2025 International Electron Devices and Materials Symposium (IEDMS 2025)

National Tsing Hua University, Taiwan

Oct 30-31, 2025

Symposium Program

Organizer: 國立清華大學 NATIONAL TSING HUA UNIVERSITY

Co-organizers:

國家實驗研究院 台灣半導體研究中心 Taiwan Semiconductor Research Institute

Advanced Semiconductor Technology Center 前瞻半導體技術研究中心 Advanced Semiconductor Technology Center

ETPC

NSTC 國家科學及技術委員會 National Science and Technology Council

台灣電子材料與元件協會 The Electronics Devices and Materials Association

Corporate Sponsors

Welcome Message

On behalf of organization committee, we warmly welcome you to the 30th International Electron Devices and Materials Symposium (IEDMS 2025) held in Hsinchu, Taiwan from Oct. 30 to 31, 2025. As the General Chair of this prestigious event, we are honored to invite you to join us for what promises to be an inspiring and transformative two-day symposium. This year, the IEDMS 2025 will be hosted by National Tsing Hua University and sponsored by The Electronics Devices and Materials Association, Ministry of Science and Technology Taiwan, and Taiwan Semiconductor Research Institute. This conference offers a platform for international scientists, engineers, and researchers to present the latest research results, ideas, developments, and applications in electron devices and materials.

This year we received a record-high number of submissions. The program includes 3 plenary talks, 12 invited talks, 80 oral presentations, and 204 poster papers, as well as is organized into 8 oral presentation sessions and 2 poster sessions. Contributions from researchers from over 6 countries around the world are featured. This conference offers a platform for international scientists, engineers, and researchers to present the latest research results, ideas, developments, and applications in electron devices and materials.

We are very delighted to have three keynote speakers for the plenary session: Dr. Chih-Yuan Lu of Macronix Co. will speak on "*Dual-Axis Century: A Century of Sparks in the Quantum Revolution and Semiconductor Civilization*", Prof. Peide Ye of Purdue University who will speak on "*Atomic-layer-deposited atomically thin In_2O_3 transistors for BEOL logic and memory applications*", and Prof. Martin Kuball of The University of Bristol who will speak on "*Opportunities for heterogenous integration: From GaN to Gallium Oxide*". We also deeply appreciate all the invited speakers and authors going extra miles on the preparation of their presentations for this conference.

We would like to express my sincere appreciation to all the contributors for sharing their latest research results and ideas that make IEDMS 2025 such a stimulating and exciting event. The innovations presented at IEDMS span a wide range of disciplines, driving progress not only in digital infrastructure but also in sensing, communication, energy, and fundamental physics. By fostering interdisciplinary dialogue, IEDMS continues to play a vital role in shaping the future of science and technology.

We hope you enjoy the exciting program and engage in inspiring discussions and fruitful exchanges throughout the symposium.

K.S. Chang-Liao , *General Chair*

Pei-Wen Li, *Technical Program Chair*
2025 International Electron Devices and Materials Symposium

Program Agenda

Oct. 30 2025 (Thu.)

On-site Registration: 08:30-17:00

	Time Slots	International Conference Hall (國際會議廳)						Poster area
09:00 17:40	09:00-09:10	Open Ceremony						Exhibition Corridor 1F展示走廊 Poster 12:00-17:40 (AP1~32, BP1~24, CP1~28, DP1~17) Poster Discussion 17:00-17:40 半導體學院重點設備海報展
	09:10-10:00	Plenary (I) *Dr. C.Y. Lu, Macronix*						
	10:00-10:20	Group Photo & Coffee Break						
	10:20-11:10	Plenary (II) *Prof. Peide Ye, Purdue Univ., USA*						
	11:10-12:00	Plenary (III) *Prof. Martin Kuball, Univ. of Bristol, UK*						
	12:00-12:50	Lunch Time						
		Track A	**Track B**	**Track C**	**Track D**	**Special Session**		
	12:50-14:15	**A1** **Advance Logic Device** Rm 243	**B1** **Advances in GaN Power Devices** Rm 253	**C1** **Ferroelectrics** Rm 346	**D1** **Novel Optoelectronic Materials & Devices (I)** Rm 354	**A世代** **清沙龍**		
	12:50-13:15	**Invited Talk IA-1** ***Dr. Meng-Yi Wu (PUFsecuity)***	**Invited Talk IB-1** ***Dr. JianJang Huang (NTU)***	**Invited Talk IC-1** ***Dr. Min-Hyuk Park (Seoul Univ)***	**Invited Talk ID-1** ***Dr. Sarah Uvin (Ghent Univ)***	12:50	A世代-1	
	13:15-13:27	A1-1: #1023	B1-1: #1282	C1-1: #1056	D1-1: #1014	13:20	A世代-2	
	13:27-13:39	A1-2: #1165	B1-2: #1208	C1-2: #1180	D1-2: #1026			
	13:39-13:51	A1-3: #1020	B1-3: #1018	C1-3: #1166	D1-3: #1060			
	13:51-14:03	A1-4: #1112	B1-4: #1262	C1-4: #1265	D1-4: #1096	13:50	A世代-3	
	14:03-14:15	A1-5: #1122	B1-5: #1058	C1-5: #1168	D1-5: #1135			
	14:15-14:35	Coffee Break						
	14:35-15:47	**A2** **Ferroelectric Thin Film Technology** Rm 243	**B2** **SiC & β-Ga_2O_3 Power Devices** Rm 253	**C2** **2D Materials** Rm 346	**D2** **Novel Optoelectronic Materials & Devices (II)** Rm 354	**A世代** **清沙龍**		
	14:35-14:47	A2-1: #1089	B2-1: #1019	C2-1: #1177	D2-1: #1137	14:35	A世代-4	
	14:47-14:59	A2-2: #1153	B2-2: #1007	C2-2: #1216	D2-2: #1170			
	14:59-15:11	A2-3: #1167	B2-3: #1131	C2-3: #1294	D2-3: #1207			
	15:11-15:23	A2-4: #1188	B2-4: #1127	C2-4: #1206	D2-4: #1239	15:05	A世代-5	
	15:23-15:35	A2-5: #1211	B2-5: #1227	C2-5: #1033	D2-5: #1259			
	15:35-15:47	A2-6: #1236	B2-6: #1043	C2-6: #1197	D2-6: #1276			
	15:47-16:00	Break						
	16:00-17:05	**Poster Short Presentation**						
		AP Rm 243	**BP** Rm 253	**CP** Rm 346	**DP** Rm 354			
		AP1 ~ AP64	BP1 ~ BP49	CP1 ~ CP57	DP1 ~ DP34			
	17:00-17:40	**Poster Discussion I @ Exhibition Corridor 1F展示走廊** **AP1~32, BP1~24, CP1~28, DP1~17**						
	18:00-20:00	Banquet						

Program Agenda

Oct. 31, 2025 (Fri.)								
On-site Registration: 08:30- 11:00								
09:00 ~ 16:20	Time Slots 09:00-10:25	**Track A** **A3** **Memory Technology** Rm 243	**Track B** **B3** **GaN Device Reliability & Circuits** Rm 253	**Track C** **C3** **Advanced Semiconductor Devices** Rm 346	**Track D** **D3/C3** **High-Speed Optoelectronics** Rm 354	**Special Session** **A世代** 清沙龍		Poster Area Exhibition Corridor 1F展示走廊
	09:00-09:25	**Invited Talk IA-2** ***Dr. E Ray Hsieh (NYCU)***	**Invited Talk IB-2** ***Dr. Tian-Li Wu (NYCU)***	**Invited Talk IC-2** ***Dr. Artur Useinov (NYCU)***	**Invited Talk ID-2** ***Dr. Jen-Inn Chyi*** (NCU)			Poster 9:00-12:30 (AP33~64, BP25~49, CP29~57, DP18~34) Poster Discussion 10:25~11:05 半導體學院重點設備海報展
	09:25-09:37	A3-1: #1068	B3-1 #1084	C3-1: #1103	D3-1 #1258	09:25	A世代-6	
	09:37-09:49	A3-2: #1222	B3-2 #1305	C3-2: #1118	D3-2 #1248			
	09:49-10:01	A3-3:#1277	B3-3 #1279	C3-3: #1281	D3-3 #1106			
	10:01-10:13	A3-4:#1034	B3-4 #1298	C3-4: #1030	C3-6: #1102	09:55	A世代-7	
	10:13-10:25	A3-5:#1054	B3-5 #1228	C3-5: #1117	C3-7: #1100			
	10:25-11:05	Coffee Break	**Poster Discussion II @ Exhibition Corridor 1F展示走廊** **AP33~64, BP25~49, CP29~57, DP18~34**					
	11:05-12:30	**A4** **Ferroelectric FETs** Rm 243	**B4** **RF/mmWave GaN HEMTs & InP HBTs** Rm 253	**C4** **Sensors, MEMS, Bioelectronics** Rm 346	**A5** **Quantum Dot Devices** Rm 354	**A世代** **清沙龍**		
	11:05-11:30	**Invited Talk IA-3** ***Dr. Darsen Lu (NCKU)***	**Invited Talk IB-3** ***Dr. Cheng-Kuo Lin (WIN)***	**Invited Talk IC-3** ***Dr. Chien-Fu Chen (NTU)***	**Invited Talk ID-3** ***Dr. Yi-Jen Chiu (NSYSU)***	11:00	A世代-8	
	11:30-11:42	A4-1: #1051	B4-1 #1184	C4-1: #1091	A5-1: 1081	11:30	A世代-9	
	11:42-11:54	A4-2: #1055	B4-2 #1289	C4-2: #1176	A5-2: 1250			
	11:54-12:06	A4-3: #1082	B4-3 #1075	C4-3: #1199	A5-3: 1251			
	12:06-12:18	A4-4: #1105	B4-4 #1021	C4-4: #1093	A5-4: 1212			
	12:18-12:30	A4-5: #1233	B4-5 #1254	C4-5: #1119	A5-5: 1241			
	12: 30-13: 20	Lunch Time						
	Time Slots	International Conference Hall (國際會議廳)		周懷樸講堂		EDMA理監事會議 教育館225室 12:10-13:30		
	13:20-14:00	Industry Technology Speech (I), *tsmc, Sr. Director Eric Lu*		13:00 微電子學門報到與海報張貼		A世代 成果展示 教育館1F大廳 13:30-16:00		微電子學門海報張貼 半導體學院重點設備海報展 1F展示走廊 (NSTC Event) 13:00-16:00
	14:00-14:50	Industry Technology Speech (II), *Lam Research Co., VP David M. Fried*		13:40 微電子學門經驗分享 (NSTC Event)				
	14:50-15:40	Industry Technology Speech (III), *Micron Tech, Sr. Director Teddy Pramono*		15:10 微電子學門海報評分 (NSTC Event) & Coffee Break				
	15:40-16:00	Award and Closing Ceremony						

IEDMS 2025 Committes

Honorary Chair:
賴朝松教授 Prof. C.S. Lai (cslai@nycu.edu.tw)
國立陽明交通大學/National Yang Ming Chiao Tung University, Taiwan

General Chair:
張廖貴術教授 Prof. Kuei-Shu Chang-Liao (lkschang@ess.nthu.edu.tw)
國立清華大學/National Tsing Hua University, Taiwan

Program Chair:
李佩雯教授 Prof. Pei-Wen Li (pwli@nycu.edu.tw)
國立陽明交通大學/National Yang Ming Chiao Tung University, Taiwan

Technical Program Track Chairs:

A: Emerging Devices, Logic and Memory Technology
金雅琴教授 Prof. Ya-Chin King (ycking@ee.nthu.edu.tw)
國立清華大學/National Tsing Hua University, Taiwan

B: High Frequency, Power Devices and Circuits, and Compound Semiconductor Technology
辛裕明教授 Prof. Yue-ming Hsin (yhsin@ee.ncu.edu.tw)
國立中央大學/National Central University, Taiwan

C: Novel Materials, MEMS, Sensors, Package and Heterogeneous Integration Technology
李敏鴻教授 Prof. Min-Hung Lee (minhunglee@ntu.edu.tw)
國立臺灣大學/National Taiwan University, Taiwan

D: Optoelectronics Devices and Silicon Photonic Technology
李明昌教授 Prof. Ming-Chang Lee (mclee@ee.nthu.edu.tw)
國立清華大學/National Tsing Hua University, Taiwan

Funding and Publicity Chair:
沈昌宏教授 Prof. Chang-Hong Shen (chshen@mx.nthu.edu.tw)
國立清華大學/National Tsing Hua University, Taiwan

Local Arrangement and Exhibit Chair:
葉昭輝教授 Prof. C.H. Yeh (chyeh@ee.nthu.edu.tw)
國立清華大學/National Tsing Hua University, Taiwan

Conference Secretary:
Ms. Crystal Huang (iedms2025@gmail.com)
國立清華大學/National Tsing Hua University, Taiwan

Plenary Speeches

Plenary (I)

Chih-Yuan (C. Y.) Lu 盧志遠

Election Year 2018
Macronix International Co., Ltd.
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Hsin-chu, Taiwan, R.O.C.
Tel: 03-578-6688*76667 / Fax: 03-5785336
cylu@mxic.com.tw

Current Positions

- CTO and President, Macronix International Co.,Ltd
- Chairman, Ardentec Corporation

Education

- B.S., Physics, National Taiwan University, Taipei, Taiwan (1972)
- M.A. & M.Ph., Physics, Columbia University, N.Y., N.Y. (1974, 1975)
- Ph.D., Physics, Columbia University, N.Y., N. Y. (1977)

Professional Experience

- National Chiao-Tung University, Assoc. Prof. (1977-81), Full Professor (1981-1983)
- Science & Tech Advisory Group, Executive Yuan, Res. Consultant (1979-1983)
- North Carolina State University, Visiting Professor (1983-1984)
- AT&T Bell Labs, MTS and Project Leader (1984-1989)
- ERSO/Industrial. Tech. Res. Inst., Deputy General Director (1989-1994)
- Submicron Project, Chief Director at ITRI granted by MOEA (1990-1994)
- Vanguard International Semiconductor Corp., Co-Founder, VP (1994-98), President (1998-1999)
- Ardentec Corp., Founding Chairman & CEO (1999-)
- Macronix International Co., Ltd., Senior Advisor & CTO (1999-2003), Senior VP (2003-2007), President (2007-)

Specialties

- Semiconductor Physics and Technology, Integrated Circuits Engineering, and Applied Physics

Awards and Honors

- Individual Special Contribution Awards, AT&T Bell Laboratories (1988)
- "National Science & Technology Contribution Prize" by the Prime Minister of Taiwan, ROC (1993)
- Fellow, IEEE (1994)
- Distinguished Alumni Award, National Chiao-Tung University (1994)
- National Invention Award, Ministry of Economic Affairs, Taiwan, ROC(1994)
- CIE Achievement Award, Chinese Institute of Engineers (CIE-USA) (1995)
- Int' l Symp. on VLSI-TSA "Outstanding Contribution Award" (1999)
- IEEE Third Millennium Medal (2000)
- Outstanding Research Award, Pan WenYuan Foundation (2002)
- Distinguished Alumni Achievement Award, Physics Department, National Taiwan University (2002)
- Fellow, APS (American Physical Society) (2004)
- Special Contribution Award, Physical Society of ROC (PSROC) (2012)
- Fellow, Chinese Society for Management of Technology (CSMOT) (2007)
- Honorary Distinguished Chair Professor, National Taiwan University (2007)
- Distinguished Alumni Award, National Taiwan University (2010)
- IEEE Frederik Philips Award (2012)
- Honorable Doctorate, National Chiao-Tung University (2013)
- ITRI(Industrial Technology Research Institute) Laureate (2013)
- ROC Presidential Science Prize (2013)
- TWAS Prize in Engineering Sciences for 2014 (2014)
- Technology Management Award, the highest Award by CSMOT (2017)
- Fellow, NAI (National Academy of Inventors, USA) (2017)
- Academician, Academia Sinica (2018)
- Materials Technology Contribution Award of Materials Research Society Taiwan (2018)
- Fellow, The World Academy of Sciences (TWAS) (2020)
- Fellow, CIEE (Chinese Institute of Electrical Engineers, R.O.C) (2021)
- George E. Pake Prize (APS) (2024)

Speech title: Dual-Axis Century: A Century of Sparks in the Quantum Revolution and Semiconductor Civilization

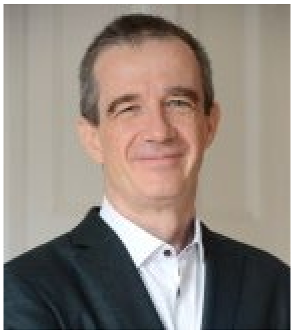
Plenary (II)

Prof. Peide Ye is the Richard J. and Mary Jo Schwartz Professor of Electrical and Computer Engineering at Purdue University, USA. His research focuses on atomic layer deposition and its integration on various novel channel materials including III-V, Ge, 2D materials and complex oxides. He obtained his BS from Fudan University, China and Ph.D. from Max-Planck Institute for Solid State Research in Germany. Before joining Purdue faculty, he worked for NTT Basic Research Laboratory, NHMFL and Princeton University, Bell Labs of Lucent Technologies and Agere Systems. Dr. Ye received the 2011 IBM Faculty Award, 2017 Sigma Xi Research Award and 2018 Arden Bement Jr. Award at Purdue University. He is IEEE Fellow and APS Fellow for his contributions to materials and device development for compound semiconductor MOSFETs. Prof. Ye is also recognized as a Highly Cited Researcher among 6000 world wide in all fields.

https://engineering.purdue.edu/~yep/

Speech title: Atomic-layer-deposited atomically thin In_2O_3 transistors for BEOL logic and memory applications

Plenary (III)



Prof. Martin Kuball is Royal Academy of Engineering Chair in Emerging Technologies, Fellow of the Institute of Electrical and Electronics Engineers (IEEE), Materials Research Society (MRS), Society of Photo-Optical Instrumentation Engineers (SPIE), IET (Institute of Engineering and Technology) and IoP (Institute of Physics), and Royal Society Merit Award Holder. Prof. Kuball is leading the Center for Device Thermography and Reliability (CDTR), a research centre focusing on improving the thermal management, electrical performance and reliability of novel devices, circuits and packaging. Prof. Kuball is co-funder of TherMap Solutions, a spin-out company from the University of Bristol, providing industry the tools for accurate thermal conductivity measurements of materials used in a wide range of applications, ranging from electronics, to aerospace, to nuclear applications and beyond. Good heat sinking is critical for many applications which the thermal measurement tools support to develop.
https://research-information.bris.ac.uk/en/persons/martin-h-h-kuball

Speech title: Opportunities for heterogenous integration: From GaN to Gallium Oxide

Invited Speakers

IA-1

Dr. Meng-Yi Wu is a leading expert in physical unclonable functions (PUF) and its derivative security chip design, as well as embedded flash and OTP memory. He received his BS, MS, and PhD degrees in electrical engineering from National Tsing-Hua University in 1999, 2001 and 2005, respectively. From 2007 to 2018, He was one of the principal inventors behind NeoPUF for eMemory, which received the ISSCC 2018 Takuo Sugano Award. Dr. Wu joined PUFsecurity since 2019 and currently oversees Research and Development for PUFsecurity into Hardware Root of Trust, Crypto Coprocessor and associated fields of Hardware Security Technology.

https://www.pufsecurity.com/zh-hant/author/meng-yi-wu/

Speech title: Secure PUF-based OTP technology down to 2nm: Essential IP for AI SoCs and Chiplet Architectures

IA-2

Associate Professor E Ray Hsieh, now at the Institute of Electronics, National Yang Ming Chiao Tung University (NYCU), is a prominent researcher in Resistive Random-Access Memory (RRAM). His expertise in this next-generation non-volatile memory technology was significantly shaped during his time as a visiting scholar at Stanford University (2018-2019). There, he collaborated with leading experts, gaining deep insights into RRAM's mechanisms, characterization, scalability, and reliability. This period of interdisciplinary collaboration and access to advanced facilities proved crucial for his future research endeavors.

Upon his return to Taiwan, Professor Hsieh joined the Department of Electrical Engineering at National Central University (NCU), serving as Assistant Professor (2020-2022) and later as Associate Professor (2022-2024). At NCU, he established a thriving research group focused on RRAM advancements. His contributions during this period are marked by innovative material engineering approaches aimed at enhancing RRAM device endurance, reducing power consumption, and improving switching uniformity. His research explored novel materials and device architectures to overcome limitations of existing memory technologies.

Professor Hsieh's impactful work has been published in leading international journals and presented at prestigious conferences, earning him recognition within the scientific community. His research at NCU extended beyond fundamental aspects to explore RRAM's potential in emerging fields like neuromorphic computing and in-memory processing. He successfully secured research funding and fostered collaborations with academia and industry, demonstrating his ability to translate research into potential technological advancements. He also actively mentored students at NCU, contributing to the development of future engineers.

In 2024, Professor Hsieh moved to the Institute of Electronics at NYCU, bringing his extensive experience and ongoing dedication to RRAM research. His current work at NYCU is expected to build upon his previous achievements, pushing the boundaries of non-volatile memory and its applications. Professor E Ray Hsieh’s innovative research and significant contributions firmly position him as a rising leader in the global microelectronics field.

https://iee.nycu.edu.tw/tw/teacher/p1.php?num=190&page=1

Speech title: A Novel Non-Von Neumann Architecture for Next-Generation Memory and Computing

IA-3

Prof. Darsen Lu joined NCKU as Macronix Endowed Chair Professor (assistant professor) since 2015. His research interests focus on artificial intelligence and deep learning related topics. In particular, my research team is working on the simulation of electronic circuits and devices for deep machine learning applications. We are exploring different memory categories, such as PCM, RRAM, FeRAM and Flash in search for the best one for deep learning. In addition, as a continuation of my prior work, we also work on the modeling and simulation of FinFET and other multiple-gate transistors. Last but not the least, two of our team members are working on the fabrication of MIM selection diodes for 3D memory applications.

https://researchoutput.ncku.edu.tw/zh/persons/darsen-lu

Speech title: Independent Double-Gate FinFETs for Logic and Memory Applications

IB-1

Prof. JianJang Huang received the Ph.D. degree in Electrical Engineering from the University of Illinois, Urbana-Champaign, in 2002. In Illinois, he demonstrated the first real working GaN-based HBTs with common emitter current gain 11 at room temperature and 31 at 175K in 2000. He had worked with Watkins Johnson Communications in California, as a Staff Scientist from 2002 to 2004. He was in charge of the development of GaAs HBTs for power amplifiers and the benchmark of GaAs MESFET PA yield rate in the production line. He joined the faculty members at NTU EE and GIPO in 2004. Prof. Huang has devoted to the use of nanostructures for optoelectronic and biophotonic applications. Prof. Huang's scientific accomplishments have been recognized by numerous awards. He is a member of the Phi Tau Phi Scholastic Honor Society. He received "Wu Da-Yu" award and excellent young electrical engineer from the Chinese Institute of Electrical Engineering in 2008. He currently serves as the Editor in IEEE, Transactions on Electron Devices.

https://www.ee.ntu.edu.tw/profile1.php?teacher_id=941015

Speech title: InP Heterojunction Bipolar Transistors for High-speed Interconnect AI servers

IB-2

Prof. Tian-Li Wu received the Ph.D. degree in electrical engineering from KU Leuven, Belgium, in 2016. From 2011 to 2017, He was with the GaN power device group at imec, Leuven, Belgium, where he focused on research and development of CMOS compatible 200-mm GaN-on-Si platform for power switching applications and investigation of reliability issues in GaN power devices. In 2016, he visited IBM, New York, NY, USA, where he focused on interface characterization in sub-10nm SiGe pMOS FinFETs. He is currently the Associate Professor with Institute of Electronics at National Yang Ming Chiao Tung University, Hsinchu, Taiwan. He was the recipient of the Semiconductor Award from the TSIA in 2021, Fellow of the Higher Education Academy in 2020, MOST Young Scholar Fellowship in 2019, MediaTek Junior Chair Professorship in 2017, the Fellowship for long term abroad research from Flanders Research Foundation in 2015, and imec Ph.D. Fellowship in 2012.

https://iee.nycu.edu.tw/tw/teacher/p1.php?num=225&page=1

Speech title: Recent Progress in GaN and SiC Power Technologies: Toward High Voltage in GaN Power HEMTs and Toward Monolithic Integration in SiC Power MOSFETs

IB-3

Dr. Cheng-Kuo Lin received his Ph.D. in Electrical Engineering from National Central University in 2005 and has since accumulated nearly 20 years of experience at WIN Semiconductors Corp. He is currently the Associate Vice President of the Advanced Technology Center, where he leads a team of approximately 120 engineers. His work focuses on the development of compound semiconductor and microwave device technologies, including 6-inch GaAs HBT/pHEMT, InP HBT, and 4-inch GaN/SiC HEMT. Dr. Lin has been involved in various technology development and integration projects that supported device performance improvement and volume production. He is the inventor of 36 patents related to compound semiconductor manufacturing processes.

Speech title: Introduction of latest mm-wave GaAs and GaN device technology in WIN Semiconductor foundry service

IC-1

Prof. Min Hyuk Park received his B.S. and Ph.D. degrees in Materials Science and Engineering from Seoul National University, Seoul, Korea, in 2008 and 2014, respectively. He worked as a postdoc in Seoul National University (2014–2015) and NaMLab gGmbH in Dresden Germany (2015–2018), and an assistant professor in School of Materials Science and Engineering of Pusan National University (2018-2021) and Department of Materials Science and Engineering of Seoul National University (2021-2023). He is currently an associate professor in the Department of Materials Science and Engineering of Seoul National University since 2023. His research interests include ferroelectric and antiferroelectric thin films for neuromorphic computing, memory, energy storage, energy harvesting, and solid-state cooling.

https://nano.snu.ac.kr/people/principal-investigator

Speech title: Understanding Effects of Bottom Electrode Materials on the Polymorphism and Resulting Ferroelectricity in $(Hf,Zr)O_2$ thin films

IC-2

Dr. Artur Useinov received Ph.D in theoretical physics from Kazan State University in 2008 in Russia. He joined King Abdullah University of Science and Technology of Saudi Arabia in 2009 as Post Doc researcher. Continue his research in 2013 at California State University, Northridge (W.M. Keck Computational Materials Theory Center). In 2014, he joined National Tsing Hua University (Taiwan) as research scientist. He joined National Chiao Tung University, International College of Semiconductor Technology (Taiwan) in 2017 as assistant professor. His research interests include solid state physics, thin-film heterostructures, quantum and spin electronics.

https://icst.nycu.edu.tw/?page_id=1745&lang=en

Speech title: Application of the point-contact model for spintronic devices: sensors, memristors and memory cells

IC-3

Prof. Chien-Fu Chen received his Ph.D. degree from the Institute of Applied Mechanics at National Taiwan University in 2007, followed by four years of postdoctoral training at the University of Maryland, College Park, USA. He currently serves as a faculty member at the Institute of Applied Mechanics and holds a joint appointment with the Graduate School of Advanced Technology at National Taiwan University. He is also the Director of the Center for Semiconductor Processing and Systems Research. Prof. Chen's research focuses on the development of micro/nanofabricated and lab-on-a-chip devices to create compact, low-sample-consumption, high-sensitivity, and user-friendly solutions for water quality monitoring, chemical process analysis, and personalized precision medicine. His work has been featured in IEEE GlobalSpec, ACS Headline Science, and ACS PressPac. He is the recipient of two major national research awards in Taiwan: the Ta-You Wu Memorial Award (2019) and the Outstanding Research Award (2021) from the National Science and Technology Council. In 2024, he was elected as a Fellow of the Royal Society of Chemistry (FRSC).

https://www.iam.ntu.edu.tw/en/facilities-en/169-en/member-en/professor-info-2/1284-chien-fu-chen-2

Speech title: Lab-on-a-chip devices for semiconductor manufacturing

ID-1

Dr. Sarah Uvin received her degree in Photonics Engineering from Ghent University, Belgium, in 2013, followed by a PhD in 2020 with the Photonics Research Group at the same university. Her doctoral work led to multiple journal publications and conference presentations in silicon photonics and heterogeneous integration. She then joined Brolis Sensor Technology as a Photonics Engineer, where she managed cleanroom operations and developed fabrication processes for GaSb gain chips and photodetectors. Since November 2023, she has been R&D Project Leader at imec, coordinating Transverse, the wafer-scale pilot line for micro-transfer printing that provides industry with a platform to evaluate and develop 200 mm processes for heterogeneous integration, with a current focus on LN and III–V devices.

https://photonics.intec.ugent.be/contact/people.asp?ID=341

Speech title: Moving beyond silicon photonics limits with heterogeneous integration at wafer scale level

ID-2

Prof. Jen-Inn Chyi received the Ph.D. degree in electrical engineering from the University of Illinois, Urbana-Champaign, in 1990.
In 1991, he joined the Department of Electrical Engineering, National Central University (NCU), Jhongli, Taiwan, R.O.C.. He was Vice President of National Applied Research Laboratories from 2012-2015. He is currently Vice President of NCU. His research interest includes MBE and MOVPE growth of III-V semiconductors and their heterostructures for high-speed electronic, optoelectronic and high power devices.
Professor Chyi has authored and co-authored over 340 journal papers and been granted 58 patents. He received the Distinguished Research Award of the National Science Council in 2002, 2009, and 2013, the Distinguished Professor Award of the Chinese Institute of Electrical Engineering in 2004, the Industrial Contribution Award of the Ministry of Economic Affairs in 2008, the Distinguished Technology Transfer Award of the National Science Council in 2012, and the Outstanding Researcher Award, Pan Wen Yuan Foundation in 2015. He also serves as a Distinguished Lecturer of IEEE EDS from 2004 to 2009. He was an Associate Editor of IEEE Photonics Technology Letters and is currently an Overseas Editor of Japanese Journal of Applied Physics. Dr. Chyi is a member of Phi Tau Phi, and Fellow of IEEE and SPIE.

https://www.ncu.edu.tw/tw/pages/show.php?top=1&num=26

Speech title: Molecular Beam Epitaxial Growth of InAs Quantum Dots on GaAs for Light Emitters beyond 1380 nm

ID-3

Prof. Yi-Jen Chiu received the Ph.D. degree under supervision of Prof. John E. Bowers in Electrical and Computer Engineering from University of California Santa Barbara (UCSB), in 1999 and continued his post-doc research after graduation. In 2002, he jointed National Sun Yat-sen University. His current research interests lie in broadband optoelectronic devices for photonics integrations and related technologies, such as Si photonics, wafer bonding and quantum well intermixing for photonics integration for hybrid Si photonics. The related applications and research topics has been extended to ultra-high-speed electroabsorption modulator (EAM), semiconductor optical amplifier (SOA), high-power broadband DFB laser, photodetector, VCSEL and their integration. Semiconductor super-luminance diode for gyro sensor applications (SLD). Since 2017, he served as principal investigator for Si photonics projects for high-speed photonic integration (collaboration with ITRI) and also Si-photonic gyroscope (MOST based). And he also served as Vice Dean of College of Engineering, NSYSU recently. He has been invited as speaker of 2001 IEEE LEOS, 2013, 2016 OptoElectronics and Communications Conference (OECC), 2013 International Conference on Advancements in Information Technology (ICAIT), and 2014 IEEE International Conference on Optical Communications and Networks (ICOCN). He was the recipient of 2004 Da-You Wu Memorial Award. He served on program committees of various conferences, such as OPTIC, MOC and OECC. In 2016, he was elected as 2016 Who's Who in the World. In 2017, he served as the program committee chair of OPTIC, which is the largest Photonic meeting in Taiwan. In 2024, he served as general chair of MOC2024. And he received honor of Taiwan photonics society (TPS) fellow in 2023.

https://dop.nsysu.edu.tw/p/404-1207-189097.php?Lang=zh-tw

Speech title: Hybrid Si photonics for optical light source integration and related applications

Industry Technology Speech (I)

tsmc, Sr. Director Eric Lu

Eric Lu received his B.S. and M.S. degrees in Electrical Engineering from National Chiao Tung University, Taiwan. He is currently serving as a Deputy Director at Taiwan Semiconductor Manufacturing Company (TSMC) Fab 18A, where he has accumulated more than 25 years of extensive experience in semiconductor manufacturing and advanced process technology development. Throughout his career, Eric has been deeply involved in mass production of the most advanced technology nodes at the time, from C018, C013, N90, N40, N28/N22, N16/N12, to the latest N5 and N4 technologies. Over the past six years, he has led a process integration team of around 300 engineers, driving the successful ramp-up and mass production of N4/N5 AI products to support the rapid rise of the AIera in time.

Speech title: TSMC Technical & Career Talk

Industry Technology Speech (II)

Lam Research Co., VP David M. Fried

Dr. David M. Fried is Corporate Vice President of Semiverse™ Solutions at Lam Research. Fried is responsible for the company's strategic direction and implementation of software products and algorithms for predictive process modeling and process control.

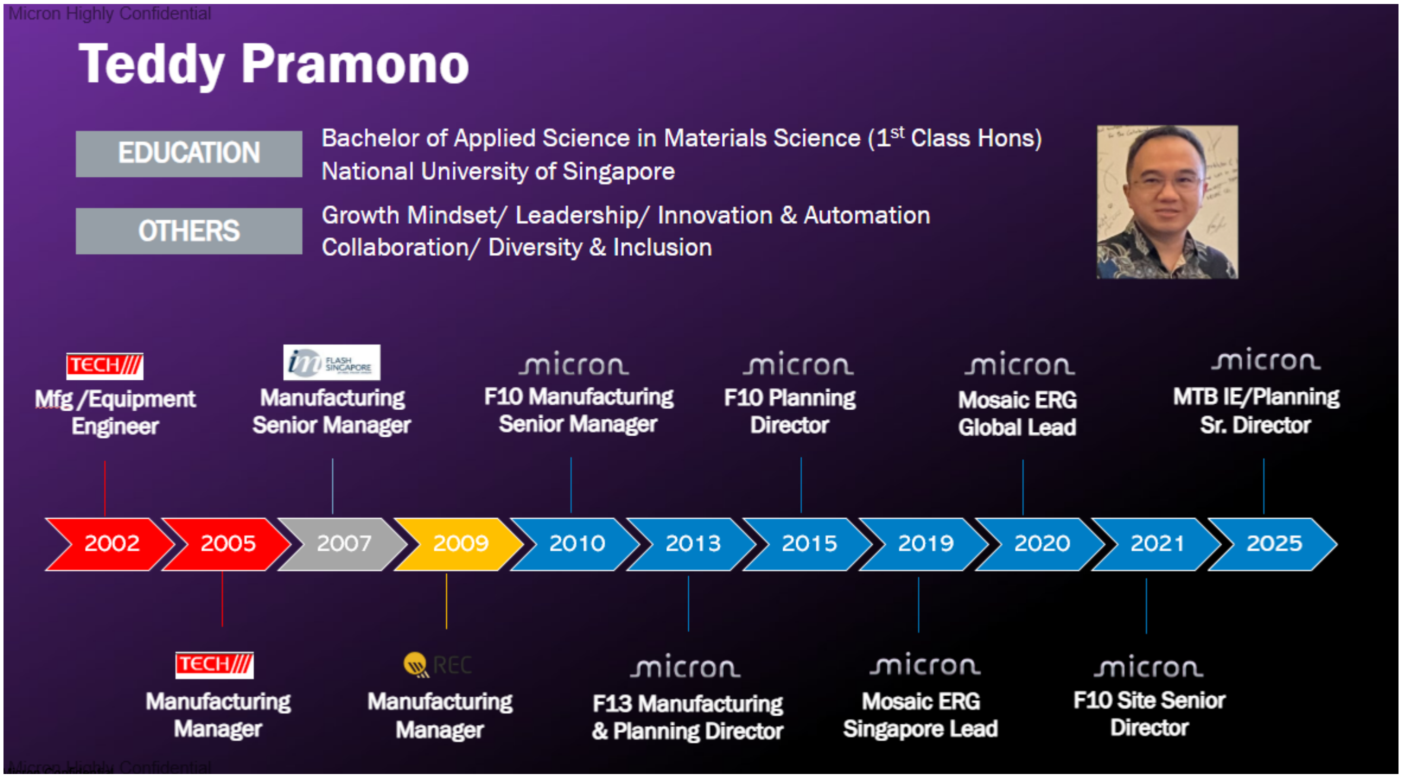
He received his BS, MS, and PhD degrees in electrical engineering from Cornell University. He joined Lam Research in 2017 as a part of Lam's acquisition of Coventor, where he served as Chief Technology Officer (CTO) for five years. At Coventor, he also led the execution of technology strategy for technology platforms, partnerships, and external relationships.

Fried is a well-respected technologist in the semiconductor industry. He has over 60 patents and 50 publications to his credit and a notable 14-year career with IBM, where he held leadership positions in successive process generations from 65-nanometer through 22-nanometer for IBM's Systems and Technology Group. His expertise touches upon areas such as Silicon-on-Insulator (SOI), FinFETs, memory scaling, strained silicon, and process variability.

Speech title: "Lights Out ! Virtualizing the Semiconductor Ecosystem"

Industry Technology Speech (III)

Micron Technology Inc., Sr. Director Teddy Pramono



Speech title: Engineering the future of AI: Powered by HBM and advanced packaging

Technical Program

Oral Sessions

A1 Advance Logic Device Rm243
Chair: Prof. Wei-Chen Tu (NCKU)

A1-1 **Performance Boost and Parasitic Capacitance Reduction in CFETs via Middle Dielectric Isolation and Middle Via Integration**, *Wu Meng-Lin (National Taiwan University), Lu Yu-Cheng (National Taiwan University), and Vita Pi-Ho Hu (National Taiwan University)*

A1-2 **AC Performance Optimization of Double-CFET (ɔc-FET) with Dielectric-wall by Isolation-last Process**, *Yu-Shang Shih (National Central University), Hao-Ming Huang (National Central University), Ting-Kuan Ma (National Central University), Shih-Che Lin (National Yang Ming Chiao Tung University), and E Ray Hsieh (National Yang Ming Chiao Tung University)*

A1-3 **Electrical Performance and Reliability of High-k HfO_2/ZrO_2 Superlattice in Germanium Stacked Nanosheet GAAFET at Cryogenic Temperature**, *Jung-Yi Lin (National Tsing Hua University), Tzu-I Kao (National Tsing Hua University), Kai Wei Huang (National Tsing Hua University), Chen-You Wei (National Tsing Hua University), Yi-Wen Lin (National Tsing Hua University), Fu Ju Hou (National Nano Device Laboratories), and Yung Chun Wu (National Tsing Hua University)*

A1-4 **Enhanced Electrical Characteristics of Ge n/p-FinFETs by Low Temperature Oxidation and Nitridation Treatments**, *Yu-Ren Lin (Semiconductor Device Processing & Measuring Lab), and Kuei-Shu Chang-Liao (National Tsing Hua University)*

A1-5 **Improved Electrical Characteristics of Ge FinFET CMOS Invertor with Low Power Rapid Plasma Oxidation Treatment**, *Yu-Chao Huang1 (National Tsing Hua University), Dun-Bao Ruan (National Tsing Hua University), Kuei-Shu Chang-Liao (National Tsing Hua University), and Cheng-Han Li (National Tsing Hua University)*

B1 Advances in GaN Power Devices Rm253
Chair: Prof. Hsien-Chin Chiu (NCU)

B1-1 **Demonstration of High Voltage (>2500V) GaN MISHEMTs with On-Current Boosting using Superlattice Ferroelectric Dielectric,** *Yu-An Chen (National Yang Ming Chiao Tung University), Thi My Hanh Dao (National Yang Ming Chiao Tung University), Kuang-Hsuang Lu (Vanguard International Semiconductor Corporation), Cheng-Wei Chou (Vanguard International Semiconductor Corporation), Shyh-Chiang Shen (Vanguard International Semiconductor Corporation), and Tian-Li Wu (National Yang Ming Chiao Tung University)*

B1-2 **Analysis of BGaN Back Barrier Integration in Enhancement Mode GaN Power HEMTs**, *Hung-Yang Lin (National Central University), Si-Hong Chen (National Central University), Yu-Hui Lin (National Central University), Hui-Pi Yu (National Central University), Shao-hsiang Hsu (National Central University), Sheng-Kai Chen (National Central University), Wei-Jen Hsueh (Wafer Works Corporation), and Jen-Inn Chyi (National Central University)*

B1-3 **A 650 V GaN Power Transistor with Built-in Diode and Gate Resistance Structure for Reverse Conduction Loss Reduction**, *Jui-Yi Yan (National Central University), Tsai-Ni Yang (National Central University), Jun-Sheng Huang (National Central University), Xin-Yi Luo (National Central University), and Yue-Ming Hsin (National Central University)*

B1-4 **Enhanced Electrical Performance of Vertical GaN MOSFETs with Body Trench Structure**, *Jun-Xiang Wang (National Taiwan University), and Jian Jang Huang (National Taiwan University)*

B1-5 **Temperature-Dependent Soft Breakdown Mechanisms in Fabricated and Commercial 100 V p-GaN Gate GaN HEMTs**, *Chia-Yu Hsieh (National Central University), Hsin-Pei Lan (National Central University), and Yue-ming Hsin (National Central University)*

C1 Ferroelectrics Rm346
Chair: Prof. Ying-Tsan Tang (NCU)

C1-1 **Stacked AFE-like/FE HZO with Water Quenching and TiN Top Electrode Achieve Low Voltage Operation and Record Endurance**, *Yan-Jyun Chen (National Taiwan University), Jhih-Yuan Liang (National Taiwan University), Bo-Hui Yu (National Taiwan University), Min-Hsuan Tsai (National Taiwan University), Kuan-Heng Lin (National Taiwan University), and Chee-Wee Liu (National Taiwan University)*

C1-2 **Fatigue-Free HZO with 6.3MV/cm EBD and 64μC/cm^2 final 2Pr after 5E12 Endurance Using β-W Electrodes**, *Bo-Hui Yu (National Taiwan University), Yu-Tsung Liao (National Taiwan University), Ming-Chang Liu (National Taiwan University), Yan-Jyun Chen (National Taiwan University), Min-Hsuan Tsai (National Taiwan University), Kuan-Heng Lin (National Taiwan University), and Chee-Wee Liu (National Taiwan University)*

C1-3 **Stress Effects on $Hf_{0.5}Zr_{0.5}O_2$ Ferroelectrics Induced by Substrates with Different Coefficients of Thermal Expansion**, *Hyun Woo Jeong (Seoul National University), Younghwan Lee (Chonnam National University), and Min Hyuk Park (Seoul National University)*

C1-4 **Enhanced Polarization by Controlling Wake-up in Ru/WN_x-ICL/$Hf_{0.33}Zr_{0.66}O_2$/TiN Ferroelectric Memory**, *Abhijit Aich (Chang Gung University), Asim Senapati (Chang Gung University), Minh Long Le Nguyen (Chang Gung University), Yii-Tay Chang (National Taiwan University), TSZ Cheung Law (Chang Gung University), Yung Yu Wang (Chang Gung University (Chang Gung University), Yi-Pin Chen (Chang Gung Memorial Hospital (Keelung Chang Gung Memorial Hospital), Chang Gung University (Chang Gung University), Shih-Yin Huang (Keelung Chang Gung Memorial Hospital), Min-hung Lee (National Taiwan University), and Siddheswar Maikap (Chang Gung University)*

C1-5 **(Ti,Mo)N Alloy Electrode for enhanced Ferroelectricity in 5 nm-thick $Hf_{0.5}Zr_{0.5}O_2$ Film**, *Jaewook Lee (Seoul National University), Yong Hyeon Cho (Seoul National University), Hyun Woo Jeong (Seoul National University), Hyojun Choi (Seoul National University), and Min Hyuk Park (Seoul National University)*

D1 Novel Optoelectronic Materials & Devices (I) Rm354
Chairs: Prof. Ray-Hua Horng (NYCU),
Prof. Chao-Hsin Wu (NTU)

D1-1 **Pyrene-Based Non-Doped OLED with Ultra Stable Blue-Green Emission**, *Kuan-Wei Chen (National Taiwan University), Hui-Chun Lu (National Taiwan University), Man-Kit Leung (National Taiwan University), Tien-Lung Chiu (Yuan Ze University), and Jiun-Haw Lee (National Taiwan University)*

D1-2 **A Triboelectric-Pair Consisting of Waste Rubber Bands and Black TiO_2 Based Optically Active Layer for Dual-energy Harvesting and Self-Powered Photodetection**, *Ishita Chakraborty (National Yang Ming Chiao Tung University), Ming-Chung Wu (Chang Gung University), and Chao-Sung Lai (National Yang Ming Chiao Tung University)*

D1-3 **In-Sensor Analog Encoding of Temporal Response Dynamics for Neuromorphic Vision**, *Kim Yelim (Hanyang university), Lia Saptini Handriani1 (Hanyang university), and Won Il Park (Hanyang university)*

D1-4 **Ultra-High Photoresponse, Transparent, and Flexible Ultraviolet Photodetectors Based on One-dimensional ZnO Nanorod Arrays**, *Cheng-shao Tseng (Chung Yuan Christian University), Yuan-tun Cheng (Chung Yuan Christian University), Wei-shiang Tseng (Chung Yuan Christian University), Wei-chun Wang (Chung Yuan Christian University), Meng-Lin Tsai (National Taiwan University of Science and Technology, Taiwan), ChiaShain Chuang (Chung Yuan Christian University), and Dung-sheng Tsai (Chung Yuan Christian University, Taiwan.)*

D1-5 **Achieving sub-band Gap Emission in Tetracene-based OLEDs**, *Yulin Lin (National Cheng Kung University), Hong-Fu Liu (National Cheng Kung University), Chen Chun-Yu (National Cheng Kung University), and Tzung-Fang Guo (National Cheng Kung University)*

A2 Ferroelectric Thin Film Technology Rm 243
Chair: Prof. Chao-Hui Yeh (NTHU)

A2-1 **Interface-Engineered SnO_x Layer for Wake-Up Suppression and Endurance Enhancement in HZO-Based Ferroelectric Capacitors**, *Chun-Yi Kuo (National Tsing Hua University), Hao Teng Wen (National Tsing Hua University), Hsin Yu Hsu (National Tsing Hua University), Kai Sheun Lee (National Tsing Hua University), Yi-Fan Chen (National Tsing Hua University), and Yung-Hsien Wu (National Tsing Hua University)*

A2-2 **HZO Interface Engineering with Flat Amorphous TiN Achieving Uniform c-axis Orientation, High Breakdown Field, and Final $2P_r$ of 56 $\mu C/cm^2$ @ 4E12 Endurance**, *Kuan-Heng Lin (National Taiwan University), Yu-Tsung Liao (National Taiwan University), Jhih-Yuan Liang (National Taiwan University), Min-Hsuan Tsai (National Taiwan University), Yan-Jyun Chen (National Taiwan University), and Bo-Hui Yu (National Taiwan University), and C. W. Liu (National Taiwan University)*

A2-3 **Impact of Starting Layer on Ultra-thin Ferroelectric $HfZrO_2$ Toward Energy-Efficient FeRAM Applications**, *Kuan-Ting Wu (National Taiwan University), Cheng-Hong Liu (National Taiwan University), and Min-Hung Lee (National Taiwan University)*

A2-4 **Innovative Nb Metal Engineering for BEOL-Compatible Ferroelectric Memory with High Energy Efficiency and Robust Reliability**, *Cheng-Hung Wu (National Taiwan University), Jia-Tai Wu (National Taiwan University), Wei-Tung Cheng (National Taiwan University), Chun-Jung Su (National Yang Ming Chiao Tung University), and Vita Pi-Ho Hu (National Taiwan University)*

A2-5 **NH_3 Plasma Surface Nitridation to Mitigate Etch-Induced Damage for Reliable Ferroelectric Switching on Ge-Based MFIS Capacitors**, *Kuei Yuan Chen (National Yang Ming Chiao Tung University), Po Lun Lin (National Yang Ming Chiao Tung University), Chun-Jung Su (National Yang Ming Chiao Tung University), and Pin Su (National Yang Ming Chiao Tung University)*

A2-6 **Modeling Wake-Up Dynamics of Hafnium Zirconium Oxide Ferroelectric Memories under Bipolar and Unipolar Cycling**, *Yu-Ling Shih (National Yang Ming Chiao Tung University), Chen-Yi Cho (National Yang Ming Chiao Tung University), and Tuo-Hung Hou (National Yang Ming Chiao Tung University)*

B2 SiC & β-Ga_2O_3 Power Devices Rm 253
Chair: Prof. Bing-Yue Tsui (NYCU)

B2-1 **Comprehensive Investigating and Enhancing Continuous Switching Stability of β-Ga_2O_3 SBDs**, *Haoran Wang (National Tsing Hua University), Chi-Rui Hwang (National Tsing Hua University), Po-Yen Huang (National Tsing Hua University), Yeke Liu (National Tsing Hua University), Shawn S. H. Hsu (National Tsing Hua University), and Roy K.-Y. Wong (National Tsing Hua University)*

B2-2 **High-Temperature Characterization of Gate Charge Behavior and Miller Plateau Voltage in 1200 V SiC MOSFETs**, *Jun-Sheng Huang (National Central University), Xin-Yi Luo (National Central University), Jui-Yi Yan (National Central University), Tsai-Ni Yang (National Central University), and Yue-Ming Hsin (National Central University)*

B2-3 **Study on Temperature Coefficient of Vth of 4H-SiC MOSFETs**, *Chih-Fang Huang (National Tsing Hua University), Jia-Wei Hu (National Tsing Hua University), Jung-Yan Jang (National Tsing Hua University), and Kuan-Min Kang (Institute of Electronics Engineering, National Tsing Hua University, Taiwan)*

B2-4 **A Self-Aligned Shielded-Gate SiC VDMOSFET for Optimized Field Distribution and Reduced Reverse Transfer Capacitance**, *Fu-Chen Liang (National Yang Ming Chiao Tung University), Wei-Jhe Liao (National Yang Ming Chiao Tung University), Han-Wei Chen (National Yang Ming Chiao Tung University), and and Bing-Yue Tsui (National Yang Ming Chiao Tung University)*

B2-5 **Electrical Properties and Reliability of 4H-SiC MOS Capacitors with Thermally Grown SiO_2 vs. ALD SiO_2 Gate Oxides**, *Seok Huey Soo (National Yang Ming Chiao Tung University), Wei-Cheng Lin (National Yang Ming Chiao Tung University), Yu-Chieh Chen (National Yang Ming Chiao Tung University), Jun Xian Chen (National Yang Ming Chiao Tung University), Hsiao Yi-Kai (Hon Hai Research Institute), Chia Lung Hung (Hon Hai Research Institute), Hao-Chung Kuo (National Yang Ming Chiao Tung University), and Tian-Li Wu (National Yang Ming Chiao Tung University)*

B2-6 **High-Endurance Ferroelectric Capacitors Without Wake-Up Effect via Combined ZrN Interface Engineering and Microwave Annealing**, *Sheng-Ying Lu (National Tsing Hua University), Ching-Hsien Wang (National Tsing Hua University), and Yung-Hsien Wu (National Tsing Hua University)*

C2 2D Materials Rm 346
Chair: Prof. Tsung-En Lee (NYCU)

C2-1 **Monolithic heterogeneous integration of MoS_2-Si CFET inverter with stacking common-gate structure**, *Chuan-You Lin (National Tsing Huang University), Shih-Chun Hung (National Tsing Huang University), Yi-Lun Kuo (National Tsing Huang University), Zih-Yi Wen (National Tsing Huang University), I-Min Liu (National Tsing Huang University), Han-Hsiang Pai (National Tsing Huang University), Chih-Chao Yang (NDL), and Chao-Hui Yeh (National Tsing Huang University)*

C2-2 **Low-Temperature Transferred Nanostructured 2D Transition Metal Dichalcogenides by a Direct Laser Contact Sublimation Transfer Method**, *Paul Albert Labasano Sino (National Tsing Hua University), Tzu-Yi Yang (National TsingHua University), Yu Hsuan Tsai (National Tsing Hua University), and Yu-Lun Chueh (National Tsing Hua University)*

C2-3 **Tailoring Carrier Polarity in CVD-WSe_2 for Ultra-Thin-Body p-FETs Performance Boost**, *I-Ling Li (National Tsing Hua University), Cheng Chieh Hsieh (National Chung Hsing University), Chan Yuen Chang (Taiwan Instrument Research Institute), Chien Wei Chen (Taiwan Instrument Research Institute), Wei Ting Hsu (National Tsing Hua University), Ying-Hao Chu (National Tsing Hua University), and Chao-Hui Yeh (National Tsing Huang University)*

C2-4 **Pulsed Laser Annealing-Enhanced Crystallinity of P-Type 2D Tellurium Thin Films for High-Performance Photodetectors and Highly Sensitive Gas Sensors**, *Chia-Hung Lo (National Tsing Hua University), Chia-Chen Chung (National Tsing Hua University), Sung-Tsun Wang (National Yang Ming Chiao Tung University), Der-Hsien Lien (National Yang Ming Chiao Tung University), and Yu-Lun Chueh (National Tsing Hua University)*

C2-5 **High-Performance Tungsten Diselenide Transistors: Layer Number Dependence, Contact Electrode Crystallinity and Channel Passivation**, *You-Jue Ling (National Yang Ming Chiao Tung University), Che-Jia Chang (National Taiwan University), Po-Tsung Lee (National Yang Ming Chiao Tung University), and Shih-Yen Lin (Academia Sinica)*

C2-6 **Tuning Selectivity of Two-Dimensional based Gas Sensors via Hexagonal Boron Nitride Encapsulation**, *Cyu Ruei-Hong (National Tsing Hua University), and Yu-Lun Chueh (National Tsing Hua University)*

D2 Novel Optoelectronic Materials & Devices (II) Rm 354
Chair: Prof. Chii-Chang Chen (NCU)

D2-1 **Unanticipated Interfacial Redox Reaction in the NiO_x Transport Layer of Perovskite Light-Emitting Diodes**, *Hoai Thi Do (Department of Photonics, National Cheng Kung University, Tainan), Aswaghosh Loganathan (National Cheng Kung University), Yun-Han Wu (National Cheng Kung University), Yaw-Shyan Fu (National University of Tainan), and Tzung-Fang Guo (National Cheng Kung University)*

D2-2 **Electrical Characteristics of p-Type Charge Layer InGaP/GaAs SPADs with Beveled Edge Termination**, *Yunseok Han (Yonsei University), Soo-hyun Baek (GQT Korea), Chan-yong Park (GQT Korea), and Ilgu Yun (Yonsei University)*

D2-3 **Self-organized Ge Quantum-dot/SiN Array Architectures: From Planar to Vertically-integrated Si Photonic Interconnects**, *Shih-Hsiang Yang (National Yang Ming Chiao Tung University), Chi-Hao Wu (National Yang Ming Chiao Tung University), Po-Yu Hong (Nation Chiao Tung University), and Pei-Wen Li (National Yang Ming Chiao Tung University)*

D2-4 **Linearly Polarized Plasmonic-Enhanced Electroluminescence from Suspended Monolayer WSe_2 via Dual-Pulse Injection**, *Hsien Kung Chang (National Kaohsiung University of Science and Technology), Zheng-Zhe Chen (Academia Sinica), Che-Jia Chang (National Taiwan University), Shih-Yen Lin (Academia Sinica), and Min-Hsiung Shih (Academia Sinica)*

D2-5 **Tailoring Evaporation-Solution Method of Wide Bandgap Perovskite Crystallization in Perovskite/Silicon Tandem Solar Cells**, *Yu-Ting Chen (National Cheng Kung University), Jin-Yu Lin (National Yang Ming Chiao Tung University), Chih-Wei Chu (Academia Sinica), and Tzung-Fang Guo (National Cheng Kung University)*

D2-6 **Lead-Free Double Perovskite for Light-Controlled RRAM**, *Peng Xiang Zheng (National Cheng Kung University), Ke Jing Lee (Cheng Shiu University), Cheng-Jung Lee (National Cheng Kung University), Hao Hsu (National Cheng Kung University), and Yeong-Her Wang (National Cheng Kung University)*

A3 Memory Technology Rm 243
Chair: Prof. Tsung-En Lee (NYCU)

A3-1 **Design Technology Co-Optimization for CFET-Based SRAM Signal and Power Routing Designs**, *Yu-Cheng Lu (National Taiwan University), Meng-Lin Wu (National Taiwan University), Ranjan Trivedi Amit (University of Illinois at Chicago), and Vita Pi-Ho Hu (National Taiwan University)*

A3-2 **UTF-NVMRAM: A Universal Temperature-Friendly (4K-400K) Nonvolatile Memory Solution**, *Yu-Ho Kao (National Yang Ming Chiao Tung University), Ming-Chun Hong (National Yang Ming Chiao Tung University), Chen-Yu Yang (National Yang Ming Chiao Tung University), Sin-You Huang (Industrial Technology Research Institute), Chiao-Yun Lo (Industrial Technology Research Institute), Ho-Lin Tsai (Industrial Technology Research Institute), Yao-Jen Chang (Industrial Technology Research Institute), Shih-Ching Chiu (Industrial Technology Research Institute), Jeng-Hua Wei (Industrial Technology Research Institute), and Tuo-Hung Hou (National Chiao Tung University)*

A3-3 **Development of 8Kb Embedded RRAM Core Toward Power-Efficient Edge Computing**, *Yong-Zhi Liu (National Tsing Hua University), Po-Rui Huang (National Tsing Hua University), Bang-Shuo Wu (National Tsing Hua University), and Chao-Hui Yeh (National Tsing Huang University)*

A3-4 **Cryo III-V NVM: A Novel Universal Memory in Quantum Computing System with 1V of Program < 1ns, 10-year of Retention**, *Zi Yao Chung (National Central University), Min Jie Chen (National Central University), and E-Ray Hsieh (National Central University)*

A3-5 **Asymmetric One-Time Programming Cells in FinFET Technologies for Computing in Memory Arrays**, *Bing-Rong Tang (National Tsing Hua University), Cheng-Ying Chuang (National Tsing Hua University), Ya-Chin King (National Tsing Hua University), and Chrong Jung Lin (National Tsing Hua University)*

B3 GaN Device Reliability & Circuits Rm 253
Chair: Prof. Chih-Fang Huang (NTHU)

B3-1 **Dynamic Ron Degradation in p-GaN Gate HEMTs Induced by Over-Voltage Hard Switching Stress**, *Po-Yen Huang (National Tsing Hua University), Haoran Wang (National Tsing Hua University), Wei-Ting Hsu (National Tsing Hua University), Shawn S. H. Hsu (National Tsing Hua University), and Roy K.-Y. Wong (National Tsing Hua University)*

B3-2 **A 134-MHz UGB Capacitorless GaN-Based LDO With Wide Load Range and High-Temperature Stability**, *Pin Shiuan Kuo (National Yang Ming Chiao Tung University), Cheng Sung (National Yang Ming Chiao Tung University), Yu Sheng Hsiao (National Yang Ming Chiao Tung University), and Tian-Li Wu (National Yang Ming Chiao Tung University)*

B3-3 **A Ferroelectric AlGaN/GaN FinHEMT with an AlScN/Al_2O_3 Gate Stack for Enhanced and Tunable Threshold Voltage,** *Shi-Feng Liang (National Cheng Kung University), Joe Kao (National Cheng Kung University), Kuan-Wei Lee (I-Shou University), Yeong-Her Wang (National Cheng-Kung University)*

B3-4 **Normally-Off GaN HEMTs with HfAlO Charge-Trapping Layer and A1ScN Ferroelectric Gate Stacks**, *Chuan Yi Kuo (National Central University), Wen-Yao Yang (Institute of Microelectronics, Department of Electrical Engineering), Kuan-Wei Lee (I-Shou University), and Yeong-Her Wang (National Cheng Kung University)*

B3-5 **PBTI Investigation of Schottky HEMTs with Varying NH_3 Pre-Treatment Before SiN Deposition**, *Wei-Tung Lin (National Yang Ming Chiao Tung University), Meng-Che Tsai (National Yang Ming Chiao Tung University), Yi Yang (National Yang Ming Chiao Tung University), Yi-Shao Liu (Win Company), Kai-Sin Cho (Win Company), Chu-Lung Huang (Win Company), and Tian-Li Wu (National Yang Ming Chiao Tung University)*

C3 Advanced Semiconductor Devices Rm 346
Chair: Prof. Sourav De (NTHU)

C3-1 **Face-to-Face 3D 2-Layer Stacked CFET Standard Cell Circuit with Physical Design Flow**, *Liang-Chi Huang (National Taiwan University), Bo-Hsun Juan (National Taiwan University), Pen-Yi Chu (National Taiwan University), Xiang-Ting Huang (National Taiwan University), Yu-An Yang (National Taiwan University), Yuan-Ju Tien (NTU), Cheng-Yuan Wu (NTU), Jheng-Yan Li (National Taiwan University), and Tzu-Hsuan Chang (National Taiwan University)*

C3-2 **High-Density Heterogeneous Integration of Full-Oxide Thin-Film Transistors for Advanced Logic Circuits Applications**, *Xin Yan Wu (National Yang Ming Chiao Tung University), Tsung-Che Chiang (National Yang Ming Chiao Tung University), Cheng-Wei Wang (National Yang Ming Chiao Tung University), Pei-Yun Huang (National Yang Ming Chiao Tung University), and Po-Tsun Liu (National Yang Ming Chiao Tung University)*

C3-3 **Impact of Hydrogen Engineering on the Electrical Properties of Self-aligned Top-Gate a-IGZO TFTs**, *Ying-Jung Chen (National Taiwan University), YuanMing Liu (National Taiwan University), Yu-Shan Wu (National Taiwan University), Chia-Chun Yen (Innolux Corporation), Tsang-Long Chen (Innolux Corporation), Cheng-Hsu Chou (Innolux Corporation), and Chee-Wee Liu (National Taiwan University)*

C3-4 **Investigated Properties of NO_2 Gas Sensors with Nanostructured In_2O_3 Grown using Solvothermal Method**, *Che-Yuan Hung (National Cheng Kung University), Li CHENG YUAN (National Cheng Kung University), Hsin-Ying Lee (National Cheng Kung University), and Ching-Ting Lee (National Cheng Kung University)*

C3-5 **High-Performance Ultra-Nanosheet Indium Oxide-based TFTs with L_{CH} of 100 nm and T_{CH} of 2 nm for BEOL-Compatible Applications**, *Huei-Yun Zeng (National Yang Ming Chiao Tung University), Tsung-Che Chiang (National Yang Ming Chiao Tung University), Zhen-Hao Li (National Yang Ming Chiao Tung University), Yu-Chen Chen (National Yang Ming Chiao Tung University), and Po-Tsun Liu (National Yang Ming Chiao Tung University)*

D3/C3 High-Speed Optoelectronics Rm 354
Chair: Prof. Jin-Wei Shi (NCU)

D3-1 **High Modulation Linearity of Double Injection Microring Fano Modulators**, *Yu-Min Pai (National Tsing-Hua University), Pei-En Huang (National Tsing-Hua University), Ming-Chang Lee (National Tsing Hua University), Ming-Wei Lin (Taiwan Semiconductor Research Institute), and Hsiang-Chih Kao (National Tsing-Hua University)*

D3-2 **High-Speed GaN-Based μ-LED with Optimized QW and EBL Design for Optical Interconnect Applications**, *Tzu-Yi Lee (National Yang Ming Chiao Tung University), Chien-Chi Huang (National Yang Ming Chiao Tung University), I-Jou Lin (National Yang Ming Chiao Tung University), Li-Yin Chen (National Yang Ming Chiao Tung University, Hsinchu, 30010, Taiwan), Tzer-Perng Chen (Tera Electronics Corp), Solomon Chi (Tera Electronics Corp), Chia Feng Lin (National Chung Hsing University), Guo-Yi Shiu (National Chung Hsing University), and Hao-Chung Kuo (National Yang Ming Chiao Tung University)*

D3-3 **Investigation of High-Frequency Characteristics of QWLET and the Influence of Optical Injection on Frequency Response**, *Jia-Zhen Cai (National Taiwan University), Yun-Jie Huang (National Taiwan University), and Chao-Hsin Wu (Graduate Institute of Photonics and Optoelectronics)*

C3-6 **Interfacial Engineering and Dielectric Enhancement in $Ga_2O_3/HfO_2/Si$ Stacks for Next-Generation Electronic Devices**, *Bi-Xian Wu (National Taiwan University), Chi-Tai Hsieh (National Taiwan University), Heng-Jui Chang (National Taiwan University), Cheng-Yuan Wu (National Taiwan University), Yuan-Ju Tien (National Taiwan University), Wei-He Chen (National Taiwan University), Liang-Chi Huang (National Taiwan University), and Tzu-Hsuan Chang (National Taiwan University)*

C3-7 **Heterogeneous Integration of Sub-nanometer Thick Ga_2O_3 on Si(100) for Advanced Electronic Devices through Ga_2O_3 Polarization Layer**, *Bi-Xian Wu (National Taiwan University), Heng-Jui Chang (National Taiwan University), Chi-Tai Hsieh (National Taiwan University), Yuan-Ju Tien (National Taiwan University), Cheng-Yuan Wu (National Taiwan University), Wei-He Chen (National Taiwan University), Liang-Chi Huang (National Taiwan University), and Tzu-Hsuan Chang (National Taiwan University)*

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A4-1 **Improved Radiation Hardness in Ferroelectric Field-Effect Transistors Using Com- positionally Graded $Hf1\text{-}_xZr_xO_2$ Films**, *Jung-Ting Chang (National Tsing Hua University), and Yung-Hsien Wu (National Tsing Hua University)*

A4-2 **Synergistic Enhancement of FeFET Memory Characteristics through Solid-Solution/Superlattice Ferroelectrics and Interface Optimization**, *Yu-Cheng Lin (National Tsing Hua University), Tsen-Hsiang Pan (National Tsing Hua University), and Yung-Hsien Wu (National Tsing Hua University)*

A4-3 **The Synergistic Effects of Random Phase Distribution and Polarization Strength Variation on FeFETs with Varying Grain Sizes and Ferroelectric Percentages**, *Yi-Ming Tseng (National Taiwan University), and Vita Pi-Ho Hu (National Taiwan University)*

A4-4 **Enhanced Memory Window and Reliability for FeFET Memory by Integrating AlON Chanel Interfacial Layer, AFE/FE Stack and Al_2O_3 Gate Interlayer**, *Hao Teng Wen (National Tsing Hua University), Yu-Hsing Chen (National Tsing Hua University), and Yung-Hsien Wu (National Tsing Hua University)*

A4-5 **Ultraviolet-Assisted Oxidation for Defect Passivation in All-Oxide 2D Ferroelectric Semiconductor Field-Effect Transistors**, *Yi-Zheng Chen (National Tsing Hua University), Long-An Lee (National Tsing Hua University), and Po-Wen Chiu (National Tsing Hua University)*

B4 RF/mmWave GaN HEMTs & InP HBTs Rm 253
Chair: Prof. Tian-Li Wu (NYCU)

B4-1 **Quaternary Barrier AlInGaN/GaN-on-Si HEMT with Record $f_T \cdot L_g$ Product of 13.8 GHz·μm and High Power Performance at 38 GHz**, *Po Tsung Tu (Department of Photonics, National Yang Ming Chiao Tung University), Sheng-Kai Chen (National Central University), Hsin-Chu Chen (National Sun Yat-sen University), Jen-Inn Chyi (National Central University), Po-Tsung Lee (National Yang Ming Chiao Tung University), and Hao-Chung Kuo (National Yang Ming Chiao Tung University)*

B4-2 **RF Loss Reduction in GaN-on-Si HEMTs via 2DHG-Induced Substrate Shielding**, *Yeke Liu (National Tsing Hua University), Po-Yen Huang (National Tsing Hua University), Chun Chuang (National Tsing Hua University), Haoran Wang (National Tsing Hua University), Tsung-Lin Lee (National Tsing Hua University), Shawn Hsu (National Tsing Hua University), and Roy K.-Y. Wong (National Tsing Hua University)*

B4-3 **Gate Length-Dependent Parasitic Suppression and Intrinsic Scaling Trends in InAlGaN/GaN HEMTs Toward Sub-THz RF Operation**, *Kun-Yang Jhang (National Taiwan University), and Min-Chun Chung (National Taiwan University)*

B4-4 **Reducing Contact Resistance in AlGaN/GaN HEMTs Using Graphene-Driven TiC Formation at Low Annealing Temperatures**, *Hui-Chung Huang (National Central University), Wei-Sheng Kao (National Central University), Chen-Hsiang Chung (National Central University), T-H Chou (National Central University), K-A Lu (National Central University), and C-Y Su (National Central University) and Yue-Ming Hsin (National Central University)*

B4-5 **DC and RF Performance Evaluation of InP-Based Heterojunction Bipolar Transistors**, *Hsin-Ta Huang (National Taiwan University), and Jian Jang Huang (National Taiwan University)*

C4 Sensors, MEMS, Bioelectronics Rm 346
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C4-1 **High-Resolution Patterning of Single-Walled Carbon Nanotubes for Stretchable Microsupercapacitor**, *Chia-Yu Chen (National Yunlin University), Shi Ting Lu (National Yunlin University of Science and Technology), and Chien-Chung Shih (National Yunlin University of Science and Technology)*

C4-2 **Chelating Molecule–Mediated Interface Passivation in Defective Perovskites: A DFT Study on Carrier Recombination Suppression**, *Hong-Yi Lin (Chang Gung University), Kai-Chi Hsiao (Chang Gung University), Ting-Han Lin (Chang Gung University), and Ming-Chung Wu (Chang Gung University)*

C4-3 **Engineering $BaTiO_3$/Ag-Doped TiO_2 Heterostructures for Synergistically Enhanced Piezo-Photocatalytic CO_2 Reduction**, *Yen-Chang Chen (Chang Gung University), Ting-han Lin (Chang Gung University), Chang Jia-Mao (Chang Gung University), Kuo-Ping Chiang (Chang Gung University), and Ming-Chung Wu (Chang Gung University)*

C4-4 **Development of a Low-cost Microsensor for Liver Cancer Tumor Markers Detection Utilizing MEMS and 3D Printing Technologies**, *Chia-Hsu Chia (National Sun Yat-sen University), Cheng-Chuan Chou (National Sun Yat-sen University), Zhen-Yu Chen (National Sun Yat-sen University), and I-Yu Huang (National Sun Yat-sen University)*

C4-5 **Low-Voltage and High-Reliability WORM Memory Using RF-Sputtered Ta_2O_5 Thin Films for Secure Integration Application**, *Hsuan-Han Wu (National Yunlin University), Yu-Ting Liu (National Yunlin University), Che-Hao Liao (National Yunlin University), and Shih-Hung Lin (National Yunlin University)*

A5 Quantum Dot Devices Rm 354
Chairs: Dr. Sarah Uvin (Gent Univ), Prof. Chien-Yuan Chang (NTHU)

A5-1 **Investigation of Interface Engineering in Top-Gate Indium Oxide Thin-Film Transistors via Fluorine Plasma Treatment**, *Yao-Jen Lee (National Yang Ming Chiao Tung University)*

A5-2 **Enhanced Electrical Transport Properties of Molybdenum Disulfide Field-Effect Transistors by Using Alkali Metal Fluorides as Dielectric Capping Layers**, *Kai-Chuan Yang (National Tsing Hua University), Sumayah Wani Shakil (National Tsing Hua University), Chen-Chieh Hsu (Chung Yuan Christian University), Yuan-Liang Zhong (Chung Yuan Christian University), and Yu-Lun Chueh (National Tsing Hua University)*

A5-3 **Geometry–Environment Coupling in Scaled a-IGZO Transistors: W/L Scaling and Ambient-Dependent Electrical Characteristics**, *I-Hsuan Chen (National Yang Ming Chiao Tung University), Tsai-Ming Huang (National Yang Ming Chiao Tung University), Chun-I Lu (Taiwan Semiconductor Research Institute), Wei-Ning Chang (Taiwan Semiconductor Research Institute), Wei-Kai Yu (National Yang Ming Chiao Tung University), Chih-Wei Chen (National Yang Ming Chiao Tung University), Chang-Hsien Lin (NDL), Wen-Fa Wu (Taiwan Semiconductor Research Institut), Chao-Cheng Lin (Taiwan Semiconductor Research Institute), and Tuo-Hung Hou (National Yang Ming Chiao Tung University)*

A5-4 **Low-Frequency Charge Noise Analysis of Ge Quantum-Dot Single-Hole Transistors in Few-Hole regime**, *Chi-Cheng Lai (National Yang Ming Chiao Tung University), Ting Tsai (National Yang Ming Chiao Tung University), Horng-Chih Lin (National Yang Ming Chiao Tung University), and Pei-Wen Li (National Yang Ming Chiao Tung University)*

A5-5 **Charge Stability and Sensing Design of Germanium Quantum dots/Si-SiN Composite Barrier Charge Qubits**, *Ting Tsai (National Yang Ming Chiao Tung University), Chi-Cheng Lai (National Yang Ming Chiao Tung University), Horng-Chih Lin (National Yang Ming Chiao Tung University), and Pei-Wen Li (National Yang Ming Chiao Tung University)*

Poster sessions

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AP-1	Fundamental Insights into Trap Accumulation and Endurance Degradation in HfO_2 FeFETs via Low Frequency Analysis and Charge Pumping, *Apu Das (National Tsing Hua University), Masud Rana Sk (IIT Madras-India), Gautham Kumar (National Tsing Hua University), Asim Senapati1 (National Tsing Hua University), Ricardo Olivo (Fraunhofer IPMS-Germany), Yannick Raffel (Fraunhofer IPMS-Germany), Agniva Paul (National Tsing Hua University), Konrad Seidel (Fraunhofer IPMS-Germany), Andrea Padovani (University of Modena and Reggio Emilia-Italy), Bhaswar Chakrabarti (IIT Madras-India), and And Sourav De (National Tsing Hua University)*
AP-2	Reliability of HfO_2-FeFETs Under Thermal Stress: Trap Evolution and e-NAND Applications Insights,*Sourav De (College of Semiconductor Research- National Tsing Hua University)*
AP-3	Random-Telegraph Signal Noise in Nanosheet FeFETs with Various RTA Temperatures, *Yu Ting Chen (Taiwan Semiconductor Research Institute, and National Institutes of Applied Research)*
AP-4	Next-Generation 2D Material Transistors with Low Power Consumptions, Enhanced Stability and High Scalability: Polycrystalline Electrodes and In-Plane Gate Architectures, *Che-Jia Chang (National Taiwan University), Chen Shih-Jie (National Yang Ming Chiao Tung University), Tzu-Hsuan Chang (National Taiwan University), Po-Tsung Lee (National Yang Ming Chiao Tung University), and Shih-Yen Lin (Academia Sinica)*
AP-5	GAAFET Hybrid Memory Utilizing HfO_2/ZrO_2 Superlattice with Morphotropic Phase Boundary for BEOL Integration, *Cheng-En Wu (National Tsing Hua University), Chen-You Wei (National Tsing Hua University), Yi-Ju Yao (National Tsing Hua University), Kuei-Chun Liao (National Tsing Hua University), Chien-Lung Chen (National Tsing Hua University), Chih-Chao Yang (National Nano Device Laboratories), Guang-Li Luo (National Nano Device Laboratories), Fu Ju Hou (National Nano Device Laboratories), and Yung Chun Wu (National Tsing Hua University)*
AP-6	Enhanced Ferroelectric Switching Symmetry and Reduced Coercive Field in Superlattice $Hf_{0.5}Zr_{0.5}O_2$ Metal-insulator-Metal Capacitors via Microwave Annealing, *You Wen Fan (National Tsing Hua University), Kai-Ting Huang (National Tsing Hua University), Chen-You Wei (National Tsing Hua University), Cheng-En Wu (National Tsing Hua University), Fu Ju Hou (National Nano Device Laboratories), Guang-Li Luo (National Nano Device Laboratories), and Yung Chun Wu (National Tsing Hua University)*
AP-7	Highly Stable Strontium Oxide-Based Bipolar Resistive Switching Memory Device Fabricated by a Fast and Low-Cost Sol-Gel Method, *Bo-An Ko (National Yunlin University), Li En Liu (National Yunlin University), Xu Wei Hong (National Yunlin*

University), and Chih-Chieh Hsu (National Yunlin University)

AP-8 Implementation of Optimized HfO_2/ZrO_2 Superlattice Dielectric in High-Performance SiGe/Si Superlattice p-type GAAFETs, *Chien-Lung Chen (National Tsing Hua University), Kai-Ting Huang (National Tsing Hua University), Yi-Ju Yao (National Tsing Hua University), Chen-You Wei (National Tsing Hua University), Bo-Xu Chen (National Tsing Hua University), Tsai-Jung Lin (National Tsing Hua University), Yung Teng Fang (National Tsing Hua University), Fu Ju Hou (National Nano Device Laboratories), and Yung Chun Wu (National Tsing Hua University)*

AP-9 Comparison of nNS-on-pNS CFET and nNS-on-pFF CFET Channel Orientation Effects of CFET device, *Chao Wei Wu (National Tsing Hua University), Yueh Chun Wu (National Tsing Hua University), Bo-Xu Chen (National Tsing Hua University), Yu Hsien Lin (National United University), Guang-Li Luo (National Nano Device Laboratories), Fu Ju Hou (National Nano Device Laboratories), and Yung Chun Wu (National Tsing Hua University)*

AP-10 Al_2O_3/SiO_2 Stack Engineering in a Concentric MOS Ring Structure for Nonvolatile Capacitive Synapses, *Chi-Yi Kao (National Taiwan University), and Jenn-Gwo Hwu (National Taiwan University)*

AP-11 Transient Current Behavior and Memory Application of Coupling Concentric Metal-Insulator-Semiconductor Tunnel Diodes (MISTDs), *Yu-Che Tsai (National Taiwan University), and Jenn-Gwo Hwu (National Taiwan University)*

AP-12 Analysis of Threshold Voltage Variation in Polycrystalline Silicon Thin-Film Transistors, *Ding-Sheng Lin (National Yang Ming Chiao Tung University), and Horng-Chih Lin (National Yang Ming Chiao Tung University)*

AP-13 Monolayer and Bilayer Bottom-Gated MoS_2 TFTs with Channel Prepared by Transfer Method, *Hung-Tse Hsu (National Yang Ming Chiao Tung University), and Horng-Chih Lin (National Yang Ming Chiao Tung University)*

AP-14 High-Performance Submicron Independent Double-Gated Amorphous ITO Thin-Film Transistors, *Tse-Yu Liao (National Yang Ming Chiao Tung University), Ching-Hsiang Chang (National Yang Ming Chiao Tung University), Chien-Wei Chen (Taiwan Instrument Research Institute (TIRI)), Chi-Chung Kei (Taiwan Instrument Research Institute (TIRI)), Guo-Wei Huang (Taiwan Semiconductor Research Institute (TSRI), Pei-Wen Li (National Yang Ming Chiao Tung University)and Horng-Chih Lin (National Yang Ming Chiao Tung University)*

AP-15 TCAD Simulation and Analysis of the Impact of Trap Charges on the Variability of FinFET and NSFET Electrical Characteristics, *Shiang-Ching Huang (Department of Electrical Engineering, National Cheng Kung University), Meng-Hsueh Chiang (National Cheng Kung University), Yi-Hsiang Hsueh (National Cheng Kung University), and Pei-Hua Guo (National Cheng Kung University)*

AP-16 Microwave Annealing for BEOL: Stabilizing Morphotropic Phase Boundaries and Reducing Leakage in HfO_2/ZrO_2 Superlattice super High-k Materials, *Yueh Chun Wu (National Tsing Hua University), Chen-You Wei (National Tsing Hua University),*

University), and Kuo-Hsing Kao (National Cheng Kung University)

AP-26 Resistive Random Access memory with a high resistance switching ratio based on Cu/$BaTiO_3$/n+-Si structure, *Yu-Ting Liu (National Yunlin University), Hsuan-Han Wu (National Yunlin University), Min-Chen Cai (National Yunlin University), and Che-Hao Liao (National Yunlin University), and Shih-Hung Lin (National Yunlin University)*

AP-27 Effect of Neighboring Gear-shaped MIS Structures on the Enhancement of Coupling Transient Current in Center MIS Tunnel Diode for Memory Applications, *Chia-Ying Wang (National Taiwan University), and Jenn-Gwo Hwu (National Taiwan University)*

AP-28 BEOL-Compatible In_2O_3-Based HZO FeFETs with Enhanced Memory Performance via Optimized Rapid Thermal Annealing, *Cheng-Hsuan Chan (National Yang Ming Chiao Tung University), Tsung-Che Chiang (National Yang Ming Chiao Tung University), Meng-Chun Lin (National Yang Ming Chiao Tung University), and Po-Tsun Liu (National Yang Ming Chiao Tung University)*

AP-29 Performance Improvement of Gum Arabic Based Resistive Switching Memory via AlO_x Interface Layer, *Wei-Ren Chen (Department of Electrical Engineering, National Dong Hwa University), and Chun-Chieh Lin (National Dong Hwa University)*

AP-30 Enhanced Electrical Characteristics of Ge MOS Device by In-situ Low Temperature H_2 Treatment, *PaiYu Hsiao (National Tsing Hua University), and Kuei-Shu Chang-Liao (National Tsing Hua University)*

AP-31 Total Ionizing Doses Effects on MOSFET, FinFET, and GAAFET after Co-60 Radiation Exposure, *Jing-Lin Zheng (National Tsing Hua University), Dun-Bao Ruan (National Tsing Hua University), and Kuei-Shu Chang-Liao (National Tsing Hua University)*

AP-32 Ferroelectric Enhancement and Quadruple-Level Cell Operation in Antiferroelectric HZO Capacitors Enabled by Low-Temperature ALD Process and Metal Electrode Engineering, *Kun Tao Lin (National Yang Ming Chiao Tung University), Yu Yun Wang (National Yang Ming Chiao Tung University), Jerry Chang (National Yang Ming Chiao Tung University), Kuan Wen Huang (National Yang Ming Chiao Tung University), and Tien-Sheng Chao (National Yang Ming Chiao Tung University)*

AP-33 The Investigation of the Channel-All-Around (CAA) Ferroelectric FETs by TCAD Simulation, *Pei-Ying Li (National Taiwan University), Hsin-Tzu Liao (National Taiwan Normal University), and Min-Hung Lee (National Taiwan University)*

AP-34 Output Performance Enhancement of TiO_2-NFs-Blended P(VDF-TrFE) Nanogenerators Via Ultraviolet-Thermal Annealing, *Chen Yang (Chang Gung University), Tzu Chuan Yang (Chang Gung University), Chen Yang Tseng (Chang Gung University), Yu Hong Wang (Chang Gung University), Karthekeyan Periasamy (Aalto University), Ming-Chung Wu (Chang Gung University), and Jer-Chyi Wang (Chang Gung University)*

University), and Chun-Jung Su (National Yang Ming Chiao Tung University)

AP-55 TiO_2/Al_2O_3 Selector-Based RRAM for 3D Crossbar Array Applications, *I Chen Lee (National Cheng Kong University), Ke-Jing Lee (Institute of Microelectronics), Yi-Hsuan Yeh (National Cheng-Kung University), Cheng-Jung Lee (National Cheng-Kung University), and Yeong-Her Wang (National Cheng-Kung University)*

AP-56 TCAD Simulation of Taper-Angle-Induced Variations in Silicon and Germanium CFETs, *Liang Chen (National Cheng Kung University), and Yeong-Her Wang (National Cheng-Kung University)*

AP-57 Enhanced Switching Stability in $FASnI_3$-Based RRAM via PVA Incorporation and PEDOT: PSS Interface Engineering, *Pin Jia Lai (National Cheng Kung University), Cheng-Jung Lee (National Cheng-Kung University), and Po-Wen Sze (Kao-Yuan University)*

AP-58 Continuous-Wave Laser Annealing for Direct Synthesis of Low-Resistance 1T'-$MoTe_2$ Contacts on MoS_2 FETs, *Kuo Yao-Zen (National Tsing Hua University), Ming Jin Liu (National Tsing Hua University), Ho Cheng Yuan (National Tsing Hua University), Paul Albert Labasano Sino (Nanoscale and Nanodevices Laboratory), and Yu-Lun Chueh (National Tsing Hua University)*

AP-59 WN_x ICL Thickness Dependent FE Memory and FTJ Characteristics in $Ru/WN_x/Hf_{0.1}Zr_{0.9}O_2/Al_2O_3/TiN$ Capacitor Structure, *Asim Senapati (Chang Gung University), Abhijit Aich (Chang Gung University), Minh Long Le Nguyen (Chang Gung University), Yii-Tay Chang(Graduate School of Advanced Technology, National Taiwan University), Ko Dong Ting (Chang Gung University), Wang Yen Jen (Chang Gung University), Yi-Pin Chen (Chang Gung Memorial Hospital (Keelung Chang Gung Memorial Hospital), Chang Gung University (Chang Gung University), Shih-Yin Huang (Keelung Chang Gung Memorial Hospital), Min-hung Lee (National Taiwan University), and Siddheswar Maikap (Chang Gung University)*

AP-60 Long-Retention Capacitorless 1T-DRAM Design Using Experimentally Calibrated Process/Device Simulations, *Shoa-Han Cheng (National Yang Ming Chiao Tung University), Chun-Hung Wang (National Yang Ming Chiao Tung University), Fu-Chang Hsu (NEO Semiconductor Inc.), Yao-Jen Lee (National Yang Ming Chiao Tung University), and Yiming Li (National Yang Ming Chiao Tung University)*

AP-61 High-Temperature Performance of Ni-Doped BaMgO ReRAM Devices Prepared via Sol–Gel Processing, *Chan Seng Lo (National Cheng Kung University), You De Lin (National Cheng Kung University), Ke Jing Lee (Cheng Shiu University), Cheng-Jung Lee (National Cheng-Kung University), and Yeong-Her Wang (National Cheng-Kung University)*

AP-62 Observation of Charge Trapping in Atomic Layer Deposited Gallium Nitride Film in $n\text{-}Si/SiO_2/GaN/Al_2O_3/Al$ Memory Capacitor, *Atanu Das (Manipal Institute of Technology), Sankar Prasad Bag (Chang Gung University), Vishnuram Abhinav (IIT Mumbai), Chia-Lung Tsai (Chang Gung University), and Chu Fu Chen (National Chung-Shan Institute of Science and Technology)*

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BP-1 Influence of Homoepitaxial Layer Thickness on Chemical Mechanical Planarization Induced Scratches of 4H-Silicon Carbide Epi-Wafers, *Chi Hsiang Hsieh (National Yang Ming Chiao Tung University), Chiao Yang Cheng (HuaHsu Silicon Materials Corporation), Hsiao Yi-Kai (Hon Hai Research Institute), Zi Hao Wang (National Cheng Kung University), Chang Ching Tu (National Central University), Chao-Chang Arthur Chen (National Taiwan University of Science and Technology), Po-Tsung Lee (National Yang Ming Chiao Tung University), and Hao-Chung Kuo (National Yang Ming Chiao Tung University)*

BP-2 An Asymmetric RF Switch Featuring Absorptive Characteristics for Millimeter-wave Phased-Array System, *Yihua Chen (National Yang Ming Chiao Tung University), Yi-Fan Tsao (National Yang Ming Chiao Tung University), and Heng-Tung Hsu (National Yang Ming Chiao Tung University)*

BP-3 Design of a Novel ADC Circuit Based on NDR Using CMOS Fabrication Technology, *Ming-Yang Liu (National Chiayi University), Bo-Xiang Li (National Chiayi University), and Kwang-Jow Gan (National Chiayi University)*

BP-4 Machine Learning-Assisted Design of a Dual-band Low-Noise Amplifier for Millimeter-wave Multi-standard Applications, *Hao-Yu Luo (National Yang Ming Chiao Tung University), Heng-Tung Hsu (National Yang Ming Chiao Tung University), and Yi-Fan Tsao (National Yang Ming Chiao Tung University)*

BP-5 Simulation on the Effects of the Pillar Configurations on 1.2 kV 4H-SiC Superjunction DMOSFET, *Keng-Ming Liu (National Dong Hwa University), and Shih-Ching Ou (National Dong Hwa University)*

BP-6 A Low-Loss Reflective-Type Phase Shifter for Next-Generation Indoor WiFi Applications, *Po-Han Chen (National Yang Ming Chiao Tung University), Yi-Fan Tsao (National Yang Ming Chiao Tung University), and Heng-Tung Hsu (National Yang Ming Chiao Tung University)*

BP-7 Investigation of Flat-Band Voltage Shift of SiC MOSFET under High Step Stress, *Yu-Cheng Wang (National Central University), Yi Hsuan Lee (National Central University), Lin Yen-Chun (National Central University), Tsung Yu Yu (National Central University), Hsin-Chieh Liang (National Central University), Tian-Li Wu (National Yang Ming Chiao Tung University), and Chang Ching Tu (National Central University)*

BP-8 InAlGaN/AlN/GaN MOS-HFETs with $(Al_{0.7}Ga_{0.3})_2O_3$ Gate-Dielectric and Drain Field-Plate Design, *Ching-Huan Peng (Feng Chia University), Ching-Sung Lee (Feng Chia University), Jian Hong Ke (Feng Chia University), Min Jun Du (Feng Chia University), Xiang Li Wang (Feng Chia University), Huang Rui Chen (Feng Chia University), and Wei-Chou Hsu (National Cheng Kung University)*

Yang Ming Chiao Tung University), Yu-Wen Lai (National Yang Ming Chiao Tung University), Mao-Heng Lee (National Yang Ming Chiao Tung University), Chieh-Fu Lin (National Yang Ming Chiao Tung University), Chang-Ching Tu (National Central University), Po-Tsung Lee (National Yang Ming Chiao Tung University), and Hao-Chung Kuo (National Yang Ming Chiao Tung University)

BP-29 Low On-Resistance of QST Substrate with HfAlO dielectric layer HEMT, *Kuang-Ting Hsieh (National Cheng Kung University), Yi-Hsuan Chang (Institute of Microelectronics, National Cheng Kung University), Yan-Kuei Wu (Institute of Microelectronics, National Cheng Kung University), Rong-Ming Ko (College of Electrical Engineering and Computer Science,), and Wei-Chou Hsu (National Cheng Kung University)*

BP-30 TLM-Based Defect Analysis of Back Barrier Trapping in C- and Fe-Doped GaN HEMTs Through Constant Stressing Time, Voltage and Temperature-Dependent IDLTS, *Yiliang Chong (National Yang Ming Chiao Tung University), Yi Yang (National Yang Ming Chiao Tung University), Wei-Tung Lin (National Yang Ming Chiao Tung University), Cheng-Ying Huang (National Yang Ming Chiao Tung University), and Tian-Li Wu (National Yang Ming Chiao Tung University)*

BP-31 Investigation of Self-Heating Effects and Post-Degradation Leakage Anomalies in SiC MOSFET, *Chun Hung Chiang (National Sun Yat-Sen University), Hung-Ming Kuo (National Sun Yat-sen University), Wei Chieh Hung (National Sun Yat-Sen University), and Ting-Chang Chang (National Sun Yat-Sen University)*

BP-32 Low-temperature synthesized diamond like carbon films for carbon-based devices, *Cheng-Hsun Tony Chang (Minghsin University of Science and Technology), Yu-Ting Chow (Minghsin University of Science and Technology), Pei-Cheng Jiang (Minghsin University of Science and Technology), Chung-Tzu Chang (Minghsin University of Science and Technology), Yu-Chi Chang (Minghsin University of Science and Technology), Mei-Yuan Zheng (Minghsin University of Science and Technology), Mu-Chun Wang (Minghsin University of Science and Technology), Chi-Wen Liu (Minghsin University of Science and Technology), and Wen-Yuan Chan (Minghsin University of Science and Technology)*

BP-33 The performance comparison of GaN vertical transistors with sidewalls treated using TMAH and H_3PO_4 solutions, *Ting-Ci Li (National Taiwan University), Jian Jang Huang (National Taiwan University), Yu-Chuan Chu (National Taiwan University), Chih-Kang Chang (National Taiwan University), and Jian-Jang Huang (National Taiwan University)*

BP-34 High Specific Capacitance Supercapacitor based on Laser-Induced Graphene with Interdigitated Electrodes, *Jia-Chuan Lin (National Taipei University), Hung Yeh Lin (National Taipei University), Hsu Nan Yen (National Taipei University), and Jun Hao Chen (National Taipei University)*

BP-35 Demonstration of High-Voltage (>2000V) Monolithic Dual-Gate GaN-on-QST p-GaN HEMT Bidirectional Switch, *Yu-Ting Wei (National Yang Ming Chiao Tung University), Hung-Wei Chen (National Yang Ming Chiao Tung University), and Tian-Li Wu (National Yang Ming Chiao Tung University)*

BP-36 Demonstration of High Voltage (>2000V) GaN-on-QST p-GaN Power HEMTs with Novel Embedded p-GaN SBD to Reduce the V_{RC}, *Ding-Qian Chen (National Yang Ming Chiao Tung University), Hung-Wei Chen (National Yang Ming Chiao Tung University), and Tian-Li Wu (National Yang Ming Chiao Tung University)*

BP-37 Impact of *in-situ* SiN Thickness on Current Collapse in GaN MIS-HEMTs under OFF-State Stress Pulses, *Cheng-Ying Huang (National Yang Ming Chiao Tung University), Yi Yang (National Yang Ming Chiao Tung University), and Tian-Li Wu (National Yang Ming Chiao Tung University)*

BP-38 Monolithically Integrated AlGaN/GaN HEMTs-Based DCFL Logic Circuits, *Pei-Yu Ling (National Cheng Kung University), Bottamakorn Klansaeng (National Cheng Kung University), Lung-Hsing Hsu (TSRI), Wen-Hsien Huang (TSRI), Kuan-Wei Lee (I-Shou University), and Yeong-Her Wang (National Cheng-Kung University)*

BP-39 A 10-Bit 120-FPS Driver for Passive-Matrix Mini-LED Displays, *Chih-Wen Lu (National Chiao Tung Univ.), and Pei-Yi Lai Lee (Novatek Microelectronics Corp.)*

BP-40 Demonstration of Monolithic Dual-Gate Bidirectional High Voltage (>2000V) MIS-HEMTs on GaN-on-SiC/Si and GaN-on-QST© with Symmetrical Performance, *Hsin-Wei Chen (National Yang Ming Chiao Tung University), Hsin-Wei Chen (National Yang Ming Chiao Tung University), and Tian-Li Wu (National Yang Ming Chiao Tung University)*

BP-41 A Low-Voltage-Output Switched-Capacitor Bandgap Reference Circuit, *Chih-Wen Lu (National Chiao Tung Univ.), Chun-Hao Huang (National Tsing Hua University), Tzu-Yi Hung (National Tsing Hua University), and Ping-Hung Yin (National Tsing Hua University)*

BP-42 Influence of Post-metallization annealing Temperature on Threshold Voltage in GaN-HEMT Power Devices, *Hao-Wei Chang (National Yang Ming Chiao Tung University), and Po Chuan Liao (National Yang Ming Chiao Tung University)*

BP-43 Enhanced Power Performance of RF HEMT with 10 nm InAlGaN Barrier and AlN Spacer on 6-inch Si Wafer, *Yen-Yang Hsieh (National Yang Ming Chiao Tung University), Chihyao Chang (National Yang Ming Chiao Tung University), Lung-Hsing Hsu (Taiwan Semiconductor Research Institute), Ming-Hsuan Kao (Taiwan Semiconductor Research Institute), Wen Hsien Huang (Taiwan Semiconductor Research Institute), Kun-Lin Lin (Taiwan Semiconductor Research Institute), Jia-Min Shieh (Taiwan Semiconductor Research Institute), and Hao-Chung Kuo (National Yang Ming Chiao Tung University)*

BP-44 Enhancement of Forward I-V Performance and Reliability of Vertical GaN-on-GaN PN Diode with N_2 Plasma Treatment, *Chi-An Chen (National Yang Ming Chiao Tung University), Terathad Pukpiboon (National Yang Ming Chiao Tung University), and Tian-Li Wu (National Yang Ming Chiao Tung University)*

BP-45 Comparison of AlInN and AlGaN HEMT Structures and Electrical Characteristics Analysis, *Cheng Xiu Zheng (Feng Chia University), Yu-Heng Chen (Feng Chia University), Chia-Lung Tsai (Chang Gung University), and Tong-Wen Wang (Feng*

Chia University)

BP-46 Ab initio Study of Stability and Thermodynamics of $GaAs_{1-x}Bi_x$ ($0 \leq x \leq 1$) Special Quasi-random Structures*, Han-Wen Chang (National Taiwan University), and Hao-Hsiung Lin (National Taiwan University)*

BP-47 Effect of Refresh on the Operation Efficiency of the Polyimide-based Photomemory*, Chi Hsin Chang (Feng Chia University), Chieh Lo (Feng Chia University), Yong-Wei Zhuang (Feng Chia University), Chin-Shen Wong (Feng Chia University), and Wen-Luh Yang (Feng Chia University)*

BP-48 Thermal Influence of InGaN Capping with 10nm-InAlGaN Barrier in HEMTs Template*, Chuan-Yeh Yu (National Tsing Hua University), Lung-Hsing Hsu (Taiwan Semiconductor Research Institute), Ming-Hsuan Kao (Taiwan Semiconductor Research Institute), Wen Hsien Huang (Taiwan Semiconductor Research Institute), Kun-Lin Lin (Taiwan Semiconductor Research Institute), Yu-Lun Chueh (National Tsing Hua University), and Chang-Hong Shen Shen (Taiwan Semiconductor Research Institute)*

BP-49 Improving Hard-Switching Induced Dynamic RON on p-GaN HEMT through Drain Field Plates and Al concentration Engineering*, Ching-Chia Lee (National Yang Ming Chiao Tung University), Yu-Ting Lee (National Yang Ming Chiao Tung University), Zhen-Hong Huang (National Yang Ming C*

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CP-1 Failure Mechanism of Chip Burn-in Test on the Reliability and Durability of Burn-in Board, *Sin Bei Lin (National Yang Ming Chiao Tung University), and Fu-Hsiang Ko (National Yang Ming Chiao Tung University)*

CP-2 Copper Alloy Thin Films for Semiconductor Applications: Fabrication and Characterization, *Chon-Hsin Lin (Lunghwa University of Science and Technology)*

CP-3 Enhanced EIS Biosensing Using 2D Magnetic VSe_2 and High-k Y-doped ZrO_2 under Magnetic Fields, *Ming Ling Lee (Minghsin University of Science and Technology), Yuting Chow (Minghsin University of Science and Technology), Chien-Hung Wu (Chung Hua University), You-Bin Lin (Minghsin University of Science and Technology), Jun-Long Deng (Minghsin University of Science and Technology), Pin-Zhu Liao (Minghsin University of Science and Technology), and Ming-Chun Lee (Minghsin University of Science and Technology)*

CP-4 Niobium Oxide (Nb_xO_y) Thin Film as a High-k Layer in EIS Structures for Biomedical Sensing, *Nguyen-Dang Quoc-Hoi (Minghsin University of Science and Technology), Ming Ling Lee (Minghsin University of Science and Technology), Chien-Hung Wu (Chung Hua University), Dang Nhut-Hao (Minghsin University of Science and Technology), Pin-Zhu Liao (Minghsin University of Science and Technology), and Ming-Chun Lee (Minghsin University of Science and Technology)*

CP-5 Low-Illumination Reliability Analysis of Gap-Type Thin Film Transistors for Image Sensors, *Chih-Chung Tu (National Yang Ming Chiao Tung University), and Ya-Hsiang Tai (National Yang Ming Chiao Tung University)*

CP-6 Investigation of Flat-Band Voltage Shift of SiC MOSFET under High Step Stress, *Chun Hsu Shen (Ming Chuan University), I Fan Cheng (Ming Chuan University), Jia Wei Liu (Ming Chuan University), and Jing-Yuan Chen (Ming Chuan University)*

CP-7 The Effect of Thickness on InGaSnO-based RRAM, *Huai-Cong Teng (Nation Cheng Kung University), Sheng-Po Chang (National Kaohsiung University of Science and Technology), and Jone-Fang Chen (Nation Cheng Kung University)*

CP-8 Optimization of ALD process for Al_2O_3 sensing membranes in LAPS, *Li-Hsiang Chou (Chang Gung University), Yu-Tzu Lin (Chang Gung University), Leung Sze Tsui (Chang Gung University), and Chia Ming Yang (Chang Gung University)*

CP-9 Two-dimensional SnS_2 materials as high-performance pH sensors with high sensitivity and linearity, *Qi Rui Qiu (National Cheng Kung University), Sheng-Po Chang (National Kaohsiung University of Science and Technology), Jone F. Chen (National Cheng Kung University), Wei-Yu Liu (Nation Cheng Kung University), and Shoou Jinn Chang (National Cheng Kung University)*

CP-10 Impact of 2D Interface Thickness on Substrate-overlayer Interaction in WS_2/MoS_2 Vertical Heteroepitaxy, *Lia Saptini Handriani (Hanyang university), Kim Yelim (Hanyang university), and Won Il Park (Hanyang university)*

CP-11 Low-cost Fabrication of Disposable Ag/AgCl Electrodes for Single-use pH Sensing Devices, *Prakash Sasikumar (Chang Gung University), and Chia Ming Yang (Chang Gung University)*

CP-12 Achieving High Reliability for 3D Conformal Low Carbon Electronics via Integrated Lamination and Laser Rework, *Dong Sen Chen (Industrial Technology Research Institute), Hsiao-Fen Wei (Industrial of Technology Research Institute), Yirong Lin (Industrial of Technology Research Institute), Li-Wei Yao (Industrial of Technology Research Institute), Yun-Chiao Hsiao (Industrial Technology Research Institute), and Chung-Wei Wang (Industrial of Technology Research Institute)*

CP-13 Development of Acetone Gas Microsensor for Non-Invasive Blood Glucose Detection, *Chia-Hsu Chia (National Sun Yet-Sen University), Bo-Yan Liu (National Sun Yat-sen University), Nian-Ru Wu (National Sun Yat-sen University), and Cheng-Chuan Chou (National Sun Yet-Sen University)*

CP-15 Impact of Voltage Fluctuations on Differential Hall Measurement, *Bo-Wen Lee (Chang Gung University), Ting Hsuan Chu (Chang Gung University), and Ruey Dar Chang (Chang Gung University)*

CP-16 Enhanced Memory Window in BEOL-Compatible Ferroelectric Thin-Film Transistors with In_2O_3 Channel via Superlattice HZO, *Chi Tseng (National Taiwan University), Sie Beng Ting (National Taiwan University), Zhao-Feng Lou (National Taiwan University), Min-Hung Lee (National Taiwan University), and I-Chun Cheng (National Taiwan University)*

CP-17 Self-Aligning Electrical Interface for Curved Integrated Forming, *Li-Wei Yao (Industrial of Technology Research Institute), Yirong Lin (Industrial of Technology Research Institute), Hsiao-Fen Wei (Industrial of Technology Research Institute), Dong Sen Chen (Industrial Technology Research Institute (ITRI)), and Chung-Wei Wang (Industrial of Technology Research Institute)*

CP-18 Preparation of Enzyme Immobilized Potentiometric Enzyme Acetylcholine Biosensor Based on Functionalized ZnO Thin Film, *Hong-Wei Zhu (National Yunlin University of Science and Technology), and Po-Hui Yang (National Yunlin University of Science and Technology)*

CP-19 Modulation of Bi/p-Si Schottky Barrier Height via Quantum Confinement Effect and Temperature, *Tsun-Tai Chien (National Taiwan University), Yi-Hsiang Hsu (National Taiwan University), Hsin-Yu Wang (National Taiwan University), Chieh Chou (National Taiwan University), and Hao-Hsiung Lin (National Taiwan University)*

CP-20 Porous Agar Scaffolds Containing Carbon Nanotube, MXene, and Conductive Polymer for Thermoelectric Energy Harvesting, *Shih-Huan Huang (National Yang Ming Chiao Tung University), Ning-Jun Zhang (National Yang Ming Chiao Tung University), and Gen-Wen Hsieh (National Yang Ming Chiao Tung University)*

CP-21 Performance Optimization of MOCVD-Grown β-Ga_2O_3 for Biosensor Applications via Etching and Surface Patterning, *Po-An Yang (Chung Hsing University), Jun-Wei Chen (Chung Hsing University), Yao-Chi Chang (Chung Hsing University), Hsin-Yu Chou (National Chung Hsing University), Wei-Hsiang Chiang (National Dong Hwa University), Po-Kai Kung (National Chi Nan University), Anoop Kumar Singh (National Chung Hsing University), Po-Liang Liu (National Chung Hsing University), and Dong-Sing Wuu (National Chi Nan University)*

CP-22 Lattice Constant and Incorporation Behavior of GaAsBi Epilayers Grown on GaAs by MBE, *Shi-Zhe Zhang (National Taiwan University), Chia-Che Yang (National Taiwan University), and Hao-Hsiung Lin (National Taiwan University)*

CP-23 An IGZO-Based Enzymatic Biosensor for Uric Acid Detection Using Potentiometric Measurement, *Li-Yao Song (National Yunlin University), and Po-Hui Yang (National Yunlin University)*

CP-24 Size and Strain Broadening in the XRD Peaks of Granular Bi Thin Films, *Yi-Yan Shen (National Taiwan University), Tien-Kuei Lee (National Taiwan University), Chieh Chou (National Taiwan University), and Hao-Hsiung Lin (National Taiwan University)*

CP-25 Nanostructured g-C_3N_4-Decorated Heterogeneous Graphite Felt Electrodes for Enhanced Redox Kinetics in Vanadium Redox Flow Batteries, *Iqra Shaheena (Chang Gung University), Yu-Xian Lee (Chang Gung University), Wei-Hao Chiu (Chang Gung University), and Shih-Hsuan Chena Kun-Mu Lee (Chang Gung University)*

CP-26 Electrical and Reliability Characteristics of CoAl/Co as Interconnect Metal, *Yen-Jui Chen (National Chi-Nan University), and Yi-Lung Cheng (National Chi-Nan University)*

CP-27 Ultrasensitive Detection of Organic Analytes Using Self-Precipitated Au-Titanate Nanofiber SERS Substrates, *Ming-Chung Wu (Chang Gung University), Yin-Hsuan Chang (Chang Gung University), Ting-Han Lin (Chang Gung University), Kai-Chi Hsiao (Chang Gung University), and Chang Jia-Mao (Chang Gung University)*

CP-28 CVD-engineered Niobium-doping for robust WSe_2 p-FET Applications, *Chia-Chung Wu (National Tsing Hua University), I-Ling Li (National Tsing Hua University), Cheng Chieh Hsieh (National Chung Hsing University), Tsung Che Hsieh (National Tsing Hua University), Hung Hui Yang (National Tsing Hua University), Pin Yi Li (National Tsing Hua University), and Chao-Hui Yeh (National Tsing Huang University)*

CP-29 Performance Enhancement of P-type Tellurium Thin-Film Transistors via Ultralow-Temperature Deposition and Al_2O_3 Passivation, *Pingchun Hsieh (National Taiwan University), Chi-Hao Chang (National Taiwan University), and I-Chun Cheng (National Taiwan University)*

CP-30 Integrated CBD-Fabricated β-Ga_2O_3 EGFET Platform for pH Sensing, *Ching-Ho Tien (Tunghai University), Cheng-Xiang Yan (Tunghai University), Hao-Ting Hsu (Tunghai University), Jin-Wei Chang (Tunghai University), Jia-Cheng Wu (Tunghai*

University), and Hsin-Yu Chou (National Chung Hsing University)

CP-31 Impact of Oxygen Incorporation in Ru Electrodes on the Ferroelectric Properties of $Hf_{0.5}Zr_{0.5}O_2$, *Hyojun Choi (Seoul National University), Kun Yang (Seoul National University), Ji Sang Ahn (Seoul National University of Science and Technology), Eun Ji Ju (Seoul National University of Science and Technology), Dong In Han (Seoul National University), Se Hyun Kim (Seoul National University), Ju Yong Park (Seoul National University), Heejin Hong (Seoul National University), Jeong Hwan Han (Seoul National University of Science and Technology), and Min Hyuk Park (Seoul National University)*

CP-32 Resistance Reduction in Nanoscale Copper Interconnects via Low-Temperature Grown Graphene, *Yi-Hsiang Shih (National Cheng Kung University), Peng-Chi Wang (National Cheng Kung University), and Wei-Chen Tu (National Cheng Kung University)*

CP-33 Electrochemical Performance Analysis of Boron Nitride and Nitrogen-Doped Nanodiamond Composite Nanostructures for Supercapacitor Applications, *Bohr-Ran Huang (National Taiwan University), and Po-Wen Cheng (National Taiwan University)*

CP-34 Zinc Acetate Modified $FAPbI_3$ Quantum Dot Photodetectors with Enhanced NIR Response, *Che-Wei Chang (Ming Chi University of Technology), Cheng-Ho Hsieh (Ming Chi University of Technology), Kuan-Yu Ke (Ming Chi University of Technology), Yu-Cheng Zhang (Ming Chi University of Technology), Xiu-Jia Guan (Ming Chi University of Technology), and Zong-Liang Tseng (Ming Chi University of Technology)*

CP-35 Phase-Engineered Heterostructures of Mo_2C via Plasma-Assisted Selenization and Sulfurization Processes for Plasmon-Free Surface-Enhanced Raman Spectroscopy and Excellent Hydrogen Evolution Reaction, *K.m.m.d.k.kimbulapitiya (National Tsing Hua University), Bushra Rehman (National Tsing Hua University), and Yu-lun Chueh (National Tsing Hua University)*

CP-36 TRT/PMMA Bi-Layer Support Enabled Top-Down Transfer for Fully Transferred Transition Metal Dichalcogenide Transistor Arrays, *Yu-Qi Huang (National Tsing Hua University), Ying-Chun Shen (National Tsing Hua University), and Yu-Lun Chueh (National Tsing Hua University)*

CP-37 Enhanced Performance of Wafer-scale MoS_2 Transistors Through Low-Power Plasma-Assisted Molecular Doping and Encapsulation Techniques, *Po-Yen Chen (National Tsing Hua University), Ming Jin Liu (National Tsing Hua University), and Yu-Lun Chueh (National Tsing Hua University)*

CP-38 Impacts of Strain Engineering and Spin-Orbit Coupling on Hole Mobility of Monolayer Hafnium Disulphide, *Shu-Tong Chang (National Chung Hsing University), Kai-Wei Huang (National Chung Hsing University), and Yen-Shuo Su (National Chung Hsing University)*

(National Tsing Hua University), and Yu-Lun Chueh (National Tsing Hua University)

CP-49 Epitaxial Growth and Conversion Control of High-Quality 2 Inch Single-Crystalline Fe_2O_3 Thin Films, *Hu Hsiang-Sheng (National Tsing Hua University), Ming Jin Liu (National Tsing Hua University), Zheng Zeng (National Tsing Hua University), and Yu-Lun Chueh (National Tsing Hua University)*

CP-50 Microstructural Evolution and Interfacial Reaction between Indium Solders and Ag under a Temperature Gradient during Reflow Process, *Tingyu Chou (National Tsing Hua University), Zhouyi Wu (National Tsing Hua University), Yang Pohsun (National Tsing Hua University), and Fan-Yi Ouyang (National Tsing Hua University)*

CP-51 Investigation of Passivation-Induced Field-Effect Modulation in BEOL-Compatible P-type Cu_2O Thin-Film Transistors, *Yuang Ming Lin (College of Semiconductor Advanced Technology Research, NSYSU), and Hsin-Chu Chen (National Sun Yat-sen University)*

CP-52 Embedded Motorcycle Safety System with TRIZ-Guided MobileNet-SSD Object Detection, *Yuang-Ming Lin (National Taipei University of Technology), Chin-Chuan Hsieh (National Taipei University of Technology), Zheng-Xian Huang (National Taipei University of Technology), and Hung-Yuan Kuo (National Taipei University of Technology)*

CP-53 Characterization of EMI Shielding and Reliability in Sputtered Cu-Based Multi-layers for Advanced Packaging, *Che-Jung Chang (National Sun Yat-Sen University), Yuang Ming Lin (College of Semiconductor Advanced Technology Research, NSYSU), Cheng-Hsuan Liu (National University of Kaohsiung), and Hsin-Chu Chen (National Sun Yat-sen University)*

CP-54 Enhanced Ag Nanopaste Bonding with Cu Surface Pre-Treatment of Self-Assembled Monolayers, *Hsin-Yu Hou (National Tsing Hua University), and Fan-Yi Ouyang (National Tsing Hua University)*

CP-55 High pH and Urea Sensing Using Thin Ir Membrane in AgCl/electrolyte/Ir/SiO_2/p-Si Sensor, *Minh Long Le Nguyen (Chang Gung University), Abhijit Aich (Chang Gung University), Asim Senapati (Chang Gung University), Yi-Pin Chen (Chang Gung Memorial Hospital (CGMH), Chang Gung University), Shih-Yin Huang (Keelung Chang Gung Memorial Hospital), and Siddheswar Maikap (Chang Gung University)*

CP-56 Synthesis of bi-layer MoS_2 single crystals and measurement of electrical properties, *Ping-Sheng Lin (National Sun Yat-sen University), Jia-He Liu (National Sun Yat-sen University), Kuang-I Lin (National Cheng Kung University), Horng-Chih Lin (National Yang Ming Chiao Tung University), Wen-Hao Chang (National Yang Ming Chiao Tung University), and Chang-Hsiao Chen (National Sun Yat-Sen University)*

CP-57 Enhanced Selectivity of Hydrogen Sulfide Gas by Hybrid Zeolitic Imidazolate Framework-67/2D Platinum Diselenide-based Sensors toward Wafer-scale Production*, Ren-Hao Guo (National Tsing Hua University), Tzu-Wen Kuo (National Tsing Hua University), Jun Bi Yang (National Tsing Hua University), Paul Albert Labasano Sino (National Tsing-Hua University), and Yu-Lun Chueh (National Tsing Hua University)*

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DP-2 Green Light by Second-Harmonic Generation of 1064-nm Photonic-Crystal Surface-Emitting Lasers, *Gray Lin (National Yang Ming Chiao Tung University), Mao-Jie Huang (National Yang Ming Chiao Tung University), Shih-En Li (National Yang Ming Chiao Tung University), and Chun-Yu Cho (National United University)*

DP-3 Defect-Engineered Mg-Doped α-Ga_2O_3 Thin Films for Ultraviolet Photodetectors with Enhanced Responsivity and Fast Response, *Chun Chia Lin (National Cheng Kung University), Chien Sheng Cheng (National Cheng Kung University), Hao-Chun Hung (National Cheng Kung University), Shun-Cheng Shih (National Cheng Kung University), Wei-Chou Hsu (National Cheng Kung University), and Wen-Chau Liu (National Cheng Kung University)*

DP-4 Flexible Photodetectors Based on PEDOT:PSS/$CsPbBr_3$/Green Graphene Heterostructures, *Wen-Hsu Chang (Chung Yuan Christian University), Hung-Hsun Chen (Chung Yuan Christian University), Tsung-Yen Tsai (Chung Yuan Christian University), Yi-Chia Cheng (Chung Yuan Christian University), Yu-Chi Hu (Chung Yuan Christian University), Meng-Lin Tsai (National Taiwan University of Science and Technology, Taiwan), Chiashain Chuang (Chung Yuan Christian University), and Dung-Sheng Tsai (Chung Yuan Christian University, Taiwan.)*

DP-5 Highly Efficient Anthracene-Based Host for Blue Triplet–Triplet Fusion OLEDs, *Yu-Ting Lin (National Taiwan University), Jiun-Haw Lee (National Taiwan University), Tien-Lung Chiu (Yuan Ze University), and Yi-Ting Lee (Soochow University)*

DP-6 Balancing Breakdown Voltage and Field Stability in AlGaAsSb SPADs through Charge Layer Doping Optimization, *Hsiao-Ching Huang (National Tsing Hua University), Yu Tung Hsieh (National Tsing Hua University), Meng-Chen Hsueh (National Tsing Hua University), Xue-Wen Liu (National Tsing Hua University), and Yi-Shan Lee (National Tsing Hua University)*

DP-7 Evaluating the Dominant Leakage Mechanisms in AlGaAsSb SPADs for Low-Noise Photon Detection, *Jing-Siou Su (National Tsing Hua University), Chih-Yun Chou (National Tsing Hua University), Xue-Wen Liu (National Tsing Hua University), and Yi-Shan Lee (National Tsing Hua University)*

DP-8 Deposition of Amorphous Indium Gallium Oxide Thin Films via RF-Sputtering for Photodetectors Application, *Wei-You Shen (National Kaohsiung University), Yu-Quan Zhang (National Kaohsiung University), Zi-Zhen Wang (National Kaohsiung University), Feng-Chi Liu (National Kaohsiung University), Song-Jing Song (National Kaohsiung University), Ming-Chih Tsai (National Kaohsiung University of*

Science and Technology), Yi Chou (National Kaohsiung), and Sheng-Po Chang (National Kaohsiung University)

DP-9 Paper-Based Light-Emitting Diodes with $CsPbBr_3$ Perovskite Quantum Dots, *Chang-Syuan Wang (Chung Yuan Christian University), Wen-Cheng Su (Chung Yuan Christian University), Tsung-Che Wang (Chung Yuan Christian University), Yu-Chi Hu (Chung Yuan Christian University), Wen-Chen Tseng (Chung Yuan Christian University), Ji-Lin Shen (Chung Yuan Christian University), and Dung-Sheng Tsai (Chung Yuan Christian University)*

DP-10 Defect-Controlled Gain and Response Trade-off in Mg-Doped β-Ga_2O_3 UV Photodetectors by Mist-CVD, *Kai Ting Chang (National Cheng Kung University), Chien Sheng Cheng (National Cheng Kung University), Shiou-Ying Cheng (National Ilan University), Wen-Chau Liu (Nation Cheng Kung University), and Wei-Chou Hsu (National Cheng Kung University)*

DP-11 High Photoconductive Gain of GaN Epilayer Enhanced by Gold Nanoparticles, *Yi-Chan Lee (National Central University), Wen-Chi Tseng (National Central University), Kuan-Hung Lo (National Central University), Yu-Cheng Wang (National Central University), Hung-Yang Lin (National Central University), Jen-Inn Chyi (National Central University), and Chang Ching Tu (National Central University)*

DP-12 Development of Stretchable Organic Photodiodes and Their Application in PPG Heart Rate Sensing, *Tien Hao Wu (National Yunlin University of Science and Technology), Tzu Ming Hung (National Yunlin University of Science and Technology), and Chien-Chung Shih (National Yunlin University of Science and Technology)*

DP-13 Phase-Dependent UV Response of Mg-doped Ga_2O_3 Photodetectors Grown by Mist-CVD, *Syuan Hao Lin (National Cheng Kung University), Chien Sheng Cheng (National Cheng Kung University), Shiou-Ying Cheng (National Cheng Kung University), Wen-Chau Liu (National Cheng Kung University), and Wei-Chou Hsu (National Cheng Kung University)*

DP-14 Benzimidazole Derivative as Host for Blue Phosphorescent Organic-Light-Emitting Diodes, *Wei Luo (National Taiwan University), Chiao-Ying Kuo (National Taiwan University), Man-Kit Leung (National Taiwan University), Tien-Lung Chiu (Yuan Ze University), and Jiun-Haw Lee (National Taiwan University)*

DP-15 Dispersion Engineering for Pulse Compression by using Tantalum Pentoxide Waveguide, *Jung Ti Hsu (National Sun Yat-sen University.), Li Cheng Chuang (National Sun Yat-sen University), Yu Hsiang Lin (National Sun Yat-sen University), Bo Huei Lia (Taiwan Instrument Research Institute of NARLabs), Guan Hong Li (National Sun Yat-sen University), Yi Jen Chiu (National Sun Yat-sen University), Min-Hsiung Shih (Academia Sinica), and Chao Kuei Lee (National Sun Yat-sen University)*

DP-16 128Gb/s per Channel O-band CWDM Photonic Engine for Co-packaged Optical Interconnects, *Jun-Rui Chen (National Taiwan University of Science and Technology), San Liang Lee (National Taiwan University of Science and Technology), Ming-Wei Lin (Taiwan Semiconductor Research Institute), Jing-Wei Peng (Taiwan Semiconductor Research Institute), Dong-Hong Su (Taiwan Semiconductor Research*

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DP-17 Design Optimization and Analysis of High-Power DFB Lasers with AR/AR Coatings, *Siti Sulikhah (National Taiwan University of Science and Technology), and San Liang Lee (National Taiwan University of Science and Technology)*

DP-18 Comparative Studies on Electrical and Optical Characteristics of Micro-LEDs Fabricated via ICP Etching and Ion Implantation, *Jun-Wei Chen (National Chung Hsing University), Po-An Yang (National Chung Hsing University), Lo Shiang-Jiun (National Chung Hsing University), Yu-Chih Hsu (National Chung Hsing University), Wei-Hsiang Chiang (National Dong Hwa University), Hsin-Yu Chou (National Chung Hsing University), Kung Po-Kai (National Chi Nan University), Anoop Kumar Singh (National Chung Hsing University), Po-Liang Liu (National Chung Hsing University), and Dong-Sing Wuu (National Chi Nan University)*

DP-19 Unprecedented Boost in External Quantum Efficiency of Subband Gap Organic Light-emitting Diodes, *Anas Mujahid (National Cheng Kung University), Tzu-Yu Huang (National Cheng Kung University), and Tzung-Fang Guo (National Cheng Kung University)*

DP-20 Enhanced Stability of Perovskite Solar Cells in Extreme Space Environments via Polymer Modification, *Harini Srikanth Rao (Chang Gung University), Seoungjun Ahn (Chang gung University), Wei-Chen Chu (Chang Gung University), Shih-Hsuan Chen (Chang Gung University), Wei-Hao Chiu (Chang Gung University), and Kun-Mu Lee (Chang Gung University)*

DP-21 Study of Phase-controlled Phase Modulators, *Joey Ke (National Central University), Te Chih Song (National Central University), and Chii-Chang Chen (National Central University)*

DP-22 Optical Eraser Experiments Implemented with Gallium Nitride Meta-Devices at Visible Wavelengths, *Yang Jui-Cho (National United University), Yan-Kai Huang (National United University), Meng-Hsin Chen (National United University), Chih-Tien Chen (Chung-Shan Institute of Science and Technology), Chien-Te Ku (Chung-Shan Institute of Science and Technology), Guan-Shian Liu (Chung-Shan Institute of Science and Technology), and Vin-Cent Su (National United University)*

DP-23 Enhancing Cu (In,Ga) Se_2 Solar Cell Efficiency with Vertically Channel-Stacked WSe_2 Rear Passivation Layers, *Chia-Chen Chung (National Tsing Hua University), Jun-Nan Liu (National Tsing Hua University), Chih-Huang Lai (National Tsing Hua University), and Yu-Lun Chueh (National Tsing Hua University)*

DP-24 Defect Passivation-Driven Electroluminescence Enhancement in Two-Dimensional Semiconductor via $(NH_4)_2S$ Surface Treatment, *Cheng-Ying Yang (National Taiwan Ocean University), James Singh Konthoujam (Academia Sinica), Che-Jia Chang (National Taiwan University), Shih-Yen Lin (Academia Sinica), Chiao-Yun Chang (National Taiwan Ocean University), and Min-Hsiung Shih (Academia Sinica)*

DP-25 Ultrahigh-Q Thermal Emission from Engineering Light Absorption Associated with Quasi-BIC Modes, *Chang-Wei Chu (National Taiwan University of Science and Technology), Ming-Hsun Wang-Chang (National Taiwan University of Science and Technology), Bo-Tai Huang (National Taiwan University of Science and Technology), Jin-Ruei Shih (National Taiwan University of Science and Technology), and Yang-Chun Lee (National Taiwan University of Science and Technology)*

DP-26 Gap-Type MSM TFT Phototransistors Based on 1600 nm PbS CQDs for IR Detection, *Jia-Wei Fan (National Yang Ming Chiao Tung University), Bo-Wei Liou (National Yang Ming Chiao Tung University), Chih-Chung Tu (National Yang Ming Chiao Tung University), Ya-Hsiang Tai (National Yang Ming Chiao Tung University), Wang-Wei Ko (National Tsing Hua University), Che-Yu Lai (National Tsing Hua University), and Hsueh-Shih Chen (National Tsing Hua University)*

DP-27 Novel Buried Heterostructure Laser Design for Wide Single-Mode Operation, *Ika Novitasari (National Taiwan University of Science and Technology), and San Liang Lee (National Taiwan University of Science and Technology)*

DP-28 Plasmonic TiN Metal-Insulator-Metal Linear-Polarized Absorber, *Tsung-Tu Huang (National Tsing Hua University), Zheng-Zhe Chen (Academia Sinica), Tzu-Yu Peng (National Taiwan University), Yu-Jung Lu (Academia Sinica), and Min-Hsiung Shih (Academia Sinica)*

DP-29 Conductivity Improvement of Low-Temperature Growth of Graphene, *Li-Chia Tai (National Cheng Kung University), Yi-Hsiang Shih (National Cheng Kung University), Shao-Yu Liu (National Cheng Kung University), and Wei-Chen Tu (National Cheng Kung University)*

DP-30 High-Efficiency 2T Perovskite/Silicon Tandem Solar Cells Using Commercial TOPCon and Dual Interface Passivation, *Muhammad Asim (National Cheng Kung University), Yu-Ting Chen (National Cheng Kung University), Yang Kai-Wei (National Cheng Kung University), Faisal Attique (Research center for Critical Issues (RCCI)), and Hsiao-Chen Lin (Research center for Critical Issues (Research center for Critical Issues (RCCI)), Pei-Ying Lin(Research center for Critical Issues (RCCI)), Chih-Wei Chu(Research Center for Applied Sciences), Wei-Chih Lai(National Cheng Kung University), Tzung-Fang Guo(National Cheng Kung University)*

DP-31 CMOS-Based Design Structure for High-Performance Avalanche Photodiodes, *Jau-Yang Wu (National Taiwan University of Science and Technology)*

DP-32 Enhancing Sensitivity and Stability of Drop-Cast ZnO/MXene Sensors via UV-Ozone Surface Modification, *Jian-Fu Tang (National Kaohsiung University of Science and Technology), Chung-Yuan Yang (National Kaohsiung University of Science and Technology), Lin-Wei Yang (National Kaohsiung University of Science and Technology), and Chien-Hsiung Tang (National Cheng Kung University)*

DP-33 Flexible and Transparent MoS_2 Quantum Dots/Green Graphene Heterostructures for High-Sensitivity UV Detection, *Bo-Wei Kuan (Chung Yuan Christian University), Yun-Shan Li (Chung Yuan Christian University), Po-Kei Chen (Chung Yuan Christian University), Yu-Chi Hu (Chung Yuan Christian University), Ji-Lin Shen (Chung Yuan Christian University), Chiashain Chuang (Chung Yuan Christian University), and*

Dung-Sheng Tsai (Chung Yuan Christian University)

DP-34 Achieving over 31% Efficiency in Perovskite/Silicon Tandem Solar Cells via Noval SAM-Induced Interface Optimization, *Farhan Yousuf (National Cheng Kung University), Yu-Ting Chen (National Cheng Kung University), Tzung-Fang Guo (National Cheng Kung University), Chih-Wei Chu (Research Center for Applied Sciences), and Peter Chen (National Cheng Kung University)*