J Santamaria<sup>b</sup>, K A Griffin<sup>c</sup>, K M Krishnan<sup>c</sup>, W D Luo<sup>d</sup>, and S T Pantelides<sup>d</sup>, <sup>a</sup>Oak Ridge National Laboratory, Oak Ridge TN, USA, <sup>b</sup>Universidad Complutense de Madrid, Madrid, Spain, <sup>c</sup>University of Washington, Seattle WA, USA, <sup>d</sup>Vanderbilt University, Nashville TN, USA.
- 1000-1045 **C3** ABERRATION CORRECTED STEM IMAGING; WHAT'S NEW?  
Andrew Bleloch<sup>§</sup>, Quentin Ramasse<sup>†</sup>, Uwe Falke<sup>§</sup>, and Meiken Falke<sup>§</sup>, <sup>§</sup>CLRC Daresbury, Daresbury, UK, <sup>†</sup>Lawrence Berkeley Laboratory, Berkeley CA, USA.
- 1045-1115 TEA & COFFEE
- 1115-1145 **C4** Z-CONTRAST STEM STUDY OF AMORPHOUS INTERGRANULAR PHASES IN SILICON NITRIDE CERAMICS  
Naoya Shibata<sup>§</sup>, Gayle S Painter<sup>†</sup>, Paul F Becher<sup>†</sup> and Stephen J Pennycook<sup>†</sup>, <sup>§</sup>The University of Tokyo, Tokyo, Japan, <sup>†</sup>Oak Ridge National Laboratory, Oak Ridge, USA.
- 1145-1215 **C5** EARLY RESULTS FROM AN ABERRATION CORRECTED JEOL 2200FS AT OAK RIDGE NATIONAL LABORATORY





SCANNING TRANSMISSION ELECTRON MICROSCOPY AND  
ELECTRON ENERGY LOSS SPECTROSCOPY IN MATERIALS SCI-  
ENCE

John Silcox, *Cornell University, Ithaca NY, USA.*

1300-1400 LUNCH  
1400-1815 EXCURSION  
1900-2000 DINNER

**2000-2200 POSTER SESSION PB**

**Thursday 29 September 2005**

**SESSION F: ELECTRON ENERGY LOSS SPECTROSCOPY**  
**Chair: Ferdinand Hofer**

0830-0915 **F1** EELS IN MATERIALS SCIENCE: WHY SOME INTERFACES CAN NEVER BE SHARP  
D A Muller<sup>§</sup>, N Nakagawa<sup>†</sup>, and H Y Hwang<sup>†</sup>, <sup>§</sup>*Cornell University, Ithaca NY, USA*, <sup>†</sup>*University of Tokyo, Japan.*

0915-1000 **F2** EXPLORING THE RESOLUTION LIMITS WITH A MONOCHROMATED (S)TEM  
Werner Grogger, Gerald Kothleitner, Bernhard Schaffer, and Ferdinand Hofer, *Graz University of Technology, Graz, Austria.*

1000-1045 **F3** PROBING COMPLEX OXIDES AND NANOSTRUCTURED MATERIALS USING ELECTRON ENERGY-LOSS SPECTROSCOPY  
David W McComb<sup>§</sup>, Alan J Craven<sup>†</sup>, Maureen MacKenzie<sup>†</sup>, Frances T Docherty<sup>†</sup>, David Eustace<sup>†</sup>, P Harkins<sup>†</sup>, and C McGilvery<sup>§</sup>, <sup>§</sup>*Imperial College, London, UK*, <sup>†</sup>*University of Glasgow, Glasgow, UK.*

1045-1115 TEA & COFFEE

1115-1145 **F4** LOW-LOSS EELS AND OPTICAL PROPERTIES: THE ROLE OF CALCULATIONS FROM FIRST PRINCIPLES



Kazuo Furuya<sup>§</sup>, Masayuki Shimojo<sup>†</sup>, Kazutaka Mitsuishi, Masaki Takeguchi, Miyoko Tanaka and Minghui Song, <sup>§</sup>*National Institute for Materials Science, Tsukuba, Japan*, <sup>†</sup>*Saitama Institute of Technology, Saitama, Japan*.

- 1715-1745      **G5**    SMALL-SCALE PLASTICITY OF THIN FILMS  
Gerhard Dehm<sup>1</sup>, Marc Legros<sup>2</sup>, and Beverley J Inkson<sup>3</sup>,  
<sup>1</sup>*University of Leoben, Leoben, Austria*, <sup>2</sup>*CEMES-CNRS, Toulouse, France*, <sup>3</sup>*University of Sheffield, Sheffield, UK*.
- 1745-1815      **G6**    QUANTITATIVE MEASUREMENT OF THE COMPOSITION OF EMBEDDED Cu-RICH PRECIPITATES IN FERRITIC STEEL  
J M Titchmarsh, S Lozano-Perez and M L Jenkins, *Oxford University, Oxford, UK*.
- 1915-2000      SHERRY AND WINE RECEPTION
- 2000              CONFERENCE DINNER

## **Friday 30 September 2005**

### **SESSION H:**

#### **INTERFACES**

**Chair: C Barry Carter**

- 0830-0915      **H1**    ATOMIC STRUCTURES, CHEMISTRY AND PROPERTIES IN CERAMIC INTERFACES  
Y Ikuhara, J Buban, N Shibata, K Matsunaga, and T Yamamoto,  
*University of Tokyo, Tokyo, Japan*.
- 0915-1000      **H2**    ATOMISTIC STUDIES OF LINE DEFECTS AT GRAIN BOUNDARIES  
Douglas L Medlin, *Sandia National Laboratories, Livermore CA, USA*.
- 1000-1045      **H3**    STRESS FIELDS AT BOUNDARIES BETWEEN CONTACTING SMALL PARTICLES  
Anders Thölen, *Chalmers University of Technology, Göteborg, Sweden*.
- 1045-1115      TEA & COFFEE



## Poster Programme

### Poster Session PA (Topics A - D)

Tuesday 27 September, 2000-2200

- PA01\*** ABERRATION FREE MICROSCOPY FOR LIFE SCIENCE APPLICATIONS  
J M Plitzko<sup>£</sup>, B Freitag<sup>§</sup>, R Hegerl<sup>£</sup>, A Ziegler<sup>£</sup> , and U Lücken<sup>§</sup>, <sup>£</sup>*Max Planck Institute for Biochemistry, Martinsried, Germany*, <sup>§</sup>*FEI Company, Eindhoven, The Netherlands*.
- PA02\*** ESEM-INVESTIGATIONS APPLYING THE "WET-MODE" TECHNOLOGY: OBJECTIVES, RESULTS AND FUTURE PROSPECTS  
Heinz Hohenberg and Norbert Franz, *Heinrich-Pette-Institute, Hamburg, Germany*.
- PA03\*** HOW TO PREVENT DEHYDRATION OF HYDRATED MATERIAL IN THE ESEM: TECHNICAL SOLUTIONS AND APPLICATIONS  
Norbert Franz, Petra Sanger, and Heinz Hohenberg, *Heinrich-Pette-Institute, Hamburg, Germany*.
- PA04\*** DIFFERENT STRATEGIES FOR THE MORPHOLOGICAL ANALYSIS OF FULLY HYDRATED AND LIFE-LIKE BIOLOGICAL MATERIAL IN THE XL30-ESEM  
Roger Wepf<sup>§</sup>, Rudolf Reimer<sup>£</sup>, Robert Getzieh<sup>£</sup>, Norbert Franz<sup>£</sup>, and Heinz Hohenberg<sup>£</sup>, <sup>§</sup>*Beiersdorf AG, Hamburg, Germany*, <sup>£</sup>*Heinrich-Pette-Institute, Hamburg, Germany*.
- PA05\*** ESEM-TECHNOLOGY IN MEDICINE AND BIOLOGY: NEW APPLICATION FIELDS, FASTER RESULTS AND HIGHER BIOLOGIC PRECISION  
Norbert Franz<sup>£</sup>, Dieter Weiss<sup>§</sup>, Martin Ritter<sup>£</sup>, and Heinz Hohenberg<sup>£</sup>, <sup>£</sup>*Heinrich-Pette-Institute, Hamburg, Germany*, <sup>§</sup>*University of Rostock, Rostock, Germany*.
- PA06\*** CRYO-TEM INVESTIGATIONS OF NATURAL AND SYNTHETIC SUPRAMOLECULAR ASSEMBLIES  
C Bottcher, K Ludwig, B Schade, and H von Berlepsch, *Freie Universitat Berlin, Berlin, Germany*.

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\* Special presentation in the framework of the "Abschlukolloquium der DFG-Grogerateinitiative".

- PA07\*** IN-SITU INVESTIGATIONS IN AN ENVIRONMENTAL SCANNING ELECTRON MICROSCOPE  
Frank Heyroth, Hans-Reiner Höche, Frank Syrowatka, Reinhold Godehardt and Werner Lebek, *Martin-Luther University Halle, Halle, Germany.*
- PA08\*** NANOSTRUCTURES IN A FIELD EMISSION TEM: ANALYSIS AND MANIPULATION ON THE SUB-NANOMETRE SCALE  
J X Li, U Kolb, and F Banhart et al., *Universität Mainz, Mainz, Germany.*
- PA08A\*** STRUCTURE ANALYSIS VIA 3D ELECTRON DIFFRACTION  
Ute Kolb, Tatiana Gorelik, and Diana Nihtianova, *Johannes Gutenberg-Universität Mainz, Mainz, Germany.*
- PA09\*** ENERGY FILTERING TRANSMISSION ELECTRON MICROSCOPY WITH A CORRECTED 90° OMEGA-FILTER  
Helmut Kohl, A Putnis, R Reichelt, G Schmitz, and N Stolwijk, *Westfälische Wilhelms-Universität Münster, Münster, Germany.*
- PA10\*** THE SUB-ELECTRON-VOLT-SUB-ANGSTROM-MICROSCOPE (SESAM) PROJECT  
M Rühle<sup>§</sup>, W Sigle<sup>§</sup>, C Koch<sup>§</sup>, E Essers<sup>†</sup>, G Lang<sup>†</sup>, and G Benner<sup>†</sup>, *§MPI für Metallforschung, Stuttgart, Germany, †Carl Zeiss SMT, Oberkochen, Germany.*
- PA11\*** TRANSMISSION ELECTRON MICROSCOPY OF NANOSTRUCTURED SEMICONDUCTOR MATERIALS  
W Neumann, H Kirmse, I Häusler, and I Hähner, *Humboldt University of Berlin, Berlin, Germany.*
- PA12\*** TRANSMISSION ELECTRON MICROSCOPY AT VARIABLE SPHERICAL ABERRATION  
Knut Urban, Chunlin Jia, and Markus Lentzen, *Research Centre Jülich, Jülich, Germany.*
- PA13** DEVELOPMENT OF ULTRAHIGH-VACUUM Cs CORRECTED SCANNING TRANSMISSION ELECTRON MICROSCOPE  
K Mitsuishi<sup>§</sup>, M Takeguchi, Y Kondo<sup>†</sup>, F Hosokawa<sup>†</sup>, K Okamoto<sup>†</sup>, T Sannomiya<sup>†</sup>, M Hori<sup>†</sup>, T Iwama<sup>†</sup>, M Kawazoe<sup>†</sup>, and K Furuya, *§National Institute for Materials Science, Tsukuba, Japan, †JEOL Ltd, Tokyo, Japan.*
- PA14** THREE-DIMENSIONAL ARRANGEMENT OF RARE-EARTH ATOMS AT PRISM SURFACES OF SILICON NITRIDE GRAINS USING ABERRATION-CORRECTED HAADF-STEM

Christian Dwyer<sup>§</sup>, Graham B Winkelman<sup>§</sup>, Raphaelle L Satet<sup>†</sup>, Michael J Hoffmann<sup>†</sup> and David J H Cockayne<sup>§</sup>, <sup>§</sup>*University of Oxford, Oxford, UK*, <sup>†</sup>*Universität Karlsruhe, Karlsruhe, Germany*.

- PA15** PERFORMANCE EVALUATION OF A JEOL 2200FS FOR INVESTIGATION OF HETEROEPITAXIAL INTERFACES AND NANOPARTICLES  
Thomas J Zega and Rhonda M Stroud, *Naval Research Laboratory, Washington DC, USA*.
- PA16** FIRST RESULTS FROM A MONOCHROMATED AND Cs-CORRECTED 200KV STEM  
T Walther<sup>§</sup>, G Benner<sup>†</sup>, H Stegmann<sup>†</sup>, A Thesen<sup>†</sup>, and E Quandt<sup>§</sup>, <sup>§</sup>*Center of Advanced European Studies and Research, Bonn, Germany*, <sup>†</sup>*Carl Zeiss NTS GmbH, Oberkochen, Germany*.
- PA17** QUALIFICATION OF THE MANDOLINE FILTER IN THE SESAME  
E Essers and G Benner, *Carl Zeiss SMT, Oberkochen, Germany*.
- PA18** SEM RESOLUTION IMPROVEMENT AT LOW VOLTAGE WITH A HIGH BRIGHTNESS ELECTRON GUN MONOCHROMATOR  
Dane Cubric<sup>§</sup>, Simon van Kranen<sup>†</sup>, Mike Rignall<sup>§</sup>, and Pieter Kruit<sup>†</sup>, <sup>§</sup>*Shimadzu Research Laboratory, Manchester, UK*, <sup>†</sup>*Delft University of Technology, Delft, The Netherlands*.
- PA19** HIGH RESOLUTION SINGLE AND DUAL AXIS TILT TOMOGRAPHY OF SEMICONDUCTOR NANOMATERIALS  
I Arslan<sup>§</sup>, T J V Yates<sup>§</sup>, J Tong<sup>§</sup>, N D Browning<sup>†‡</sup>, and P A Midgley<sup>§</sup>, <sup>§</sup>*University of Cambridge, Cambridge, UK*, <sup>†</sup>*University of California, Davis CA, USA*, <sup>‡</sup>*Lawrence Berkeley National Laboratory, Berkeley, CA, USA*.
- PA20** APPLICATION OF STEM NANOPROBE TO MICROELECTRONICS DEVICE INVESTIGATION  
F Sammiceli and G Pavia, *STMicroelectronics, Agrate Brianza, Italy*.
- PA21** IMAGING SINGLE ATOMS IN THREE DIMENSIONS: POSSIBILITIES AND FRONTIERS  
Klaus van Benthem<sup>§</sup>, Andrew R Lupini<sup>§</sup>, Yiping Peng<sup>§</sup>, Sergey N Rasheev<sup>†,§</sup>, Sokrates T Pantelides<sup>†,§</sup>, and Stephen J Pennycook<sup>§,†</sup>, <sup>§</sup>*Oak Ridge National Laboratory, Oak Ridge TN, USA*, <sup>†</sup>*Vanderbilt University, Nashville TN, USA*.
- PA22** PRECISE ESTIMATION OF STRUCTURE PARAMETERS FROM HIGH RESOLUTION ELECTRON MICROSCOPY IMAGES

S Van Aert<sup>§</sup>, A J den Dekker<sup>‡</sup>, and D Van Dyck<sup>§</sup>, <sup>§</sup>*University of Antwerp, Antwerp, Belgium*, <sup>‡</sup>*Delft University of Technology, Delft, The Netherlands*.

- PA23** COMPARISONS OF IMAGE RESTORATION METHODS IN HIGH-RESOLUTION ELECTRON MICROSCOPY  
Shery L Y Chang, Rüdiger R Meyer, and Angus I Kirkland, *University of Oxford, Oxford, UK*.
- PA24** ABERRATION-CORRECTED HRTEM OF DEFECTS IN STRAINED La<sub>2</sub>Cu<sub>4</sub> FILMS GROWN ON SrTiO<sub>3</sub>  
Lothar Houben, *Research Centre Jülich, Jülich, Germany*.
- PA25** IMPROVEMENTS IN RECONNOITRING THE STRUCTURE OF LATTICE DEFECTS IN METALS AND SEMICONDUCTORS AT ATOMIC RESOLUTION: VANTAGES ACCRUING FROM THE COMBINED USE OF SPHERICAL-ABERRATION CORRECTED IMAGING AND THE RETRIEVAL OF THE EXIT-PLANE WAVEFUNCTION  
Karsten Tillmann, Andreas Thust, and Knut Urban, *Research Centre Jülich, Jülich, Germany*.
- PA26** SOLVING THE MISSING LIGHT ATOM PROBLEM IN ELECTRON CRYSTALLOGRAPHY VIA EXIT WAVE RECONSTRUCTION  
Juri Barthel<sup>§</sup>, Thomas E Weirich<sup>†</sup>, Gerhard Cox<sup>‡</sup>, Hartmut Hibt<sup>‡</sup>, and Andreas Thust<sup>§</sup>, <sup>§</sup>*Forschungszentrum Jülich GmbH, Jülich, Germany*, <sup>†</sup>*RWTH Aachen University, Aachen, Germany*, <sup>‡</sup>*BASF-AG, Ludwigshafen, Germany*.
- PA27** NEW FRONTIERS IN ELECTRON CRYSTALLOGRAPHY: STRUCTURE DETERMINATION FROM PRECESSION ELECTRON DIFFRACTION DATA  
Thomas E Weirich<sup>§</sup>, Joaquim Portillo<sup>†,‡</sup>, Gerhard Cox<sup>‡</sup>, Hartmut Hibt<sup>‡</sup> and Stavros Nicolopoulos<sup>†,&</sup>, <sup>§</sup>*RWTH Aachen University, Aachen, Germany*, <sup>†</sup>*NanoMegas SPRL, Brussels, Belgium*, <sup>‡</sup>*Universitat de Barcelona, Barcelona, Spain*, <sup>‡</sup>*BASF-AG, Ludwigshafen, Germany*, <sup>&</sup>*Universidad Politecnica de Valencia, Valencia, Spain*.

## Poster Session PB (Topics E - H)

Wednesday 28 September, 2000-2200

- PB01** QUANTITATIVE EDX ANALYSIS OF SURFACES WITH ROUGH MORPHOLOGY  
Dror Horvitz and Yuli Chakk, *Intel Electronics Ltd, Kiryat Gat, Israel.*
- PB02** ATOMIC AND ELECTRONIC STRUCTURES OF METAL-OXIDE INTERFACES BY HRTEM-ELNES AND FIRST-PRINCIPLES CALCULATIONS  
Takeo Sasaki, Teruyasu Mizoguchi, Katsuyuki Matsunaga, Takahisa Yamamoto, and Yuichi Ikuhara, *The University of Tokyo, Tokyo, Japan.*
- PB03** NEW POSSIBILITIES OF STANDING X-RAYS METHOD IN CASE OF CONTINUED RESONANT COMBINATIVE X-RADIATION DISPERSION  
E N Moos and I A Zeltser, *Analytical Center of G Schuppe, Ryazan, Russia.*
- PB04** DYNAMIC MONTE CARLO SIMULATION ON THE ELECTRON-BEAM-INDUCED DEPOSITION OF C, Ag AND W SUPERTIPS  
Zhi-Quan Liu, Kazutaka Mitsuishi, and Kazuo Furuya, *National Institute for Materials Science, Tsukuba, Japan.*
- PB05** CONTRIBUTION OF DYNAMIC CHARGING EFFECTS INTO DOPANT CONTRAST MECHANISM IN SILICON  
Yuli Chakk and Dror Horvitz, *Intel Electronics Ltd, Kiryat Gat, Israel.*
- PB06** TEM SAMPLE PREPARATION USING NEW NANO-FABRICATION TECHNIQUE COMBINING ELECTRON-BEAM-INDUCED DEPOSITION AND LOW ENERGY ION MILLING  
K Mitsuishi<sup>§</sup>, M Shimojo<sup>†</sup>, M Tanaka, M Takeguchi, M Song and K Furuya, <sup>§</sup>*National Institute for Materials Science, Tsukuba, Japan,* <sup>†</sup>*Saitama Institute of Technology, Saitama, Japan.*
- PB07** PATTERN RECOGNITION IN COMPLEX MATERIALS  
Tore Niermann, Karsten Thiel, and Michael Seibt, *Universität Göttingen, Göttingen, Germany.*
- PB08** QUANTITATIVE CHARACTERISATION OF A CRYSTALLINE-AMORPHOUS INTERFACE BY HIGH-RESOLUTION ELECTRON MICROSCOPY  
K Thiel<sup>§</sup>, N I Borgardt<sup>†</sup>, B Plikat<sup>‡</sup>, T Niermann<sup>§</sup>, and M Seibt<sup>§</sup>, <sup>§</sup>*Universität Göttingen, Göttingen, Germany,* <sup>†</sup>*Moscow Institute of Electronic Technology, Moscow, Russia,* <sup>‡</sup>*Infineon Technologies AG, Regensburg, Germany.*

- PB09** IN SITU DEFORMATION OF SILICON NANOSPHERES  
Julia Deneen, William M Mook, Andrew Minor<sup>§</sup>, William W Gerberich, and C Barry Carter, *University of Minnesota, Minneapolis MN, USA*, <sup>§</sup>*Lawrence Berkeley National Laboratory, Berkeley CA, USA*.
- PB10** QUANTITATIVE TEM CHARACTERISATIONS OF MULTILAYER SYSTEMS ON STRUCTURED SILICON SUBSTRATES  
D Häußler<sup>§</sup>, E Spiecker<sup>§</sup>, W Jäger<sup>§</sup>, M Störmer<sup>†</sup>, R Bormann<sup>†</sup>, C Michaelssen<sup>‡</sup>, J Wiesmann<sup>‡</sup>, and G Zwicker<sup>+</sup>, <sup>§</sup>*Christian-Albrechts-University of Kiel, Kiel, Germany*, <sup>†</sup>*GKSS Forschungszentrum Geesthacht GmbH, Geesthacht, Germany*, <sup>‡</sup>*Incoatec GmbH, Geesthacht, Germany*, <sup>+</sup>*Fraunhofer Institute for Silicon Technology, Itzehoe, Germany*.
- PB11** TEM CHARACTERISATIONS OF NOVEL METAL-FILLED CARBON NANOTUBES  
F Liu<sup>§\*</sup>, X B Zhang<sup>§</sup>, W Jäger<sup>†</sup>, D Häussler<sup>†</sup>, X Y Tao<sup>§</sup>, J P Cheng<sup>§</sup>, G F Yi<sup>§</sup> and S M Zhou<sup>§</sup>, <sup>§</sup>*Zhejiang University, Hangzhou, P R China*, <sup>†</sup>*Christian-Albrechts-University of Kiel (CAU), Kiel, Germany*.
- PB12** TEM CHARACTERISATIONS OF MULTI-WALL CARBON NANOTUBES SUPPORTED METAL AND METAL OXIDE PARTICLES  
F Liu<sup>§\*</sup>, X B Zhang<sup>§</sup>, W Jäger<sup>†</sup>, D Häussler<sup>†</sup>, G F Yi<sup>§</sup>, J P Cheng<sup>§</sup>, X Y Tao<sup>§</sup>, Z Q Luo<sup>§</sup> and S M Zhou<sup>§</sup>, <sup>§</sup>*Zhejiang University, Hangzhou, P R China*, <sup>†</sup>*Christian-Albrechts-University of Kiel (CAU), Kiel, Germany*.
- PB13** NANOFOLD NETWORK FORMATION ON LAYERED CRYSTAL SURFACES  
E Spiecker<sup>§,†</sup>, S Hollensteiner<sup>§</sup>, W Jäger<sup>§</sup>, A K Schmid<sup>†</sup>, A Minor<sup>†</sup>, and U Dahmen<sup>†</sup>, <sup>§</sup>*Universität Kiel, Kiel, Germany*, <sup>†</sup>*Lawrence Berkeley National Laboratory, Berkeley CA, USA*.
- PB14** FABRICATION AND CHARACTERISATION OF Au-NANOPARTICLES / W-NANODENDRITE STRUCTURES ON INSULATOR Al<sub>2</sub>O<sub>3</sub> SUBSTRATES  
Guoqiang Xie<sup>§</sup>, Minghui Song, and Kazuo Furuya, *National Institute for Materials Science, Tsukuba, Japan*.
- PB15** ATOMISTIC-SCALE DYNAMIC OBSERVATION OF CRACK PROPAGATION IN GOLD  
Y Matsukawa, J A Horton Jr, and S J Zinkle, *Oak Ridge National Laboratory, Oak Ridge TN, USA*.
- PB16** ALTERNATIVE GATE OXIDES FOR MICROELECTRONIC APPLICATIONS: HRTEM INVESTIGATION OF RARE EARTH SCANDATE / TITANATE MULTILAYERS

M Boese, T Heeg, J Schubert and M Luysberg, *Research Centre Jülich, Jülich, Germany.*

- PB17** ELECTRON HOLOGRAPHY CHARACTERISATION OF MAGNETIC NANOSTRUCTURES FORMED BY ELECTRON BEAM INDUCED CHEMICAL VAPOUR DEPOSITION  
M Takeguchi<sup>1</sup>, M Shimojo<sup>1,2</sup>, K Mitsuishi<sup>1</sup>, M Tanaka<sup>1</sup>, R Che<sup>1</sup> and K Furuya<sup>1</sup>, <sup>1</sup>*National Institute for Materials Science, Japan*, <sup>2</sup>*Saitama Institute of Technology, Japan.*
- PB18** SEGREGATION OF REACTIVE ELEMENTS AT GRAIN BOUNDARIES IN FeCrAl ALLOYS  
D L Ram, G J Tatlock, and U Falke<sup>5</sup>, *University of Liverpool, Liverpool, UK*, <sup>5</sup>*Daresbury Laboratory, Warrington, UK.*
- PB19** HREM OF THE {111} SURFACES OF IRON OXIDE NANOPARTICLES  
G Lovely<sup>1</sup>, A J Scott<sup>1</sup>, A P Brown<sup>1</sup>, R Brydson<sup>1</sup>, A I Kirkland<sup>2</sup>, R R Meyer<sup>2</sup>, L Y Chang<sup>2</sup>, D A Jefferson<sup>3</sup>, M Falke<sup>4</sup>, and A Bleloch<sup>4</sup>, <sup>1</sup>*University of Leeds, Leeds, UK*, <sup>2</sup>*University of Oxford, Oxford, UK*, <sup>3</sup>*University of Cambridge, Cambridge, UK*, <sup>4</sup>*Daresbury Laboratory, Daresbury, UK.*
- PB20** IN-SITU OBSERVATIONS OF MARTENSITIC TRANSFORMATION IN Ti USING ULTRAFAST ELECTRON MICROSCOPY  
T LaGrange, G H Campbell, and W E King, *Lawrence Livermore National Laboratory, Livermore CA, USA.*
- PB21** IDENTIFICATION OF A NEW TITANIUM INTERMETALLIC PHASE BY MEANS OF TEM  
V Y Gertsman and O Dremailova, *Materials Technology Laboratory, Ottawa ON, Canada.*
- PB22** CORRELATING THE MACROSCOPIC TENSILE RESPONSE OF METALLIC FILMS WITH MICROSCOPIC PROCESSES  
I M Robertson, K Hattar, J Han, and T Saif, *University of Illinois, Urbana IL, USA.*
- PB23** IN SITU HREM OBSERVATION OF CRYSTALLINE-TO-GAS TRANSITION IN NANOMETRE SIZED SILVER PARTICLES ON GRAPHITE  
Jung-Goo Lee and Hirotaro Mori, *Osaka University, Osaka, Japan.*
- PB24** STRUCTURES OF BULK NANOCRYSTALLINE ALLOYS STUDIED BY TEM  
H Peter Karnthaler, Christian Rentenberger, and Thomas Waitz, *University of Vienna, Wien, Austria.*

**PB25** MORPHOLOGY OF HAFNIUM-SILICATE ( $\text{Hf}_x\text{Si}_{2-x}\text{O}_4$  FOR  $x = 45, 55, 65$  AND 75) GATE DIELECTRIC THIN FILMS AFTER THERMAL PROCESSING  
Brendan Foran<sup>§</sup>, Guoda Lian<sup>§</sup>, Mark Clark<sup>§</sup>, Gennadi Bersuker<sup>†</sup>, and Pat S Lysaght<sup>†</sup>, <sup>§</sup>*ATDF, Austin TX, USA*, <sup>†</sup>*SEMATECH, Austin TX, USA*.

**PB26** TEM STUDIES OF MICROSTRUCTURE AFTER AMORPHOUS-CRYSTALLINE TRANSITION IN CHALCOGENIDE-BASED FILMS UNDER E-BEAM ANNEALING  
V Yu Kolosov, *Ural State Economic University, Ekaterinburg, Russia*.