

4th East-Asia Microscopy Conference (EAMC4)
National Taiwan University, 3-5 December, 2022, Taipei, Taiwan

Scientific Program

Day 1 (Saturday, 3rd December, 2022)

Room 203 International Hall, College of Engineering, NTU

08:00~09:30 Registration

09:30~10:00 Opening
第 42 屆台灣顯微鏡年會暨會員大會

10:00~10:30 **高速時間解析 TEM 觀察技術 (中文演講)**
Mr. Yieng-Chieh Hung, JEOL Ltd. / JIEDONG Co. Ltd.
Session Chair: President Jer-Ren Yang

10:30~10:55 Coffee Break

10:55~11:25 MST Member Meeting

11:25~11:55 **NOVEL OPTICAL DESIGN OF FIELD EMISSION SEMS-INNOVATIONS IN GEMINI COLUMN, DETECTION TECHNOLOGY AND VARIABLE PRESSURE TECHNOLOGY**
Mr. Raphael Sung, Carl Zeiss Co. Ltd.
Session Chair: Dr. Shen-Chuan Lo

11:55~13:00 Luncheon (Room205, Room207, Room209, Room228)

Plenary Speech I

Session Chair: Professor Shang-Rung Wu

13:00~13:45 **DEVELOPMENT AND CURRENT STATUS OF HIGH-RESOLUTION CRYO-EM RESEARCH IN TAIWAN**
Prof. Ming-Daw Tsai, Academia Sinica, Taiwan

Local Invited Speech I

Session Chair: Professor Wen-Wei Wu

13:45~14:35

IN SITU HEATING TRANSMISSION ELECTRON MICROSCOPY STUDIES ON FABRICATION, THERMAL EXPANSION AND THERMAL STABILITY OF NANOMATERIALS

Prof. Chiu-Yen Wang, National Taiwan University of Science and Technology, Taiwan

Session Co-Chair: Professor Shang-Rung Wu

MOCAT: COMBINATION OF LONG-TERM TISSUE PRESERVATION AND FAST-SPEED ORGAN-LEVEL IMAGING IN CELLULAR RESOLUTION

Prof. Li-An Chu, National Tsing Hua University, Taiwan

14:35~16:00

Local Poster and Photo Session

Open for Taiwan Attendees

Local Invited Speech II

Session Co-Chair: Professor Chien-Chun Chen

16:00~17:00

APPLICATIONS OF ANALYTICAL MICROSCOPY FOR R&D ACTIVITIES

Dr. Chien-Wei Wu, Materials Analysis Technology Inc. , Taiwan

THE APPLICATION OF HITACHI ULTRA HIGH RESOLUTION FESEM

Mr. Hank Kuo, E hong instrument Co., Ltd. , Taiwan

AZTEC FOR EDS ANALYSIS SOLUTIONS

Dr. T.Y. Wang, Oxford Instruments, Taiwan

Day 2 (Sunday, 4th December, 2022)

Virtual Conference (Pre-recorded video streamed using Cisco Webex)

09:00~09:45	<p>Plenary Speech II</p> <p>VISUALIZING CRYSTAL GROWTH ON 2D MATERIALS SURFACES WITH THE HELP OF ELECTRON MICROSCOPY</p> <p>Prof. Frances M. Ross, Massachusetts Institute of Technology (MIT), USA</p>		
09:45~10:30	<p>Plenary Speech III</p> <p>THE ROLE OF CORRELATIVE CT AND TEM INVESTIGATIONS IN THE DEVELOPMENT OF BATTERY TECHNOLOGIES</p> <p>Prof. Joachim Mayer, RWTH Aachen University, Germany</p>		
10:30-10:40	Break		
10:40~12:00	<p>[Oral 1]</p> <p>Instruments and Techniques I</p>	<p>[Oral 2]</p> <p>Materials Science I</p>	<p>[Oral 3]</p> <p>Life Science I</p>
[Oral 1] Instruments and Techniques I	<p>AXON DOSE: A NEW PARADIGM IN DOSE MANAGEMENT FOR TRANSMISSION ELECTRON MICROSCOPY</p> <p><i>Invited Speakers:</i> Dr. Simon Ma, Protochips</p>		
	<p>ADVANCING SOFT MATERIALS RESEARCH USING IN-SITU LIQUID TEM</p> <p><i>Invited Speakers:</i> Dr. Yaofeng Guo, Protochips</p>		
	<p>ZEISS LASERFIB – AN EMERGING CORRELATIVE PLATFORM FROM X-RAY TOMOGRAPHY TO FIB THROUGH FEMTOSECOND LASER TO INVESTIGATE DEEP BURIED STRUCTURES</p> <p>Dr. Arul Maximus Rabel, Carl Zeiss PTE LTD</p>		
	<p>DIRECT OBSERVATION OF MAGNETIC DOMAINS IN A FERROMAGNETIC QUASICRYSTAL BY DPC STEM</p> <p>Takeshi Iwata, The University of Tokyo, Japan</p>		
[Oral 2] Materials Science I	<p>Evaluation of Martensite-Austenite constituent in low-alloy steel using advanced microscopy techniques</p> <p><i>Invited Speakers:</i> Dr. Toru Hara, National Institute for Materials Science, Japan</p>		

PRECESSION ENHANCED ELECTRON DIFFRACTION APPLICATIONS IN TEM FOR NANOMATERIALS STUDIES

Invited Speakers: Dr. Athanasios S Galanis, NanoMegas

INVESTIGATION OF MICROSTRUCTURE AND MECHANICAL PROPERTIES OF ULTRALIGHT LAZ SERIES MAGNESIUM ALLOYS

Prof. Te-Cheng Su, National Taiwan University, Taiwan

COMPLEMENTARY CHARACTERIZATIONS BY EBSD AND ECCI IN GEOMETRICALLY NECESSARY DISLOCATIONS AND STATISTICALLY STORAGE DISLOCATIONS IN HIGH-ENTROPY STEEL

Yi-Hsuan Sun, National Taiwan University, Taiwan

MORPHOLOGICAL ANALYSIS OF THE ISOLATION MEMBRANE BY CRYO-ELECTRON TOMOGRAPHY AND CRYO-FOCUSED ION BEAM

Invited Speakers: Dr. Yoshiyuki Fukuda, The University of Tokyo, Japan

DEVELOPMENT OF ARRAY TOMOGRAPHY-BASED 3D-CLEM AND VISUALIZATION OF ER BODY IN THE ARABIDOPSIS LATERAL ROOT CAP

Invited Speakers: Dr. Kiminori Toyooka, RIKEN CSRS (Center for Sustainable Resource Science), Japan

[Oral 3]
Life Science I

ULTRACELLULAR IMAGING OF BRONCHOALVEOLAR LAVAGE FROM YOUNG AGE COVID-19 PATIENTS WITH COMORBIDITIES SHOWED GREATER SARS-COV-2 INFECTION BUT LESSER ULTRASTRUCTURAL DAMAGE THAN THE OLD AGE PATIENTS

Dr. Subhash Chandra Yadav, All India Institute of Medical Sciences, New Delhi, India

RECENT ADVANCES IN AUTOMATED VOLUME EM FOR LIFE SCIENCES APPLICATION AT NANOMETER RESOLUTION

Dr. Tan Bee Yi, Carl Zeiss PTE, LTD.

12:00~13:00

Luncheon

Plenary Speech IV

13:00~13:45

PROSPECTS AND OPPORTUNITIES FOR ELECTRON PTYCHOGRAPHY AT LOW DOSE

Prof. Angus Kirkland, University of Oxford and The Roslind Franklin Institute, UK

13:45~14:30	Plenary Speech IV		
	3D ATOM DYNAMICS OF SOFT MATTER Prof. Fu-Rong Chen, City University of Hong Kong, China		
14:30-15:00	Keynote Speech I		
	TEM ANALYSIS OF GRAPHENE DOMAIN BOUNDARY GROWN FROM MOBILE HOT WIRE ASSISTED CVD Prof. Seokwoo Jeon, Korea Advanced Institute of Science and Technology (KAIST), Korea		
15:00-15:20	Break		
15:20~15:50	Keynote Speech II		
	ADVANCES IN TWO-DIMENSIONAL MATERIALS RESEARCH USING ABERRATION-CORRECTED TEM/STEM Prof. Zonghoon LEE, Ulsan National Institute of Science and Technology (UNIST) and CMCM, Institute for Basic Science, Korea		
15:50~16:40	[Oral 4] Instruments and Techniques II	[Oral 5] Materials Science II	[Oral 6] Life Science II
16:40~17:35			[Oral 7] In-Situ TEM I
17:35~17:55			Break
[Oral 4] Instruments and Techniques II	CAPABILITIES OF TAIWAN PHOTON SOURCE 23A X-RAY NANOPROBE <i>Invited Speakers:</i> Dr. Bi-Hsuan Lin, National Synchrotron Radiation Research Center, Taiwan		
	HIGH ENERGY SYNCHROTRON X-RAY SCATTERING METHODS AND ITS APPLICATIONS AT BL04B2 AND BL08W, SPRING-8 <i>Invited Speakers:</i> Dr. Jo-Chi Tseng, Japan Synchrotron Radiation Research Institute SPring-8, Japan		
	RESOLVING GRAIN SHAPE AND CRYSTALLOGRAPHIC ORIENTATION NON-DESTRUCTIVELY IN 3D BY LABORATORY X-RAY DIFFRACTION CONTRAST TOMOGRAPHY Miss Yanjing Yang, Carl Zeiss Pte. Ltd.		
	GROUND STATE ELECTRONIC STRUCTURE PREDICTION FROM ELNES/XANES BY MACHINE LEARNING CHEN Po-Yen, University of Tokyo, Japan		

	<p>CHARACTERIZATION OF ONE-ATOMIC AU LAYER IN NIS₂/SI INTERFACE BY STEM-EELS</p> <p>Chia-Yi Wu, National Yang Ming Chiao Tung University, Taiwan</p>
	<p>TRANSMISSION ELECTRON MICROSCOPY TOMOGRAPHIC SPECIMEN PREPARATION BY FOCUSED ION BEAM SYSTEM</p> <p>Yu Lun, Liu, National Tsing Hua University, Taiwan</p>
	<p>THE APPLICATION OF THREE-DIMENSIONAL ATOMIC ELECTRON TOMOGRAPHY TO SEMICONDUCTOR DEVICES</p> <p>Yu-Ting Peng, National Tsing Hua University, Taiwan</p>
	<p>EPITAXIAL ANTIPEROVSKITE / PEROVSKITE HETEROSTRUCTURES FOR MATERIALS DESIGN</p> <p><i>Invited Speakers:</i> Prof. Si-Young CHOI, Pohang University of Science and Technology, Korea</p>
	<p>TWISTED COMPLEX OXIDE LATERAL HOMOSTRUCTURES</p> <p><i>Invited Speakers:</i> Prof. Jan-Chi Yang, National Cheng Kung University, Taiwan</p>
	<p>INVESTIGATION OF PHASE TRANSFORMATION TOUGHENING MECHANISM IN ZIRCONIA CERAMICS BY IN-SITU TEM OBSERVATION</p> <p>Prof. Bin Feng, The University of Tokyo, Japan</p>
[Oral 5] Materials Science II	<p>PRECIPITATION AND DISLOCATION BEHAVIOR OF AA7075T7352 ALUMINUM ALLOY AT VARIOUS TENSILE TRUE STRAINING</p> <p>Mr. Roopchand Tandon, Indian Institute of Technology (BHU) Varanasi, Technical university in Varanasi, India</p>
	<p>TEM INVESTIGATIONS ON NANO PRECIPITATES AND REVERSED AUSTENITE IN TI-MO MARAGING STAINLESS STEEL</p> <p>Dr. Chih-Yuan Chen, National Taipei University of Technology, Taiwan</p>
	<p>GUANIDINIUM INCORPORATION EFFECTS ON THE MICROSTRUCTURE OF MAPBI₃ PEROVSKITES</p> <p>Byeongjun Gil, Seoul National University, Korea</p>
	<p>MICROSTRUCTURAL CHARACTERIZATION AND MECHANICAL PROPERTIES OF HOT WORK TOOL STEELS UNDER TEMPERING TREATMENT</p> <p>Cheng-Yu Wei, National Taipei University of Technology, Taiwan</p>
[Oral 6] Life Science II	<p>CRYOEM WORKFLOW APPLICATION</p> <p><i>Invited Speakers:</i> Mr. Eric Chen, Thermo fisher scientific</p>
	<p>HIGH RESOLUTION STRUCTURE BIOLOGY, FROM MEMBRANE PROTEINS TO DISEASES</p> <p><i>Invited Speakers:</i> Dr. Abhay Kotecha, Thermo fisher scientific</p>

IN-SITU LIQUID PHASE TEM: A POWERFUL TOOL FOR PHARMACEUTICAL STUDIES AND LIFE SCIENCE APPLICATIONS

Invited Speakers: Dr. Vasilis Papadimitriou, DENSsolutions

[Oral 7]
In-Situ TEM I

ELECTRICAL CONDUCTANCE OF SUSPENDED MOS₂ NANORIBBON MEASURED BY IN-SITU TRANSMISSION ELECTRON MICROSCOPE

Limi Chen, Japan Advanced Institute of Science and Technology, Japan

CONTROLLING THE THERMAL GRADIENT DURING IN SITU TRANSMISSION ELECTRON MICROSCOPE HEATING EXPERIMENTS

Yi-Chieh Yang, Danmarks Tekniske Universitet, Danmark

Day 3 (Monday, 5th December, 2022)

Virtual Conference (Pre-recorded video streamed using Cisco Webex)

Plenary Speech VI			
09:00~09:45	<p>TOWARD HIGH-PRECISION ANALYSIS OF ELECTROMAGNETIC FIELD USING ELECTRON HOLOGRAPHY</p> <p>Prof. Yasukazu Murakami, Kyushu University, Japan</p>		
Keynote Speech III			
09:45~10:15	<p>INFORMATIVE THREE-DIMENSIONAL IMAGING BY LOW-VACUUM SCANNING ELECTRON MICROSCOPY AND NOVEL IN SITU NANOGOLD LABELING FOR BIO-MEDICAL TARGET LOCALIZATION.</p> <p>Prof. Akira Sawaguchi, University of Miyazaki, Japan</p>		
10:15-10:25	Break		
10:25~11:05	[Oral 8] In-Situ TEM II	[Oral 9] Materials Science III	[Oral 10] Life Science III
11:05~11:45		[Oral 11] In-Situ TEM III	
11:45~11:50		Break	
11:50~12:00	Break		
[Oral 8] In-Situ TEM II	<p>IN-SITU OBSERVATION OF CHEMICALLY REACTED PARTICLES IN GAS ATMOSPHERE WITH AN ABERRATION CORRECTED STEM/SEM</p> <p><i>Invited Speakers:</i> Mr. Hiroaki Matsumoto, Hitachi High-Tech Corporation, Core Technology & Solutions Business Group</p>		
	<p>MEMS-BASED IN-SITU TEM: EXPLORING UNTAPPED OPPORTUNITIES IN BATTERY RESEARCH, CATALYSIS AND ELECTROCHEMISTRY</p> <p><i>Invited Speakers:</i> Dr. H. H. Pérez-Garza, DENSSolutions</p>		
	<p>SEMI IN-SITU OBSERVATION OF MICRO-CRACK FORMATION IN DUAL-PHASE STEEL</p> <p>Miss Min-Yu Tseng, National Taiwan University, Taiwan</p>		

INTERATOMIC BOND STRENGTH IN PT ATOMIC CHAINS MEASURED BY IN-SITU TEM USING A QUARTZ RESONATOR

Prof. Yoshifumi Oshima, Japan Advanced Institute of Science and Technology, Japan

CRITICAL SHEAR STRESS OF GOLD NANOCONTACT MEASURED BY TEM COMBINED WITH A QUARTZ RESONATOR

LIU JIAMING, Japan Advanced Institute of Science and Technology, Japan

ELECTRONIC STRUCTURE MOSAICITY OF TRANSITION METAL DICHALCOGENIDES BY NON-EQUILIBRIUM MOLECULAR ASSEMBLY

Invited Speakers: Prof. Daisuke Kiriya, The University of Tokyo, Japan

NOVEL STRUCTURE ANALYSIS BY HIGH-RESOLUTION SCANNING TRANSMISSION ELECTRON MICROSCOPY

Invited Speakers: Prof. Bin Xiang, Department of Materials Science & Engineering, Anhui Laboratory of Advanced Photon Science and Technology, University of Science and Technology of China, China

QUALITY CONTROL FOR III/V COMPOUND MATERIALS, FROM SUBSTRATE TO DEVICE

Dr. Yan Chen, ZEISS Research Microscopy Solution, Carl Zeiss (Shanghai) Co. Ltd.

A NOVEL ANALYSIS TECHNOLOGY FOR ANALYZING INCLUSIONS IN EN1.4418 LOW CARBON MARTENSITIC STAINLESS STEEL

Dr. Tzu-Hsien Yang, National Taiwan University, Taiwan

DIMORPHISM AND MICROCYCLE CONIDIATION OF PSEUDOCERCOSPORA PSEUDOSTIGMINA-PLATANI ON AMERICAN SYCAMORE LEAVES

Invited Speakers: Prof. Ki Woo KIM, Kyungpook National University, Korea

UNIQUE PHASE-RETRIEVAL FROM TWO-DIMENSIONAL SOLUTION DIFFRACTION PATTERNS

NingJung, Chen, National Tsing Hua University, Taiwan

IN-SITU STEM OBSERVATION OF SUPPORTED NI CATALYSTS FOR DRY REFORMING OF METHANE

Dr. Tomokazu Yamamoto, Kyushu University, Japan

[Oral 9]
Materials
Science III

[Oral 10]
Life Science III

[Oral 11]
In-Situ TEM III

<p>IN-SITU LIQUID CELL TRANSMISSION ELECTRON MICROSCOPY FOR POLYMERIC NANOPARTICLES</p> <p>Dr. Chisato Takahashi, National Institute of Advanced Industrial Science and Technology, Japan</p>			
<p>TRANSMISSION ELECTRON MICROSCOPY STUDY OF THE DYNAMICS OF NANOSTRUCTURES IN A CARBON COATED LIQUID CELL</p> <p>Dr. Masaki Takeguchi, National Institute for Materials Science, Japan</p>			
12:10~13:00	Luncheon		
13:00~13:40	[APT 1]	[Oral 12] Materials Science IV	[Oral 13] Instruments and Techniques III
13:40~14:05			Break
14:05~14:10	Break		Break
[APT 1]	<p>CRYO-ATOM PROBE TOMOGRAPHY ANALYSIS OF BATTERY MATERIALS <i>Invited Speakers:</i> Prof. Baptiste Gault, Max-Planck-Institut für Eisenforschung, Germany</p>		
	<p>APT AND TEM ANALYSIS OF PASSIVE OXIDE FILMS FORMED ON CORROSION RESISTANT STEELS <i>Invited Speakers:</i> Prof. Jae-Bok Seol, Gyeongsang National University, Korea</p>		
	<p>ANALYSIS OF PHOSPHORUS IMPLANTED POLYCRYSTALLINE SILICON BY ATOM PROBE TOMOGRAPHY AND DIFFERENTIAL HALL EFFECT METROLOGY Dr. Kun-Lin Lin, Taiwan Semiconductor Research Institute, Taiwan</p>		
[Oral 12] Materials Science IV	<p>STEM-EELS OPTIMIZED FOR LESS THAN 80KV <i>Invited Speakers:</i> Dr. Ray D. Twesten, Gatan (Ametek)</p>		
	<p>STEM-EELS SPECTROMICROSCOPY OF OXIDE HETEROSTRUCTURES Dr. Alexandre GLOTER, University Paris-Saclay, France</p>		
	<p>SUBPERCENT LOCAL STRAIN IN GOLD NANORODS REVEALED BY ELECTRON MICROSCOPY AND DATA-DRIVEN ANALYSIS Dr. Kohei Aso, Japan Advanced Institute of Science and Technology, Japan</p>		
	<p>ATOMIC-SCALE ANALYSIS ON SURFACE STRUCTURE AND CHEMICAL STATES OF MN3O4 NANOPlates VIA STEM-EELS Jaeyeon Jo, Seoul National University, Korea</p>		

[Oral 13] Instruments and Techniques III	CHANNEL STRAIN MEASUREMENT BETWEEN SI / GE STRESSORS OF TRI-GATE FIELD-EFFECT TRANSISTOR USING MOIRÉ FRINGES APPEARED IN SCANNING TRANSMISSION MICROSCOPY <i>Invited Speakers:</i> Dr. Yukihito Kondo, JEOL Ltd.		
	WAVEFIELD RECONSTRUCTION USING STRUCTURED ELECTRON BEAMS Mr. Hirokazu Tamaki, Hitachi, Ltd.		
14:10~14:25	Break		
14:25~15:35	[APT II]	[Oral 14]	[Oral 15]
15:35~15:40		Materials Science V	4D STEM
			Break
[APT II]	ATOM PROBE TOMOGRAPHY OF HYDROGEN DISTRIBUTION IN STEELS <i>Invited Speakers:</i> Dr. Yi-Sheng Chen, National Taiwan University, Taiwan		
	APT INVESTIGATION OF PRECIPITATION BEHAVIOR IN COMMERCIAL NI-BASED ALLOYS <i>Invited Speakers:</i> Dr. Li-Jen Yu, Taiwan Semiconductor Manufacturing Company (TSMC), Taiwan		
	ATOM PROBE STUDY ON SOLUTE PARTITIONING DURING AUSTENITE REVERSION IN MN-RICH STEELS Prof. Hung-Wei Yen, National Taiwan University, Taiwan		
	INVESTIGATIONS ON SOLUTE BEHAVIOR AT INTERPHASE BY 3D ATOM PROBE TOMOGRAPHY IN AN INTERPHASE PRECIPITATION STRENGTHENED COLD-ROLLED DUAL PHASE STEEL Shao-Lun Lu, National Taiwan University, Taiwan		
[Oral 14] Materials Science V	DIRECT EVIDENCE ON CU-ATOM LOCATIONS IN THE ROCKSALT SNTE Mr. Youichirou Kawami, Kyushu University, Japan		
	HYDROGEN TRAPPING IN STEELS: THE ROLES OF HYPO-STOICHIOMETRIC CEMENTITE AND ITS STRAIN FIELD AT FERRITE INTERFACE Pang-Yu Liu, The University of Sydney, Australia		
	ATOMIC SCALE OBSERVATION OF SOLUTE SEGREGATION AT YSZ ASYMMETRIC GRAIN BOUNDARIES Mikihiro Matsuda, The University of Tokyo, Japan		
	RESEARCHES AND APPLICATIONS OF NANOSTRUCTURED 2D MATERIALS GROWTH BY CONTINUOUS WAVELENGTH LASER PROCESS Tzu-Yi Yang, National Tsing Hua University, Taiwan		
	HYDROGEN TRAPS AND HYDROGEN EMBRITTLEMENT IN HYBRID STEEL Mr. Chin-En Chou, National Taiwan University, Taiwan		

	FAST 4D STEM WITH ARINA HYBRID-PIXEL DETECTOR		
	<i>Invited Speakers:</i> Dr. Daniel G. Stroppa, DECTRIS		
	REAL TIME INTEGRATION CENTER OF MASS (RICOM) RECONSTRUCTION FOR 4D-STEM		
[Oral 15] 4D STEM	Chu-Ping Yu, University of Antwerp, Belgium		
	THE APPLICATION OF ELECTRON PTYCHOGRAPHY ON 2D MATERIALS WITH THE NOVEL 4D STEM DETECTOR		
	Chen Ying, National Tsing Hua University, Taiwan		
	REAL TIME 4D STEM RECONSTRUCTION – TWO RECENT APPROACHES		
	Chu-Ping Yu, University of Antwerp, Belgium		
15:40~15:45	Break		
15:45~16:35	Poster Session I	Poster Session II	Poster Session III