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®, 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§, Neil Bacon§, George Corbin§, Niklas Dellby§, Petr Hrnčirík§, Robert Keyse§, Matt Murfitt§, Peter Nellist†, Christopher Own§, and Zoltan Szilagyi§, §Nion Co., Kirkland WA, USA, †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 ELECTRON SPECTRO-MICROSCOPE FOR EXTENDED SURFACE STUDIES
Eberhard Umbach§, Thomas Schmidt§, Helder Marchetto†, Ulrich Groh§, Rainer Fink§, and the SMART collaboration, §Universität Würzburg, Würzburg, Germany, †Fritz-Haber-Institut der Max-Planck Gesellschaft, Berlin, Germany, §Universität Erlangen, Erlangen, Germany.

1245-1400 LUNCH

SESSION B: PHASE CONTRAST
Chair: Dirk van Dyck

1400-1445 B1 ITERATIVE PHASE-RETRIEVAL OF COMPLEX INFINITE SPECIMEN TRANSMISSION FUNCTIONS FROM DIFFRACTION PATTERNS
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 RETRIEVAL WITH ELECTRONS
David M Paganin, Monash University, Victoria, Australia.
1630-1715  B4  ASPECTS OF CONTRAST THEORY FOR HRTEM AT THE SUB-ÅNGSTRÖM FRONTIER
Markus Lentzen, Andreas Thust, and Knut Urban, Research Centre Jülich, Jülich, Germany

1715-1745  B5  MEASURING, CORRECTING AND COMPENSATING ABERRATIONS FOR HREM
A I Kirkland and L Y Chang, Oxford University, Oxford, UK.

1745-1815  B6  ELECTRON HOLOGRAPHY USING A Cs-CORRECTED TEM: TOWARDS THE FRONTIERS OF ATOMIC CHARACTERISATION

1815-2000  DINNER

SESSION CL: PRESENTATIONS OF COMPANY REPRESENTATIVES
Chair: Andreas Thust

2000-2020  CL1  THE DESIGN AND FIRST RESULTS OF A DEDICATED CORRECTOR (S)TEM

2020-2040  CL2  REALIZING DEEP SUB-ÅNGSTROM RESOLUTION
G Benner, E Essers, G Lang, M Matijevic, P Schlossmacher, and A Thesen, Carl Zeiss SMT, Oberkochen, Germany.

2040-2100  CL3  THE EFFECT OF OBJECTIVE LENS SPHERICAL ABERRATIONS ON FILTERED IMAGING AND SPECTRAL ENERGY RESOLUTION FOR A POST-COLUMN IMAGING ENERGY FILTER
M M G Barfels, M Kundmann, C Trevor, and J A Hunt, Gatan Inc, Pleasanton CA, USA.

2100-2120  CL4  SPECIMEN PREPARATION FOR HIGH RESOLUTION TRANSMISSION ELECTRON MICROSCOPY USING A GASEOUS, LOW-ENERGY, FOCUSED ION SOURCE
P E Fischione, R R Cerchiara, A C Robins, and D W Smith, E A Fischione Instruments Inc, Corporate Circle Export PA, USA.
Tuesday 27 September 2005

SESSION C: PROBES
Chair: Stephen Pennycook

00830-0915 C1 HIGH SPATIAL AND ENERGY RESOLUTION EELS
N D Browning1,2, I Arslan3, R Erni4, L Fu5, J C Idrobo5, Q Ramasse5, and A Ziegler6, 1University of California, Davis CA, USA, 2Lawrence Berkeley National Laboratory, Berkeley CA, USA, 3University of Cambridge, Cambridge, UK, 4FEI Electron Optics, Eindhoven, The Netherlands, 5University of Illinois at Chicago, Chicago, IL, USA, 6Max-Planck Institut für Biochemie, Martinsried, Germany.

0915-1000 C2 COMPLEX OXIDE CHARACTERISATION IN THE ABERRATION CORRECTED STEM
M Varela8, K van Benthem8, A R Lupini8, S J Pennycook5, V Peña9, Z Sefriou9, J Santamaria9, K A Griffin10, K M Krishnan10, W D Luo11, and S T Pantelides12, 8Oak Ridge National Laboratory, Oak Ridge TN, USA, 9Universidad Complutense de Madrid, Madrid, Spain, 10University of Washington, Seattle WA, USA, 11Vanderbilt University, Nashville TN, USA.

1000-1045 C3 ABERRATION CORRECTED STEM IMAGING; WHAT’S NEW?
Andrew Bleloch5, Quentin Ramasse1, Uwe Falke5, and Meiken Falke5, 5CLRC Daresbury, Daresbury, UK, 1Lawrence 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 Shibata5, Gayle S Painter7, Paul F Becher7 and Stephen J Pennycook1, 5The University of Tokyo, Tokyo, Japan, 7Oak Ridge National Laboratory, Oak Ridge, USA.

1145-1215 C5 EARLY RESULTS FROM AN ABERRATION CORRECTED JEOL 2200FS AT OAK RIDGE NATIONAL LABORATORY
Douglas A Blom§, Lawrence F Allard§, Satoshi Mishina†, and Michael A O’Keefe‡, Oak Ridge National Laboratory, Oak Ridge TN, USA, †JEOL USA, Peabody MA, USA, ‡Department of Energy, Washington, DC, USA.

1215-1245  C6  EXAMINATION OF INTERGRANULAR GLASSY FILMS BY ENERGY-FILTERED ELECTRON DIFFRACTION
Christoph Koch, Somnath Bhattacharyya, and Manfred Rühle, Max Planck Institut für Metallforschung, Stuttgart, Germany.

1245-1400  LUNCH

SESSION D:  ENERGY DISPERSIVE X-RAY ANALYSIS
Chair: David Williams

1400-1445  D1  ELECTRON-EXCITED ENERGY DISPERSIVE X-RAY SPECTROMETRY AT HIGH SPEED AND AT HIGH RESOLUTION: SILICON DRIFT DETECTORS AND MICROCALORIMETERS
Dale E Newbury, National Institute of Standards and Technology, Gaithersburg MD, USA.

1445-1530  D2  AUTOMATED MULTIVARIATE STATISTICAL ANALYSIS OF SEM AND STEM X-RAY SPECTRAL IMAGES
Paul G Kotula and Michael R Keenan, Sandia National Laboratories, Albuquerque NM, USA.

1530-1600  TEA & COFFEE

1600-1645  D3  FRONTIERS OF X-RAY ANALYSIS IN ANALYTICAL ELECTRON MICROSCOPY: TOWARDS ATOMIC-SCALE RESOLUTION AND SINGLE-ATOM SENSITIVITY
Masashi Watanabe and David B Williams, Lehigh University, Bethlehem PA, USA.

1645-1715  D4  QUANTITATIVE CHARACTERISATION OF NANOPRECIPITATES IN IRRADIATED LOW ALLOY STEELS: ADVANCES IN THE APPLICATION OF FEG-STEM QUANTITATIVE MICROANALYSIS TO REAL MATERIALS
M G Burke§, M Watanabe†, and D B Williams†, ‡Bechtel Bettis Inc., West Mifflin PA, USA, †Lehigh University, Bethlehem PA, USA.
1715-1745  **D5**  ANALYTICAL TEM FOR 3D RECONSTRUCTIONS OF NANOCOMPOSITES
Günther Möbus, Sheffield University, Sheffield, UK.

1745-1815  **D6**  CONVENTIONAL AND UNCONVENTIONAL ELECTRON TOMOGRAPHY
Paul Midgley, Timothy Yates, Ilke Arslan, Jenna Tong, Mhairi Gass, Alison Twitchett, Rafal Dunin-Borkowski, and John Meurig Thomas, University of Cambridge, Cambridge, UK.

1815-2000  DINNER

2000-2200  POSTER SESSION PA

**Wednesday 28 September 2005**

**SESSION E:** SPECIAL TOPICS
Chair: Ulrich Dahmen

0830-0915  **E1**  FLUCTUATION MICROSCOPY: A SENSITIVE PROBE OF MEDIUM RANGE ORDER IN DISORDERED MATERIALS
M M J Treacy, Arizona State University, Tempe, USA.

0915-1000  **E2**  LOW ENERGY ELECTRON MICROSCOPY
Ruud M Tromp, IMB Thomas J Watson Research Centre, Yorktown Heights, USA.

1000-1045  **E3**  NEW DEVELOPMENTS IN ELECTRON NANO-DIFFRACTION AND NEW APPLICATIONS TO MATERIALS CHARACTERISATION
Jian-Min Zuo, University of Illinois at Urbana-Champaign, USA.

1045-1115  TEA & COFFEE

1115-1200  **E4**  SYNCHROTRON X-RAY MICROSCOPY AS A TOOL IN MATERIALS SCIENCE AND NANOSCIENCE
J Murray Gibson, Argonne National Laboratory, Argonne IL, USA.

1200-1300  **E5**  FEMMS 2005 DISTINGUISHED LECTURE:
SCANNING TRANSMISSION ELECTRON MICROSCOPY AND ELECTRON ENERGY LOSS SPECTROSCOPY IN MATERIALS SCIENCE
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§, N Nakagawa†, and H Y Hwang†, §Cornell University, Ithaca NY, USA, †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§, Alan J Craven†, Maureen MacKenzie†, Frances T Docherty†, David Eustace†, P Harkins†, and C McGilvery§, §Imperial College, London, UK, †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
1145-1215  F5  PRINCIPLES OF ENERGY LOSS CHIRAL DICHROISM IN THE TEM
Peter Schattschneider, Vienna University of Technology, Vienna, Austria.

1215-1245  F6  ELNES, CHEMICAL BONDING, AND PROPERTIES OF METAL / CERAMIC INTERFACES
Teruyasu Mizoguchi, Takeo Sasaki, Isao Tanaka, Katsuyuki Matsunaga, Takahisa Yamamoto, and Yuichi Ikuhara,
Lawrence Berkeley National Laboratory, Berkeley, USA, The University of Tokyo, Tokyo, Japan, Kyoto University, Kyoto, Japan.

1245-1400  LUNCH

SESSION G: DEFECTS
Chair: Ian Robertson

1400-1445  G1  CHARACTERISING SMALL POINT-DEFECT CLUSTERS IN THE TEM - NEW APPROACHES TO AN OLD PROBLEM
M L Jenkins, University of Oxford, Oxford, UK.

1445-1530  G2  TEM ANALYSIS OF DISLOCATION PROPERTIES IN METALLIC ALLOYS
Patrick Veyssière and Yulung Chiu, CNRS-ONERA, Chatillon, France, The University of Auckland, Auckland City, New Zealand.

1530-1600  TEA & COFFEE

1600-1645  G3  DISLOCATIONS AND MECHANICAL PROPERTIES OF ICOSAHEDRAL AlPdMn QUASICRYSTALS
Daniel Caillard and Fred Mompiou, CEMES-CNRS, Toulouse, France.

1645-1715  G4  POSITION AND SIZE CONTROLLED FABRICATION OF NM-SIZED STRUCTURES WITH INTENSE FOCUSED ELECTRON BEAM
Kazuo Furuya§, Masayuki Shimojo†, Kazutaka Mitsuishi, Masaki Takeguchi, Miyoko Tanaka and Minghui Song, §National Institute for Materials Science, Tsukuba, Japan, †Saitama Institute of Technology, Saitama, Japan.

1715-1745  G5  SMALL-SCALE PLASTICITY OF THIN FILMS
Gerhard Dehm¹, Marc Legros², and Beverley J Inkson³,
¹University of Leoben, Leoben, Austria, ²CEMES-CNRS, Toulouse, France, ³University 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 Thölén, Chalmers University of Technology, Göteborg, Sweden.

1045-1115  TEA & COFFEE
1115-1200  **H4**  ABERRATION-CORRECTED TRANSMISSION ELECTRON MICROSCOPY IN MATERIALS SCIENCE  
Knut Urban, Chunlin Jia, Lothar Houben, Markus Lentzen, and Karsten Tillmann, Research Centre Jülich, Jülich, Germany.

1200-1230  **H5**  IRRADIATION OF CARBON NANOTUBES WITH A FOCUSED ELECTRON BEAM: IN-SITU TEM ON THE SUB-NANOMETRE SCALE  
F Banhart, Universität Mainz, Mainz, Germany.

1230-1300  **H6**  IN-SITU IMAGING AND MEASURING OF MICROMAGNETIC BEHAVIOUR  
Josef Zweck, Thomas Uhlig, Martin Heumann, Thomas Haug, Christian Hurm, Christian Dietrich, and Christian Back, University of Regensburg, Regensburg, Germany.

1300  LUNCH  
END OF CONFERENCE
Poster Programme

Poster Session PA  (Topics A - D)

Tuesday 27 September, 2000-2200

PA01*  ABERRATION FREE MICROSCOPY FOR LIFE SCIENCE APPLICATIONS
J M Plitzko, B Freitag, R Hegerl, A Ziegler, Max Planck Institute for Biochemistry, Martinsried, Germany, 
and U Lücken, Max Planck Institute for Biochemistry, Martinsried, Germany.

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 Sänger, 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, Rudolf Reimer, Robert Getzieh, Norbert Franz, and Heinz Hohenberg, Beiersdorf AG, Hamburg, Germany, 
and Heinrich-Pette-Institute, Hamburg, Germany.

PA05*  ESEM-TECHNOLOGY IN MEDICINE AND BIOLOGY: NEW APPLICATION FIELDS, FASTER RESULTS AND HIGHER BIOLOGIC PRECISION
Norbert Franz, Dieter Weiss, Martin Ritter, and Heinz Hohenberg, Heinrich-Pette-Institute, Hamburg, Germany, 
and University of Rostock, Rostock, Germany.

PA06*  CRYO-TEM INVESTIGATIONS OF NATURAL AND SYNTHETIC SUPRAMOLECULAR ASSEMBLIES
C Böttcher, K Ludwig, B Schade, and H von Berlepsch, Freie Universität Berlin, Berlin, Germany.

* Special presentation in the framework of the “Abschlußkolloquium der DFG-Großgeräteinitiative”.
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.

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.

STRUCTURE ANALYSIS VIA 3D ELECTRON DIFFRACTION
Ute Kolb, Tatiana Gorelik, and Diana Nihtianova, Johannes Gutenberg-Universität Mainz, Mainz, Germany.

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.

THE SUB-ELECTRON-VOLT-SUB-ANGSTROM-MICROSCOPE (SESAM) PROJECT
M Rühle§, W Sigle§, C Koch§, E Essers†, G Lang†, and G Benner†, §MPI für Metallforschung, Stuttgart, Germany, †Carl Zeiss SMT, Oberkochen, Germany.

TRANSMISSION ELECTRON MICROSCOPY OF NANOSTRUCTURED SEMICONDUCTOR MATERIALS
W Neumann, H Kirmse, I Häusler, and I Hähnert, Humboldt University of Berlin, Berlin, Germany.

TRANSMISSION ELECTRON MICROSCOPY AT VARIABLE SPHERICAL ABERRATION
Knut Urban, Chunlin Jia, and Markus Lentzen, Research Centre Jülich, Jülich, Germany.

DEVELOPMENT OF ULTRAHIGH-VACUUM Cs CORRECTED SCANNING TRANSMISSION ELECTRON MICROSCOPE
K Mitsuishi§, M Takeguchi, Y Kondo†, F Hosokawa†, K Okamoto†, T Sanomiya†, M Horii, T Iwama†, M Kawazoe†, and K Furuya, §National Institute for Materials Science, Tsukuba, Japan, †JEOL Ltd, Tokyo, Japan.

THREE-DIMENSIONAL ARRANGEMENT OF RARE-EARTH ATOMS AT PRISM SURFACES OF SILICON NITRIDE GRAINS USING ABERRATION-CORRECTED HAADF-STEM
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§, G Benner†, H Stegmann†, A Thesen†, and E Quandt§, §Center of Advanced European Studies and Research, Bonn, Germany, †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§, Simon van Kranen†, Mike Rignall§, and Pieter Kruit†, §Shimadzu Research Laboratory, Manchester, UK, †Delft University of Technology, Delft, The Netherlands.

PA19 HIGH RESOLUTION SINGLE AND DUAL AXIS TILT TOMOGRAPHY OF SEMICONDUCTOR NANOMATERIALS
I Arslan§, T J V Yates§, J Tong§, N D Browning†‡, and P A Midgley§, §University of Cambridge, Cambridge, UK, †University of California, Davis CA, USA, ‡Lawrence Berkeley National Laboratory, Berkeley, CA, USA.

PA20 APPLICATION OF STEM NANOPROBE TO MICROELECTRONICS DEVICE INVESTIGATION
F Sammiceli and G Pavia, SMIcroelectronics, Agrate Brianza, Italy.

PA21 IMAGING SINGLE ATOMS IN THREE DIMENSIONS: POSSIBILITIES AND FRONTIERS
Klaus van Benthem§, Andrew R Lupini§, Yiping Peng§, Sergey N Rashkeev†§, Sokrates T Pantelides†§, and Stephen J Pennycook§†, §Oak Ridge National Laboratory, Oak Ridge TN, USA, †Vanderbilt University, Nashville TN, USA.

PA22 PRECISE ESTIMATION OF STRUCTURE PARAMETERS FROM HIGH RESOLUTION ELECTRON MICROSCOPY IMAGES
PA23

COMPARISONS OF IMAGE RESTORATION METHODS IN HIGH-RESOLUTION ELECTRON MICROSCOPY

PA24

ABERRATION-CORRECTED HRTEM OF DEFECTS IN STRAINED La$_2$Cu$_4$ FILMS GROWN ON SrTiO$_3$
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, Thomas E Weirich, Gerhard Cox, Hartmut Hibst, and Andreas Thust, Forschungszentrum Jülich GmbH, Jülich, Germany, RWTH Aachen University, Aachen, Germany, BASF-AG, Ludwigshafen, Germany.

PA27

NEW FRONTIERS IN ELECTRON CRYSTALLOGraphY: STRUCTURE DETERMINATION FROM PRECESSION ELECTRON DIFFRACTION DATA
Thomas E Weirich, Joaquim Portillo, Gerhard Cox, Hartmut Hibst and Stavros Nicolopoulos, RWTH Aachen University, Aachen, Germany, NanoMegas SPRL, Brussels, Belgium, Universitat de Barcelona, Barcelona, Spain, BASF-AG, Ludwigshafen, Germany, 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§, M Shimojo†, M Tanaka, M Takeguchi, M Song and K Furuya, §National Institute for Materials Science, Tsukuba, Japan, †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§, N I Borgardt†, B Plikat‡, T Niermann§, and M Seibt§, §Universität Göttingen, Göttingen, Germany, †Moscow Institute of Electronic Technology, Moscow, Russia, ‡Infineon Technologies AG, Regensburg, Germany.
PB09  IN SITU DEFORMATION OF SILICON NANOSPHERES
Julia Deneen, William M Mook, Andrew Minor*, William W Gerberich, and C Barry Carter, University of Minnesota, Minneapolis MN, USA, §Lawrence Berkeley National Laboratory, Berkeley CA, USA.

PB10  QUANTITATIVE TEM CHARACTERISATIONS OF MULTILAYER SYSTEMS ON STRUCTURED SILICON SUBSTRATES
D Häussler§, E Spiecker§, W Jäger†, M Störmer†, R Bormann†, C Michaelisen†, J Wiesmann†, and G Zwicker+, §Christian-Albrechts-University of Kiel, Kiel, Germany, †GKSS Forschungszentrum Geesthacht GmbH, Geesthacht, Germany, ‡Incoatec GmbH, Geesthacht, Germany, †Fraunhofer Institute for Silicon Technology, Itzehoe, Germany.

PB11  TEM CHARACTERISATIONS OF NOVEL METAL-FILLED CARBON NANOTUBES
F Liu*, X B Zhang§, W Jäger†, D Häussler†, X Y Tao§, J P Cheng§, G F Yi§ and S M Zhou§, §Zhejiang University, Hangzhou, P R China, †Christian-Albrechts-University of Kiel (CAU), Kiel, Germany.

PB12  TEM CHARACTERISATIONS OF MULTI-WALL CARBON NANOTUBES SUPPORTED METAL AND METAL OXIDE PARTICLES
F Liu*, X B Zhang§, W Jäger†, D Häussler†, G F Yi§, J P Cheng§, X Y Tao§, Z Q Luo§ and S M Zhou§, §Zhejiang University, Hangzhou, P R China, †Christian-Albrechts-University of Kiel (CAU), Kiel, Germany.

PB13  NANOFOLD NETWORK FORMATION ON LAYERED CRYSTAL SURFACES
E Spiecker§, S Hollensteiner§, W Jäger§, A K Schmid†, A Minor†, and U Dahmen†, §Universität Kiel, Kiel, Germany, †Lawrence Berkeley National Laboratory, Berkeley CA, USA.

PB14  FABRICATION AND CHARACTERISATION OF Au-NANOPARTICLES / W-NANODENDRITE STRUCTURES ON INSULATOR Al₂O₃ SUBSTRATES
Guoqiang Xie§, 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, M Shimojo, K Mitsuishi, M Tanaka, R Che and K Furuya, National Institute for Materials Science, Japan, 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, University of Liverpool, Liverpool, UK, Daresbury Laboratory, Warrington, UK.

PB19 HREM OF THE (111) SURFACES OF IRON OXIDE NANO Particles

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 NANO METRE 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 (Hf$_{x}$Si$_{2-x}$O$_{4}$ FOR x = 45, 55, 65 AND 75) GATE DIELECTRIC THIN FILMS AFTER THERMAL PROCESSING Brendan Foran$, Guoda Lian$, Mark Clark$, Gennadi Bersuker†, and Pat S Lysaght†, $ATDF, Austin TX, USA, †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.