Asia-Pacific Advanced Microscopy Symposium

In conjunction with the 25th Annual Meeting of the Taiwan Microscopy Society

November 16-18,2005 Hotel Bellevista, Hualien, Taiwan

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Welcome Address

Dear Honorable Guests and Participants

On behalf of the organizing committee of the Asia-Pacific Advanced Microscopy Symposium and the 25th Annual Meeting of the Taiwan Microscopy Society, I have the privilege of welcoming you to this symposium being held from Nov.15-18, 2005 in Hualien, Taiwan. It is a great honor for the Society to host this conference and we would like to thank all participants for contributing to this symposium.

As you can see in the program, this symposium is filled with the best scientists from all over the world who bring us many excellent and exciting results in Nanomaterial, Biology Microscopy. I am sure that all participants will have a very fruitful meeting in attending and discussing the most up-to-date research results.

This symposium is a first try to gather the top scientists in microscopy among the Asia-Pacific region to discuss the most advanced science and technology in microscopy. We wish that with the success of this symposium, it can become a tradition in this region to take turns among the societies in a frequency of every two years to enhance new friendship and collaboration in this region.

Finally, we wish that you all have a scientifically profitable meeting and enjoy your stay here and take away happy memories of your time in Hualien.

Ji-Jung Kai

President, Taiwan Microscopy Society

Welcome Address

It is my pleasure to welcome the participants of this symposium to Hualien. Authorized by the Committee of Asia-Pacific Societies for Microscopy to promote collaboration and research activity in Microscopy, this meeting is co-sponsored by the National Science Council of Taiwan, National Tsing Hua University, National Dong Hwa University, and the Institutes of Physics and Atomic and Molecular Science of Academia Sinica. Although I am not an electron microscopist, being an astrophysicist by profession and married to a bio-technologist, I am deeply appreciative of the importance of ultra-high resolution imaging and advanced techniques in spectroscopy to many forefront scientific fields where complexity of structure is intrinsic to function but stands as a challenge to understanding. Fundamental advances in these subjects are often driven today by pushing on the envelope of what can be resolved in angular detail or in the spectral domain, and by interpreting properly the resulting ultra-high resolution images or spectral features. Given the importance of such investigations for Asia-pacific interests in the fields of material-, nano-, and bio-science, it augurs well for the future to hold this timely meeting in the unspoiled environs of Hualien. May your deliberations and discussions be productive and fruitful, and may collaboration and research activity flower in this coming together of mind and spirit.

Frank H. Shu

President, National Tsing Hua University

Welcome Address

Professor Ji-Jung Kai, President of Taiwan Microscopy Society, distinguish guests and fellow microscopists, it is my privilege to have this opportunity to participate in the Asia-Pacific Advanced Microscopy Symposium and to welcome all of you to this event on behalf of Taiwan Microscopy Society and CAPSM.

Miscrosopy has become an essential tool for many research areas in both life and physical sciences. In the

past the microscopists working in either biological or physical sciences use the same microscope but for separate purposes. There was minimal cross talk between the two groups of microscopists. However, this trend of working has to change in today's research world. Cross fertilization of disciplines in research are highly encouraged in enhance discovery and application.

In the field of bioengineering, researchers in the life sciences, material sciences and medical professions will need to work together. The material scientist generates the appropriate scaffold for the biomedical researcher to grow the cells and finally a medical team to insert this cell-covered scaffold into the patient to repair damage tissue. In nanotechnology, nano-structures are being investigated as possible vehicles for drug delivery. Therefore, this is a start for a change of mind set and we should consciously investigate on how our individual expertise can cross disciplines to accelerate the progress of science for mankind.

Sharing is always a very difficult thing for us humans to practice. We like to build walls rather than to break them. As microscopists we are in the best position to break down communication barriers because we actually use the same instruments i.e. the microscope. Through the microscope we can speak a common language and think in the same wavelength since we share a common goal i.e. to use the microscope to understand the processes in nature in both the physical and biological worlds. Therefore as microscopists, we are in the best position to be the key players to amalgamate the knowledge in both the physical and biological worlds.

I hope meeting like this one will provide the platform for microscopists from the physical and life sciences to talk and understand each others research problems and come up with a combined solution. I am very grateful to Professor Kai and his esteem committee in organizing this meeting in conjunction with CAPSM. They spared no effort to ensure that microscopists from both the physical and biological research are well represented. Small sized meeting of this nature is the most fertile ground to sow cross-thinking and promote communications amongst the delegates since we can get to know each other well.

Thank you very much for the invitation to be here and to enjoy the Science and the scenery of Hualian.

Mary, Mah-Lee Ng
President, CAPSM

Organizing Committees

Ji-Jung Kai (President)	**NTHU**	**Jui-Sen Yang**	**NTOU**
Shang-Ming Yu (Vice President)	**NYMU**	**Li Chang**	**NCTU**
Cheng-Hsuan Chen	**NTU**	**Liang-Ping Lin**	**NTU**
Chih-Hao Lee	**NTHU**	**Lih-Juann Chen**	**NTHU**
Chih-Pu Chang	**NSYSU**	**Ling-Long Huang**	**NTU**
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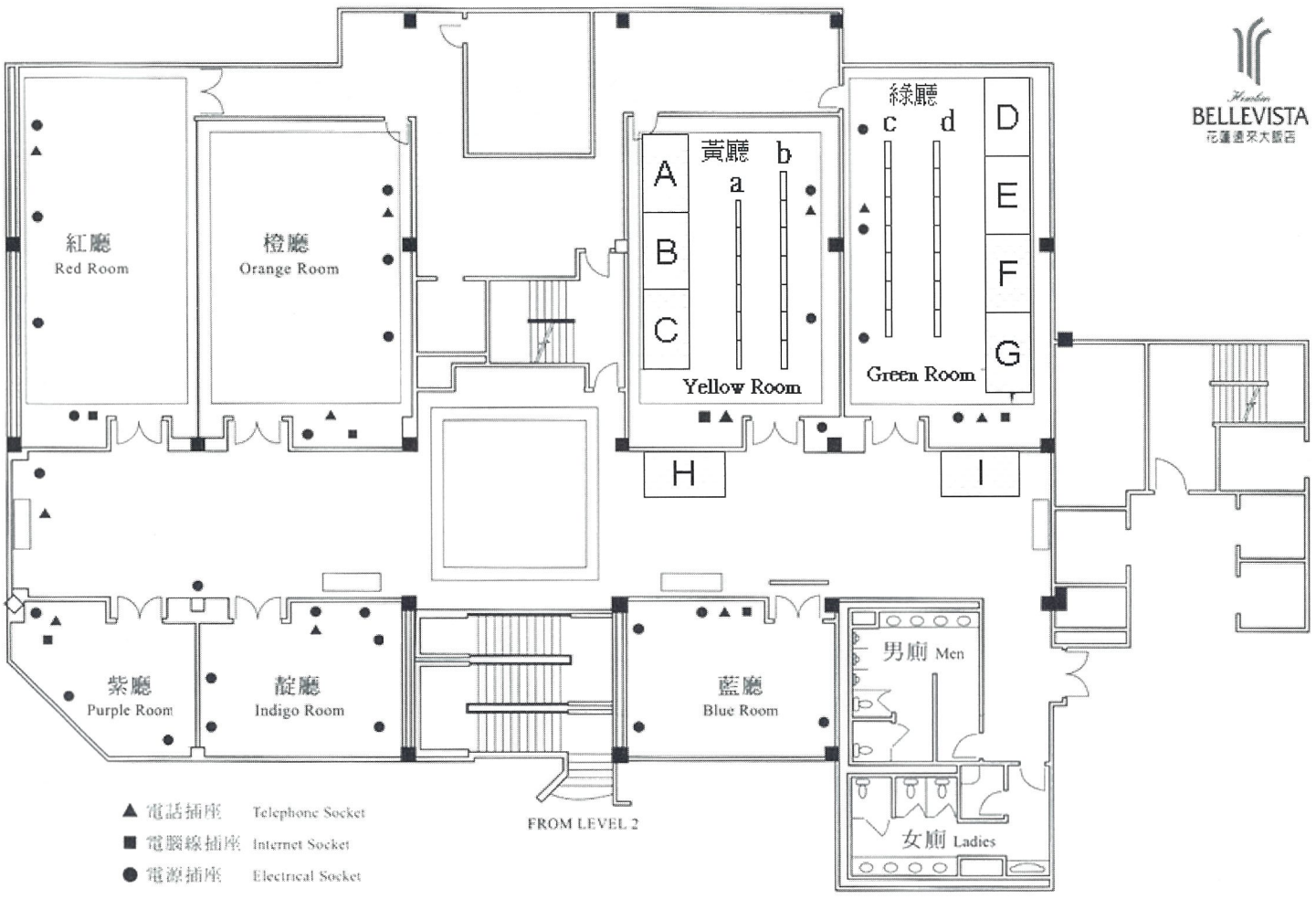
Hung-Tu Huang	**NSYSU**	**Yung-Ruei Chen**	**NTU**
Jer-Ren Yang	**NTU**		

Reception	**Tuesday, Nov. 15**	**19:00~21:00**	**2F Victoria House**
Opening Ceremony	**Wednesday, Nov. 16**	**08:00 ~ 08:15**	**2F Victoria House**
Plenary Lecture	**Wednesday, Nov. 16**	**08:15 ~ 09:30**	**2F Victoria House**
Closing Remark	**Friday, Nov. 18**	**12:55~13:10**	**4F Red & Orange Room**

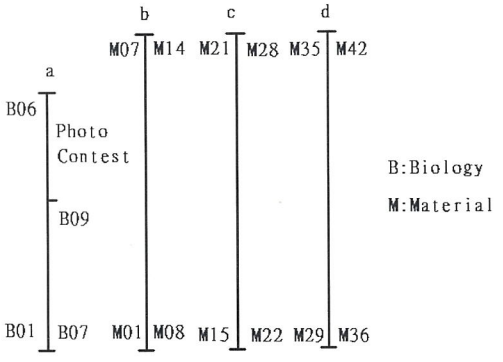
Social Program			
Welcome Banquet	**Wednesday, Nov. 16**	**19:00~21:00**	**2F Victoria House**
Local Tour	**Thursday, Nov. 17**	**13:00~21:30**	**Taroko National Park**

Planner



Poster Panel No. and Photo Contest

(Yellow & Green Room)



Exhibition (Yellow & Green Room)

A	E HONG Instrument Co.,Ltd.
B	KEYBOND technology Inc
C	JIE DONG CO., LTD.
D	Taiwan Instrument Co. ,Ltd.
E	Material Science Service Co.,Ltd.
F	PENTAD SCIENTIFIC CORPORATION
G	LeadinWay Co.,Ltd.
H&I	Unionoptical Co.,Ltd.

Program of Asia-Pacific Advanced Microscopy Symposium

In conjunction with the 25th Annual Meeting of the Taiwan Microscopy Society

Date	Nov.15(Tue.)	Nov. 16(Wed.)		Nov. 17(Thu.)		Nov. 18 (Fri.)	
Place		Victoria House		Schedule	Session V: Exit Wave	Schedule	Session VIII : EELS
08:00-08:15		Opening Ceremony		Place	Red/ Orange Room	Place	Red/ Orange Room
Schedule		Plenary		Chairman	Hideki Ichinose	Chairman	Lian-Mao Peng
08:15-08:30		Ting-Kuo Lee		08:00-08:25	Dirk Van Dyck	08:00-08:25	Christian Colliex
08:30-09:00		Hatsujiro Hashimoto		08:25-08:50	Christian Kisielowski	08:25-08:50	Ray Egerton
09:00-09:30		Jing Zhu		08:50-09:15	Angus Kirkland	08:50-09:15	Kazutomo Suenaga
Schedule		Session(S) I: Nanomaterials		09:15-09:40	Fu-Rong Chen	09:15-09:40	Les Allen
Chairman		Jing Zhu		09:40-10:05	Lian-Mao Peng	09:40-10:05	Hao Ouyang
09:30-09:55		Lih-Juann Chen		10:05-10:20	Break	10:05-10:20	Break
09:55-10:20		Kazuo Furuya		Schedule	S VI : Instrumentation	Schedule	S IX: HVEM&Cs Corrected EM
10:20-10:45		Yuh-Lin Wang		Place	Red/ Orange Room	Place	Red/ Orange Room
10:45-11:10		Mark Aindow		Chairman	Chih-Hao Lee	Chairman	Fu-Rong Chen
11:10-11:35		Bing-She Xu		10:20-10:45	Hidetaka Sawada	10:20-10:45	Hideki Ichinose
11:35-13:00		Lunch & Poster		10:45-11:10	Dong Tang	10:45-11:10	John Hutchison
Schedule		Session II: Biology & Physics			Session VII : HRTEM	11:10-11:35	Makoto Shiojiri
Place		Red/ Orange Room		11:10-11:35	Youn Joong Kim	11:35-12:00	Yi-Mei Zhu
Chairman		Mah-Lee Ng		11:35-12:00	Sung Bo Lee	12:00-12:25	Li Chang
13:00-13:25		Mah-Lee Ng		12:00-13:00	Lunch & Poster	12:25-12:55	Kunio Takayanagi (plenary)
13:25-13:50		Kuniaki Nagayama				12:55-13:10	Closing Remark
13:50-14:15		Atsuo Miyazawa				13:10-14:30	Lunch & Poster
14:15-14:40		Shang-Ming Yu					
14:40-15:05		Yeu-Kuang Hwu					
15:05-15:20		Break					
Schedule		S III: Materials Science	S IV: Biology				
Place		Red/ Orange Room	Indigo Room				
Chairman		Li Chang	Shang-Ming Yu				
15:20-15:40		Jianbo Wang	Hian Lian Hing				
15:40-16:00		Chuan-Pu Liu	Ling-Long Huang				
16:00-16:20		Quan Li	Hung-Tu Huang				
16:20-16:40		Ming-Wen Chu					
16:40-17:00		Man-Ling Sui					
17:00-17:20		Liu-Wen Chang					
17:20-17:40		Shen-Chuan Lo					
17:40-18:00		Jer-Ren Yang					
19:00- 21:00	Reception	Banquet		Special Dinner and Show			

Registration

Local Tour

Plenary

Place: Victoria Ho

08:15 **Ting-Kuo Lee**

Institute of Pl

08:30 **Historicals**

HR-TEM

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09:00 **Orientation**

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Session I: Nanoma

Chairman: Jing Zh

09:30 **In Situ UHV**

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The controlled devitrification of metastable metallic glasses is a very attractive route for the production of nanostructured alloys. This is mainly because one can disperse much higher volume fractions of strengthening intermetallic phases than is possible using conventional precipitation hardening approaches. The approach is particularly useful for aluminum – rare earth – transition metal (Al-RE-TM) alloys in which metastable glasses can be produced from the melt at modest cooling rates, but the devitrification mechanisms and the character of the products are not well understood.

11:10 **Bing-She Xu**

Beijing University of Technology, China

11:35 Lunch & Poster

Session II: Biology & Physics
Place: Red/Orange Room
Chairman: Mah-Lee Ng

13:00 **The Use of Microscopy Technology for Drug Discovery**

Mah-Lee Ng, Justin, Jang-Hann Chu and Jason, Wei-Ming Lee

Department of Microbiology, National University of Singapore, Singapore

Molecular biology techniques are well-established and have provided tools to understand cell biology and physiology including pathogen-host interactions. However, nothing is more convincing than visualization of an event that is occurring within the cell or when proteins interact.

13:25 **Enhancement of TEM Contrast with Phase Plates for Soft Materials**

Kuniaki Nagayama

Okazaki Institute for Integrative Bioscience, National Institutes of Natural Sciences, Japan

While in the past few decades, so many TEM researchers have been involved in the development of phase contrast methods using phase plates, no satisfying results have yet been materialized due to the fundamental issue of the charging of phase plates. Our six years efforts for the development of anti-static phase plates have given an answer to this long-standing problem and now we have three kinds of phase plate methods, workable respectively with their own merits when applied to objects made of light elements even under the non-staining condition.

13:50 **Structure and Mechanism of Nicotinic Acetylcholine Receptor**

Atsuo Miyazawa

Bio-multisome Research Team, Membrane Dynamics Research Group, RIEKN Harima Institute, Japan

The electric organ of the *Torpedo* ray is highly enriched in acetylcholine (ACh) receptor containing membranes which are readily converted into tubular crystals, having helical symmetry. Electron crystallographic studies of the tubular crystals have provided the information about three-dimensional structure of the receptor and about how it works as an ion channel. The analysis was conducted on images recorded at 4K with a 300kV field emission electron microscope, by combining data from four helical families of tubular crystals, and applying three-dimensional corrections for lattice distortions.

14:15 **Ultrastructural Changes in the Neuron and the Astrocyte of the Dentate Gyrus of the Hippocampus in Heatshock-Induced Rats**

Shang-Ming Yu[1], Tai-Hao Huang[1], Kwan-Hwa Lin[2], and Mao-Tsun Lin[3]

[1]Institute of Anatomy and Cell Biology, National Yang-Ming University [2]School of Physical Therapy, College of Medicine, National Taiwan University

[3]Institute of Physiology, National Yang-Ming University

Heatstroke is induced by a highly ambient temperature and induces cerebral ischemia and neuronal damage. The aim of this study was to investigate the fine structure of neurons and astroglia in the hippocampus of rats after heatstroke induction. Sprague-Dawley rats were exposed to ambient temperature of 42℃ and pulsatile arterial pressure and colonic temperature were monitored continuously with a pressure transducer and a chart recorder (Gould model 2400).

14:40 **Phase Contrast Micro- and Nano-Rradiology**

Yeu-Kuang Hwu

Institute of Physics, Academia Sinica, Taiwan

15:05 Break

Session III: Materials Science
Place: Red/Orange Room
Chairman: Li Chang

15:20 **QCBED Determination of Bonding Charge Density in AlPdMn Icosahedral Quasicrystal**

Huamin Zou, Fengmei YU, Aihua Fang, Jun Wang , **Jianbo Wang**, Renhui Wang

Department of Physics, Wuhan University, China

Center for Electron Microscopy, Wuhan University, China

TEM plays very important roles in the discovery of quasicrystals and the study on the exotic microstructures of quasicrystalline materials. They also show unusual electronic properties, which are not expected for alloys consisting of normal metallic elements, such as the high electrical resistivity, the negative temperature coefficients of resistivity, the increase of resistivity with improved quality of samples and so on.

15:40 **Microscopy Studies of InGaN Dots Embedded in GaN Barrier**

Chuan-Pu Liu

Department of Materials Science and Engineering, National Cheng Kung University, Taiwan

While solid-state self-assembly quantum dots were predominantly fabricated by the S-K growth method, I demonstrate the growth of InGaN quantum dots by phase separation in InGaN quantum wells sandwiched between GaN barriers. Here I am particularly concerned with the characterization of In composition in InGaN quantum dots, essential materials for blue light emission. Quantum dots have been shown to enhance light emission for future white light application and composition is one of the decisive factors.

16:00 **Probing the Local Electronic Structures of Nanowires Using Valence Electron Energy Loss Spectroscopy**

Quan Li

Department of Physics, The Chinese University of Hong Kong, Hong Kong

In recent years, the proposed bottom up approach as a cost-effective means in achieving various nanodevices has promoted the research of various one-dimensional (1D) nanomaterials. It is known that material properties and thus the final performance of a device are mainly determined by its electronic states. Therefore, a fundamental understanding of the electronic structure of the 1D nanomaterial (in comparison to its bulk counterpart) is of primary concern.

16:20 **Geometrical Effect on Plasmon Modes of Au Nanoparticles with Various Shapes: A Spatially Resolved Electron Energy Loss Spectroscopy Study**

Ming-Wen Chu[a], Cheng-Hsuan Chen[a], Jin-Pei Deng[b], and Chung-Yuan Mou[a,b]

[a]Center for Condensed Matter Sciences, National Taiwan University, Taiwan [b]Department of Chemistry, National Taiwan University, Taiwan

Bulk gold (Au) has played an intimate role in human life ranging from arts to technologies. Thanks to the modern chemistry synthesis approaches, nanocrystalline Au particles (< ~30 nm) with a wide spectrum of shapes, e.g., rods and spheres, can now be prepared with high homogeneity. In contrast to the bulk Au, the nanoparticles (NPs) exhibit remarkable catalytic properties and a broad range of colors in the visible range.

16:40 **Phase Separation Prior to Nanocrystallization in an $Al_{85}Ni_5Y_6Fe_2Co_2$ Metallic Glass**

Y.B. Wang[a], H.W. Yang[a], B.B. Sun[a], B. Wu[a], J.Q. Wang[a], **Man-Ling Sui**[a*], E. Ma[b]

[a]Shenyang National Laboratory for Materials Science, Institute of Metal Research, Chinese Academy of Sciences, China [b]Department of Materials Science and Engineering, The Johns Hopkins University, Baltimore Maryland, USA

Multi-component Al-based metallic glasses are of significant interest as low-density, high-strength alloys. Upon primary crystallization of the melt-spun ribbon, the microstructure comprises of a high density (>10^{22}/m^3) of fcc-Al nanocrystals in an amorphous matrix, leading to exceptional mechanical properties.

17:00 **AEM and PEEM Studies of Interfacial Oxides Formed on Hot-Rolled Steels**

Liu-Wen Chang, Y. Huw, S. N. Lin

Department of Materials Science and Optoelectronic Engineering, National Sun Yat-sen University

17:20 **Property Map by Electron Spectroscopy Imaging**

Shen-Chuan Lo*, Fu-Rong Chen, Ji-Jung Kai, Ko-Feng Chen, Jing-Yi Yan, Jin-Sheng Tsai and Li Chang**
Department of Engineering and System Science, National Tsing Hua University, Taiwan. *Microstructure and Characterization Lab., Materials Research Laboratories, Industrial Technology Research Institute, Taiwan. **Department of Materials Science and Engineering, National Chiao-Tung University, Taiwan.

With the rapidly development of nanotechnology, there will be an increasingly strong need for imaging techniques that allow high spatial resolution studies of nanostructured materials. To link the relationship between the unique nano-materials properties and its nanostructure and chemical properties will help to speed up the nano-technology development. Energy filtering transmission electron microscopy (EFTEM) has become a useful tool in characterizing material properties, because it allows studying local chemical and electronic properties of a specimen with nanometer level spatial resolution.

17:40 **TEM Observation of Strained-Induced Nanoscale Martensite in Ultra-Fine 316L Stainless Steel Wires**

Han-ShenWang[a], Ru-ChaWei[a], and **Jer-Ren Yang**[a*]
[a]Department of Materials Science and Engineering, National Taiwan University, Taiwan.

Beginning with 190μm wire of 316L stainless steel, ultra-fine wire just 8μm indiameter has been made and characterised. There was no intermediate heat treatment used in the process of drawing, the amount of true strain was about 6.3, and a remarkably high yield strength (about 2 GPa) was achieved. A specimen preparation method for the cross-sectional transmission electron microscopy (XTEM) of ultra-fine wires of 316L strainless steel has been developed.

Session IV: Biology
Place: Indigo Room
Chairman: Shang-Ming Yu

15:20 **Refinement of Focused Ion Beam (FIB) Technique on Biomedical Materials**

Hian Lian Hing, C. Burkhardt[a], P. Gnauck[a], S. Sally[b], Y. Muranaka[c], M.A. Kaswandi, A.Z. Sahalan, S. Normalawati, M.W. Shamsudin & M.S. M Yasin
Faculty of Allied Hlth Sci, Universiti Kebangsaan Malaysia, Malaysia. [a]Natural & Medical Science Institute, Germany. [b]EM Unit, Australia [c]Research Equipment Center, Hamamatsu University, Japan

Focused Ion Beam (FIB) is an instrument that uses highly charged gallium ions to mill samples of minutes sizes or as an accessory of the scanning electron microscope. The FIB had been used extensively in the semi-conductor industry, defect analysis, circuit modification, mask repair and TEM sample preparations. Recently, FIB has been used as ultra microtome for the sectioning of biological and biomedical materials.

15:40 **Chitosan/Gelatin/TPP Nanocomposites For Bio-mimetic Growth of Hydroxyapatite**

Ling-Long Kuo-Huang[1]*, Shiang-Jiuun Chen[1], Chih-Kang Peng[2], Shin-Shing Shyu[3], Shu-Huei Yu [4]
[1]Department of Life Science, National Taiwan University, Taiwan [2]Department of Chemical and Material Engineering, National Central University, Taiwan [3]Center of Polymer Material Research, Vanung University, Taiwan [4]Department of Polymer Materials, Vanung University, Taiwan

The extracellular matrices (ECMs) of hard tissue are mainly composed of organic and inorganic such as collagen, glycosaminoglycans (GAGs) and hydroxyapatite (HAp). This study proposed a biologically inspired method to produce size-controlled nanoapatites that are mineralized within the chitosan/gelatin/hydroxyapatite (HAp) nanocomposites

16:00 **Histamine-Induced Secretion Discharge From Serous Cells in Rat Tracheal Epithelium**

Jui-Hsin Chang, **Hung-Tu Huang**
Department of Biological Sciences, National Sun Yat-Sen University, Taiwan

Secretory cells in tracheal epithelium of specific pathogen-free rat are serous cells with many secretory granules containing calcitonin gene-related peptide. In the present study, a high dose of histamine (18 μmol/kg) was administered intravenously to the rat to induce inflammation and serous cell secretion in the trachea of specific pathogen-free rats of Sprague-Dawley strain.

Nov. 17 Thu.

Session V: Exit Wave

Place: Red/Orange Room

Chairman: Hideki Ichinose

08:00 **Obstacles on the Road Towards Atomic Resolution Tomography**

Dirk Van Dyck*, S. Van Aert*, M.D. Croitoru*

* EMAT-University of Antwerp, Belgium

Electrons are the ideal particles to unravel the atomic structure of non-periodic objects such as nanoparticles, crystal defects and amorphous structures. As compared to X-rays, the interaction between electrons and atoms is orders of magnitude larger with less radiation damage. Moreover, with the development of aberration correctors, high resolution electron microscopy is now entering the domain where individual atoms can be resolved.

08:25 **Discrete Tomography: A Novel Approach to Obtain Atomic Resolution**

Christian Kisielowski[a], Joerg R. Jinschek[a], Fu-Rong Chen[b], and Joost Batenburg[c]

[a]Ernest Orlando Lawrence Berkeley National Laboratory, National Center for Electron Microscopy, U.S.A [b]Center for Electron Microscopy, Department of Engineering and System Science, National Tsing-Hua University, Taiwan [c]Leiden University, Mathematical Institute, The Netherlands.

Ongoing technological advancements of electron microscopy will reshape the way electron scattering is utilized to investigate structure and composition of materials down to the atomic level. It foreseeable (and partly established) that electron microscopes will have the ability to image single atoms of most elements of the periodic table and to tie the spatial information to spectroscopy that probes for chemical constituents and local bonding.

08:50 **Direct and Indirect Aberration Correction and Compensation**

Angus I. Kirkland, L. Y. Chang

Department of Materials, University of Oxford, UK

Direct electron-optical aberration correction in High Resolution Transmission Electron Microscopy (HRTEM) [1] has now been clearly demonstrated with the successful implementation of commercially available Hexapole correctors providing correction of aberration coefficients to third order. Indirect restoration of the complex specimen exit plane wavefunction using either focal or tilted illumination datasets of images is also routinely used to compensate of the coefficients of the wave aberration function to arbitrary order.

09:15 **Atomic Resolution Tomography in Icosahedron Nano-Particle**

Fu-Rong Chen

Department of Engineering and System Science, National Tsing-Hua University, Taiwan

09:40 **Electron Atomic Scattering Factors, Debye-Waller Factors and the Optical Potential for High Energy Electron Diffraction**

Lian-Mao Peng

Key Laboratory for the Physics and Chemistry of Nanodevices and Department of Electronics, Peking University, China

High-energy electrons may be elastically and inelastically scattered by a solid. To a good approximation the effect of inelastic scattering on the elastically scattered electrons may be taken into account using the concept of the complex optical potential. The optical potential may be calculated using electron atomic scattering factors and Debye-Waller factors, which in turn can be evaluated numerically using Hartree Fock atomic wave functions and shell models of lattice dynamics.

10:05 **Break**

Session VI: Instrumentation

Place: Red/Orange Room

Chairman: Chih-Hao Lee

10:20 **A 200kV Aberration Corrected STEM**

Hidetaka Sawada[a], Takumi Sannomiya[a], Eiji, Okunishi[a], Takeshi Tomita[a] ,Eiji, Abe[b]

[a]JEOL Ltd., Japan [b]Department of Materials Engineering, The University of Tokyo, Japan

We have successfully developed a spherical aberration corrected electron microscope for STEM (probe-forming) and TEM (image-forming) systems in cooperation with Haider's group. The Cs-corrected TEM enables us to obtain a better first zero of the contrast transfer function than the uncorrected one. As a result, higher resolution images have been obtained.

10:45 **Electron Optical Aberration Corrected 300KV (S)TEM in Nano-Characterization**

Dong Tang, Bert Freita, Rolf Erni

FEI Company, The Netherlands

Nano-characterization of the shrinking dimensions in nano-science and nano-technology demands (scanning-) tansmission electron microscope ((S)TEM) better performance. The links of (S)TEM resolution to the spherical aberration coefficient of (condenser) objective lens have been broken by Cs-correctors developed in recent years.

Session VII : HRTEM

11:10 **HVEM Application to Materials Science in the Korea Basic Science Institute (KBSI)**

Youn-Joong Kim, Young-Min Kim, Jin-Kyu Kim, Jong-Man Jeung

Division of Electron Microscopic Research, Korea Basic Science Institute, Korea

A new high voltage electron microscope (HVEM, Model JEM-ARM1300S, "Morning Star"), installed at the Korea Basic Science Institute (KBSI), has been operated as a national user facility from April, 2004. The primary application field of the KBSI-HVEM is quantitative 3-D structural analysis from μm-nm level (electron tomography) to atomic level (electron crystallography) utilizing its penetration power (1250kV), atomic resolution (0.12 nm, point-to-point), tilting capability (±60°; ±45°) as well as energy-filtering functions.

11:35 **Imaging of Oxygen Dimmers in the $SrTiO_3$(110) Surface**

Sung Bo Lee

Department of Ceramic Engineering, Hanyang University, South Korea

Using a high-resolution transmission electron microscope equipped with a heating stage, we observe a TEM hole edge surface of pure $SrTiO_3$ in the cross-section view with the zone axis of [100]. In situ observations of dynamic surface phenomena are recorded. The hole edge surface undergoes the faceting into the {001} and {011} surfaces. The {001} surface is terminated by SrO plane, and the {011} surface by O atoms. Two surface O atoms in the {011} surface move closer together forming bonds, indicative of a peroxo group. Atoms sublimate from the {001} surface, faster than

12:00

Session
Place: R
Chairm

08 : 00

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08 : 50

Physical and chemical properties of carbon nanostructure can be drastically altered by its atomic defects and chirality. The stability and mobility for vacancy, interstitial and topological defects in carbon nanotube, those are induced during HR-TEM observations, are examined. Thermal relaxation of metastable Frenkel defect (interstitial and vacancy pair) created "in-situ" by electron irradiation is clearly observed at the temperatures above 473K, and it is attributed to an instantaneous recombination (annihilation) of interstitials and vacancies.

09:15 **Nonlocality and Channelling in Core - Loss Spectroscopy**

Les J. Allen[a]*, S. D. Findlay[a], M. P. Oxley[b], C. Witte[a] and N. Zaluzec[c]

[a]School of Physics, University of Melbourne, Australia [b]Condensed Matter Sciences Division, Oak Ridge National Laboratory, USA [c]Electron Microscopy Center, Materials Science Division, Argonne National Laboratory, USA

A number of factors affect spectra and images based on core-loss spectroscopy. These include the propagation of the probe through the sample, the "delocalization" of the inelastic scattering on which the imaging is based, and whether the interaction can be adequately described by a "local" or "object function" approximation.

09:40 **Interfacial Nanoscaled Oxide Layers of Bonded n- and p-type GaAs wafers/ first-principles Approach**

Hao Ouyang[a], Meng-Hsuan Wu[a], Ji-Hao Cheng[a], Hsiao-Hao Chiou[a] YewChung Sermon Wu[b], and Cheng-Lun Lu[b] Shan-Haw Chiou[c]

[a]Department of Materials Engineering National Chung Hsing University, Taiwan [b]Department of Materials Science and Engineering, National Chiao Tung University, Taiwan [c]Industrial Technology Research Institute, Taiwan

This study explored in detail the microstructures and electrical characteristics of in- and anti-phase bonded interfaces for both *n* and *p*-type (100) GaAs wafers treated at different temperatures, and found that *n*-GaAs did not bond directly to itself, but instead via an amorphous oxide layer at 500 °C. The non-linear behavior of current versus voltage is related to the potential barrier formed at the continuous oxide interface. Both first-principles calculations and experimental observation confirm the existence of this barrier.

10:05 Break

Session IX: HVEM&Cs Corrected EM
Place: Red/Orange Room
Chairman: Fu-Rong Chen

10:20 **Hideki Ichinose**

Center for Advanced Research of Energy Conversion Material, Japan

10:45 **Applications Of Aberration-Corrected HREM in Materials Science**

John L. Hutchison

Department of Materials, University of Oxford, UK

The recent successful design and development of aberration correctors for modern FEG/TEM instruments is a major step forward in HREM. These devices are based on combinations of round transfer lenses and non-round (hexapole) correctors beneath the objective lens. Currently, correction of aberrations out to third order (i.e. C_3) is achievable in these systems.

11:10 **HADDF-STEM and Its Application to Structural Analysis of GaN-Based Violet Laser Diodes**

Makoto Shiojiri[a], Jung-Tsung Hsu[b], Jer-Ren Yang[c], Miran Čeh[d] and Hiroshi Saijo[a]

[a]Kyoto Institute of Technology, Japan [b]Opto-Electronics and Systems Laboratories, ITRI, Taiwan [c]Inst. Mater. Sci. & Engineer., National Taiwan Univ., Taiwan [d]Depart. of Nanostructured Mater., Jožef Stefan Institute, Slovenia

Atomic-resolution high-angle annular dark field (HAADF) scanning transmission electron microscopy (STEM) has been widely used to structural and compositional analysis of crystals. We have examined systematically the influence of the optical parameters; the spherical aberration of the probe-forming lens C_s, the defocus Δf, the semi-angle of the probe α, and the collection angle range of the annular detector D, on the HAADF-STEM images, developing a new scheme for STEM image simulation.

11:35 **Quantitative Analyses of Doping/Hole Concentration, Electrostatic Potential and Strain Field of Interfaces in Superconducting Oxides**

Yimei Zhu

Department of Nanoscience, Brookhaven National

Laboratory, USA

Quantitative characterization of interfacial structure and properties in complex materials as well as in strongly correlated electron systems such as technologically important high-temperature superconductors, poses a big challenge, but also great opportunities to materials scientists as well as to electron microscopists. New characterization methods help us to understand the fascinating behavior of advanced functional materials, while new materials stimulate the further development of novel techniques.

12:00 **EELS on Wide Band Gap Materials**

Li Chang

Department of Materials Science and Engineering, National Chiao Tung University, Taiwan

Plenary

12:25 **Future Direction of 4D-Electron Microscopy by TEM-STEM: Development of the Probe-Forming Cs Corrector for Ultra-High Vacuum-TEM**

Kunio Takayanagi[a*], Y.Tanishiro[a], Y.Ohshima, F. Hosokawa[b], T.Sannomiya[b], H.Sawada[b], and Y.Kondo[b]

Tokyo Institute of Technology, Physics Department, Japan.

*JEOL Ltd, Japan.

UHV (ultra-high vacuum) electron microscopy has been used for studies of surfaces and nanowires and particles. The UHV condition allows us to observe individual atoms suspended in vacuum [1]. Also in-situ UHV-electron microscopy enabled us to manipulate nanowires in-situ at the specimen stage of the microscope in combination with the scanning tunneling microscope (STM) technique.

12:55 **Closing Remark**

13:10 Lunch & Poster

Poster

Biology

B01 **Scanning Electron Microscopic and Histochemical Study on Surface Epithelial Cells of Nasolabial Cysts**

Chih-Ying Su[1], Ho-Yih Liu[2], Chih-Yen Chien[1], Chao-Cheng Huang[3], and Hung-Tu Huang[2]

Departments of [1]Otolaryngology and [3]Pathology, Chang Gung University and Chang Gung Memorial Hospital Kaohsiung Medical Center, Kaohsiung, [2]Department of Biological Sciences, National Sun Yat-Sen University, Taiwan

B02 **Unusual 'Iridoplast'-Like Chloroplasts in the Leaves of the Shade Plant *Selaginella Erythropus***

Chiou-Rong Sheue[a*], Vassilios Sarafis[b], Ruth Kiew[c], Ling-Long Kuo-Huang[d], Yuen-Po Yang[e] and Ho-Yih Liu[e]

[a]Graduate Institute of Bioresources, National Pingtung University of Science and Technology, Pingtung County 912, Taiwan. [b]School of Integrative Biology and CSSIP University of Queensland and CHAPS University of Western Sydney, Australia. [c]Singapore Botanic Gardens, Singapore [d]Department of Life Sciences, National Taiwan University, Taiwan. [e]Department of Biological Sciences, National Sun Yat-sen University, Taiwan.

B03 **Calcium Content of Anoectochilus Formosanus Hay at Different Calcium Supplyin Relation to Calcium Oxalate Crystal Idioblast Formation**

Feng-Yi Ma[a], Yi-Ru Huang[b], Han-Yi Fu[a], Doris C. N. Chang[c], Ling-Long Kuo-Huang[a]

[a]Department of Life Science, National Taiwan University, Taiwan. [b]College of Bioresources and Agriculture, Experimental Forest, National Taiwan University, Taiwan. [c]Department of Horticulture, National Taiwan University, Taiwan.

B04 **Egg Microstructure for Tilapia Species Identification**

Han-Chieh Kuo[a], Rong-Hwa Chen[b], Fu-Guang Liu[b] and Jui-Sen Yang[a]

[a]Institute of Marine Biology, National Taiwan Ocean University, Taiwan. [b]Freshwater Aquaculture Research Center, Fusheries Research Institute, Council of Agriculture, Executive Yuan, Taiwan

B05 **Morphological Alterations and Gfap-Like Immunoreactivity of the Hippocampus in Heatshock-Induced Gerbil**

HUANG, Hong -Lin[1], LIN, Kwan-Hwa[2], and YU, Shang-Ming[1]

1. Institute of Anatomy and Cell Biology, National Yang-Ming University 2. School of Physical Therapy, College of Medicine, National Taiwan University

B06 **Comparison of the Physicochemical Properties of Fast- And Slow-Growing Rhizobia by Atomic Force Microscopy**

Ji-Liang Chen[1], Shiming Lin[2] and Liang-Ping Lin[1]

[1]Institute of Microbiology & Biochemistry, National Taiwan University, Taiwan. [2]Center for Optoelectronic Biomedicine, National Taiwan University, College of Medicine, Taiwan

B07 **Observations on a Stroma's Structures of Cordyceps Militaris Under Cryo-SEM**

Ji-Liang Chen, Yun-Chi Ling and Liang-Ping Lin

Isogreen Biotechnology Co. Ltd, Taipei, Taiwan

B08 **A Parasite in Marine Fishes – Anisakis Simplex**

Li-Kou Chen and Jui-Sen Yang

Institute of Marine Biology, National Taiwan Ocean University, Taiwan

B09 **Endotoxin-Induced Goblet Cell Secretion in Rat Intestinal Villi: Evaluation With Scanning Electron Microscopy**

Shang-Pin Liu, Che-Jen Lin and Hung-Tu Huang

Department of Biological Sciences, National Sun Yat-Sen University, Taiwan

Materials Science

M01 **High-Resolution Transmission Electron Microscopy Characterization of 1-D Nitride-Based Nanomaterials**

Chien-Ting Wu[a], Chun-Wei Chen[a], Kuei-Hsien Chen[b], Li-Chyong Chen[c], Ming-Wen Chu[c], Cheng-Hsuan Chen[c]

[a]Dept. of Material Science and Engineering, National Taiwan University, Taiwan [b]Institute of Atomic and Molecular Sciences, Academia Sinica, Taiwan [c]Center for Condensed Matter Sciences, National Taiwan University, Taiwan

M02 **Cross-Sectional TEM Studies of Direct Methanol Fuel Cells Utilizing Ultramicrotomy**

Chih-Jen Lin[a], Hung-Shang Huang[a], Cheng-Cheng Chiang[a], Shen-Chuan Lo[a], Chih-Yuan Chen[a], Shu-Jan Chen[a], Fu-Rong Chen[b], Ji-Jung Kai[b], Jian-Long Horng[a]

[a]Materials Research Laboratories, Industrial Technology Research Institute, HsinChu, Taiwan. [b]Center for Electron Microscopy, Department of Engineering and System Science, National Tsing-Hua University, Taiwan.

M03 **Microstructural Investigation of Epitaxial ZnO Thin Films on Y_2O_3/Si and Yttria-Stabilized Zirconia**

Chih-Wei Lin, Yen-Cheng Chao, Li Chang*

Department of Materials Science and Engineering, National Chiao Tung University, Taiwan

M04 **Nano Precipitates in a New HSLA Steel**

Chih-Yuan Chen*, Ting-Yu Wang , Hsueh-Ren Chen and Jer-Ren Yang

Department of Materials Science and Engineering, National Taiwan University, Taiwan.

M05 **Growth of Single-Crystalline FE_3O_4 Nanowires**

Chung-Ming Tseng, Ming-Wen Chu, Yi-Jun Lin, Leeyih Wang, Jauyn G. Lin, and Cheng-Hsuan Chen

Center for Condensed Matter Sciences, National Taiwan University, Taiwan

M06 **Well-dispersed Ru Nanoparticles on Arrayed N-doped Carbon Nanotubes**

Fu-Kuo Chiang[a]*, Chia-Liang Sun[b], Wei-Chuang Feng[a], and Li-Chyong Lin[a], Kuei-Hsein Chen[b]

[a]Center for Condensed Matters Science, National Taiwan University. [b]Institute of Atomic and Molecular Sciences, Academia Sinica, Taiwan

M07 **HAADF-STEM Imaging on V-defect and Superlattice of GaN-based Semiconductor**

H. L. Tsai[a], T. Y. Wang[a], J. R. Yang[a] and Z. C. Feng[b]

[a]Department of Materials Science & Engineering, National Taiwan University, Taiwan [b]Graduate Institute of Electro-Optical Engineering and Department of Electrical Engineering, National Taiwan University, Taiwan

M08 **On the Precipitation Behavior of Cu-Al-Be Shape-Memory Alloy**

H.H. Kuo[a], Y.F. Hsu[b], W.H. Wang[a]

[a]Department of Materials Science and Engineering, National Taiwan University, Taiwan. [b]Department of Materials and Mineral Resources Engineering, National Taipei University of Technology, Taiwan

M09 **AEM Study in Tabular Al_2O_3 Formation**

*Bang-Ying Yu , and Wen-Cheng, J. Wei

Institute of Materials Science and Engineering, National Taiwan University, Taiwan.

M10 **Electronic Microscopy Study of Diamond Nanoplatelets**

Hou-Guang Chen , Li Chang

Department of Materials Science and Engineering, National Chiao Tung University, Taiwan

M11 **First-Principles Analysis of Interfacial Oxide Layers of Bonded GaAs Wafers**

Hsiao-Hao Chiou[a], Ji-Hao Cheng[a], Meng-Hsuan Wu[a], Hao Ouyang[a]*, YewChung Sermon Wu[b] and Shan-Haw Chiou[c]

[a]Department of Materials Engineering, National Chung Hsing University, Taiwan [b]Department of Materials Science and Engineering, National Chiao Tung University, Taiwan [c]Materials Research Laboratories, Industrial Technology Research Institute, Taiwan

M12 **Identification of Ionic Cluster in PVDF-G -SPS Membrane Using AFM and TEM**

Hung-Shang Huang, Shen-Chuan Lo, Chih-Jen Lin, Chih-Yuan Chen, Shu-Jan Chen and Li-Jiaun Lin
Materials Research Laboratories, Industrial Technology Research Institute, Taiwan.

M13 **Z-contrast Hollow Cone Dark Field Image**

Hung-Sheng Chen[a], Fu-Rong Chen[a], Kisielowski Christian[b] and Ji-Jung Kai[a]
[a]Center for Electron Microscopy, Department of Engineering and System Science, National Tsing-Hua University, Taiwan. [b]National Center for Electron Microscopy, Lawrence Berkeley National Lab., U.S.A.

M14 **TEM Investigation of Cone-Like Structure of Diamond/ SiC/ Si**

Jhih-Kun Yan, Li Chang
Department of Materials Science and Engineering, National Chiao Tung University, Taiwan

M15 **The Microstructural Study on Solid State Recycling AZ91D Alloy**

Jian-Yih Wang*[a], Ying-Nan Lin*[b], Tien-Chan Chang*[b] and Shyong Lee*[b]
[a] Department of Materials Science and Engineering, National Dong Haw University, Taiwan [b] Department of Mechanical Engineering, National Central University, Taiwan

M16 **Valence State Mapping of Iron Oxide Thin Film by Signal Processed ESI Series Energy-Loss Image**

Ko-Feng Chen[a], Fu-Rong Chen [a]*, Ji-Jung Kai[a] and Shen-Chuan Lo[b]
[a] Center for Electron Microscopy, Department of Engineering and System Science, National Tsing-Hua University, Taiwan. [b] Microstructure and Characterization Laboratories, Industrial Technology Research Institute, Taiwan

M17 **Fabrication of Ni Metal Wire Arrays by Using Anodic Alumina Templates**

Kuan-Yu Chen, Yi-Pei Wei, and Shao-Liang Cheng*
Department of Chemical and Materials Engineering, National Central University, Taiwan

M18 **Probing of Individual Ruthenium Oxide Nanowires by TEM -STM**

Kuei-Chun Lin, Fu-Rong Chen, and Ji-Jung Kai
Center for Electron Microscopy, Department of Engineering and System Science, National Tsing-Hua University, Taiwan.

M19 **On the Ni_4Ti_3 Precipitates in the Multiple-Stage Transformation of $Ni_{50.3}Ti_{49.7}$ Shape Memory Alloy**

Lung-Jen Chiang[a]*, Yung-Fu Hsu[b] and Wen-Hsiung Wang[a]
[a]Department of Materials Science and Engineering, National Taiwan University, Taiwan. [b] Department of Materials and Mineral Resources Engineering, National Taipei University, Taiwan

M20 **Coalescence Defects in Nanosize Anatase Condensates**

Meng-Hsiu Tsai[a], Shuei-Yuan Chen[b]*, and Pouyan Shen[a]
[a]Institute of Materials Science and Engineering, National Sun Yat-sen University, Taiwan [b]Department of Mechanical Engineering, I-Shou University, Taiwan

M21 **Upper Bainite in JIS SK5 Steel**

Meng-Yin Tu[a]*, Yung-Fu Hsu[b] and Wen-Hsiung Wang[a]
[a]Department of Materials Science and Engineering, National Taiwan University, Taiwan. [b] Department of Materials and Mineral Resources Engineering, National Taipei University of Technology, Taiwan.

M22 **Formation and Characterization of Tungsten Oxide Nanowires on Si**

Mu-Tung Chang, Li-Jen Chou[#], Yu-Lun Chueh and Chin-Hua Hsieh
Department of Materials Science and Engineering, National Tsing Hua University, Taiwan

M23 **HRTEM and EELS Study in GaN-based Diluted Magnetic Semiconductor**

R. T. Huang[a*], C. F. Hsu*, J. J. Kai*, F. R. Chen*, T. S. Chin**

*Department of Engineering and System Science, National Tsing-Hua University, Taiwan. **Department of Physics, National Tsing-Hua University, Taiwan

M24 **Synthesis and Microstructural Study of Fe-doped $Zn_{1-x}Cu_xO$ Diluted Magnetic Semiconductor Nanowires**

R. T. Huang[a], M. C. Wang[a], J. Y. Yan[a], T. W. Wu[a], Z. Y. Wu[a], J. J. Kai[a], F. R. Chen[a], W. B. Jian[b], and J. J. Lin[b]

[a]Department of Engineering and System Science, National Tsing-Hua University, Taiwan. [b]Department of Physics, National Chiao-Tong University, Taiwan.

M25 **Structural and Composition Characterization of Al Doped ZnO Nanostructures by HRTEM**

Ruey-Chi Wang[a], Chuan-Pu Liu [a]*, Jow-Lay Huang[a], and Shu-Jen Chen[b]

[a]Department of Materials Science and Engineering, National Cheng Kung University, Taiwan .and Center for Micro/nano Technology Research, National Cheng Kung University, Taiwan. [b]Department of Chemical and Material Engineering, National Kaohsiung University of Applied Sciences, Taiwan

M26 **TEM Analysis of Self- Assembled Silicide Nanowires**

S. Y. Chen and L. J. Chen

Department of Material Science and Engineering, National Tsing Hua University, Taiwan

M27 **The Radiation Effect on Microstructure of SiC/PyC/SiC Composites for Fusion Reactor**

Shang-Wei Li[a], Ji-Jung Kai[a]*, Fu-Rong Chen [a] and Y. Katoh[b]

[a]Center for Electron Microscopy, Department of Engineering and System Science, National Tsing-Hua University, Taiwan. [b]Institute of Advanced Energy, Kyoto University, Japan

M28 **Growth of Large Periodic Arrays of Ni Silicide Nanodots**

Shao-Wei Lu, Shao-Liang Cheng, and Hui Chen

Department of Chemical and

National Central University,

M29 **Advanced FETEM/DB-F the Recording Mechanis**

Shen-Chuan Lo, Wei-Chih H Lin, Cheng-Cheng Chiang, S and Song-Yeu Tsai

Materials Research Laborato Research Institute, Taiwan

M30 **Growth of Epitaxial Iron Ion Beam Sputtering**

Shu-Fang Chan, Chuan-Pu L

Department of Materials Scie

National Cheng Kung Univer

M31 **Nanometer-size P/K-rich inclusions in microdiamo Kokchetav and Erzgebir characteristics of the for metamorphic microdiam**

Shyh-Lung Hwang[a], Hao-Tsu Pouyan Shen[d], Hans-Peter Sc Nikolai V. Sobolev[g]

[a] Department of Materials Sci National Dong Hwa Universit [b]Central Geological Survey, T Earth Sciences, Academia Sin Materials Science and Engine University, Taiwan. [e]Institute e und Geophysik, Ruhr-Univers [f]Department of Geological an Stanford University, USA. [g] In Petrography, Siberian Branch Sciences, Novosibirsk, Russia

M32 **A Novel Approach to Gro Thin Film on Silicon Sub**

Ting-Yu Wang[a], Hung-Ling T Jer-Ren Yang[a]

[a] Department of materials scie National Taiwan University, T photonics, National Chiao Tun

M33 **Navel Sample Holder Design for CNT Characterization and AFM Tip in UHV-TEM**

Yang-Shan Huang, and Chia-Seng Chang
Institute of Physic, Academia Sinica, Taiwan.

M34 **Determination of Three Phase Boundary of Ni/YSZ Thin Film of a Solid Oxide Fuel Cell Prepared by Plasma Spray**

Yao-Yu Yang[a], Chih-Hao Lee[a] ,Chia-Ho Yu[b] , Chang-Sing Hwang[b]
[a]Department of Engineering and System Science, National Tsing-Hua University, Taiwan. [b]Institute of Nuclear Energy Research, Taiwan

M35 **Resolution Extension and Exit Wave reconstruction in Complex HREM**

Yee-Lang Liu, Fu-Rong Chen ,and Ji-Jung Kai
Center for Electron Microscopy, Department of Engineering and System Science, National Tsing-Hua University, Taiwan

M36 **In-Situ Observation of the Interactions Between Silver Nanoparticles and Carbon Nanotubes**

Yuan-Hong Liao, Yuan-Chin Chang, Yuan-Shan Hwang,Chia-Seng Chang, and Tien-Tzou Tsong
Institute of Physics, Academia Sinica, Taiwan, Tung Hsu
Department of Materials Sciences and Engineering
Tsing-Hua University, Taiwan

M37 **HRTEM Investigation of Strain Distribution in Multi-layers of InAs/GaAs Quantum Dots**

Yue-Han Wu[a*], Li Chang[a], Fu-Rong Chen[b], Ru-Shang Hsiao[c], and Jenn-Fan Chen[c]
[a]Department of Materials Science and Engineering, National Chiao-Tung University, Taiwan. [b]Center for Electron Microscopy, Department of Engineering and System Science, National Tsing-Hua University, Taiwan
[c]Department of Electrophysics, National Chiao-Tung University, Taiwan

M38 **Supercapacitor Characteristics of Hydrous Ruthenium Oxides Coatings by Cathodic Deposition Method and its Anodic Oxidization Effect**

Yuli Lin and H.-S Hwang
Department of Mechanical Engineering, Chung Hua University, Taiwan

M39 **Transmission Electron Microscopy and Correlated Optical Investigation on InGaN/GaN Multiple Quantum Well Light Emitting Diodes**

Z. C. Feng[a,*], J. H. Chen[a], H. L. Tsai[b], J. R. Yang[b], P. Li[c], C. Wetzel[c], T. Detchprohm[c], and J. Nelson[c]
[a]Graduate Institute of Electro-Optical Engineering and Department of Electrical Engineering, National Taiwan University, Taiwan. [b]Department of Materials Science & Engineering, National Taiwan University, Taiwan
[c]Uniroyal Optoelectronics, USA

M40 **Annealing effect on the Magnetic Properties of Co-implanted ZnO Nanowires**

Zong-Yi Wu[a], R. T. Huang, Fu-Rong Chen [a]*, Ji-Jung Kai[a] and W. B. Jian[b]
[a]Center for Electron Microscopy, Department of Engineering and System Science, National Tsing-Hua University, Taiwan. [b]Department of Electrophysics, National Chiao Tung University, Taiwan

M41 **The Relationship of Diameter and Resistance of Indium Tin Oxide Nanowires**

Hui-Fang Chuang, F. R. Chen, J. J. Kai
Center for Electron Microscopy, Department of Engineering and System Science, National Tsing-Hua University, Taiwan

M42 **The Effects Of Annealing On Gan-Based Diluted Magnetic Semiconductors By Ion Implantation**

Yudi Liu[a], R.T. Huang[a], F.R. Chen[a], J.J. Kai[a], Ey Chang[b]
[a]Center for Electron Microscopy, Department of Engineering and System Science, National Tsing-Hua University, Taiwan. [b]CSD Laboratory, Department of Materials Science and Engineering, National Chiao Tung University, Taiwan

M43 **Electricity and Microstructure Investigation of AlGaN-based Diluted Magnetic Semiconductor Prepared by Ion Implantation**

Jong-Jeng Jian, Rong-Tan Huang, Fu-Rong Chen , Ji-Jung Kai
Department of Engineering and System Science, National Tsing-Hua University, Taiwan

M44 **Synthesis and Microstructural Study of ZnCuO Diluted Magnetic Semiconductor Nanowires**

Hsing-Yu Li, Fu-Rong Chen , Ji-Jung Kai
Center for Electron Microscopy, Department of Engineering and System Science, National Tsing-Hua University, Taiwan

M45 **Fabrication and Application of Phase Plate**

Sheng-Hui Huang, Fu-Rong Chen and Ji-Jung Kai
Center for Electron Microscopy, Department of Engineering and System Science, National Tsing-Hua University, Taiwan

M46 **Direct-driven Electrochromic Displays**

Shih-Hung Chiu, F. R. Chen, J. J. Kai
Department of Engineering and System Science, National Tsing-Hua University, Taiwan

M47 **Atomic Resolution Tomography of Icosahedral Structure**

Amy Wang, Fu-Rong Chen , Ji-Jung Kai
Center for Electron Microscopy, Department of Engineering and System Science, National Tsing-Hua University, Taiwan

M48 **V_2O_5 Nanowires As a Functional Material for Electrochromic Device**

Cheng Keng-Jer, Kai Ji-Jung, Chen Fu-Rong
Department of Engineering and System Science, National Tsing Hua University, Taiwan

M49 **An Solid State Electrochromic Device Based on Tungsten Oxide Nanoparticles**

Chia-Ching Liao, Fu-Rong Chen, Ji-Jung Kai
Center for Electron Microscopy, Department of Engineering and System Science, National Tsing-Hua University, Taiwan

M50 **The Electrochromic behavior of Nickel Oxide Thin Film Prepared with different Morphologies**

Sheng-Hui Lin, Fu-Rong Chen, Ji-Jung Kai
Center for Electron Microscopy, Department of Engineering and System Science, National Tsing-Hua University, Taiwan

M51 **Cavity Formation Study in SiC/SiC Composite Irradiated with Multiple-ion Beam at Elevated Temperatures**

Zi-Huai Zeng, Hsu-Tsu Keng, Ji-Jung Kai, and Fu-Rong Chen
Center for Electron Microscopy, Department of Engineering and System Science, National Tsing-Hua University, Taiwan

M52 **Irradiation-Produced Cavity Formation Study in SiC_f/SiC Composites by Multiple-ion Beam Irradiation**

H. T. Keng[a], J. J. Kai[a], F. R. Chen[a], Y. Katoh[b], A. Kohyama[b]
[a]Center for Electron Microscopy, Department of Engineering and System Science, National Tsing-Hua University, HsinChu, Taiwan [b]Institute of Advanced Energy, Kyoto University, Japan

M53 **WMO_3 Nanowires as a Functional Material for Eectrochromic Device**

Chun-Long Fu, Fu-Rong Chen and Ji-Jung Kai
Department of Engineering and System Science, National Tsing Hua University, 101, Section 2 Kuang Fu Road, Hsinchu, Taiwan 300, Republic of China

M54 **CRYSTALLIZATION BEHAVIOR OF CU60HF25TI15 BULK METALLIC GLASS WITH TEM ANALYSES**

Hsin-Hsin Hsieh[a]*, Wu Kai [a], Ron-Tan Huang[a], and Yu-Lung Lin[b]
[a]Institute of Materials Engineering, National Taiwan Ocean University, Taiwan. [b]Chung-Shan Institute of Science and Technology, Taiwan.

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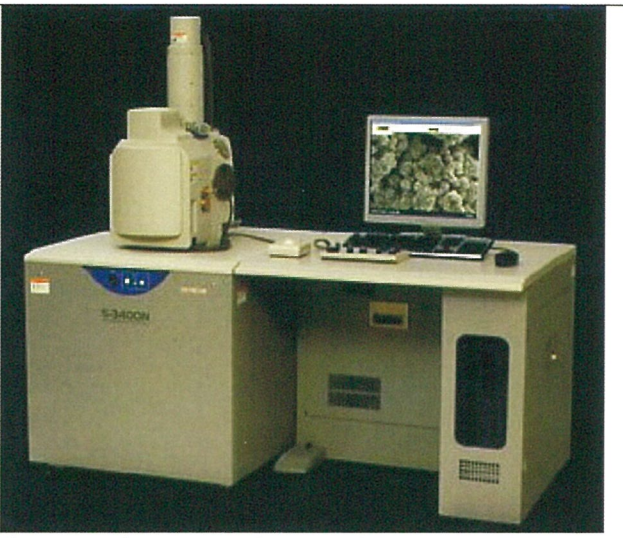

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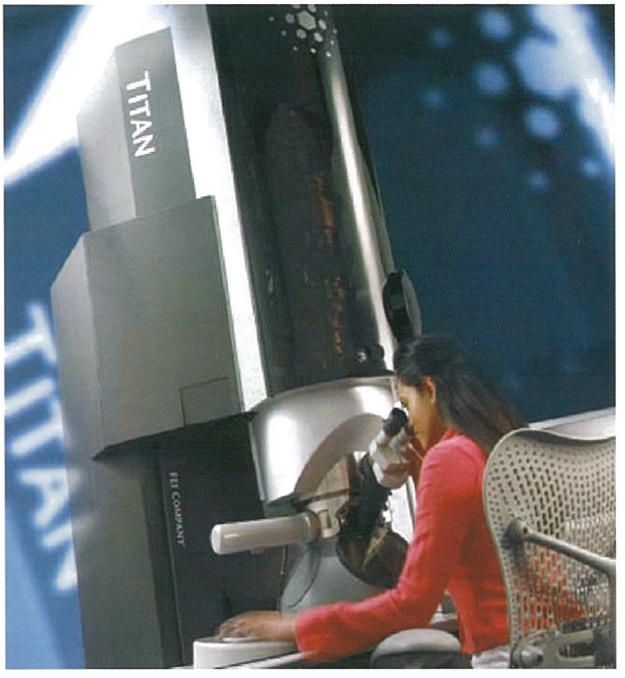

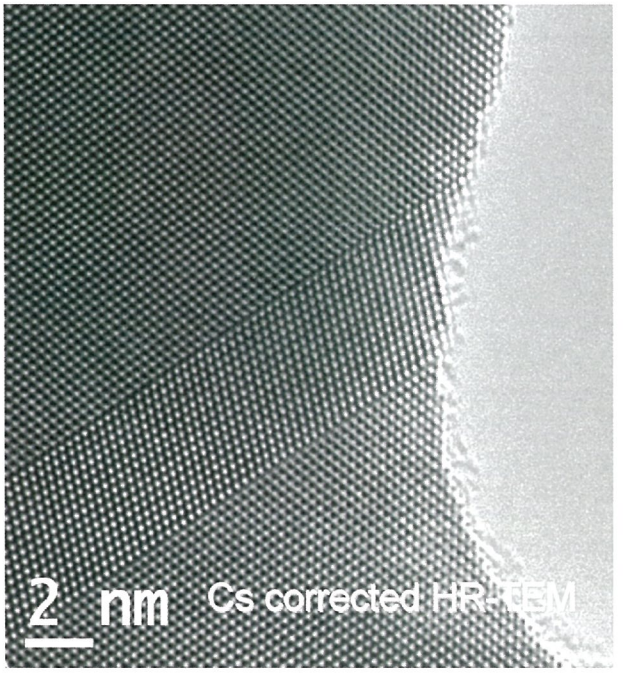

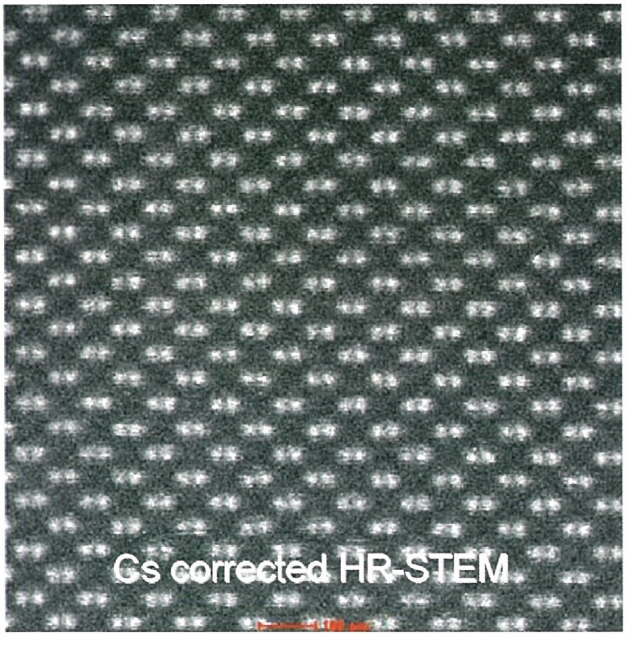

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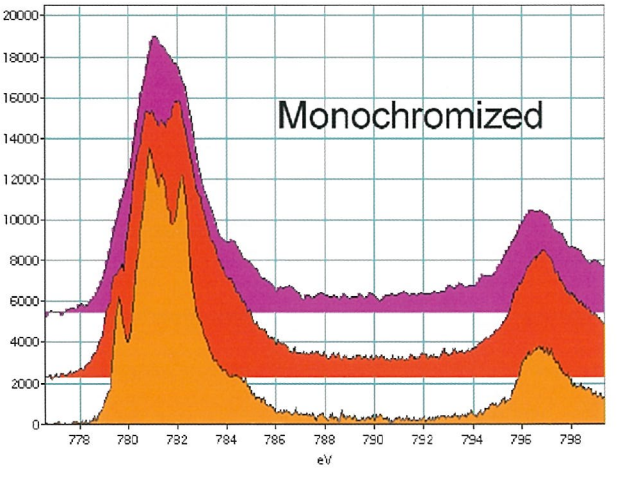

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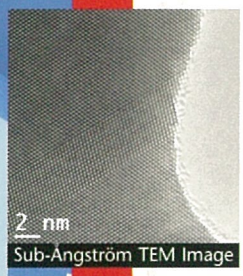
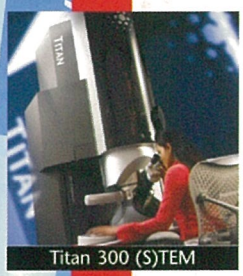
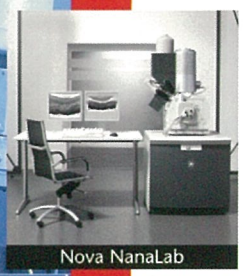


Sub-Ångström TEM Image



Titan 300 (S)TEM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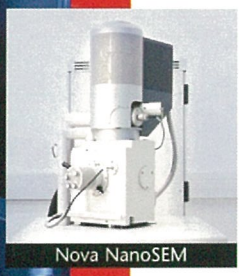
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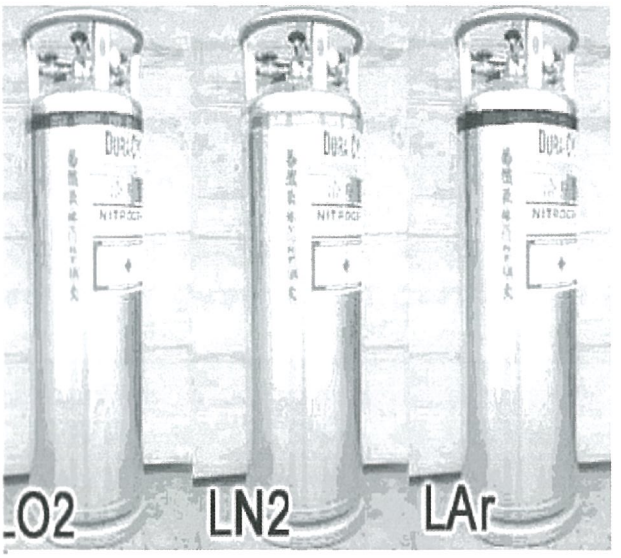

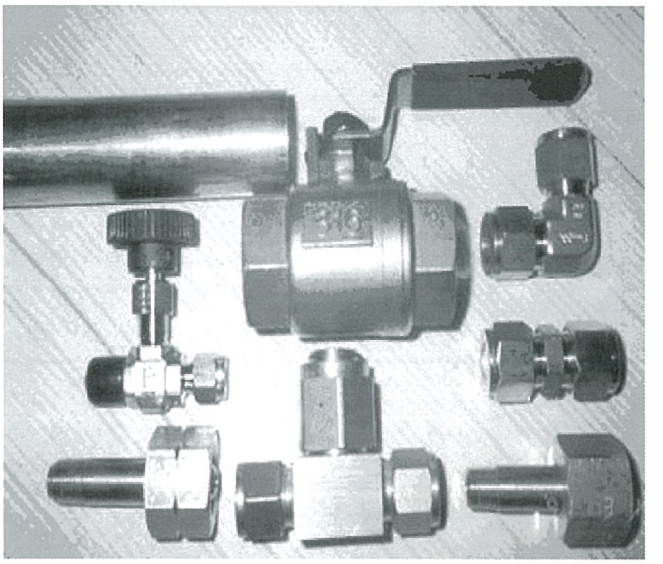

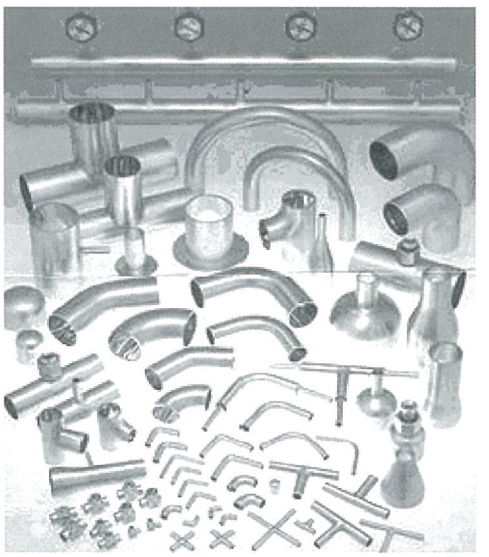

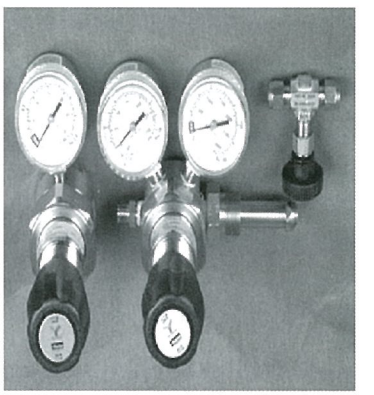

服務項目：氧氣、乙炔、氬氣、氮氣、氫氣、氦氣、二氧化碳等特殊稀有氣體、液氧、液氮、調整器、醫療用及提供相關服務與技術，進出口各種氣體、氮氣配管工程及相關業務。

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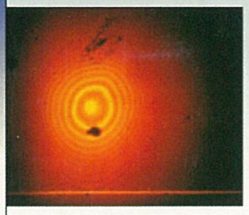
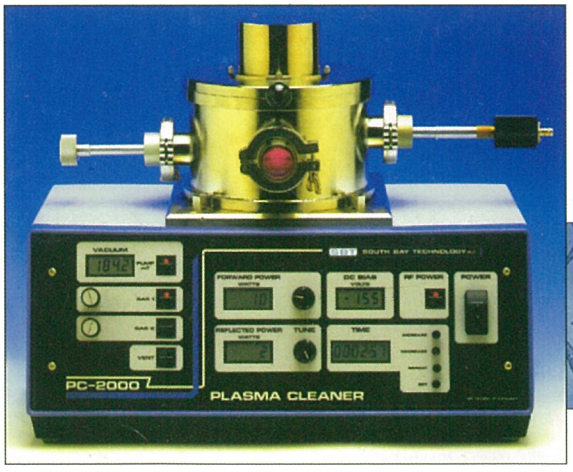


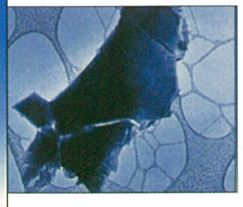
- Non-contact position sensor for accurate termination
- Automated controls for repeatability and ease of use
- New large area tools for increased thin area
- Quick Release Platens simplify sample mounting

Ion Beam Sputter Deposition and Etching System

- Uniformly thin, continuous, amorphous films
- Multiple target materials without breaking vacuum
- Improved imaging for hightest magnification FESEM
- Base pressure of 10^{-7} without LN_2 trapping



Plasma Cleaner



- Removes hydrocarbons without damaging specimen
- Intuitive front panel controls
- Ideal for multi-user environments
- Large chamber accommodates samples up to 3" tall and 6" diameter

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