

ALC'03

sponsored by The 141st Committee on Microbeam Analysis
of Japan Society for the Promotion of Science (JSPS)
The Radisson Kauai Beach Resort, Kauai, Hawaii, U.S.A.
October 05 (Sun) to Oct. 10 (Fri), 2003

Final Program

Oct. 5 (Sun.)

Tutorial I

Room A: Pakalana+Ginger

Chairperson: H. Storms

- 9:40 10:20 The early history and future of the SEM
O.C. Wells 1
- 10:20 10:50 Break
- 10:50 11:30 Diffraction of X-rays and of electrons by helical molecules: Determination of the structure of DNA and carbon nanotubes
A.A. Lucas 3
- 11:30 12:10 Atomic level characterization as applied to developing cathodes of high brightness
R. Shimizu 5
- 12:10 13:40 Lunch

Tutorial II

Room A: Pakalana+Ginger

Chairperson: R. Shimizu

- 13:40 14:25 Improving the sensitivity of electron beam microanalytical techniques by enhanced X-ray spectrometry: X-ray microcalorimetry, silicon drift detector energy dispersive X-ray spectrometry, and polycapillary X-ray optics
D.E. Newbury, J. Small, K. Irwin, G. Hilton, D. Wollman, S. Barkan and J. Iwanczyk 6
- 14:25 15:10 Quantitative microanalysis and elemental imaging in the AEM
D.B. Williams and M. Watanabe 7
- 15:10 15:40 Break
- Chairperson: R. Oiwa*
- 15:40 16:25 Historical perspective on the development of ESCA and Auger instrumentation
P.W. Palmberg 8
- 16:25 17:10 Surface electron microscopy with slow electrons
E. Bauer 9

Mixer

Poolside

- 18:00 20:00

Oct. 6 (Mon.)

Opening

Room A: Pakalana+Ginger

- 8:30 8:50 Opening (presided over by the chair of executive committee)
Opening Address from The Chair of Organizing Committee
Address from Japan Society for the Promotion of Science (JSPS)
JSPS 141 Committee Awards Ceremony (presented by the chair of JSPS 141 committee)

Plenary Lectures

Room A: Pakalana+Ginger

Chairpersons: Y. Nihei and M. Hibino

- 8:50 9:35 Sum frequency generation-Vibrational spectroscopy characterization of surface monolayers:
Catalytic reaction intermediates and polymer surfaces
G.A. Somorjai 10
Chairpersons: M. Hibino and Y. Nihei
- 9:35 10:20 1-MV field emission transmission electron microscope and its applications
A. Tonomura 11
- 10:20 10:50 Break

SPM, and Atomic and Molecular Manipulation I

Room A: Pakalana+Ginger

Chairpersons: S. Morita and H. Neddermeyer

- 10:50 11:20 Control of atomic and molecular dynamic processes on the nanoscale
M. Aono, T. Nakayama, T. Hasegawa, K. Terabe, Y. Kuwahara, M. Akai, A. Saitoh and Y. Okawa 12
- 11:20 11:50 Doing physics and chemistry with single atoms and molecules: The STM as operative tool
K.-H. Rieder 13

Student Award Ceremony and Short Presentations

Room A: Pakalana+Ginger

- 11:50 12:30 Ceremony (presided over by the program committee)
Awards presented by the chairperson of organizing committee
Short Presentations by the Winners
The phonon dispersion of a BC₃ film on NbB₂(0001) surface
H. Yanagisawa
First atomic-scale observations of two-dimensional liquefaction and solidification in real space
C. Liu
Development of coincidence transmission electron microscope- Application of waveform
K. Nishinaka
Novel structures of carbon layers on Pt(111) surface
T. Fujita
The soft X-ray analysis of fluorine from BaF₂ to HfF₄
K. Kaibuchi

12:30 14:20 Lunch

SPM, and Atomic and Molecular Manipulation II

Room A: Pakalana

Chairpersons: M. Aono, K. Rieder and P. Varga

- 14:20 14:50 Nanostructured surfaces: fabrication by size-selected clusters, characterization by local STM spectroscopy (SPELS) and application to immobilisation of proteins
R.E. Palmer 14

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15:20	15:50	Two-dimensional self-assembly of a hexagonal superlattice of metallic adatoms <i>W.-D. Schneider</i>	22
15:50	16:10	Characterization of nanowires for photonic devices <i>C.J. Barrelet, Y. Wu, D.C. Bell and C.M. Lieber</i>	23
16:10	16:40	Break	
16:40	17:10	STM study on the atomic structure of Ge(105) surface <i>Y. Fujikawa</i>	24
17:10	17:30	Observation of graphitized SiC surfaces by STM <i>Y. Hisada, Y. Mitsuoka, S. Mukainakano, H. Suzuki, T. Aoyama and A. Ichimiya</i>	25

Poster I

Pakalana + Ginger + Mokihana + Prefunction

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Oct. 7 (Tue.)

Special Session: LEEM/PEEM

Room A: Pakalana

Organized by T. Koshikawa

8:30	9:00	Nanomagnetism studies with SPLEEM and XMCDPEEM <i>E. Bauer</i>	80
9:00	9:30	Surface observation by LEEM and PEEM and high resolution PEEM by focus moving method <i>T. Koshikawa</i>	81
9:30	10:00	Low energy electron microscopy of the quantum electronic properties, stability and structure of ultrathin films <i>M.S. Altman</i>	82
10:00	10:30	Spectromicroscopy with high lateral and spectral resolution: the SMART project at BESSY II <i>T. Schmidt</i>	83
10:30	11:00	Break	

SPM, and Atomic and Molecular Manipulation III

Room A: Pakalana

Chairpersons: A. Ichimiya and W. Schneider

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11:30	12:00	STM study on the local atomic surface structure of ultra thin Fe films and the INVAR alloy <i>P. Varga</i>	85
12:00	12:30	Force microscopy investigations of molecules on insulators <i>E. Meyer, L. Nony, R. Bennowitz, O. Pfeiffer, E. Gnecco and A. Socoliuc</i>	86

12:30	12:50	Towards atomic force microscopy up to 100 MHz and atomic resolution lateral force microscopy <i>H. Kawakatsu, S. Kawai, D. Kobayashi, S. Meguro and S. Kitamura</i>	87
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Surface and Interface Phenomena I

Room B: Ginger

Chairpersons: K. Oura and W. Heiland

11:00	11:30	Surface reconstructions of indium in two and three dimensions <i>A. Pavlovska</i>	88
11:30	12:00	Chemical specific imaging and micro-spectroscopy of interfaces and dynamic surface processes with synchrotron-based techniques <i>M. Kiskinova</i>	89
12:00	12:30	Growth of Pb quantum islands on the Si(111) surface and their quantum properties <i>T.T. Tsong</i>	90
12:30	12:50	An investigation of Rh on alumina after treatments in high-temperature oxidizing/reducing conditions <i>K. Dohmae, T. Nonaka and Y. Seno</i>	91
12:50	14:20	Lunch	

Workshop I: High Depth Characterization of High-k Materials

Room A: Pakalana

Chairpersons: H. Yoshikawa and M. Schleberger

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15:20	15:50	Ultra-thin layers in microelectronics studied by LEIS <i>H.H. Brongersma</i>	94
15:50	16:20	Analysis of alternating HfO ₂ /Al ₂ O ₃ films grown on Si(001) by atomic layer deposition <i>Y. Kido, A. Tsuda, Y. Hoshino, T. Okazawa, T. Nishimura, T. Nabatame and A. Toriumi</i>	95
16:20	16:50	Break	

Sponsored Session I

16:50	17:50	"Surface Analysis and Nano-order Characterization" by JEOL Introduction of Schottky type field emission electron probe microanalyzer <i>M. Takakura</i> Micrometer to nanometer surface characterization by XPS and SAM <i>T. Tazawa</i> Application of ambient and UHV SPMs <i>C. Mooney</i>
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Poster II

Pakalana + Ginger + Mokihana + Prefunction

19:00	22:00		
P2-01		Characterization of ultrashallow As profiles using Medium Energy Ion Scattering (MEIS) before and after spike annealing <i>M. Takai, S. Ichihara, T. Nakagawa, H. Angelov and T. Lohner</i>	96
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P2-03	Effective depths for surface excitation derived by reflected electron energy loss spectroscopy-analysis <i>Z.-M. Zhang, T. Iyasu, R. Shimizu, K. Goto and T. Koshikawa</i>	98
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P2-40	Surface structural analysis of Zr-O/W(100) emitter at high temperature by X-ray photoelectron diffraction <i>K. Tamura, M. Amano, W.-G. Chu, H. Ishii, M. Owari, T. Kawano, T. Nagatomi, Y. Takai, C. Oshima, R. Shimizu and Y. Nihei</i>	135
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P2-42	High resolution observation of DNA by phase transmission electron microscopy <i>M. Hayashida, K. Takenouchi, S. Matsushita, Y. Kimura and Y. Takai</i>	137
P2-43	The phonon dispersion of a BC ₃ film on NbB ₂ (0001) surface <i>H. Yanagisawa, T. Tanaka, Y. Ishida, M. Matsue, S. Otani and C. Oshima</i>	138
P2-44	Inelastic sputtering of ionic crystals under electron and multicharged ion bombardment <i>M.S. Kuchkarov, B.G. Atabaev, B. Rahmonov and M.M. Kuchkarov</i>	139
P2-45	The erosion of KCl crystal surface at Ar ⁺ -Ar ⁶⁺ ions bombardment Inelastic sputtering of ionic crystals under electron and multicharged ion bombardment	

	<i>M.S. Kuchkarov , B.G. Atabaev, D.Kimsanov and M.M. Kuchkarov</i>	140
P2-46	Comparison of secondary electron images contrast from electron, ion and X-Ray excitation <i>Y. Sakai</i>	141
P2-47	X-ray photoemission electron microscopy (XPEEM) with the high energy SR light at SPring-8 BL15XU <i>H. Yoshikawa, H. Yasufuku, M. Kimura and S.Fukushima</i>	142
P2-48	Double alignment arrangement for crystal characterization by ion beams <i>P. Pusa, T. Ahlgren and E. Rauhala</i>	143
P2-49	STM observation of Cu nano-structure formation on hydrogen terminated Si surfaces <i>T. Igarashi, Y. Fukushima, N. Kuroiwa, P. Rajasekar, H. Neddermeyer, T. Yasue and T. Koshikawa</i>	144
P2-50	Insulator analysis for AES and XPS <i>K. Tsutsumi, T. Tazawa, Y. Nagasawa and Y. Sakai</i>	145
P2-51	The analysis of oxide precursor structures during growth of thin films of CoO(001) by scanning tunneling microscopy and spectroscopy <i>R. Shantyr, Ch. Hagendorf and H. Neddermeyer</i>	146
P2-52	RHEED analysis of surface vibration on metal adsorbed Si(111) <i>M. Hashimoto, S.N. Takeda and H. Daimon</i>	147
P2-53	The depth profile measurement of high dielectrics gate insulation using the high-resolution medium energy ion scattering <i>K. Kawashima, T. Yasue, T. Koshikawa and T. Hattori</i>	148

Oct. 8 (Wed.)

Special Session: Coherent Electron Source

Room A: Pakalana

Organized by C. Oshima

8:30 9:00	Highly coherent electrons emitted from nano-scaled emitters <i>C. Oshima</i>	149
9:00 9:30	Imaging with low-energy electron coherent beams <i>R. Morin, J. Bardon, A. Degiovanni and V. Georges</i>	150
9:30 10:00	Towards atomic resolution 3D diffraction microscopy with coherent X-rays and electrons <i>J. Miao</i>	151
10:00 10:30	Transmission and reflection holography at low energies <i>D.C. Joy, B. Frost and A. Thesen</i>	152
10:30 11:00	Break	

Ion beam (Ion scattering , SIMS and instruments)

Room A: Pakalana

Chairpersons: Y. Kido, T. Gustafsson and H. Kang

11:00 11:30	What do we know about the electronic corrugation of surfaces ? <i>W. Heiland and A. Robin</i>	153
11:30 12:00	Real-space surface crystallography from low energy ion scattering <i>J.W. Rabalais</i>	154
12:00 12:30	Analysis of magnetic surfaces by scattering of low energy ions <i>M. Schleberger, M. Dirska and J. Manske</i>	155
12:30 12:50	Ion beam analysis with monolayer depth resolution: Recent developments at the Pelletron in Stuttgart <i>S. K. Srivastava, A. Szökefalvi-Nagy and H.D. Carstanjen</i>	156

Surface and Interface Analysis

Room B: Ginger

Chairpersons: S. Ichimura, R. Palmer and H. Brongersma

11:00 11:30	Multilayer mirrors for XPS using a Schwarzschild objective	
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	<i>H. Takenaka</i>	158
11:30 12:00	Oxidation mechanism of Si in the physical deposition of SiO _x <i>K.J. Kim and D.W. Moon</i>	159
12:00 12:30	Imaging magnetic nanostructures by spin-polarized STM <i>M. Bode, O. Pietzsch, A. Kubetzka and R. Wiesendanger</i>	20
12:30 12:50	Investigation of buried solid-solid interfaces using ion beam techniques <i>S. Thevuthasan, V. Shutthanandan, C.M. Wang, F. Gao and S. Maheswaran</i>	18

Banquet *Luau* (Hawaiian style party)

17:30	Shel Lei Greeting and Mai Tai Reception
18:30	Call to Dinner
19:00	Dinner served
19:45	Dinner Show
20:30	End of Function

Oct. 9 (Thu.)

Special Session: Photoelectron Diffraction & Holography

Room A: Pakalana

Organized by Y. Nihei

8:30 9:00	3D atomic structural analysis of surface nano-structure by photoelectron diffraction and holography <i>Y. Nihei, H. Ishii, K. Tamura, W.-G. Chu and M. Owari</i>	161
9:00 9:30	Probing local atomic structure and buried interfaces via holography and standing waves <i>C.S. Fadley</i>	162
9:30 10:00	Growth morphologies and defect structure in hexagonal boron nitride monolayer films on Ni(111): a combined STM and XPD study <i>J. Osterwalder, W. Auwärter, M. Muntwiler and T. Greber</i>	163
10:00 10:30	Surface structure determination by photoelectron diffraction and electron diffraction <i>S. Kono, M. Shimomura and T. Abukawa</i>	164
10:30 11:00	Break	

XPD and SIMS

Room A: Pakalana

Chairpersons: M. Owari and M. Bode

11:00 11:20	Determination of the absolute chirality of adsorbed molecules via XPD <i>R. Fasel, J. Wider, T. Greber, C. Quitmann and K.-H. Ernst</i>	165
11:20 11:40	Stereoscopic photographs of atomic arrangement measured by display-type spherical mirror analyzer and circularly polarized light <i>H. Daimon</i>	166
11:40 12:00	Deconvolution of SIMS depth profiles of As multiple delta-layers in silicon <i>J.W. Lee, K.J. Kim, H.K. Kim and D.W. Moon</i>	167
12:00 12:30	Ion-induced emission microscopies – IEM <i>B.L. Doyle</i>	168

Nanodevices

Room B: Ginger

Chairpersons: S. Hayashi and A. Pavlovskaya

11:00 11:30	Using scanning tunneling microscopy as a tool for nanotechnology <i>A.J. Heinrich, C.P. Lutz, J.A. Gupta and D.M. Eigler</i>	169
11:30 12:00	Self-assembled nanotube networks for nano-device applications <i>Y. Homma</i>	170
12:00 12:20	Structure analysis of molecular scale single crystal silicon nanowires	

	<i>Y. Wu, C.J. Barrelet, D.C. Bell and C.M. Lieber</i>	171
12:20 12:40	Photoluminescence characterization of nano-size defects in sub-surface region of silicon wafers <i>K. Tanahashi and H.Y. Kaneta</i>	172

12:40 14:00 Lunch

Workshop II: Low Damage High Depth Resolution by Low Energy Ion Sputtering

Room A: Pakalana

Chairpersons: Y. Takai and J. Rabalais

14:00 14:30	Shallow junctions and characterization of silicon ULSI's <i>B. Mizuno</i>	173
14:30 15:00	Application of metal cluster complex ion beam for low damage sputtering <i>T. Fujimoto, T. Mizota, H. Nonaka, A. Kurokawa and S. Ichimura</i>	174
15:00 15:30	High resolution Auger depth profiling by sub-keV ion sputtering <i>M. Inoue, R. Shimizu, H.-I. Lee and H.J. Kang</i>	175
15:30 16:00	Sub-nm depth resolution in sputter depth profiling by low energy ion bombardment <i>H.-I. Lee, D.W. Moon, H.C. Shin, S.K. Oh and H.J. Kang</i>	176
16:00 16:30	Break	

Sponsored Session II

Room A: Pakalana

16:30 17:30	"Imaging and Analysis Equipment Contributing to the Advancement of Nanotechnology" by HITACHI Development of the HD-2300 scanning transmission electron microscope <i>H. Inada, S. Watanabe, H. Tanaka, S. Aizawa, W. Shimoyama, T. Ohashi, T. Hashimoto, S. Isakozawa and K. Nakamura</i> Hitachi's R&D for providing systems and equipment that our customers demand <i>N. Osakabe</i>	
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Sponsored Session III

Room A: Pakalana

17:30 18:30	"Challenge for Surface and Nanoscale Characterization" by ULVAC-PHI Activity on surface characterization in ULVAC-PHI and Physical Electronics USA <i>R. Oiwa</i> Custom system and unique systems for nanotechnology in ULVAC-PHI <i>M. Taguchi</i>	
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TEM & REM I

Room A: Pakalana

Chairpersons: T. Hirayama and H. Rose

20:20 20:50	Accurate measurements of valence electron and induction distribution in superconductors and magnetic materials using advanced electron microscopy <i>Y. Zhu</i>	160
20:50 21:20	REM investigation of the dynamic of step on silicon <i>J-J. Métois</i>	183

Surface and Interface Phenomena II

Room A: Pakalana

Chairpersons: K. Dohmae and M. Kiskinova

21:20 21:40	Self-recovery function of Sc-O/W(100) system as Schottky emitter <i>S. Iida, T. Nagatomi and Y. Takai</i>	17
21:40 22:00	Precise SIMS depth profiling of SiGe structures using convolution and backside measurement	

	<i>T. Kono, S. Soga, Y. Koyama, K. Sako, H. Imai, Y. Furukawa, T. Kobayashi, K. Kanekiyo, K. Matsumoto, M. Toita, H. Mochizuki and H. Imai</i>	19
22:00 22:20	Infrared spectroscopic investigations of solid film doped polycyclic aromatic hydrocarbons <i>M.N. Khan, P. Kumar, M. Husain and Z.H. Zaidi</i>	30

Oct. 10 (Fri)

50 Years Anniversary of Bi-prism

Room A: Pakalana

Chairpersons: R. Shimizu and Y. Zhu

8:30 9:00	50 years of electron biprism - 50 years of exciting electron physics <i>H. Lichte</i>	177
9:00 9:30	Electron wave interference by a biprism and its application to study two dimensional electric potential distributions in silicon <i>T. Hirayama, Z. Wang, T. Kato, K. Yamamoto, N. Kato, K. Sasaki and H. Saka</i>	179
9:30 10:00	Electron holography realized by electron biprism and coherent electron source <i>N. Osakabe</i>	180
10:00 10:30	Break	

TEM & REM II

Room A: Pakalana

Chairpersons: N. Osakabe and J. Métois

10:30 11:00	Prospects for aberration-free electron microscopy <i>H. Rose</i>	181
11:00 11:30	Phase transmission electron microscopy with aberration correction based on active defocus modulation <i>Y. Takai, T. Kawasaki and Y. Kimura</i>	182
11:30 11:50	Electron beam induced deposition of nano-structures with transmission electron microscopy <i>M. Tanaka, M. Shimojo, K. Mitsuishi, M. Han, Z.-Q. Liu and K. Furuya</i>	185

Closing

11:50 12:05	The Chairperson of JSPS 141 Committee	
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