APCOT2026

The 12th Asia-Pacific Conference on Transducers and Micro-Nano Technology

June 21-24, 2026

Taichung, Taiwan

& ICSS 2026

Conference Program

Advancing Sensors and Systems for a Smarter Future

Organizers

Program Overview

Sun. June 21	Mon. June 22	Tue. June 23	Wed. June 24	Thu. June 25
	08:30 Opening Plenary Speech 1	08:30 Plenary Speech 2	08:40 Plenary Speech 3	09:00 Tech Tour
	09:30 Break	09:20 Break	09:30 Break	
	10:00 OR1-1A, OR1-1B, OR1-1C, OR1-1D, OR1-1E	09:35 Special Session on International Cooperation	10:00 OR3-1A, OR3-1B, OR3-1C, OR3-1D, OR3-1E	
	12:00 Lunch Side Meeting	11:15 OR2-1A, OR2-1B, OR2-1C, OR2-1D, OR2-1E	12:00 Lunch	12:30
	13:00 OR1-2A, OR1-2B, OR1-2C, OR1-2D, OR1-2E	12:25 Lunch	13:00 OR3-2A, OR3-2B, OR3-2C, OR3-2D, OR3-2E	
	14:30 Poster Session PO1 w/ Break	13:15 MOE Meeting; NSTC Meeting; Poster Session PO2 w/ Break; 14:30 City Tour	14:00 Poster Session PO3 w/ Break	
	16:00 OR1-3A, OR1-3B, OR1-3C, OR1-3D, OR1-3E		15:30 OR3-3A, OR3-3B, OR3-3C, OR3-3D, OR3-3E	
	17:30	17:30	16:20 Award/Closing Ceremony	
			17:00	
18:00 Reception		18:00 Banquet		
20:00		20:30		

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Welcome Messages

Welcome to the 12th Asia-Pacific Conference of Transducers and Micro-Nano Technology (APCOT 2026)! APCOT is a biannual conference of the Asia-Pacific scientific community on advanced sensors, actuators, and micro/nano technology. The conference provides a forum for scientists, engineers, and practitioners around the world to present their latest works, exchange ideas, and find new directions.

APCOT 2026 is being held in Taichung, Taiwan, from June 21 to 24, 2026. Taichung is the second largest city in Taiwan. Located in central Taiwan, she hosts numerous historic sites, modern attractions, natural sceneries, fine restaurants, and leisure spots. Taichung is also the base of numerous high-tech activities in the semiconductor, precision manufacturing, intelligent machinery, optoelectronics, and biomedical industries. APCOT 2026 is held jointly with the International Conference on Smart Sensors 2026 (ICSS 2026) that is dedicated to education, research and strengthening industrial cooperation in micro-nano technologies. The joint conferences blend in local strength with the global platform to spark new ideas and foster future links and cooperation.

This year, we received more than 300 abstract submissions. In the three-day conference, we have 3 plenary speeches, 4 keynote speeches, 30 invited talks, 3 self-organized special sessions, one special industrial session, one special session on international cooperation, 149 oral presentations, 143 poster presentations, and more than 20 exhibition booths. We would like to express our most sincere gratitude to all authors for contributing their high-quality works. The efforts of committee members, conference organizers, staff and volunteers that have helped make this conference a success are also highly appreciated.

Finally, for all APCOT 2026 participants, thank you all! Please enjoy the conference and the city!

Yi Chiu, Professor, National Yang Ming Chiao Tung University, Taiwan

Yu-Lin Wang, Professor, National Tsing Hua University, Taiwan

Co-Chair, APCOT 2026

Welcome Messages

It is our great pleasure to welcome you to the 2026 International Conference on Smart Sensors (ICSS), held jointly with the 12th Asia-Pacific Conference of Transducers and Micro-Nano Technology (APCOT 2026). This event also marks the 9th joint edition of the Nano-Engineering and Micro-System Technology Conference (NMC) and the Symposium of the Association for Chemical Sensors in Taiwan (ACST), two leading organizations dedicated to advancing MEMS and sensor technologies in Taiwan.

As President of the Nano-Technology and Micro-System Association (NMA), I am honored to extend my warmest welcome to all participants attending this prestigious event focused on MEMS, NEMS, sensors, and microsystems. Over the years, ICSS has evolved into a premier platform for showcasing cutting-edge research, technological innovations, and commercialization efforts in microsensors, microactuators, MEMS, and microsystem technologies. These technologies play vital roles in a wide range of applications, including healthcare and medical devices, transportation, environmental monitoring, energy harvesting, intelligent systems, and consumer products.

Building upon the success of previous conferences, ICSS has become a highly anticipated annual event that promotes scientific excellence and strengthens collaboration between academia and industry. The joint organization of ICSS and APCOT 2026 combines regional strengths with a global perspective, creating an ideal environment for generating new ideas, fostering innovation, and establishing future collaborations.

This year, the conference is being held at The Splendor Hotel Taichung, Taiwan. With more than 300 submitted abstracts and over 20 participating exhibitors, the continued enthusiasm and active engagement of our community underscore the significance of this gathering. Our ongoing partnership with ACST further enriches the technical program, broadens participation, and enhances opportunities for networking and the exchange of ideas. Together, these efforts continue to make a meaningful and lasting impact on both our field and society.

This event would not be possible without the dedication and hard work of the organizing committee. I would like to express my sincere gratitude to Prof. Yi Chiu and Prof. Yu-Lin Wang for their outstanding leadership in planning and organizing this year's conference. I would also like to acknowledge the invaluable support provided by government agencies, academic institutions, research centers, and industry partners, including the National Science and Technology Council, National Yang Ming Chiao Tung University, and National Tsing Hua University. The participation of our industrial exhibitors is equally important in bridging the gap between research and commercialization, strengthening the connection between innovation and real-world applications.

Finally, I would like to thank all keynote speakers, invited speakers, presenters, exhibitors, and attendees for being part of ICSS 2026 and APCOT 2026. I hope this conference provides valuable opportunities to reconnect with colleagues, establish new collaborations, exchange knowledge, and enjoy a program that is both intellectually stimulating and personally rewarding.

I wish you a successful conference and a pleasant stay in Taichung.

Fan-Gang Tseng, President
Nano-Technology and Micro-System Association (NMA), Taiwan

Welcome Messages

On behalf of the Association of Chemical Sensors in Taiwan (ACST), I would like to welcome everyone to the 12th Asia-Pacific Conference on Transducers and Micro-Nano Technology (APCOT) and the International Conference on Smart Sensors (ICSS). ACST is one of the main sponsors of 2026 APCOT and 2026 ICSS. ACST has been established for 28 years and has become the major force in Taiwan dedicates in education, research, application and the commercialization of chemical sensors and biosensors.

This year, APCOT/ICSS is held from June 21 to 24 in Taichung. The conference has received numerous submissions in various disciplines including Chemical Sensors, Biosensors, Physical sensors, MEMS & NEMS Fabrication, Nanofluidics, Photonics, Packaging, and AI. In addition to presentations contributed by the academia, the conference organizers also incorporate industrial experts to share their opinions regarding to the opportunities and challenges in future world. Moreover, culture tours are also arranged for all participants. We wish all the guests can experience the culture here and explore the chances for further collaboration.

We would like to thank all the attendees for joining the conference to network and share your unique expertise during your busy schedule. We are particularly grateful to all the organizing committee who volunteered their valuable time in the organization of the conference. We hope you enjoy 2026 APCOT and your stay in Taiwan.

Sincerely

Prof. Yu-Lin Wang,
President, Association of Chemical Sensors in Taiwan
Director, Institute of Nanoengineering and Microsystems
National Tsing Hua University, Taiwan

About ICSS 2026

International Conference on Smart Sensors 2026 (ICSS 2026), Taiwan's premier conference on micro-nano technologies, focuses on advancing research and fostering industrial collaboration. With an expected 300+ attendees and 20+ industrial booths, the conference features topics in Physical and Chemical MEMS, Chemical Sensors, Biosensors, and provides a vital platform for academia and industry interaction. A special ICSS Industrial Session is organized to address the industrial deployment of MEMS/NEMS technology. Panelists from the industrial supply chain are invited to share their experience in global market access, strategic partnership, and technology transfer.

General Information

Registration and Information Desk

18:00 - 20:00 June 21	1F, National Museum of Natural Science
07:30 - 17:30 June 22	13F, Splendor Hotel Taichung
08:00 - 17:30 June 23	13F, Splendor Hotel Taichung
08:00 - 17:00 June 24	13F, Splendor Hotel Taichung

Name Badge

Name badges are required for access to all Conference activities.

Electronic Proceeding

The Proceedings will be provided via a download option to registered attendees during the week of Conference.

Coffee Break

Coffee and light snacks will be served each morning and afternoon in the Exhibit area in Grand Ballroom 2.

Lunch

Lunch will be provided to registered attendees each day. Lunch tickets, included in the name badge, are required to receive lunch boxes. Attendees can have lunches in Room Plum Blossom 1, or in other session rooms unless they are reserved for side meetings.

Banquet

Banquet will be held from 18:00-20:30 on June 23 on 11F, Splendor Hotel Taichung. Tickets are required for banquet attendees.

Wi-Fi

Wi-Fi access codes will be provided during the conference.

Cellular Phones

Please silence cellular phones or other electronic devices as a courtesy to other attendees.

Restrooms

Restrooms, accessible via elevators and stairs, are located in Floors 10-14 in Splendor Hotel Taichung.

Exhibits Hours

08:30 - 17:00 June 22
08:30 - 17:00 June 23
08:30 - 16:00 June 24

General Information

Conference Venue

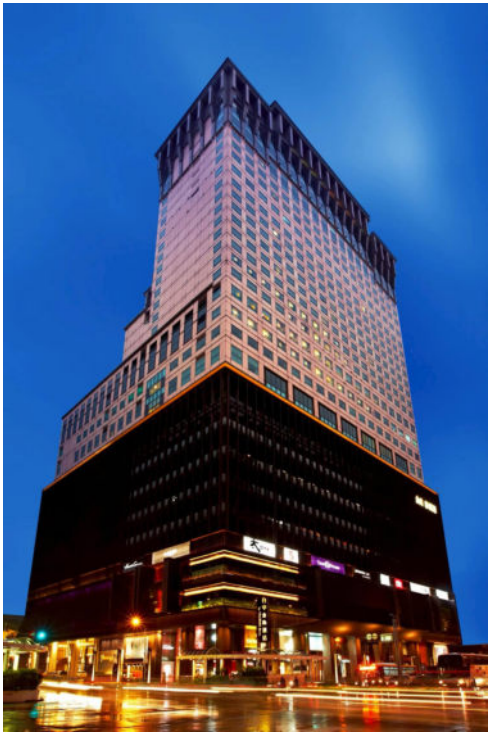
Hotel: The Splendor Hotel-Taichung 台中金典酒店

Contact: TEL: +886 4 2328 8000

Website: https://www.splendor-taichung.com.tw/en

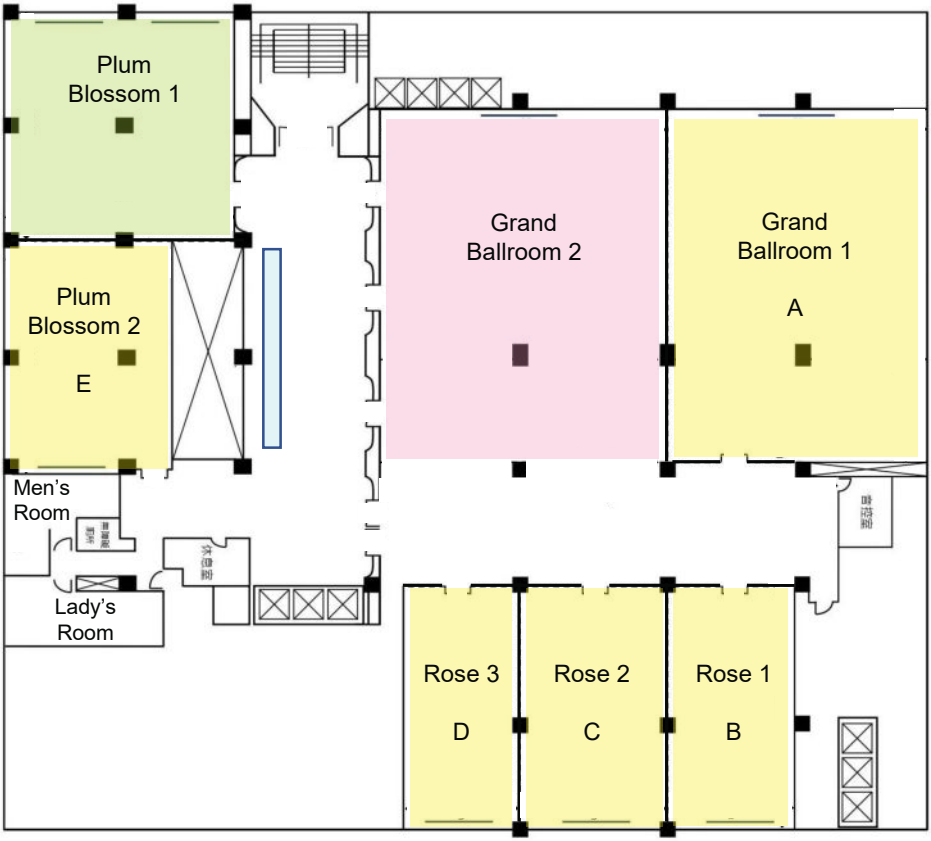
Address: No. 1049, Jianxing Rd., West Dist., Taichung City (TAIWAN)

403 台中市西區健行路1049號



General Information

Floor Plan



Session room

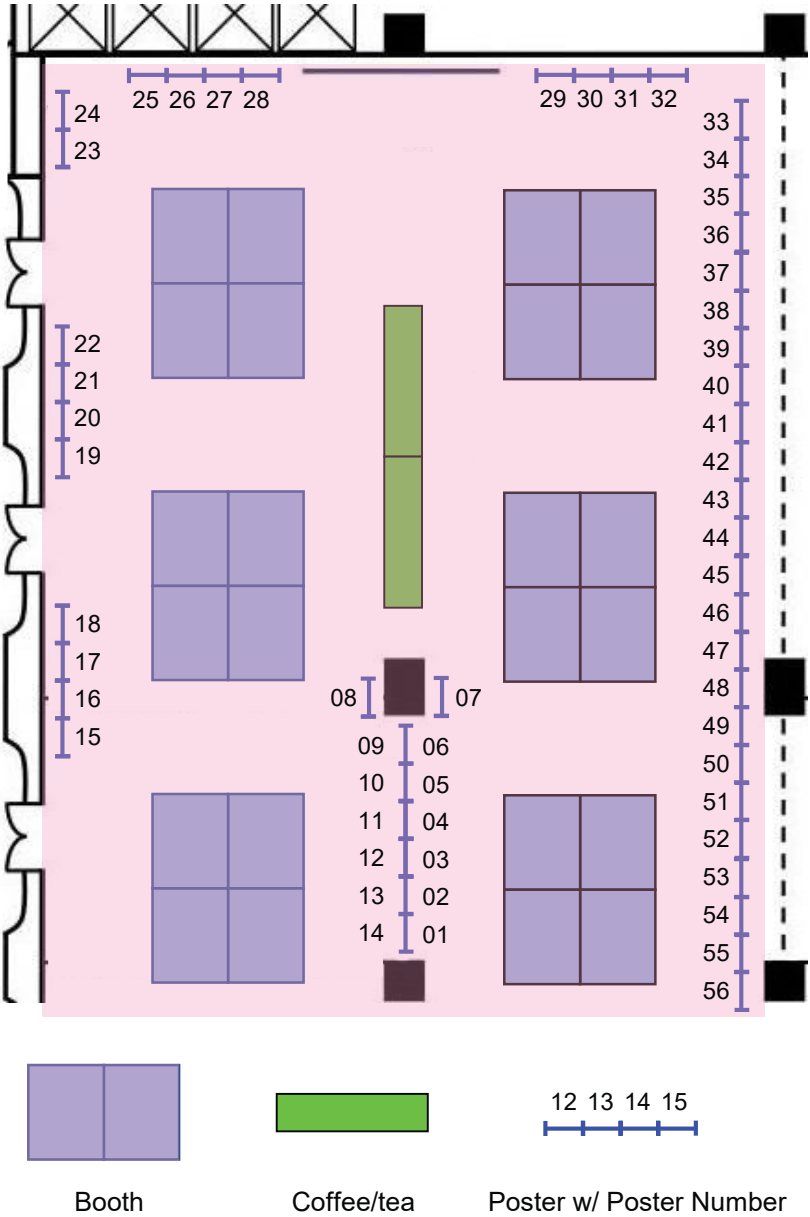
Poster/Exhibition area

Registration/Information desk

Lunch area

General Information

Exhibit/Poster Area



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NATIONAL YANG MING CHIAO TUNG UNIVERSITY

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

國立中山大學 半導體及重點科技研究學院

智慧感測器 Intelligent Sensor Alliance

TSRI 國家實驗研究院 台灣半導體研究中心

NCIR 國家實驗研究院 國家儀器科技研究中心 National Center for Instrumentation Research

ITRI Industrial Technology Research Institute

IEEJ

皮托科技 PITOTECH CO., LTD.

PQ 博全國際股份有限公司

CADMEN Taiwan Auto-Design Co. (TARC) 虎門科技股份有限公司

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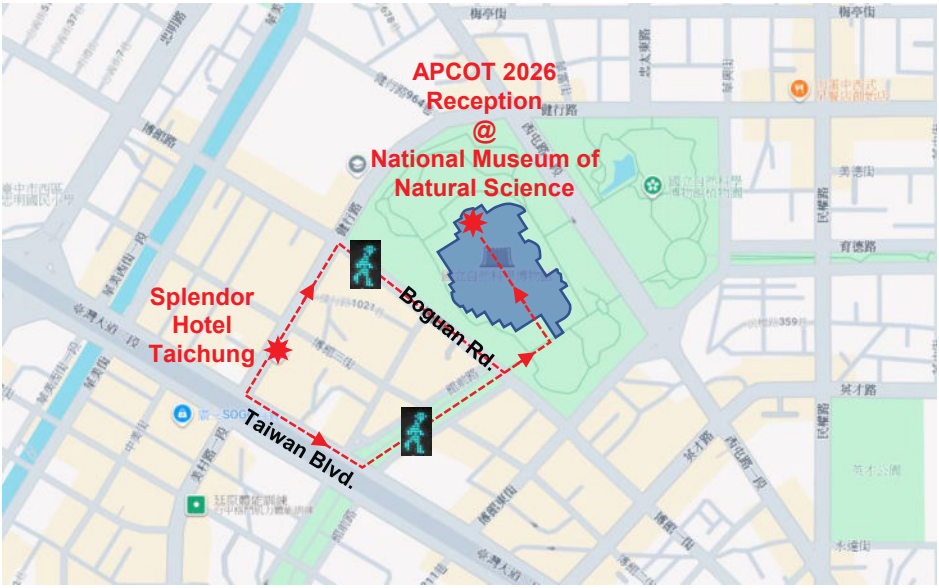
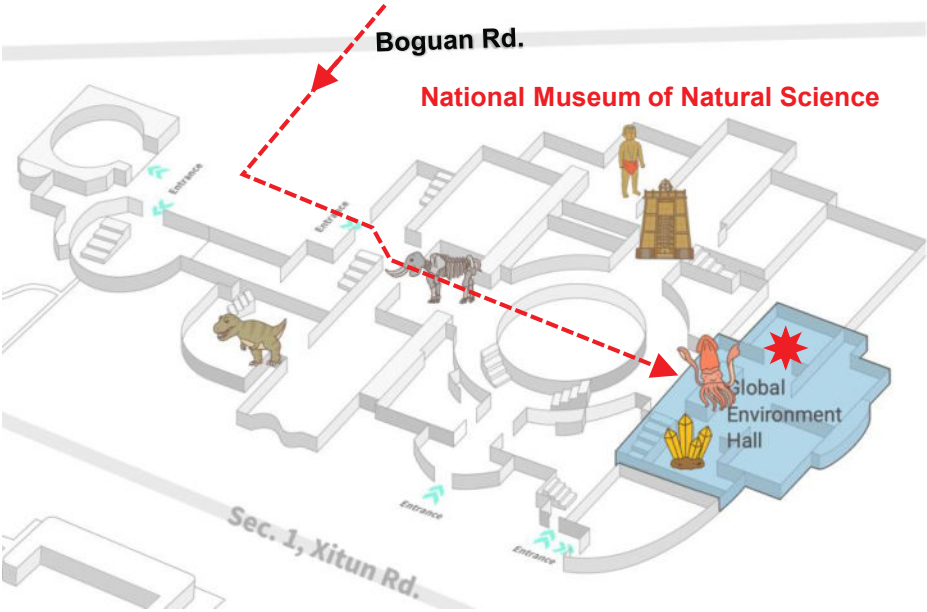
Reception

APCOT 2026 Reception will be held from 18:00 to 20:00 on June 21 at the National Museum of Natural Science, which is about 5 min walk from the conference venue, the Splendor Hotel, Taichung. Light meal and non-alcoholic drink will be served.





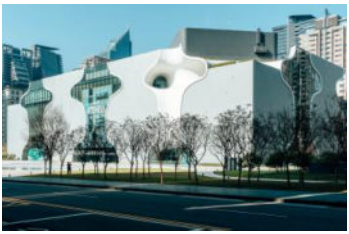
City Tours

APCOT 2026 provides two city tours for choice. We will bring you to deeply meet traditional and modern sides of Taichung. For the Traditional Taichung, the tour will go to the sole surviving Qing-era first-class official residence in Taiwan. For the Modern Taichung, we will bring you to National Taichung Theater and The Luce Memorial Chapel. Tickets are required.

➢ City Tour A for Traditional Taichung:

Wufeng Lin Family Gongbaodi Estate: Gong-Bao-Di stands as the sole surviving Qing-era first-class official residence in Taiwan. The building's symmetrical layout, with five layers in depth and eleven bays in width, is a testament to its grandeur. Lin Wen-cha, the commander-in-chief of Fujian Province's army, was a valiant defender of the Qing dynasty during the Taiping Rebellion, and his posthumous title as "Junior Guardian of the Crown Prince" bestowed a name upon his residence: "Gong-Bao-Di."

➢ City Tour B for Modern Taichung:



National Taichung Theater (NTT): The NTT's architect, Toyo Ito, once attended an open-air concert while traveling in Portugal, where he experienced a seamless merging of performance and audience—a moment that revealed music as a shared ritual. Inspired by this experience, Ito envisioned "architecture that can be listened to," designing the building as a space where sound, movement, and human presence interact. From its flowing contours to the interconnected sound caves and apertures, the design allows the arts to resonate throughout the entire structure and become part of everyday life.

The Luce Memorial Chapel: The Luce Chapel is one of the few structures in Taiwan which appears in worldwide architectural magazines. The American Chinese architect I. M. Pei designed it, in cooperation with the Tunghai University Architecture Department's first chairman, C. K. Chen. The Chapel is constructed of four curves surfaces, technically called "parabolic hyperboloids." Originally the four edges of each surface were to be straight lines, but this looked too stiff, so it was changed to two straight edges and two curved edges, a "conoid." This matches the curved eaves of Chinese buildings.

Technical Tour

APCOT 2026 organizes one technical tour that combines Tour A and Tour B in the prior plan on June 25, 2026. Tickets are required.

Tour Agenda

09:00	Depart from Splendor Hotel Taichung
09:30- 10:30	Arrive at the Bureau of Central Taiwan Science Park 中部科學園區 Central Taiwan Science Park Overview of government policy and industrial status of CTSP
10:30	Depart from CTSP
11:00- 12:00	Arrive at HIWIN Technologies Corp HIWIN® A professional manufacturer of the worldwide motion control and systematic technology
12:00	Depart from HIWIN
12:30	Arrive at Splendor Hotel Taichung Adjourn

Best Paper Awards

To recognize and celebrate exceptional contributions, APCOT 2026 will present the following awards at this year's conference:

The IEEJ-E APCOT Best Paper Award

The IEEJ-E APCOT Best Paper Award has been established by the Technical Society E, the Institute of Electrical Engineers of Japan since APCOT 2022. The IEEJ-E APCOT Best Paper Award will be also continued for APCOT2026 Conference in Taichung. IEEJ will acknowledge and honor the excellent papers presented by members of IEEJ-E at APCOT conferences. The IEEJ-E APCOT Best Paper Award Committee will select the winners based on the quality of the paper and presentation.

The Prof. Wen Ko's Best Paper Award

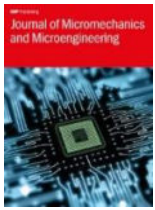
In memory of Professor Wen Hsiung Ko, a MEMS pioneer who started the first APCOT conference in 2002, the Prof. Wen Ko's Best Paper Award has been awarded to the best papers presented at APCOT since 2022. The award will be continued in APCOT 2026.

The APCOT 2026 Best Paper Award

The APCOT Best Paper Award aims to honor and encourage researchers to continue their pursuit of high-quality research work.

Special Issue Publication

Journal of Micromechanics and Microengineering



A Special Issue of the ***Journal of Micromechanics and Microengineering (JMM)*** has been set up for 12th Asia-Pacific Conference on Transducers and Micro-Nano Technology (APCOT 2026). This Special Issue extends an invitation for revised and expanded papers originally presented at the conference. For more information, please visit APCOT2026 website.

IEEJ Transactions on Electrical and Electronic Engineering

Call for Papers

Special Issue in **IEEJ Transactions on Electrical and Electronic Engineering (TEEE).** The Institute of Electrical Engineers of Japan, Technical Society E (Sensors and Micromachines), is planning a Special Issue in *IEEJ Transactions on Electrical and Electronic Engineering (TEEE)* based on papers presented at APCOT 2026. Authors of papers presented at APCOT 2026 are encouraged to submit extended versions to this Special Issue. In particular, nominees and recipients of the IEEJ-E APCOT Best Paper Award are strongly encouraged to contribute.

Submission deadline: End of August 2026

Target publication: July 2027

Details will be announced on the IEEJ Sensor and Micromachines Division website. For inquiries, please contact:

Moeto NAGAI, Guest Editor, Special Issue on APCOT 2026, IEEJ Transactions on Electrical and Electronic Engineering (TEEE)

Toyohashi University of Technology

(nagai@me.tut.ac.jp)

IEEE Transactions on NanoBioScience

The ***IEEE Transactions on NanoBioScience (TNB)*** will publish a special issue devoted to the 12th Asia-Pacific Conference on Transducers and Micro-Nano Technology (APCOT 2026). For more information, please visit APCOT2026 website.

Presentation Guidelines

Oral Presentation Guidelines

1. The session chair will have your paper title, name and affiliation to use for your introduction. Please assist the session chair with the correct pronunciation of your name.
2. Since we have a tight schedule, all presentation files need to be loaded to the computer provided by the conference organizers before the session starts. Use of your own computer is not allowed.
3. Please email your PPT presentation file to **ponpon.ee12@nycu.edu.tw** by **June 17** with the file name that contains the session code, abstract number, and last name of presenter, e.g. “OR1-1A_0111_Presenter.pptx”. Please use the following Subject in your email, “APCOT 2026 presentation submission: [insert your presentation file name here]”.
4. You are required to be present 15 minutes before the session begins to meet with the Session Chair and the Audio Visual Assistant to make sure your file is properly loaded and tested, and answer any questions that you or they may have. You will find them in the session room where your presentation is assigned. You may also update your presentation at this moment if absolutely necessary.
5. Please bring your presentation on a USB flash drive for backup. We recommend preparing both the **original presentation file** and a **PDF version** to ensure better compatibility and avoid unexpected technical issues. Since software compatibility, presenters using embedded animations, videos, or audio are strongly encouraged to verify in advance that their presentation can be played properly to ensure a smooth session.
6. Please refer to the Technical Program on the APCOT 2026 website for the day and time of your presentation with your abstract number.
7. Please create your PowerPoint using On-Screen Show **16:9** size.
8. A laser pointer and a handheld microphone will be provided.
9. Please strictly observe and not exceed your allotted time, **including Q&A**, for
   Plenary speech: 50 min
   Keynote speech: 30 min
   Invited talk: 20 min
   Self-organized talk: 15 min
   Contributed oral presentation: 12 min
10. The timing will be indicated by staff holding up signs to help keep the session on schedule.
11. If you foresee having potential problems understanding questions from the audience, please do not hesitate to ask a senior person in your team to assist you in answering questions. The audience will greatly appreciate any such actions from the author team to ensure a good scientific communication.
12. With five parallel sessions, it is critical that talks are kept on time. Therefore, your session chair will make sure that your presentation time is STRICTLY observed. Attendees highly value the chance for Q&A after a presentation, and we ask that you ensure your presentation fits within the allotted time. We provide the following suggestions to help keep your talk on time.
    (a) The session chair will read the title of your talk and introduce you. We would advise you not repeating of the title nor reading the list of authors.
    (b) We advise you avoiding lengthy outline, introduction, acknowledgement and conclusion slides.

Presentation Guidelines

Poster Presentations Guidelines

1. All posters are located in The Grand Ballroom 2 and 4, 13 F, of the Splendor Hotel-Taichung.
2. Please refer to the Technical Program on the conference website for your assigned date, time and poster number. We recommend that you search this document by your abstract number.
3. **Poster set-up time**
   PO1- Monday: 08:00 - 09:00
   PO2- Tuesday: 08:00 - 09:00
   PO3- Wednesday: 08:00 - 09:00
4. Poster session
   PO1- Monday: 14:30 – 16:00
   PO2- Tuesday: 13:15 – 14:30
   PO3- Wednesday: 14:00 – 15:30
5. **Poster take down time**
   PO1- Monday: 17:00
   PO2- Tuesday: 17:00
   PO3- Wednesday: 17:00
6. All posters are to be set up by **09:00 AM** on the day of your presentation. Posters should remain displayed until **05:00 PM** on the same day. This will give additional time for attendees to view posters during breaks and before the Conference sessions. Although the posters will be displayed for the duration of the day, you will only be required to stand in front of your poster on designated poster session time. It is important for you to stay by your poster for the whole session to give as many delegates as possible the chance to discuss your work with you.
7. Posters not taken down after 05:00 PM will be removed by conference staff and kept in storage. After the conference adjourns on June 24, these posters will be discarded.
8. **Tape** will be provided for your use to fix the posters on the poster boards.
9. It is our recommendation that you do NOT laminate your poster. The lamination is sometimes too thick and once the poster is rolled it holds that form and wants to roll back up. The poster will just 'jump' off the board.
10. The size of poster is A0 (84.1 cm x 118.9 cm)
11. A template is available. You are also free to create your own poster.

Presentation Guidelines

PowerPoint Presentation Guidelines

1. Again, please create your PowerPoint using On-Screen Show (16:9) size.
2. In order to maximize the visibility of your presentation, we recommend that you use color carefully.
3. Backgrounds should be white or light in color.
4. Not all colors are equally visible when projected. Bright red, blue, green and orange are easiest to see. Avoid yellows and light or pastel colors that are not easily seen on a clear background, except possibly as a local background in a boxed area.
5. Use extra-wide line widths for color lines.
6. Be sure to leave a 10% safety margin on all sides of your slides.
7. Placing an institutional logo in the border is acceptable, so long as it doesn't consume valuable screen area.
8. Text smaller than 20 point may be difficult to read from the back of the room.
9. View your presentation from 1.5 m away from your laptop or computer screen. If you cannot read the text from that distance, your audience will not be able to read it on a large projection screen.
10. A template is available. You are also free to create your own presentation.

Poster Presentations Guidelines

1. When planning a poster presentation, it is useful to keep in mind the advantages of a poster over a podium presentation. Posters are available for viewing throughout the day and interested viewers have scheduled time for discussion, not just a few minutes.
2. The poster number and abstract number should be placed in the two upper corners of the poster.
3. Place your poster title at the top of your poster and Capitalize Each Word. The size of the characters should be at least 2.5 cm high (72 pt recommended). Below the title, place the authors' names and affiliations.
4. It is important that you remember that the audience viewing your poster and listening to your presentation will be 1.5 m from your poster. Please double-check your poster from 1.5 m to ensure good readability.
5. Use text sparingly. Use pictures, cartoons, and figures rather than text wherever possible. Bright colors will greatly enhance the attention of the viewer.
6. The flow of your poster should be from the top left to the bottom right.
7. Make your poster as self-explanatory as possible, so that you will have time for in-depth technical discussions.

Plenary Speaker

MEMS×AI×Robotics

Isao Shimoyama

The University of Tokyo, Japan

Website link: https://leopard.mints.ne.jp/intro.html

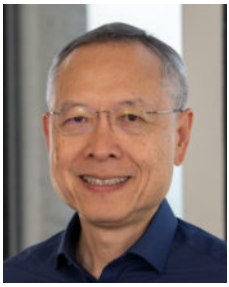
Abstract

Robot system integrators build systems by incorporating existing sensors. Integrating sensors that are widely available on the market into robotic systems poses no particular difficulty. However, innovative new sensors face significant barriers to adoption in robotic systems due to high costs resulting from low procurement volumes and the lack of a proven track record.By integrating force-sensing sensors developed by our research team through many years of research into robotic systems, we demonstrate the feasibility of creating robots equipped with skin-like physical sensing capabilities in their legs and body. Specifically, this enables robots to walk on slippery surfaces, stably grasp tools with their hands, and endow robots with force perception. Furthermore, to reduce manufacturing costs as well as computational and communication costs, we propose an implementation method for locally processing information from a large number of sensors.

Biography

Isao Shimoyama was born in Japan in 1955. He received the B.E., M.E, and Dr. of Engineering degrees in mechanical engineering from The University of Tokyo in 1977, 1979, and 1982, respectively. He joined The University of Tokyo in 1982 and was Professor, Director of Information and Robot Technology Research Initiative. Presently, he is Professor Emeritus of University of Tokyo, and President and Representative Director of Front Sensing Inc. His current Research interest is in Robotics, MEMS and nano-on-microsystems.

Plenary Speaker



Silicon Photonic MEMS for Sensing and Networking Applications

Ming Wu

The University of California, Berkeley, USA

Email: wu@eecs.berkeley.edu

Abstract

Optical interconnect plays an increasingly important role in data centers and high-performance computing systems. As the I/O bandwidth continue to grow exponentially, traditional electronic switches become the bottleneck of the interconnect network. Optical switching provides direct optical connections between processors with low power consumption, low latency, and unlimited bandwidth. Previously, high radix optical switches can only be made using free space optics. In this talk, I will introduce silicon photonic MEMS (micro-electro-mechanical systems) technology. By integrating MEMS switching elements with silicon photonics, high-radix switches can be integrated on a single chip. In addition to data center networks, high-radix switches also enable a new type of solid state LiDARs. I will discuss our recent work on solid state LiDARs with focal plane switch arrays.

Biography

Ming Wu is Nortel Distinguished Professor of Electrical Engineering and Computer Sciences at UC Berkeley. He received his Ph.D. from the same department in 1988 and joined the faculty in 2004, after conducting research at AT&T Bell Labs and UCLA. Professor Wu is recognized for his work in Optical MEMS and optoelectronic tweezers (OET). A Fellow of IEEE and Optica, his honors include the 2016 William Streifer Scientific Achievement Award, the 2017 C.E.K. Mees Medal, and the 2020 IEEE Robert Bosch MEMS Award. His research has been commercialized through several companies he co-founded, including OMM (1997), Berkeley Lights Inc. (2011, Nasdaq:BLI), and nEye.ai (2020).

Plenary Speaker

Intelligent Electrical and Optical Sensing Platforms for AI-Assisted Molecular Detection

Seong Chan Jun

Yonsei University, Republic of Korea

Email: scj@yonsei.ac.kr

Abstract

Molecular sensor systems often face challenges from electrical noise or optical miniaturization limits, hindering rapid and precise analysis. This work presents an artificial intelligence (AI)-driven platform that evaluates both electrical and optical signals. By employing dedicated nanomaterial sensors optimized for each method, the system combines high electrochemical sensitivity with the structural specificity of optical analysis. These distinct pathways ensure comprehensive molecular profiling without signal interference. Data integration is performed at the software level, where machine learning algorithms cross-validate the outputs. The AI isolates subtle signals from noise, recognizing patterns that single-modality systems might miss. This enables accurate, real-time identification of target molecules, from biochemical substances to trace exhaled gases. This framework provides a robust solution for complex molecular analysis by linking specialized hardware with data-driven validation.

Biography

Prof. Seong Chan Jun completed Bachelor, master and Ph.D. degree from George Washington University (Washington D.C.), Cornell University (Ithaca N.Y.), and Columbia University (New York, NY) respectively. After he graduated, he worked at NSEC (Nano Scale Science & Research Center) and SAIT (Samsung Advanced Institute of Technology) sequently. He has been currently appointed professor at Yonsei University (Seoul, Korea) since 2008.

Keynote Speaker

Precision Diagnostics Anywhere: Digital Partitioning, Melt Coding, and Magnetofluidic Automation – From Infection/AMR to Epigenetic Cancer Detection

Tza-Huei (Jeff) Wang

Johns Hopkins University, USA

Email: thwang@jhu.edu

Abstract

Precision medicine depends on molecular measurements that are sensitive, multiplexed, and actionable on the timescale of clinical decision-making. Yet many genetic and epigenetic assays remain too slow, costly, or infrastructure-dependent to be used routinely at the point of care or in low-resource settings. In this talk, I will present micro/nano-enabled diagnostic systems that convert complex molecular assays into portable, affordable, sample-to-answer workflows. The core strategy integrates three complementary elements: (i) digital partitioning in microfluidic arrays and droplets to detect rare targets, achieve single-molecule/single-cell sensitivity, and resolve biological heterogeneity; (ii) melt-coded sensing as an information-rich transducer that enables compact multiplexing with simplified optical hardware; and (iii) magnetofluidic automation using magnetic beads to integrate nucleic acid extraction, washing, and amplification/detection in low-cost cartridges with portable instrumentation. I will highlight applications spanning two time-critical clinical needs: rapid pathogen identification with antimicrobial resistance testing to guide evidence-based therapy, and high-precision DNA methylation analysis for early cancer detection from scarce circulating DNA. Together, these examples illustrate how digitization, melt coding, and cartridge automation can help democratize precision diagnostics by bringing actionable molecular results closer to patients.

Biography

Tza-Huei (Jeff) Wang is the Louis M. Sardella Professor of Mechanical Engineering and Biomedical Engineering at Johns Hopkins University, where he has been a faculty member since 2002. He earned his Ph.D. in Mechanical Engineering from UCLA. Dr. Wang's research focuses on developing innovative micro and nano biotechnologies for molecular analysis and biomedical diagnostics, guided by a vision to advance global health equity through technologies that deliver exceptional sensitivity, specificity, affordability, and accessibility. His group has pioneered affordable microfluidic point of care platforms for rapid infectious disease diagnostics and antimicrobial susceptibility testing (AST), enabling actionable pathogen identification and resistance profiling near the patient. He has also advanced highly sensitive and cost effective molecular detection strategies based on digital high resolution digital melt analysis to detect rare genetic and epigenetic biomarkers relevant to cancer detection and disease monitoring.Dr. Wang has published over 200 peer reviewed journal articles and delivered over 150 invited talks worldwide. He holds 27 U.S. patents and 12 international patents. His research has led to the founding of four spin off companies, including Circulomics, which was acquired by Pacific Biosciences (PacBio). Dr. Wang's contributions have been recognized with numerous honors, including the NSF CAREER Award, the CRS Jorge Heller Award, the JALA Ten Award, and the Cohen Translational Engineering Award. He has been elected a Fellow of the American Association for the Advancement of Science (AAAS), the American Institute for Medical and Biological Engineering (AIMBE), the American Society of Mechanical Engineers (ASME), the Institute of Electrical and Electronics Engineers (IEEE), the Royal Society of Chemistry (RSC), and the International Academy of Medical & Biological Engineering (IAMBE).

Keynote Speaker

From Skin to Machine: Nanogenerators for Energy Harvesting, Wound Healing, and Thermal Perception

Hoe Joon Kim

DGIST, Korea

Email: joonkim@dgist.ac.kr

Abstract

Human skin is nature's ultimate multifunctional interface — harvesting ambient energy, responding to mechanical stimuli, and perceiving thermal landscapes with remarkable sensitivity. Inspired by this biological blueprint, this keynote presents our laboratory's advances in flexible nanogenerator systems spanning triboelectric (TENG), piezoelectric (PENG), and pyroelectric transduction mechanisms. We first highlight key developments in self-powered platforms and their application in electrical wound healing, where device-generated electric fields actively promote tissue regeneration without external power sources. The talk then turns to our central theme: pyroelectric-effect-based artificial thermal perception. By engineering flexible pyroelectric polymer films into sensing arrays, we demonstrate skin-analogous thermal discrimination, including contact thermal conductivity mapping, transient thermal event detection, and spatiotemporal temperature imaging, functions that closely mirror thermoreceptor networks in human dermis. Together, these results illustrate how a unified transduction framework, rooted in the same material physics, can simultaneously power, heal, and sense: charting a roadmap toward self-powered, multisensory artificial skins for prosthetics, rehabilitative medicine, and soft robotics.

Biography

Prof. Hoe Joon Kim is an Associate Professor in the Department of Robotics and Mechatronics Engineering and the Associate Vice President for Global Engagement at Daegu Gyeongbuk Institute of Science and Technology (DGIST). Before joining DGIST, he spent 2 years as a Postdoctoral Research Associate at Carnegie Mellon University. He received his Ph.D. in Mechanical Engineering in 2015 from the University of Illinois at Urbana-Champaign. Prof. Kim's research interests include energy harvesting, electrochemical sensors, MEMS/NEMS, self-powered sensors, and nanomaterials synthesis, with applications in environmental monitoring, healthcare, and robotics. He has received several prestigious awards, including the Outstanding Researcher Award from KMEMS, the Young Researcher Award from KSME, the Best Teaching Award from DGIST, and the Young Investigator Award from the Society of Micro and Nano Systems. He is recognized for his leadership in advancing global academic cooperation in his role as Associate Vice President. Prof. Kim has served on the technical committees of major conferences, including IEEE MEMS, Transducers, and KMEMS.Currently, he leads the Global Basic Research Laboratory initiative, contributing to the Cardiovascular Energy Conversion System Laboratory, a high-impact research project funded under the National Research Foundation of Korea (NRF).

Keynote Speaker

Enabling Next-Generation AI Edge Devices: Solid-State MEMS Speakers and Micro-Cooling Solutions

Chester Hwang

xMEMS

Website: xMEMS.com

Abstract

As AI-powered solutions incorporated into smart glasses, mobile phones and wearables, they face intense thermal and audio integration constraints that traditional components cannot solve. This talk presents solid-state PiezoMEMS technology to address these challenges, specifically focusing on ultra-thin (<1.5 mm) MEMS speakers and piezo-based micro-cooling ("fan-on-a-chip") solutions. By replacing conventional moving-coil drivers, piezoelectric MEMS speakers (e.g., the xMEMS Sycamore product family) utilize an ultrasonic diaphragm platform to generate full-band, high-fidelity audio. This revolutionary "sound-from-ultrasound" principle employs ultrasound modulation to convert audio signals into ultrasonic air pulses, which are then demodulated acoustically into clear, rich sound. This architecture enables packages capabe of 70% smaller and 90% lighter, facilitating natural sound in open-ear devices. Concurrently, piezoelectric µCooling solutions deliver silent, vibration-free localized cooling, reducing surface temperatures by up to 40% and increasing processing margins by 70% to eliminate thermal throttling. Together, these technologies enable thinner, lighter devices that support advanced, continuous AI workloads. Expected in mass production by 2026, these solid-state solutions mark a pivotal advancement in all-day AI wearable design.

Biography

Dr. Chester Hwang is a seasoned semiconductor executive and currently the CTO at xMEMS. With a PhD in Electrical Engineering from the University of Florida (and a BSEE from National Taiwan University), he has pioneered device modeling to enhance IC design accuracy, improve quality, and accelerate development cycles. Throughout his career in the US, Israel, and Taiwan, he led the development of various geneartions of advanced technologies (Bipolar, BiCMOS, TFSOI CMOS) and products spanning MEMS audio drivers, image sensors, and consumer ICs for PCs and servers. A former IEEE TFSOI technical committee member, Dr. Hwang is a distinguished innovator with over 15 patents and 15 technical papers.

Keynote Speaker

Bridging Profiling and Monitoring: High-Precision Micro-GC for Full-Spectrum VOCs

Jung Hwan Seo

Hongik University, Korea

Email: gongzone@hongik.ac.kr

Abstract

Gas chromatography (GC) is essential for analyzing complex gas mixtures, yet conventional systems struggle to bridge the gap between high-resolution profiling and rapid monitoring. To address this for full-spectrum volatile organic compounds (VOCs), high-precision micro gas chromatography (μ-GC) has emerged as a powerful portable solution. In μ-GC, the micro separation column is critical to overall system performance. This study presents an innovative μ-GC column utilizing high-aspect-ratio (HAR) micropillar arrays, fabricated as black silicon via Deep Reactive Ion Etching (Deep RIE). These black silicon micro rods drastically increase the interactive surface area, enhancing analyte-stationary phase interactions. Consequently, this design improves separation resolution by at least 51% and enhances peak identification compared to traditional rectangular columns. By delivering exceptional separation efficiency within a compact form factor, this high-precision column successfully enables simultaneous detailed VOC profiling and real-time monitoring, overcoming traditional analytical trade-offs for diverse applications including chemical safety.

Biography

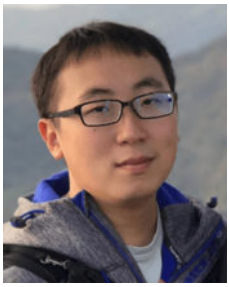
Jung Hwan Seo is a Professor in the Department of Mechanical and System Design Engineering at Hongik University and serves as the Director of the Atmospheric Environment Sensor and Core Material Research Division, National Core Materials Research Center. He received his B.S. from the Seoul National University (2004) and his M.S. and Ph.D. in Mechanical Engineering from the University of Michigan (2009, 2012). His research focuses on micro gas chromatography (μGC), micro/nano-fabrication, smart gas sensors, and micro/nano-scale phase change for semiconductor chip cooling.

Invited Speaker

Flexible and Conformal PMUT Arrays with Acoustic Focusing Based on Hydrothermal PZT Thin Films

Guo-Hua Feng
National Tsing Hua University, Taiwan
Email: ghfeng@pme.nthu.edu.tw

Dr. Guo-Hua Feng received his M.S. degree in mechanical engineering from National Central University, Taiwan, in 1995, his M.S. degree from the University of California at Los Angeles (UCLA) in 2000, and his Ph.D. degree in electrical engineering from the University of Southern California (USC) in 2004. From Spring 2005 to Fall 2020, he was a faculty member in the Department of Mechanical Engineering at National Chung Cheng University in Taiwan. In Fall 2020, he joined National Tsing Hua University (NTHU), where he is currently a Professor with the Department of Power Mechanical Engineering and the Institute of Nanoengineering and Microsystems. His research interests focus on electroactive materials, ferroelectric thin-film devices, piezoelectric acoustic devices, microfabrication and processing technology, sensors, and actuators.



Advanced Acoustic Delay Lines for RF Signal Processing

Ming-Huang Li
National Tsing Hua University, Taiwan
Email: mhli@pme.nthu.edu.tw

Ming-Huang Li received his Ph.D. degree from the Institute of NanoEngineering and MicroSystems at National Tsing Hua University, Hsinchu, Taiwan in 2015. He is currently an Associate Professor at the Department of Power Mechanical Engineering, National Tsing Hua University, Hsinchu, Taiwan. His research interests include micromechanical resonators and oscillators, surface/bulk acoustic wave devices and systems, multi-physics hybrid microsystems, monolithic CMOS-MEMS technology, and interface circuit design for MEMS-integrated microsystems.He received the TRANSDUCERS Early Career Award in 2021. He was awarded the Young Scholar Fellowship from the Ministry of Science and Technology (MOST), Taiwan, in 2019, the Young Faculty Research Award from National Tsing Hua University in 2021, and the Ta-Yu Wu Memorial Award from the National Science and Technology Council (NSTC), Taiwan, in 2025. Together with his students and collaborators, he received Best Student Paper Awards at the IEEE International Frequency Control Symposium (IFCS) in 2020, the IEEE Ultrasonics, Ferroelectrics, and Frequency Control Joint Symposium (UFFC-JS) in 2024, the IEEE Electron Devices Technology and Manufacturing Conference (EDTM) in 2025, and the IEEE International Conference on Micro Electro Mechanical Systems (MEMS) in 2026.He serves as an Associate Editor of IEEE Transactions on Ultrasonics, an Editor of IEEE Electron Device Letters, and a Junior Editorial Board member of Journal of Micromechanics and Microengineering.

Invited Speaker

New Functionalities for Perovskite Ferroelectric Oxides

Wook Jo
Ulsan National Institute of Science and Technology, Republic of Korea
Email: wookjo@unist.ac.kr

Dr. Wook Jo achieved his Ph.D. from Seoul National University (SNU) in 2005 and then continued his research as a postdoctoral research fellow at SNU for one and a half years. Then, he joined the Ceramics lab at Technische Universitaet Darmstadt, Germany as a group leader for the processing of ferroelectric oxides. In 2014, he joined the faculty of Materials Science and Engineering at Ulsan National Institute of Science and Technology (UNIST) as an Associate Professor. His research at UNIST has focused on developing advanced processing techniques and materials of new category, representatively multifunctionality in a single phase. So far, he has published more than 230 SCI-indexed papers featured by more than 24,000 citations and h-index of 73.

Stress-Engineered Multilayer Membrane Platform for Stable Microheaters

Manu Garg
Silicon Austria Labs GmbH, Austria
Email: manu.garg@silicon-austria.com

Dr. Manu Garg received his Ph.D. jointly from National Yang Ming Chiao Tung University (NYCU) and Indian Institute of Technology Delhi (IITD), India in 2024. He subsequently joined Integrated Photonics Technologies at Silicon Austria Labs (SAL) GmbH, Austria as a Research Engineer and was promoted to Senior Research Engineer in 2026. His current research focuses on Microelectromechanical Systems (MEMS) for reconfigurable Aluminum Nitride (AlN) photonics, integrated microbolometer arrays for motion sensing applications, and Silicon-master mold fabrication for Nanoimprint Lithography (NIL). His contributions have been recognized with several honors, including the Best Thesis for Industrial Relevant Project (2025) at IITD, MediaTek Foundation Scholarship at NYCU, and the prestigious Prime Minister's Research Fellowship (PMRF) from the Govt. of India at IITD.

Invited Speaker

Bringing Nano-Tactile Intelligence into Practice

Hidekuni Takao
Kagawa University, Japan
Email: takao.hidekuni@kagawa-u.ac.jp

Hidekuni Takao received his Ph.D. from Toyohashi University of Technology in 1998. He is currently Professor and Director of the Nano-Micro Structure Device Integrated Research Center at Kagawa University, Japan. His research focuses on ultra-high-performance MEMS tactile sensors, multimodal sensing systems, and their applications to medicine, healthcare, robotics, precision manufacturing, and human-interface technologies. He has served as Principal Investigator of two JST-CREST projects since 2015. His contributions have been recognized by several awards, including the Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology, Japan (2023), the CEATEC AWARD 2023 Grand Prix, and the 24th Yamazaki-Teiichi Prize (2024). He also serves as a vice-president of the sensor and micromachine society in the Institute of Electrical Engineers of Japan (IEEJ).

Next-Generation Gallium Oxide Semiconductors for Broadband Ultraviolet Photodetectors

Shih-Hung Lin
National Yunlin University of Science and Technology, Taiwan
Email: isshokenmei@yuntech.edu.tw

Dr. Shih-Hung Lin received his Ph.D. in Electronics Engineering from National Taiwan University (NTU) in 2011. He subsequently conducted postdoctoral research at Tohoku University in Japan. He also gained industrial experience through a summer internship at TSMC and worked as a semiconductor R&D engineer at United Microelectronics Corporation (UMC) and Winbond Electronics. In 2015, he joined the Department of Electrical Engineering at Tunghai University. In 2020, he moved to the Department of Electronic Engineering at National Yunlin University of Science and Technology (YunTech), where he was promoted to Full Professor in 2022. He has published more than 90 SCI-indexed journal papers. His research focuses on nanoelectronic materials and device applications, semiconductor technologies, and sensing applications. He has received several honors, including two National Innovation Awards, the Outstanding Young Researcher Award (2017), the Distinguished Professor Award (2023), and the Taiwan Ceramic Society Award (2024).

Invited Speaker

Temperature, Oxygen and Stress Measurement using Phosphor Microparticles

Kyung Chun Kim
Pusan National University, Korea
Email: kckim@pusan.ac.kr

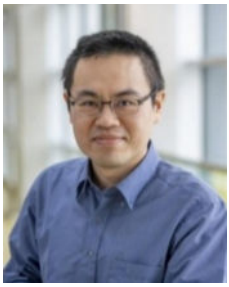
Prof. KC Kim received his MS and Ph.D degree at KAIST, Korea in 1981 and 1987, respectively. Since 1983, he is a professor at School of Mechanical Engineering in Pusan National University (PNU), Korea. He was invited as a visiting professor from Ottawa University in Canada for 1989-1990. He was joined in University of Illinois, Urbana-Champaign, USA as an invited professor for 1996-1997. He was invited as a special foreign professor from the University of Tokyo, Japan for 2009-2010. On the basis of his research outcomes, he became a member of National Academy of Engineering in Korea in 2004. He received Nakayama award in 2012, Asanuma award in 2014 and Leonardo da Vinci award in 2025. KC Kim was selected as a PNU Distinguished Professor in 2018. He is currently serving as an Editor in Chief for Journal of Visualization. In 2020, he was selected as the director of Regional Leading Research Center for Eco-friendly Smart Ship. He is top 1.2 percent scholar in his research field (Stanford University) and has published 343 SCIE international journal papers, which have been cited more than 12089 times and an H-index factor of 233. His research interests include: Microfluidics, Turbulence, Two-Phase Flows, Flow Visualization, and Artificial Intelligence.

AI-Augmented Wearable Bioelectronics: A Flexible, Sweat-Based Glucose Monitoring System for Precision Diabetes Management

Nadnudda Rodthongkum
Chulalongkorn University, Thailand
Email: Nadnudda.R@chula.ac.th

Nadnudda Rodthongkum, Ph.D., is a faculty member in the Department of Chemistry at Chulalongkorn University, Thailand. A graduate of the University of Massachusetts Amherst, Dr. Rodthongkum is recognized globally as a leader in analytical chemistry and materials science, consistently ranked among the World's Top 2% Scientists by Stanford University. With an h-index of 35 and over 5,070 citations, her research program focuses on the rational design of functional nanomaterials. Her work bridges the gap between fundamental materials science and high-impact applications in: advanced electrochemical biosensors, wearable health monitoring systems, point-of-care diagnostics & personalized medicine, advanced mass spectrometry applications. Dr. Rodthongkum's career is marked by prestigious international honors, including the L'Oréal UNESCO For Women in Science Fellowship (2016) and distinguished awards from the Thailand Toray Science Foundation and the U.S. Army. Her commitment to translating laboratory research into real-world solutions has earned her recent international acclaim, including Gold Medals at WorldInvent Singapore (2024) and Intarg Poland (2025) for her innovations in sustainable and intelligent sensor technology.

Invited Speaker



Non-volatile control for nano-optomechanical phase change metasurface

Jun-Yu Ou
University of Southampton, UK
Email: bruce.ou@soton.ac.uk

Dr Jun-Yu Ou, known as Bruce Ou, is an Associate Professor at the School of Physics and Astronomy, where he leads research on nanomechanical metasurfaces, AI-enabled nanometrology for semiconductors, and metasurfaces for AI hardware. His research has led to impacts on the fields of nanophotonics and nanomechanics. He was awarded an EPSRC Doctoral Prize Fellowship in 2014, the Institute of Physics Doctoral Research Prize in 2015, and Rising Star, Wiley Publishing Group in 2024. His research has led to impacts on the fields of nanophotonics and nanomechanics, as evidenced by 80+ high-profile journal publications, 170+ conference papers, and 3 patents. His work has also been internationally recognized by invited presentations at major conferences such as SPIE Photonics and CLEO. Furthermore, his success in the area of nano-optomechanics and metasurfaces has attracted global attention from both academic (Nature, Nature Photonics) and commercial news (BBC, Financial Times).

Optical Metasurfaces for Ultrasensitive, Label-free and Real-time Biosensing

Haogang Cai
New York University, USA
Email: haogang.cai@nyu.edu

Dr. Haogang Cai is an assistant professor in the Tech4Health Institute and Department of Radiology at New York University Grossman School of Medicine. He has a cross-appointment with the Department of Biomedical Engineering, and is also a member of the Perlmutter Cancer Center, NYU Langone Health. He received his Ph.D. degree from the Department of Mechanical Engineering at Columbia University in 2016. From 2016 to 2020, he had postdoctoral training in Biological Sciences at Columbia and the Center for Nanoscale Materials at Argonne National Laboratory. His research interests include biomedical and nanoengineering, optical metasurfaces, cell mechanobiology, microphysiological systems, biochips and biosensors. His contributions have been recognized with numerous awards, including the MIRA R35 Award from the National Institute of Health (2022), CMBE Rising Stars Award from the Biomedical Engineering Society (2025), Young Innovators Award in Cellular and Molecular Bioengineering (2025).

Invited Speaker

Beyond Piezoelectric Self-Sensing: Integrated Silicon Stress Sensors for Robust Feedback in Piezoelectric MEMS

Andrea Vergara
Tohoku University, Japan
Email: vergara@tohoku.ac.jp

Andrea Vergara received her B.E. degree in Mechanical Engineering from the University of Chile in 2015 and her Dr. Eng. degree from Tohoku University in 2021. During her doctoral studies, she spent six months as an exchange researcher at the Department of Power Mechanical Engineering, National Tsing Hua University in Taiwan. Since October 2021, she has been an Assistant Professor at Tohoku University, where she also joined the Global Promotion Office of the Mechanical and Aerospace Engineering Division in 2025.Her work focuses on developing piezoelectric MEMS devices and materials, with an emphasis on combining thin-film piezoelectric technology with microfabrication for practical microsystems. She received the Best Oral Presentation Award at IEEE MEMS 2022, contributed an invited paper to the Journal of Micromechanics and Microengineering Emerging Leaders 2023 special issue, and was honored with the Young Researcher's Encouragement Award at the 42nd Sensor Symposium by the Institute of Electrical Engineers of Japan. In 2025, she also served on the Technical Program Committee for Transducers 2025 in Orlando, USA. She is a member of IEEE, JSME, and IEEJ, and enjoys working at the interface of materials, devices, and system integration for next-generation piezoelectric MEMS.

Design and Integration of a Miniaturized Pneumatic Finger with an FPCB-Based Metallic Glass Strain Sensor

Yao-Chuan Tsai
National Chung Hsing University, Taiwan
Email: yctsaii@dragon.nchu.edu.tw

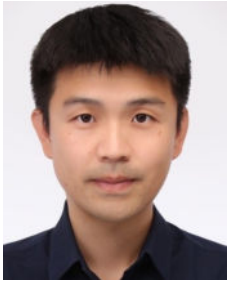
Yao-Chuan Tsai is an Associate Professor and Chair in the Department of Bio-Industrial Mechatronics Engineering at Nation Chung Hsing University (NCHU), Taichung city, Taiwan. He received the B.S. degree in mechanical engineering from National Chiao-Tung University, Hsinchu, Taiwan, in 2004, and the M.S. and Ph.D. degrees in mechanical engineering from National Taiwan University, Taipei, Taiwan, in 2006 and 2011, respectively. He was with a postdoctoral researcher at Tohoku University, Sendai, Japan from 2011 to 2014. From 2014 to 2016, he was with a researcher at MEMS-CORE Co., Ltd., Sendai, Japan.He was with the faculty as an Assistant Professor at the Department of Bio-Industrial Mechatronics Engineering, National Chung Hsing University, Taichung, Taiwan, in 2016, where he was promoted to an Associate Professor, in 2021. He was with the faculty as a Director at the Agricultural Automation Center, National Chung Hsing University, in 2021. He was with the faculty as a Chair at the Department of Bio-Industrial Mechatronics Engineering at Nation Chung Hsing University, in 2025. His current research interests include the area of micromachined sensors and actuators and smart agriculture applications.

Invited Speaker

Aptamer-functionalized Quartz Crystal Microbalance Sensor Integrated with Loop-Mediated Isothermal Amplification for Dengue Virus Detection

Dharmatov Rahula B. Albano
University of Santo Tomas, Philippines
Email: dbalbano@ust.edu.ph

Dr. Dharmatov Rahula B. Albano, Professor and former Chair at the Department of Chemistry at the University of Santo Tomas. A registered chemist, he earned his Bachelor's in 1998 and Master's degrees in Chemistry from the University of Santo Tomas in 2004, followed by a Ph.D. in Analytical Chemistry from The University of Hong Kong (HKU) in China SAR in 2014. His research interests span a broad spectrum, encompassing bioanalytical nanotechnology chemistry, capillary electrophoresis, microfluidics, lab-on-chip technologies, and aptamer biosensors. Dr. Albano's significant contributions to analytical chemistry and its applications in modern technology have solidified his position as a respected academic and industry expert.



3D-Printed Skin-Interfaced Microfluidic Systems for Sweat Collection

Chung-Han Wu
National Chung Hsing University, Taichung, Taiwan
Email: wuch@nchu.edu.tw

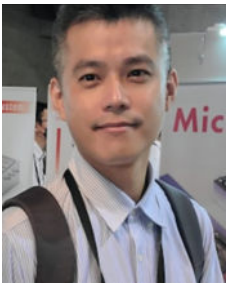
Chung-Han Wu is an Assistant Professor of Mechanical Engineering at the National Chung Hsing University in Taiwan (R.O.C.). He received his Ph.D. degree in Mechanical Engineering from the University of Hawaii at Manoa. He also collaborates as a researcher with the Changhua Christian Hospital in central Taiwan. His research interests span biomedical engineering, microfluidic design and fabrication, wearable devices, additive manufacturing (3D printing), and sensing technologies, including optical, biochemical, and biophysical systems.

Invited Speaker

Ultra-compliant Brain-Machine Interfaces

Wei-Chen Huang
National Yang Ming Chiao Tung University, Taiwan
Email: weichenh@nycu.edu.tw

Dr. Wei-Chen Huang received her PhD degree at Materials Science & Engineering in NYCU in 2015. From 2015 to 2017, Wei-Chen was a Postdoctoral Research Fellow in Materials Science and Engineering of Carnegie Mellon University in the United States. Then she served as a faculty in Taipei Medical University as an Assistant Professor from 2017 through 2019. Since 2019, Wei-Chen served in the Department of Electronics & Electrical Engineering in NYCU, and also co-jointed in the Institute of Biomedical Engineering. Currently, she is an Associate Professor at NYCU. Dr. Huang's recent research includes the development of bioconformal smart electronics applied for invasive/non-invasive prosthetics, drug delivery electronics, and biosensors. She laid the foundation on creating a variety of organic/inorganic composite materials that can replace typical electronic materials in the application of implanted neural electrode and wearable chemical/physical sensors. The electronic devices can even allow controlled drug/gene/growth factors delivery to for both diagnosis/therapy. The team's achievement is the representative of interdisciplinary combination that includes device design/fabrication, heterogeneous integration of soft transducer/electrode and circuit systems, biological responses, signal processing and final data collection/analysis.



Self-Healing and Self-Powered Intelligent E-skin Systems

Ching-Te Kuo
National Sun Yat-sen University, Taiwan
Email: chingtekuo@mail.nsysu.edu.tw

Dr. Ching-Te Kuo is an associate professor in the Department of Mechanical and Electro-Mechanical Engineering at National Sun Yat-sen University, Taiwan. Dr. Kuo received his Ph.D. in the Institute of Applied Mechanics at National Taiwan University, Taiwan, in 2013. His research focuses on wearable electronic skins, nano-energy harvesters, bioinspired tumor-on-a-chip, and EUV nano-lithography.

Invited Speaker

Manipulation and Sensing of Oxygen Microenvironment in Advanced in vitro Cell Culture Models

Yi-Chung Tung
Research Center for Applied Sciences, Taiwan
Email: tungy@gate.sinica.edu.tw

Dr. Yi-Chung Tung is a Research Fellow at the Research Center for Applied Sciences, Academia Sinica, where he has been conducting interdisciplinary biomedical research since 2009. Previously, he was a postdoctoral fellow in the Department of Biomedical Engineering at the University of Michigan, Ann Arbor (2006–2009), where he also earned his Ph.D. in Mechanical Engineering in 2005. His contributions have been widely recognized with numerous prestigious awards, including the 2020–2022 Scientist with Top 2% Single Year Impact, the 2018 Project for Excellent Junior Research Investigators (Ministry of Science and Technology, Taiwan), the 2016 Career Development Award (Academia Sinica), and the 2014 Ta-You Wu Memorial Award (Ministry of Science and Technology, Taiwan). He was also named a Top 10% Highly Cited Author in the Analytical Portfolio of Royal Society of Chemistry Journals in 2016. His research focuses on microfluidic cell culture and analysis, biomedical instrumentation, and advanced micro/nano-fabrication techniques, driving innovations in biomedical technology.

Listening to Microdroplets: Acoustic Voiceprint Features for Label-Free Microfluidic Monitoring

Chia-Hung Dylan Tsai
National Yang Ming Chiao Tung University, Taiwan
Email: dylantsai@nycu.edu.tw

Chia-Hung Dylan Tsai is an Associate Professor in the Department of Mechanical Engineering at National Yang Ming Chiao Tung University and a Senior Member of IEEE. He received his Ph.D. in Mechanical Engineering from Stony Brook University in 2010 and later conducted interdisciplinary research at Osaka University before he joined Yang Ming Chiao Tung University in 2017. His research focuses on microfluidics, intelligent sensing systems, robotics, and plasma-assisted technologies. Dr. Tsai currently serves as Chair of the IEEE Robotics and Automation Society Taipei Chapter. He is also an Editor of the ROBOMECH Journal and has served as Associate Editor for IEEE Robotics and Automation Letters (RA-L), IEEE ICRA, and IEEE/RSJ IROS. His work emphasizes interdisciplinary integration across robotics, sensing, plasma science, and microfluidic technologies.

Invited Speaker

Iontophoresis Patch with Bipolar Porous Microneedles for Transdermal Dual Delivery

Matsuhiko Nishizawa
Tohoku University, Japan
Email: nishizawa@tohoku.ac.jp

Dr. Matsuhiko Nishizawa received his Ph.D. from Tohoku University (Sendai, Japan) in 1994. In 2014, he joined the Graduate School of Engineering of Tohoku University as Research Assistant and was promoted to Associate Professor in 2002 and Full Professor in 2003. His main concern is BioMEMS technology, including the biological batteries, soft iontronic devices, and their applications in medical, cosmetic and healthcare fields. He has published more than 260 SCI-indexed papers (with over 9800 citations and an h-index of 57).

Laser-Induced Graphene–Based All-Solid-State Potentiometric Biosensing Platforms for Smart Health, Food, and Water Monitoring

Nipapan Ruecha
Chulalongkorn University, Thailand
Email: nipapan.r@chula.ac.th

Dr. Nipapan Ruecha is a Research Professor at the Metallurgy and Materials Science Research Institute (MMRI), Chulalongkorn University, Thailand. She received her PhD from Chulalongkorn University in 2015 and completed research training at Colorado State University (USA), Sogang University (Republic of Korea), and Keio University (Japan). Her research focuses on laser-induced graphene (LIG)–based electrochemical sensors, solid-contact ion-selective electrodes, and potentiometric biosensors for decentralized diagnostics. She has developed portable and smartphone-integrated sensing platforms for healthcare, food safety, and environmental monitoring. She has published more than 35 SCI-indexed papers with over 2,300 citations and an h-index of 23. She has received several prestigious awards, including the NRCT Innovation Research Award and the ASAHI Research Grant. Her work has also resulted in multiple Thai petty patents in biosensing technologies.

Invited Speaker

Towards Ultra-Low-Power and Intelligent Gas Sensing Technologies for Mobile and IoT Applications

Incheol Cho
Tech University of Korea, Korea
Email: incheol.cho@tukorea.ac.kr

Incheol Cho is an Assistant Professor in the Department of Advanced Materials Engineering at Tech University of Korea (TU Korea). He received his B.S., M.S., and Ph.D. degrees in Mechanical Engineering from KAIST in 2015, 2017, and 2021, respectively. Previously, he served as a staff engineer at the Semiconductor R&D Center of Samsung Electronics, where he contributed to the development of 0.5 μm-pitch ultra-fine pixels and low-noise transistors. In the field of micro/nano fabrication and sensors, he has published 32 SCI papers, which have garnered over 2,480 citations (h-index: 25). His current research interests focus on micro/nano technology-based environmental sensors, next-generation image sensors, and AI-converged sensor technologies. Additionally, he actively serves as a Board Member of the Korean Sensor Society (KSS) and the Society of Micro and Nano Systems (MNS) since 2026.

Low-Cost Centimeter-Scale 3D-Printed Mirror Scanners

Jui-che (Ted) Tsai
National Taiwan University, Taiwan
Email: juichetsai@ntu.edu.tw

Dr. Jui-che (Ted) Tsai received the B.S. degree in Electrical Engineering from National Taiwan University (NTU), Taiwan, in 1997. He entered the Graduate Institute of Electro-Optical Engineering (currently named GIPO) at NTU after completing his undergraduate study, and received the M.S. degree in Electro-Optical Engineering in 1999. He received the Ph.D. degree in Electrical Engineering from the University of California, Los Angeles (UCLA), in 2005. He is now a Professor of the Graduate Institute of Photonics and Optoelectronics (GIPO) and the Department of Electrical Engineering, National Taiwan University, Taiwan. His research interests include opto-electro-mechanical systems and 3D printing.

Invited Speaker

Physical Reservoir Computing with a Biaxial Resonant MEMS Accelerometer

Alberto Corigliano
Politecnico di Milano, Italy
Email: alberto.corigliano@polimi.it

Alberto Corigliano is full professor of Solids and Structural Mechanics with the Department of Civil and Environmental Engineering of Politecnico di Milano, Italy, where he coordinates the Mechanics of Materials and Structures research Section. Is member of the technical committee of Eurosime, Associate Editor of Advanced Modelling and Simulation in Engineering Sciences and of Frontiers in Materials – Mechanics of materials. He was associate Editor of the European J. of Mechanics A/Solids from 2006 to 2025. He was president of the 25° International Congress of Theoretical and Applied Mechanics (ICTAM2020+1-Virtual, 22-27 August 2021) and member of the Executive Committee of the Congress Committee of IUTAM (2016-2024). In 2006 won the Bruno Finzi prize for Rational Mechanics of the "Istituto Lombardo Accademia di Scienze e Lettere", in 2015 was appointed Euromech Fellow by the European Mechanics Society, in 2018 was elected member of the "Istituto Lombardo Accademia di Scienze e Lettere". In 2024 A. Corigliano received an ERC-advanced Grant for the project IMMENSE ERC – Immense. His research covers a wide range of subjects in the fields of structural and materials mechanics, as: damage phenomena in composite materials; brittle and quasi-brittle fracture; identification of constitutive models; reliability, design and multi-physics problems in MEMS; metamaterials; deep and reinforced learning applied to SHM.

Single-Cell Molecular Assays via Discrete Droplets and Continuous Hydrogel Matrices

Shih-Kang Fan
Kansas State University, USA
Email: skfan@ksu.edu

Shih-Kang Fan received his B.S. degree from National Central University, Taiwan in 1996, and M.S. and Ph.D. degrees from the University of California, Los Angeles (UCLA) in 2001 and 2003, respectively, all in mechanical engineering. In 2004 he joined the faculty at National Chiao Tung University, Taiwan as an assistant professor and was promoted to an associate professor in the Institute of Nanotechnology and the department of material sciences. From 2012 to 2019, he was with the department of mechanical engineering and the Center for Biotechnology at National Taiwan University, Taiwan as an associate professor, professor and distinguished professor. He is now a professor of mechanical and nuclear engineering at Kansas State University, USA.

Invited Speaker

Flexible Sensors and Actuators Through Rational Design of Microstructures

Yongrok Jeong
Kyungpook National University, South Korea
Email: yongrok@knu.ac.kr

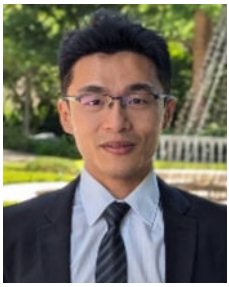
Dr. Yongrok Jeong is an Assistant Professor in the School of Mechanical Engineering and the School of Semiconductor Convergence Engineering in Kyungpook National University (KNU), south Korea. Prior to joining KNU, he served as a senior researcher in the Korea Atomic Energy Research Institute (KAERI). He received his B.S., M.S., and Ph.D. degrees in Mechanical Engineering from KAIST, South Korea. His research interest lies in flexible transducers fabricated with the semiconductor technology, which constructs the basis of his Ph.D. Combining this background with his experience at KAERI in developing atomic batteries for space applications, he now leads the Extreme Environment Transducers Lab. (EETL) at KNU, focusing on the development of next-generation transducers capable of operating in extreme environments such as outer space and deep-sea conditions. Dr. Jeong has published over 40 peer-reviewed journal papers, including publications in *Nature Communications, Advanced Materials, ACS Nano,* and *Advanced Science,* several of which have been featured on journal covers.

Toward Thermally Intelligent Power Module Packaging: Thermal Path Engineering and Junction Temperature Estimation

Sang Won Yoon
Seoul National University, Korea
Email: swyoon@snu.ac.kr

Prof. Sang Won Yoon received the Ph.D. degrees in electrical engineering and computer science from the University of Michigan, Ann Arbor, MI, USA, in 2009. From 2009 to 2013, he was a Senior Scientist and a Staff Researcher with the Toyota Research Institute of North America, Ann Arbor. From 2013 to 2023, he was an Assistant Professor, an Associate Professor, and a Professor with the Department of Automotive Engineering, Hanyang University, Seoul. Since 2023, he has been with the Department of Electrical and Computer Engineering, Seoul National University. His current research interests include packaging and reliability of semiconductors and sensor systems and their applications.

Invited Speaker



Ultrafast Laser Nanoscale 3D Printing and Micromachining for Photonics, Sensing, and Energy Storage

Po-Han Huang
National Tsing Hua University, Taiwan
Email: phhuang@pme.nthu.edu.tw

Dr. Huang is currently an Assistant Professor in the Department of Power Mechanical Engineering at National Tsing Hua University. He received his Ph.D. in Electrical Engineering (Micro and Nanosystems) in 2024 and his M.Sc. in Engineering Physics (Nanotechnology) in 2019, both from KTH Royal Institute of Technology, Sweden. His research focuses on ultrafast laser-based micro- and nanofabrication, including 3D printing and micromachining, for advanced materials and microsystems, with applications in micro-optics, integrated photonics, MEMS, sensors, and micro-supercapacitors. He has received the 2030 Cross-Generation Emerging Young Scholar grant and the Yushan Young Fellow award from Taiwan's National Science and Technology Council and Ministry of Education, respectively.

Magnetic Micro/Nano Devices Enabled Novel Applications: From Medical to Computing Applications

Tien-Kan "TK" Chung
National Yang Ming Chiao Tung University, Taiwan
Email: tkchung@nycu.edu.tw

Tien-Kan Chung received his Ph.D. degree from Mechanical Engineering in University of California at Los Angeles (UCLA), Los Angeles, USA, in 2009. Before earning the PhD degree, from 2005 to 2009, he worked for Precision Machinery R&D center, Taiwan. After earning the PhD degree, from 2009 to 2011, he worked for Department of MEMS R&D, Taiwan Semiconductor Manufacturing Company, Taiwan. From 2011-present, he has served as assistant/associate/full professor for National Yang Ming Chiao Tung University, Taiwan. He also served as an associate editor of IEEE Sensors Journal from 2018 to 2024, and guest editor for ASME special issue of Microsystem Technologies. His current research interests include magnetic and piezoelectric sensors, actuators, energy harvesters, MEMS, nano-magnetoelectrics, medical/surgical devices, and wireless IoT sensors for industrial and smart grid applications.

Invited Speaker

MEMS-Based Tri-IDT Surface Acoustic Wave Atomizer for Miniaturized Aerosol Generation

Chien-Hao Liu
National Taiwan University, Taiwan
Email: cliu82@ntu.edu.tw

Chien-Hao Liu (S'12–M'15) received the BS and MS degrees in mechanical engineering from National Taiwan University, Taipei, Taiwan, in 2005 and 2007, respectively. Then, he received his MS and Ph.D. in electrical engineering from the University of Wisconsin–Madison, Madison, WI, USA, in 2013 and 2014, respectively. He was a research assistant with the Electrical and Computer Engineering Department at UW-Madison from 2011 to 2014. From 2014 to 2015, he was a research associate with the Electrical and Computer Engineering Department at UW-Madison. He is currently an associate professor with the Mechanical Engineering Department at National Taiwan University. His research interests include RF/microwave circuits, antennas, frequency-selective surfaces, and acoustic metamaterials.

Continuous Analysis of Mechanical and Biological Properties of a Single Cell Using MEMS Tweezers

Momoko Kumemura
Kyushu Institute of Technology, Japan
Email: momo@life.kyutech.ac.jp

Momoko Kumemura received the doctoral degree from the Department of Chemistry, Graduate School of Science, Tokyo Metropolitan University in 2005, then she became a researcher at the Institute of Industrial Science, the University of Tokyo from April of the same year, where she became an assistant professor in January 2013 after becoming a researcher for collaboration between industry, academia and government and a postdoctoral fellow at LIMMS/CNRS-IIS. From April 2018, she is an associate professor in Kyushu Institute of Technology. She specializes in Micro total analysis system and BioMEMS.

Special Session Panelists

Rone Chiu

LIDS Semiconductor Technology CO., LTD., General Manager & CEO
Email : rone.chiu2019@gmail.com

Rone Chiu has 30 years' experience in semiconductor industry. For over a decade as ASML's ASIA Training Manager, I localized cutting-edge European lithography technologies, transforming them into the core capabilities of Asia's engineering teams. Leveraging this expertise, I recognized Taiwan's need for robust system integration to meet next-generation demands. Consequently, I founded LIDS Semiconductor Technology Co., Ltd., successfully guiding it from zero to one over the past five years. At LIDS, we go beyond premium technical services to chart the industry's future. We deliver resilient, ESG-compliant solutions tailored for emerging trends, including advanced packaging, silicon photonics, and net-zero emissions. By elevating local manufacturing ecosystems to top-tier international standards, we have built an irreplaceable technical moat. Reflecting on a 30-year career—from a multinational executive to a startup helmsman—I operate exactly at the intersection of technology and management. Moving forward, I remain dedicated to driving next-generation semiconductor advancements through forward-looking vision and robust global expansion strategies.

Jason Wu

Asia Pacific Microsystems, Inc., President
Email: jason.wu@apmsinc.com

Dr. Chien-Hung (Jason) Wu is President of Asia Pacific Microsystems, Inc. (APM), bringing over 20 years of experience in MEMS, sensors, microfabrication, and business development across the United States and Taiwan. Before joining APM, he led technical development of infrared sensor array technologies in the U.S., covering sensor design, process integration, CMOS/MEMS integration, packaging, and failure analysis. Since joining APM in 2014, Dr. Wu has held key roles in technical marketing, business development, and sales, helping expand APM's MEMS foundry business and strengthen partnerships with global customers. His technical background spans MEMS pressure sensors, optical MEMS, SiC-based microsystems, and sensor commercialization. Dr. Wu holds a PhD in Materials Science & Engineering from Case Western Reserve University and an MBA from Cleveland State University.

Special Session Panelists

Yunwei Lin

United Microelectronics Corporation (UMC), Technical Manager, Product Marketing Division
Email: david_yw_lin@umc.com

Yunwei Lin serves as a Technical Manager in the Product Marketing Division at United Microelectronics Corporation (UMC), bringing over 25 years of extensive semiconductor industry experience. Transitioning from a system-level R&D engineer to a commercial manager, he offers a rare, holistic perspective on foundry business development and strategic marketing. Throughout his tenure at UMC, Mr. Lin has successfully driven business growth across diverse technology segments, notably incorporating and validating strategic suppliers to enable and scale up open, collaborative manufacturing frameworks. His current responsibilities center on capturing emerging market opportunities and formulating business expansion strategies for 8-inch specialty product lines, spanning diverse design architectures and material technologies, including MEMS, Si-based Discretes, and Wide Bandgap (WBG) materials. Mr. Lin holds a B.S. in Electrical Engineering and an M.S. in Electronic Engineering from National Tsing Hua University.

Yu-Ching Lin

NextQM Inc., CEO
Email:yuching21@gmail.com

Dr. Yu-Ching Lin is the Founder and CEO of NextQM Inc., with expertise in MEMS, advanced materials, and microsystem packaging. She has over 20 years of international experience spanning academic research, technology development, and technology commercialization. Dr. Yu-Ching Lin received her Ph.D. in Engineering from Tohoku University, Japan, where she later served as an Associate Professor. She was also a Visiting Scholar at the Berkeley Sensor & Actuator Center (BSAC), University of California, Berkeley, and conducted advanced microsystems research at the Fraunhofer Institute for Electronic Nano Systems (ENAS), Germany. In industry, she has held leadership positions including Director of the Advanced Microsystem Research Center at Goertek Technology Japan and Japan Representative of Cardio Ring Technologies (USA). Her current work focuses on next-generation Quartz MEMS, advanced packaging, and enabling technologies for AI infrastructure. She is dedicated to bridging academic innovation and industrial applications while accelerating the commercialization of deep-tech innovations.

Special Session Panelists

LIMMS: Collaboration between French CNRS and UTokyo lasting over 30 years

Hiroyuki Fujita
Tokyo City University, Japan [1], National Tsing Hua University, Taiwan [2]
Website : https://limms-tokyo.org/

Hiroyuki Fujita is Yushan Honorary Chair Professor, iNEMS, Taiwan National Tsing Hua University and Distinguished Professor of Tokyo City University in Tokyo, Japan. He received Ph.D. degree in electrical engineering from The University of Tokyo, Japan, in 1980. He worked in Institute of Industrial Science of The University of Tokyo as a Faculty member (Lecturer, Assistant Professor and Professor) until 2018. He served as Founding Director of Advanced Research Laboratory, CANON Medical Systems Corporation, Japan from 2017 to 2023. He has investigated MEMS from 1987, covering the design and fabrication of MEMS and applications to optics, biotechnology, nanotechnology and IoT. He has published more than 450 academic papers. Dr. Fujita received many awards, including French l'Ordre des Palmes Academiques, Prize for Science and Technology from MEXT in Japan, and IEEE Robert Bosch Award for MEMS.

Yoshio Mita
The University of Tokyo, Japan
Email: mita@ee.t.u-tokyo.ac.jp

Dr. Yoshio Mita received the B.E., M.E., and Ph.D. degrees from the Department of Electrical and Electronic Engineering, UTokyo, in 1995, 1997, and 2000, respectively. He was an Assistant Professor with the VLSI Design and Education Center (VDEC), UTokyo, and was promoted to a Lecturer in 2001, an Associate Professor in 2005, and a Professor in 2022, all at the Department of Electrical Engineering. He is currently a Professor with the Department of Electrical Engineering and Information Systems, The University of Tokyo, Japan. He has been the Co-Principal Investigator (PI) of the Intelligent Semiconductor Microdevices Laboratory (SML) since 2002 and single PI since 2013 and the Leader of UTokyo's open nanotechnology platform federal class-1 supercleanroom. Until now, he has been co-(and first-) authored 76 journal articles and 161 international conferences (117 IEEE sponsored), including four keynote talk and 13 invited talks. His research interests include CMOS and MEMS integration technology. In 2021, he was awarded as Senior Member from IEE, Japan, in 2021. He served as the General Co-Chair for Transducers in 2021.

Special Session Panelists

Takehiko Kitamori
National Tsing Hua University, Taiwan
Email: kitamori@mx.nthu.edu.tw

Dr. Takehiko Kitamori received his Ph.D. in Engineering in 1989 from The University of Tokyo. He worked for Hitachi as a nuclear engineer, and moved to The University of Tokyo as professor of analytical chemistry. He served as Vice President after Dean of School of Engineering. In 2020, he was invited to NTHU as Yushan Sholar and Professor. Also, he has been serving as Director General of the Kanagawa Institute of Industrial Science and Technology since 2023. He founded his startup company IMT-Taiwan Co. Ltd. from NTHU, and launched an international university-industry collaboration with Daicel which is Japanese chemical company in 2021. A world first real chemical plant based on largescale serial-parallel microfluidic device system was completed, exported, and installed from Taiwan to Daicel in 2026. He has authored over 350 journal papers and been awarded by not a few honors including International Academician of Swedish Royal Academy of Science.

Inkyu Park
KAIST, Korea
Email: inkyu@kaist.ac.kr

Prof. Inkyu Park received his B.S., M.S., and Ph.D. from KAIST (1998), UIUC (2003) and UC Berkeley (2007), respectively, all in mechanical engineering. He has been with the department of mechanical engineering at KAIST since 2009 as a faculty member and is currently a full professor and KAIST Endowed Chair Professor. His research interests are micro/nanofabrication, smart sensors for healthcare, environmental and biomedical monitoring, and flexible & wearable electronics. He has published more than 226 SCI journal articles (45+ cover articles) and 50+ patents in the area of MEMS/NANO engineering, and his publications have been cited more than 23,686 times (h-index=70) as of Jun 2026. He is a recipient of HP Open Innovation Research Award (2009-2012), KAIST Prize for Academic Excellence (2021), KAIST Grand Prize for Technology Innovation Award (2019), Top 10 Nanotechnology of Korea (2023), and Minister Award from Ministry of Science and ICT (2023). He is also a fellow (academician) of Korean Academy of Science and Technology (KAST) and a general member of National Academy of Engineering of Korea (NAEK). At present, he holds the position of editor for Sensors and Actuators B: Chemical (Elsevier), a top-ranked SCI journal in the field of chemical sensor technology.

Special Session Panelists

Sheng-Hsiang Tseng
Taiwan Semiconductor Research Institute (TSRI), Taiwan
Email: shtseng@niar.org.tw

Dr. Sheng-Hsiang Tseng received his Ph.D. from the Institute of Electronics Engineering at National Tsing Hua University in Hsinchu, Taiwan. He is currently a Research Fellow and the Director of the Chip Implementation Service Division at the Taiwan Semiconductor Research Institute (TSRI) in Hsinchu, Taiwan. His research interests include CMOS-based MEMS ICs, MEMS technologies, piezoelectric MEMS, RF MEMS, heterogeneous chip integration, and advanced packaging technologies. He has contributed to the development and delivery of courses for the Taiwan–Europe IC Design Program, as well as to the cultivation of talent in advanced FinFET IC design technologies. He has received multiple awards from the National Institutes of Applied Research (NIAR) in recognition of his outstanding contributions to science and technology. Dr. Tseng received the Young Engineer Award from the Taiwan Nanotechnology and Micro System Association (NMA) in 2022. He served on the Technical Committee on Sensors, MEMS, and Bioelectronics (SMB) of the IEEE International Electron Devices Meeting (IEDM) from 2021 to 2022. He currently serves as the Secretary- General of the NMA in Taiwan.

Self-organized Session Speaker

A Stomach-Acid-Charged Tablet-Type Digital Pill with In-Body Monitoring

Kiichi Niitsu
Kyoto University, Japan
Email: niitsu.kiichi.2p@kyoto-u.ac.jp

Dr. Kiichi Niitsu is a Professor in the Department of Informatics, Graduate School of Informatics, Kyoto University, Japan. He received his B.S., M.S., and Ph.D. degrees in Electrical Engineering from Keio University. His research focuses on low-power and high-speed VLSI circuits, biomedical integrated systems, and energy-efficient sensing technologies for healthcare applications. He has made significant contributions to biomedical circuits and systems, wearable and implantable devices, and next-generation healthcare electronics. His work bridges integrated circuit design, information technology, and biomedical engineering to enable advanced intelligent healthcare systems.

Development and In Vivo Telemetry Demonstration of Ingestible Polyaniline-Based Conductometric pH Sensor

Shinya Yoshida
Shibaura Institute of Technology, Japan
Email: syoshida@shibaura-it.ac.jp

Dr. Shinya Yoshida is a Professor at Shibaura Institute of Technology, Japan. He received his Ph.D. in Engineering from Tohoku University and has extensive experience in MEMS, piezoelectric MEMS, micro/nano fabrication, and biomedical devices. His research focuses on the development of advanced microsystems, ultrasonic transducers, inertial sensors, and ingestible sensing devices for healthcare applications. By integrating microfabrication technologies with biomedical engineering, he contributes to innovative sensing platforms that bridge MEMS technology and next-generation medical diagnostics.

Self-organized Session Speaker

Design of Chemical Transducers for Bioorthogonal Signaling

Kosuke Dodo
RIKEN, Japan
Email: dodo@riken.jp

Dr. Kosuke Dodo is a Senior Research Scientist at RIKEN, Japan. He received his Ph.D. in Engineering and conducts interdisciplinary research at the interface of chemical biology, molecular imaging, and biomedical science. His research focuses on the development of functional molecular probes, Raman imaging technologies, and analytical methods for visualizing and quantifying biological processes in living systems. By integrating chemistry, biology, and advanced imaging techniques, he has contributed to a deeper understanding of cellular functions, disease mechanisms, and the development of innovative diagnostic and therapeutic technologies.

Engineering signaling systems of plant hormones as triggers and readouts of in-body avatar cells

Shigeo S Sugano
National Institute of Advanced Industrial Science and Technology, Japan
Email: shigeo.sugano@aist.go.jp

Dr. Shigeo Sugano is a Chief Senior Researcher at the National Institute of Advanced Industrial Science and Technology (AIST), Japan. He received his D.Sc. in Plant Molecular Biology from Kyoto University. His research focuses on molecular biology, genome engineering, biotechnology, and plant sciences, with applications ranging from gene regulation and genome editing to advanced biomanufacturing. He is also involved in interdisciplinary collaborations that integrate microfluidics, bioengineering, and single-cell technologies to address challenges in life science research and biotechnology.

Self-organized Session Speaker

Avatar cells production based on electromechanical poration by electrically induced bubbles

Yoko Yamanishi
Kyushu University, Japan
Email: yoko@mech.kyushu-u.ac.jp

Dr. Yoko Yamanishi is a Distinguished Professor in the Department of Mechanical Engineering at Kyushu University, Japan. She received her Ph.D. in Mechanical Engineering from Imperial College London, UK. Her research focuses on biomedical fluid engineering, microfluidics, BioMEMS, multiphase microflows, and bubble-based biomedical technologies. She has pioneered innovative approaches in microbubble generation, plasma–liquid interactions, and biomedical delivery systems. Dr. Yamanishi currently serves as a principal member of JST CREST and as a Program Manager of the Japan Moonshot Program, leading interdisciplinary research at the interface of engineering, biology, and medicine.

Droplet-Based Microfluidic Platform for Time-Lapse Monitoring of Cellular Responses to Nano-Artifact Exposure

Shinya Sakuma
Kyushu University, Japan
Email: sakuma@mech.kyushu-u.ac.jp

Dr. Shinya Sakuma is an Associate Professor in the Department of Mechanical Engineering at Kyushu University, Japan. His research focuses on microfluidics, micro/nano robotics, MEMS, and single-cell analysis. He has developed innovative microfluidic systems for cell sorting, manipulation, fusion, and analysis, as well as microscale robotic technologies for biomedical applications. His work bridges microengineering and life sciences, contributing to the advancement of lab-on-a-chip systems, microTAS technologies, and next-generation biomedical devices.

Self-organized Session Speaker

Cyto-Transducers for Visualization of Designed Cell-Cell Communications

Niko Kimura
Tokyo University of Agriculture and Technology, Japan
Email: nkimura@go.tuat.ac.jp

Dr. Niko Kimura is a Senior Assistant Professor in the Division of Advanced Mechanical Systems Engineering at Tokyo University of Agriculture and Technology (TUAT), Japan. She received her M.S. and Ph.D. degrees in Engineering from Hokkaido University and was awarded a JSPS Research Fellowship for Young Scientists (DC1). Prior to joining TUAT, she served as an Assistant Professor at Kyushu University. Her research interests include micro/nano engineering, advanced materials, and microsystem technologies, with applications in sensing and interdisciplinary engineering systems.

Optical Immunotransducer as an Evaluation Platform for Designed Cell-Cell Communication

Yoshitaka Shirasaki
The University of Tokyo, Japan
Email: shirasaki@g.ecc.u-tokyo.ac.jp

Dr. Yoshitaka Shirasaki is an Associate Professor at the Research Center for Advanced Science and Technology, The University of Tokyo, Japan. He received his Ph.D. in Science from Waseda University and has held research positions at RIKEN and The University of Tokyo. His research focuses on microfluidics, single-cell analysis, bioimaging, and quantitative life sciences. He has developed innovative microsystem technologies for studying cellular functions, protein secretion, and immune responses, contributing to the integration of micro/nano engineering with biomedical and life science applications.

Self-organized Session Speaker

Construction of Bio-Fate: A Platform Integrating Live-Cell Phenotypic Profiling and Precision Manipulation

Takashi Kamatani
Japanese Foundation for Cancer Research, Japan
Email: takashi.kamatani@jfcr.or.jp

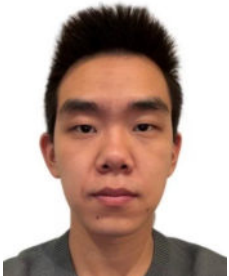
Dr. Takashi Kamatani is a Junior Associate Professor in the Division of AI and Big Data Research at the Institute of Science Tokyo, Japan. He received his medical degree from Keio University and is both a physician and biomedical researcher. His research integrates genomics, cancer immunology, artificial intelligence, and big-data analytics to advance precision medicine. Dr. Kamatani has contributed to studies on tumor microenvironments, immunotherapy, regenerative medicine, and AI-assisted medical diagnosis, bridging clinical medicine with computational and biomedical engineering approaches.

Photopatternable Drying-Resistant Conductive Hydrogel Integrated into Organ Models for Functional Evaluation of In-body Cybernetic Avatars

Hisataka Maruyama
Nagoya University, Japan
Email: hisataka.maruyama@mae.nagoya-u.ac.jp

Dr. Hisataka Maruyama is an Associate Professor in the Graduate School of Engineering at Nagoya University, Japan. He received his Ph.D. in Micro-Nano Systems Engineering from Nagoya University. His research focuses on microfluidics, micro/nano robotics, bioMEMS, microsensors, and biomedical engineering. He has developed innovative technologies for single-cell analysis, microenvironment sensing, microscale manipulation, and biomedical devices. His interdisciplinary work integrates micro/nano engineering with life sciences and medicine, contributing to advances in lab-on-a-chip systems, biosensing, and healthcare applications.

Self-organized Session Speaker



Capsule for Intestinal Surface Sampling: Sealing Mechanism for Preventing Cross-Contamination of Collected Samples

Huaiyi Zhang
The University of Tokyo, Japan
Email: huaiyi-zhang@g.ecc.u-tokyo.ac.jp

Huaiyi Zhang is a graduate student in the Department of Precision Engineering at The University of Tokyo, Japan, under the supervision of Prof. Fumihito Arai. Their research focuses on biomedical microdevices, microfluidic systems, and ingestible technologies for healthcare applications. Current research interests include the development of capsule-based devices for gastrointestinal sampling and analysis, with an emphasis on reliable sample collection and the prevention of cross-contamination. Through the integration of microengineering and biomedical technologies, their work aims to advance minimally invasive diagnostic tools for future healthcare and medical research.

On-Chip Biomimetic Platform for Functional Evaluations of Avatar Cells

Takeshi Hayakawa
Chuo University, Japan
Email: hayaka-t@mech.chuo-u.ac.jp

Dr. Takeshi Hayakawa is a Professor in the Faculty of Science and Engineering at Chuo University, Japan. He received his Ph.D. in Engineering from Nagoya University and previously held academic positions at Nagoya University and Kyushu University. His research focuses on micro/nano systems, biomedical engineering, microrobotics, soft actuators, and microfluidic technologies for cell manipulation and analysis. He has made significant contributions to the development of microsystems and robotic platforms for biomedical applications and interdisciplinary engineering research.

Self-organized Session Speaker

A Pyramidal Nanopore for ssDNA Sequencing

Jianxin Yang
The Chinese University of Hong Kong, Hong Kong, China
Email: jianxinyang@cuhk.edu.hk

Dr. Jianxin Yang received his Ph.D. in Biomedical Engineering from The Chinese University of Hong Kong (CUHK) in 2024. He subsequently conducted postdoctoral research at CUHK from 2025 onward, previously serving as a Research Assistant at CUHK between 2024 and 2025. His research focuses on nanopore sensing, microfluidics, lab-in-a-tube platforms, and molecular sensors. He has published dozens of peer-reviewed journal papers (with an h-index of 10). His contributions have been recognized with several honors, including the National Scholarship of China (2018) and the Outstanding Tutor Award from CUHK (2024).

Advanced Energy Materials and Devices for Low-grade Heat Harvesting and Flexible Thermal Sensing

Dongyan Xu
The Chinese University of Hong Kong, Hong Kong SAR, China
Email: dyxu@cuhk.edu.hk

Prof. Dongyan Xu is currently a Professor in the Department of Mechanical and Automation Engineering, The Chinese University of Hong Kong. Prof. Xu received her Bachelor, Master, and Ph.D. degrees from Tsinghua University and Vanderbilt University. After that, she worked as a Postdoc in the University of California, Berkeley and Lawrence Berkeley National Laboratory for two years. She joined CUHK in 2010 as an Assistant Professor and was promoted to Associate Professor in 2016 and Professor in 2022. Her current research interests include flexible tactile and thermal sensors, thermoelectric materials and devices, thermogalvanic cells, ionic thermoelectric materials, nanoscale thermal transport, and boiling heat transfer.

Self-organized Session Speaker

Microfluidic Encapsulation Strategies for Tissue Engineering and Regenerative Medicine

Hon Fai Chan
Chinese University of Hong Kong, Hong Kong SAR, China
Email: honfaichan@cuhk.edu.hk

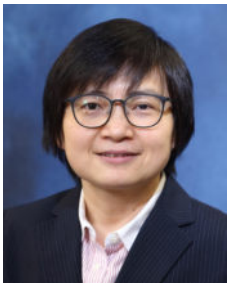
Prof. Hon Fai Chan is an Associate Professor at the School of Biomedical Sciences and the Institute for Tissue Engineering and Regenerative Medicine at The Chinese University of Hong Kong (CUHK). He received his Bachelor degree from the University of Hong Kong, before pursuing his Ph.D. degree at Duke University. During 2015-2017, he worked as a postdoctoral researcher at Columbia University and Massachusetts Institute of Technology before joining CUHK in 2018. Prof. Chan's research mainly focuses on advancing biofabrication approach and biomaterial design for stem cell tissue engineering and regenerative medicine, as well as understanding how microenvironmental cues influence stem cell proliferation and differentiation. He has published more than 70 SCI-indexed papers in journals such as PNAS, Science Advances, Nature Communications, Advanced Materials, Advanced Science, and Biomaterials.

MusTer: A Generalizable Microfluidic Platform Combining Multi-Parametric Droplet Sorting and Multi-Droplet Merging in Single-Cell Sequencing

Guangyao Cheng
The Chinese University of Hong Kong, Hong Kong SAR, China
Email: chenggy@link.cuhk.edu.hk

Dr. Guangyao Cheng is currently a Postdoctoral Fellow in the Department of Biomedical Engineering at The Chinese University of Hong Kong (CUHK). He received his B.E. from Sun Yat-Sen University and his Ph.D. in Biomedical Engineering from CUHK, where he pioneered photo-responsive fluorosurfactants for light-driven droplet manipulation. Bridging academic research and industrial application, Dr. Cheng previously worked as an Instrument Development Engineer at MGI for developing microfluidics-based high-throughput enzyme evolution platforms. His current research focuses on advancing droplet microfluidics for biochemical applications, including ultrafast PCR and single-cell analysis. He has authored 18 peer-reviewed articles, holds 3 patents, and was recognized with the CBMS LMIC Young Researcher Award at μTAS 2021.

Self-organized Session Speaker

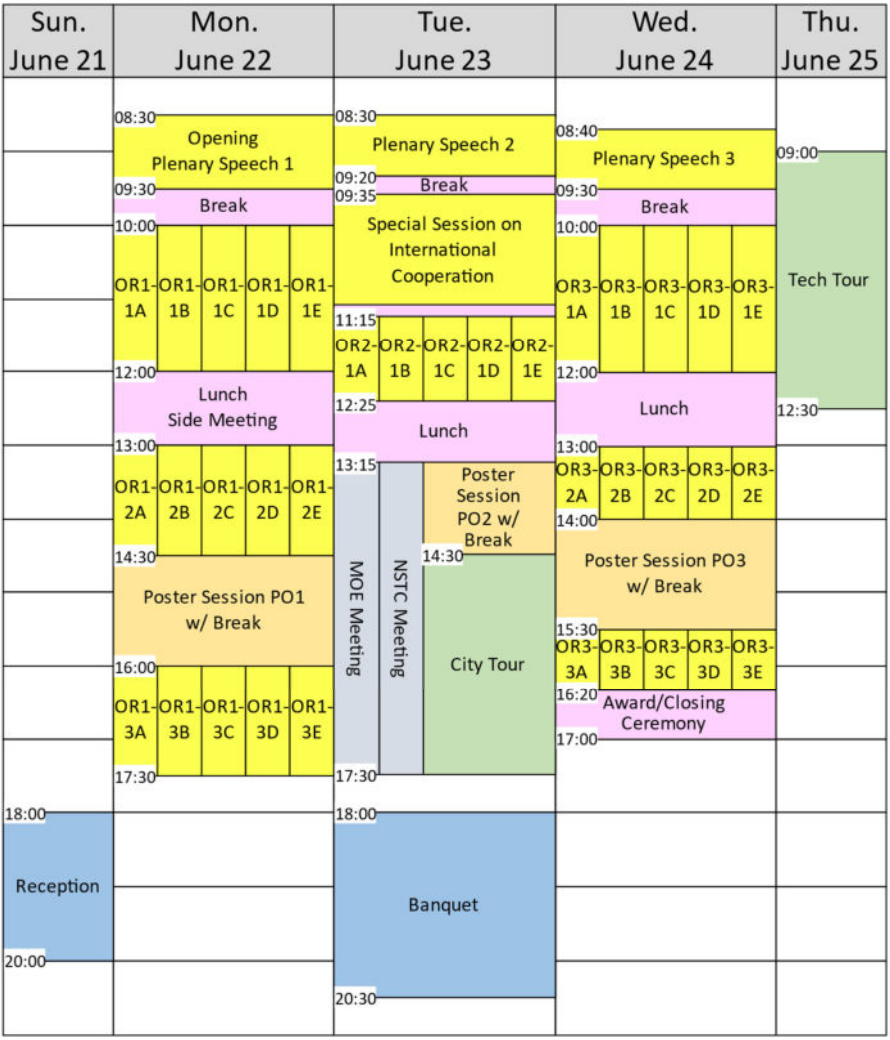


Deformability Cytometry for Noninvasive High-throughput Characterization of Cells

Megan Yi-Ping Ho
The Chinese University of Hong Kong, Hong Kong
Email: ypho@cuhk.edu.hk

Yi-Ping (Megan) Ho is currently a Professor, the Vice Chairman (Research) and the MSc Program Director in the Department of Biomedical Engineering at The Chinese University of Hong Kong. She received her B.S. and M.S. in Power Mechanical Engineering from National Tsing-Hua University, Taiwan. She received her Ph.D. in Mechanical Engineering from the Johns Hopkins University. After her postdoctoral training at the Department of Biomedical Engineering in Duke University, she received the Young Elite Researcher Award from the Danish Research Council and started her independent career in the Interdisciplinary Nanoscience Centre and the Department of Molecular Biology and Genetics at Aarhus University in Denmark. She has published 92 peer-reviewed journal articles, 7 book chapters, 92 conference papers, edited 1 book and holds 7 granted patents. The results that she presented have been recognized internationally by the American Society of Gene Therapy and Controlled Release Society. Her research is focused on developing nanosensors and microfluidics as diagnostic tools to expand the capacity of disease detection and treatment evaluation.

Program Overview



Program Overview

Sunday, June 21,2026				
Reception 18:00 – 20:00				
Monday, June 22, 2026				
Opening and Plenary Speech 08:30 – 09:30 Isao Shimoyama				
Break 09:30 – 10:00				
OR1-1A Bio/Medical Sensors and MEMS/NEMS 1	OR1-1B Acoustic and RF MEMS	OR1-1C Material, Fabrication, and Packaging 1	OR1-1D Physical Sensors and MEMS/NEMS 1	OR1-1E Chemical Sensors and MEMS/NEMS 1
10:00 – 10:30 [Keynote] Tza-Huei (Jeff) Wang	10:00 – 10:20 [Invited] GH Feng	10:00 – 10:20 [Invited] W Jo	10:00 – 10:20 [Invited] H Takao	10:00 – 10:20 [Invited] KC Kim
10:30 – 10:42 0105	10:20 – 10:40 [Invited] MH Li	10:20 – 10:40 [Invited] M Garg	10:20 – 10:40 [Invited] SH Lin	10:20 – 10:40 [Invited] N Rodthongkum
10:42 – 10:54 0207	10:40 – 10:52 0285	10:40 – 10:52 0101	10:40 – 10:52 0116	10:40 – 10:52 0155
10:54 – 11:06 0323	10:52 – 11:04 0288	10:52 – 11:04 0265	10:52 – 11:04 0132	10:52 – 11:04 0172
11:06 – 11:18 0130	11:04 – 11:16 0289	11:04 – 11:16 0123	11:04 – 11:16 0133	11:04 – 11:16 0179
11:18 – 11:30 0131	11:16 – 11:28 0298	11:16 – 11:28 0126	11:16 – 11:28 0148	11:16 – 11:28 0284
11:30 – 11:42 0144	11:28 – 11:40 0337	11:28 – 11:40 0140	11:28 – 11:40 0340	11:28 – 11:40 0221
11:42 – 11:54 0145	11:40 – 11:52 0364	11:40 – 11:52 0149	11:40 – 11:52 0214	11:40 – 11:52 0153

Program Overview

Lunch 12:00 – 13:00				
OR1-2A Energy and Power and MEMS/NEMS	OR1-2B Self Organized 1 In-body/Intrace-llular Cybernetic Avatars	OR1-2C Optical MEMS 1	OR1-2D Physical Sensors and MEMS/NEMS 2	OR1-2E Bio/Medical Sensors and MEMS/NEMS 2
13:00 – 13:30 [Keynote] HJ Kim	13:00 – 13:15 K Niitsu	13:00 – 13:20 [Invited] JY Ou	13:00 – 13:20 [Invited] A Vergara	13:00 – 13:20 [Invited] DRB Albano
13:30 – 13:42 0450	13:15 – 13:30 S Yoshida	13:20 – 13:40 [Invited] H Cai	13:20 – 13:40 [Invited] YC Tsai	13:20 – 13:40 [Invited] CH Wu
13:42 – 13:54 0156	13:30 – 13:45 K Dodo	13:40 – 13:52 0124	13:40 – 13:52 0257	13:40 – 13:52 0189
13:54 – 14:06 0187	13:45 – 14:00 S Sugano	13:52 – 14:04 0197	13:52 – 14:04 0258	13:52 – 14:04 0200
14:06 – 14:18 0263	14:00 – 14:15 Y Yamanishi	14:04 – 14:16 0229	14:04 – 14:16 0264	14:04 – 14:16 0201
14:18 – 14:30 0329	14:15 – 14:30 S Sakuma	14:16 – 14:28 0236	14:16 – 14:28 0273	14:16 – 14:28 0202
Poster Session PO1 w/ Break 14:30 – 16:00 0272, 0134, 0137, 0139, 0144, 0159, 0163, 0171, 0178, 0180, 0195, 0198, 0201, 0202, 0204, 0237, 0325, 0333, 0109, 0138, 0141, 0151, 0452, 0184, 0206, 0218, 0269, 0371, 0152, 0263, 0103, 0110, 0127, 0181, 0188, 0194, 0213, 0235, 0175, 0183, 0240, 0278, 0353, 0357, 0121, 0143, 0229, 0102, 0104, 0117, 0273, 0340, 0344, 0288, 0147, 0192				

Program Overview

OR1-3A ICSS Industrial Session	OR1-3B Self Organized 2 In-body/Intrace-llular Cybernetic Avatars	OR1-3C Novel Application of MEMS/NEMS Systems 1	OR1-3D Micro/Nano Fluidics 1	OR1-3E Bio/Medical Sensors and MEMS/NEMS 3
J Wu Y Lin YC Lin TBA	16:00 – 16:15 N Kimura 16:15 – 16:30 Y Shirasaki 16:30 – 16:45 T Kamatani 16:45 – 17:00 H Maruyama 17:00 – 17:15 H Zhang 17:15 – 17:30 T Hayakawa	16:00 – 16:20 [Invited] WC Huang 16:20 – 16:40 [Invited] CT Kuo 16:40 – 16:52 0432 16:52 – 17:04 0128 17:04 – 17:16 0186 17:16 – 17:28 0242	16:00 – 16:20 [Invited] YC Tung 16:20 – 16:40 [Invited] CH Tsai 16:40 – 16:52 0361 16:52 – 17:04 0384 17:04 – 17:16 0387 17:16 – 17:28 0411	16:00 – 16:20 [Invited] M Nishizawa 16:20 – 16:40 [Invited] N Ruecha 16:40 – 16:52 0108 16:52 – 17:04 0237 17:04 – 17:16 0243

Tuesday, June 23, 2026
Plenary Speech 08:30 – 09:20 Ming Wu
Break 09:20 – 09:35
Special Session on International Cooperation 09:35 – 11:05 H Fujita, Y Mita, T Kitamori, I Park, SH Tseng

Program Overview

OR2-1A Actuator	OR2-1B Chemical Sensors and MEMS/NEMS 2	OR2-1C Novel Application of MEMS/NEMS System 2	OR2-1D Optical MEMS 2	OR2-1E Bio/Medical Sensors and MEMS/NEMS 4
11:15 – 11:45 [Keynote] Chester Hwang	11:15 – 11:35 [Invited] I Cho	11:15 – 11:35 [Invited] A Corigliano	11:15 – 11:35 [Invited] JC Tsai	11:15 – 11:35 [Invited] SK Fan
	11:35 – 11:47 0320	11:35 – 11:47 0113	11:35 – 11:47 0246	11:35 – 11:47 0254
11:45 – 11:57 0272	11:47 – 11:59 0305	11:47 – 11:59 0191	11:47 – 11:59 0274	11:47 – 11:59 0296
11:57 – 12:09 0295	11:59 – 12:11 0223	11:59 – 12:11 0310	11:59 – 12:11 0317	11:59 – 12:11 0319
12:09 – 12:21 0336	12:11 – 12:23 0374	12:11 – 12:23 0357	12:11 – 12:23 0403	12:11 – 12:23 0325
Lunch 12:25 – 13:15				
Poster Session PO2 w/ Break 13:15 – 14:30 0211, 0215, 0228, 0280, 0282, 0299, 0306, 0307, 0326, 0327, 0349, 0224, 0238, 0287, 0315, 0318, 0341, 0365, 0199, 0209, 0259, 0260, 0286, 0321, 0324, 0230, 0234, 0261, 0176, 0177, 0193, 0196, 0208, 0267, 0276, 0301, 0281, 0303, 0359, 0241, 0313, 0422, 0112, 0351, 0447, 0330, 0385, 0154, 0164, 0167, 0173, 0129, 0166, 0182				
City Tour 14:30 – 17:30				
Banquet 18:00 – 20:30				

Wednesday, June 24, 2026
Plenary Speech 08:40 – 09:30 SC Jun

Program Overview

Break 09:30 – 10:00				
OR3-1A Micro/Nano Fluidics 2	OR3-1B Theory, Design and Simulation	OR3-1C Materials, Fabrication and Packaging 2	OR3-1D Physical Sensors and MEMS/NEMS 3	OR3-1E Self Organized 3 From Single-Cell Analysis to Biomimetic Systems
10:00 – 10:30 [Keynote] JH Seo	10:00 – 10:20 [Invited] Y Jeong	10:00 – 10:20 [Invited] SW Yoon	10:00 – 10:20 [Invited] TK Chung	10:00 – 10:15 J Yang
10:30 – 10:42 0142	10:20 – 10:32 0120	10:20 – 10:40 [Invited] PH Huang	10:20 – 10:40 [Invited] CH Liu	10:15 – 10:30 D Xu
10:42 – 10:54 0183	10:32 – 10:44 0122	10:40 – 10:52 0212	10:40 – 10:52 0348	10:30 – 10:45 VHF Chan
10:54 – 11:06 0413	10:44 – 10:56 0147	10:52 – 11:04 0213	10:52 – 11:04 0418	10:45 – 11:00 G Cheng
11:06 – 11:18 0227	10:56 – 11:08 0252	11:04 – 11:16 0235	11:04 – 11:16 0424	11:00 – 11:15 YP Ho
11:18 – 11:30 0262	11:08 – 11:20 0338	11:16 – 11:28 0309	11:16 – 11:28 0390	11:15 – 11:30 M Kumemura
11:30 – 11:42 0294	11:20 – 11:32 0388	11:28 – 11:40 0339	11:28 – 11:40 0402	11:30 – 11:42 0362
11:42 – 11:54 0353		11:40 – 11:52 0358	11:40 – 11:52 0454	11:42 – 11:54 0247
Lunch 12:00 – 13:00				

Program Overview

OR3-2A Physical Sensors and MEMS/NEMS 4	OR3-2B Data Processing, AI, and Novel Application	OR3-2C Materials, Fabrication and Packaging 3	OR3-2D Chem/Bio/Med Sensors and MEMS/NEMS	OR3-2E Bio/Medical Sensors and MEMS/NEMS 5
13:00 – 13:12 0312	13:00 – 13:12 0165	13:00 – 13:12 0217	13:00 – 13:12 0283	13:00 – 13:12 0205
13:12 – 13:24 0279	13:12 – 13:24 0152	13:12 – 13:24 0360	13:12 – 13:24 0150	13:12 – 13:24 0372
13:24 – 13:36 0291	13:24 – 13:36 0370	13:24 – 13:36 0369	13:24 – 13:36 0219	13:24 – 13:36 0377
13:36 – 13:48 0300	13:36 – 13:48 0253	13:36 – 13:48 0406	13:36 – 13:48 0368	13:36 – 13:48 0379
13:48 – 14:00 0344	13:48 – 14:00 0394	13:48 – 14:00 0157	13:48 – 14:00 0416	13:48 – 14:00 0380

Poster Session PO3 w/ Break
14:00 – 15:30

0248, 0391, 0393, 0395, 0409, 0415, 0420, 0426, 0436, 0455, 0457, 0346, 0366, 0386, 0404, 0451, 0270, 0271, 0277, 0311, 0343, 0398, 0335, 0363, 0412, 0316, 0431, 0119, 0302, 0322, 0347, 0350, 0355, 0356, 0367, 0378, 0400, 0407, 0423, 0382, 0408, 0419, 0220, 0225, 0292, 0293, 0226, 0135, 0233, 0162, 0168, 0396, 0414

Program Overview

OR3-3A Materials, Fabrication and Packaging 4	OR3-3B Physical Sensors and MEMS/NEMS 4	OR3-3C Chemical Sensors and MEMS/NEMS 3	OR3-3D Bio/Medical Sensors and MEMS/NEMS 6	OR3-3E Bio/Medical Sensors and MEMS/NEMS 7
15:30 – 15:42 0181	15:30 – 15:42 0314	15:30 – 15:42 0269	15:30 – 15:42 0333	15:30 – 15:42 0381
15:42 – 15:54 0158	15:42 – 15:54 0331	15:42 – 15:54 0290	15:42 – 15:54 0342	15:42 – 15:54 0410
15:54 – 16:06 0161	15:54 – 16:06 0334	15:54 – 16:06 0354	15:54 – 16:06 0352	15:54 – 16:06 0392
16:06 – 16:18 0174		16:06 – 16:18 0328	16:06 – 16:18 0397	16:06 – 16:18 0383
Award and Closing Ceremony 16:20 – 17:00				

Monday, June 22

08:30-09:30 Room: Grand Ballroom 1
Opening

Plenary speech
Chair: Weileun Fang, *National Tsing Hua University, Taiwan*

MEMS×AI×Robotics
Isao Shimoyama
The University of Tokyo, Japan

10:00-12:00 Room: Grand Ballroom 1
OR1-1A Bio/Medical Sensors and MEMS/NEMS 1
Chair: Hiroyuki Fujita, *National Tsing Hua University, Taiwan*
Kin Fong Lei, *Chang Gung University, Taiwan*

10:00/**Keynote speech**
Precision Diagnostics Anywhere: Digital Partitioning, Melt Coding, and Magnetofluidic Automation – From Infection/AMR to Epigenetic Cancer Detection
Tza-Huei (Jeff) Wang
Johns Hopkins University, USA

10:30/**0105**
Carboxymethyl Cellulose–Assisted ZnS@N/C–MWCNT Nanocomposite for Real-Time Dopamine Monitoring in PC-12 Cells
Jitesh Laishram, Rajalakshmi Sakthivel, Ren-Jei Chung
National Taipei University of Technology, Taiwan

10:42/**0207**
Next-Generation Wearable Organic Electrochemical Transistor-based Bioelectronic Medicine Enabled by Conducting Polymers and Laser-Scribed Graphene
Yu-Sheng Hsiao
National Taiwan University of Science and Technology, Taiwan

10:54/**0323**
Heavy Metal-Assisted CRISPR-Cas12a FET Platform for Rapid Detection of Drug Resistance Genes in Pseudomonas aeruginosa
Tsung-Chen Hsieh, Guan-Cheng Zeng, Chia-Kai Lin, Yi-Fang Wu, Yu-Lin Wang
National Tsing Hua University, Taiwan

11:06/**0130**
Rapid Oral Cancer Screening via Salivary Exosomes Using a Shear-Horizontal Surface Acoustic Wave Biosensing Platform
Dhrubajyoti Das [1], Hiromi Yatsuda [2], Wei-Fan Chiang [3], Tai-Shan Cheng [4], Chi-Ying F. Huang [4], Dar-Bin Shieh [5], Han-Sheng Chuang [1]
National Cheng Kung University, Taiwan [1] tst Biomedical Electronics Co., Ltd., Taiwan [2] Chi Mei Medical Center, Taiwan [3] National Yang Ming Chiao Tung University, Taiwan [4] National Cheng Kung University Hospital, Taiwan [5]

Monday, June 22

11:18/**0131**
Food-Based Isotropic Edible Wireless Sensor for Gastrointestinal Monitoring
Ryosuke Matsuda [1], Kentaro Tomita [1], Shion Miura [1], Michiyuki Satoh [1], Tetsuo Kan [2], Hiroaki Onoe [1]
Keio University, Japan [1] The University of Electro-Communications, Japan [2]

11:30/**0144**
Effect of Polarity on Single-cell Electroporation in a Microfluidic device with trapping orifice Kitipob Vijitnukoonpradit [1], Nitipong Panklang [2], Nisarut Phansiri [3], Boonchai Techaumnat [1]
Chulalongkorn University, Thailand [1] Rajamangala University of Technology Thanyaburi, Thailand [2] Ubon Ratchathani University, Thailand [3]

11:42/**0145**
Laser-Induced Biomimetic Micro-texturing for Oleophobic Surfaces
Ren Goto, Masaki Yamaguchi
Shinshu University, Japan

10:00-12:00 Room: Rose 1
OR1-1B Acoustic and RF MEMS
Chair: Chihchen Chen, *National Tsing Hua University, Taiwan*

10:00/**Invited speech**
Flexible and Conformal PMUT Arrays with Acoustic Focusing Based on Hydrothermal PZT Thin Films
Guo-Hua Feng
National Tsing Hua University, Taiwan

10:20/**Invited speech**
Advanced Acoustic Delay Lines for RF Signal Processing
Ming-Huang Li
National Tsing Hua University, Taiwan

10:40/**0285**
Multi resonant metamaterial-based microwave sensor for soil monitoring
Faisal Muhammad, Tetsuo Kan
The University of Electro-communication, Japan

10:52/**0288**
CMOS-MEMS NDoF Tuned-Mass-Damper (TMD) Resonators for Multi-Frequency Applications
Chiao-Jen Hsueh, Chun-Pu Tsai, Ting-Yi Chen
National Taiwan University, Taiwan

11:04/**0289**
Enhanced Frequency Tunability of CMOS-MEMS Comb-Driven Folded-Beam Resonators via Non-Uniform Comb Design
Yi-Xiang Chen, Wei-Chang Li
National Taiwan University, Taiwan

Monday, June 22

11:16/**0298**
Near Spurious-Free SH-SAW Resonators on LNOI Platform Via Propagation Angle Twisting and Tilted Electrode
Yu-Sian Lin, Sung-Yuan Huang, Ya-Ching Yu, Zhi-Qiang Lee, Ming-Huang Li
National Tsing Hua University, Taiwan

11:28/**0337**
Single-chip CMOS-MEMS Oscillators Based on 0.18 μm CMOS for Timing Applications
Yu-Hung Lee, Chan-Chen Yu, Pin-Hsien Lee, Chia-Yi Hsiao, Sheng-Shian Li
National Tsing Hua University, Taiwan

11:40/**0364**
Spurious-Free LNOI SH-SAW GHz Resonators for Impedance Transformers
Zhi-Qiang Lee, Ya-Ching Yu, Sung-Yuan Huang, Cheng-Chien Lin, Yi-Cheng Liao, Ming-Huang Li
National Tsing Hua University, Taiwan

10:00-12:00 Room: Rose 2
OR1-1C Material, Fabrication, and Packaging 1
Chair: Toshiyuki Tsuchiya, *Kyoto University, Japan*

10:00/**Invited speech**
New Functionalities for Perovskite Ferroelectric Oxides
Wook Jo
Ulsan National Institute of Science and Technology, Korea

10:20/**Invited speech**
Stress-Engineered Multilayer Membrane Platform for Stable Microheaters
Manu Garg
Silicon Austria Labs GmbH, Austria

10:40/**0101**
Generative Artificial Intelligence for the Design of Green Piezoelectric Sensors in Healthcare Applications
Ravindra Joshi [1, 2], Parag Parashar [1], Zong-Hong Lin [1, 2]
National Taiwan University, Taiwan [1] National Tsing Hua University, Taiwan [2]

10:52/**0265**
Topological Descriptor-Guided Machine Learning for Thermal Transport Design in Complex Inorganic Materials
Yen-Ju Wu [1], Ming-Yuan Hung [2], Hong-Kang Tian [2], Yibin Xu [1]
National Institute for Materials Science, Japan [1] National Cheng Kung University, Taiwan [2]

11:04/**0123**
Kirigami-inspired 4D Printing
Taiki Sugihara [1], Michinao Hashimoto [2], Eiji Iwase [1]
Waseda University, Japan [1] Singapore University of Technology and Design, Singapore [2]

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11:16/**0126**
From Metal to Polymer: Table-tilting type 5-Axis Micromilling Strategies for 3D Microfluidic Device Fabrication
Chia-Wen Tsao, Yuan Kuan Chen, Yong-Qi Zhao
National Central University, Taiwan

11:28/**0140**
Development of Soft Microgripper Arrays Using Photothermally Driven Hydrogels
Shogo Oishi, Shoma Miura, Shusuke Iwano, Yuta Sato, Masaru Mukai, Kazutoshi Iijima, Shoji Maruo
Yokohama National University, Japan

11:40/**0149**
Immersion Laser Functional Thinning of Freestanding Metal Foils for MEMS Hot-Film Thermal Sensors
Mohammad Nizar Mohammed Zukri [1], Muhammad Salman Al Farisi [1, 2], Yoshihiro Hasegawa [1], Mitsuhiro Shikida [1]
Hiroshima City University, Japan [1], Kyushu Institute of Technology, Japan [2]

10:00-12:00 Room: Rose 3
OR1-1D Physical Sensors and MEMS/NEMS 1
Chair: Sheng-Shian Li, *National Tsing Hua University, Taiwan*

10:00/**Invited speech**
Bringing Nano-Tactile Intelligence into Practice
Hidekuni Takao
Kagawa University, Japan

10:20/**Invited speech**
Next-Generation Gallium Oxide Semiconductors for Broadband Ultraviolet Photodetectors
Shih-Hung Lin
National Yunlin University of Science and Technology, Taiwan

10:40/**0116**
Reduction of Thermo-Elastic Damping by a Virtual Spring Enabled with Electrostatically Implemented Positive Stiffness
Wen-Hao Luo, Cong-Cong Li, Hao-Yi Wang, Zhen-Shuo Zhang
Waseda University, Japan

10:52/**0132**
Collapse-mode based CMOS-MEMS CMUT through atomic layer deposition process
Hsu-Chung Chen, Sheng-Shian Li
National Tsing Hua University, Taiwan

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11:04/**0133**
Novel high-order mode PMUTs in liquid for time-of-flight applications
Ching-Hsin Hsu, Sheng-Shian Li
National Tsing Hua University, Taiwan

11:16/**0148**
Miniaturization of High-Sensitivity Gold Single-axis MEMS Accelerometer by Adjusting Spring Constant and Hole Size of Perforated Proof-mass
Torauto Yamada, Chihaya Mukaide, Tomoyuki Kurioka, Katsuyuki Machida, Tso-Fu Mark Chang, Chun-Yi Chen, Yoshihiro Miyake, Masato Sone, Hiroyuki Ito
Institute of Science Tokyo, Japan

11:28/**0340**
High-Entropy Relaxor Ferroelectrics on Flexible mica substrate for Advanced Sensors
Yu-En Pan [1], Yu-Hao Tu [1], Mengyao Xiao [2], Ying-Hao Chu [1]
National Tsing Hua University, Taiwan [1] National University of Singapore, Singapore [2]

11:40/**0214**
A Monolithic CMOS-Search-Coil-Magnetometer Based Inductive Tracking Platform Using Magnetic Shunt Physics for Real-Time Object Localization and Material Identification
Hadi Tavakkoli [1], Moaaz Ahmed [1], Amine Bermak [2], Yi-Kuen Lee [1]
The Hong Kong University of Science and Technology, Hong Kong [1] Hamad Bin Khalifa University, Qatar [2]

10:00-12:00 Room: Plum Blossom 2
OR1-1E Chemical Sensors and MEMS/NEMS 1
Chair: Chih-Ting Lin, *National Taiwan University, Taiwan*

10:00/**Invited speech**
Temperature, Oxygen and Stress Measurement using Phosphor Microparticles
Kyung Chun Kim
Pusan National University, Korea

10:20/**Invited speech**
AI-Augmented Wearable Bioelectronics: A Flexible, Sweat-Based Glucose Monitoring System for Precision Diabetes Management
Nadnudda Rodthongkum
Chulalongkorn University, Thailand

10:40/**0155**
Ultralow-Power Hydrogen Detection Using Gate-All-Around PtNP-decorated Suspended Silicon Nanobelt Gas Sensors
Po-Chien Kung, Jeng-Tzong Sheu
National Yang Ming Chiao Tung University, Taiwan

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10:52/**0172**

Design of Copper Iron Prussian Blue Analogues Integrated with Graphene Quantum Dots for Nitrate Sensors

Chieh Li [1], Jung-Hsin Jen [1], Pin-Hsuan Lin [2], Mia Rinawati [1], Kuan-Jung Chen [1], Min-Hsin Yeh [1]
National Taiwan University of Science and Technology, Taiwan [1] Might Electronic Co., Ltd., Taiwan [2]

11:04/**0179**

A Non-Contact CMOS Complex Dielectric Constant Sensor System with Tunable Operating Frequency for Chemical Analysis

Min-Yen Hsieh [1], Jung-Cheng Liao [1], Ya-Fu Liou [1], Hua-En Shih [1], Yu-Wei Chiang [1], Sheng-Yu Peng [2], Chii-Wann Lin [1]
National Taiwan University, Taiwan [1] National Taiwan University of Science and Technology, Taiwan [2]

11:16/**0284**

Evaluation of Hysteresis in Au/Ta_2O_5/Pd-based Hetero-core Optical Fiber Hydrogen Sensors

Teruaki Yoshimoto [1], Ai Hosoki [2], Michiko Nishiyama [1]
Soka University, Japan [1] Akita University, Japan [2]

11:28/**0221**

Cleanroom-Free Monolithic PCB EGFET with Integrated Microchamber via Room-Temperature TiO_2 Deposition for Scalable pH Sensing

Zongqin KE [1], Amine Bermak [2], Yi-Kuen Lee [1]
The Hong Kong University of Science and Technology, Hong Kong [1] Hamad Bin Khalifa University, Qatar [2]

11:40/**0153**

Development of a Micro Gas Sensor with a Suspended Micro Heater for Nitrogen Dioxide Detection

Chia-Hsu Hsieh, Cheng-Chuan Chou, Hao-Hsuan Hung, Ya-Han Lin, Wei-Chieh Sun, Ping-Ju Wang, Chuan-Chun Liu, Yao-Ching Fang, I-Yu Huang
National Sun Yat-sen University, Taiwan

12:00-13:00
Lunch

13:00-14:30 Room: Grand Ballroom 1
OR1-2A Energy and Power and MEMS/NEMS
Chair: Tzu-En Lin, *National Taiwan University, Taiwan*

13:00/**Keynote speech**

From Skin to Machine: Nanogenerators for Energy Harvesting, Wound Healing, and Thermal Perception

Hoe Joon Kim
DGIST, Korea

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13:30/**0450**
Hierarchical Microstructure Engineering and Surface Area Optimization for 3D-Printed Triboelectric Nanogenerators
Wei-Cheng Wang, Chen-Fang Sun, Pin-Chuan Chen
National Taiwan University of Science and Technology, Taiwan

13:42/**0156**
SOI-based MEMS Vibrational Energy Harvester using Self-Assembled Electrets
Shuma Kawamura [1], Yuichiro Sunagawa [1], Hiroki Naruo [1], Satoshi Maruyama [2], Yuya Tanaka [3], Daisuke Yamane [1]
Ritsumeikan University, Japan [1] Yokogawa Solution Service Corporation, Japan [2] Gunma University, Japan [3]

13:54/**0187**
Effect of Increasing Moving Mass on the Output of an Inside-out Type Vibrational Energy Harvester
Shuntaro Miyazato [1], Hiroaki Honma [1], Hiroshi Toshiyoshi [2], Akio Uesugi [1], Koji Sugano [1], Yoshitada Isono [1]
Kobe University, Japan [1], The University of Tokyo, Japan [2]

14:06/**0263**
Piezoelectric Vibration Energy Harvester Based on Bilayer Lithium Niobate
Wei-Bin Fan [1], Chih-Yuan Hsiao [1], Yu-Sian Lin [1], Zhi-Qiang Lee [1], Huei-Chun Zeng [2], Hung-Tsai Wu [2], Ming-Huang Li [1]
National Tsing Hua University, Taiwan [1], Industrial Technology Research Institute, Taiwan [2]

14:18/**0329**
Performance Enhancement of a Frequency Conversion Interposer for MEMS Vibration Energy Harvesters using Bistable Buckled Beams
Kota Morishita [1], Yuji Takata [1], Yuya Tanaka [1], Gen Hashiguchi [2], Hiroshi Toshiyoshi [3], Takaaki Suzuki [1]
Gunma University, Japan [1], Shizuoka University, Japan [2], The University of Tokyo, Japan [3]

13:00-14:30 Room: Rose 1
OR1-2B Self Organized 1 In-body/Intracellular Cybernetic Avatars
Chair: Cheng-Hsin Chuang, *National Sun Yat-sen University, Taiwan*

13:00/**0446**
A Stomach-Acid-Charged Tablet-Type Digital Pill with In-Body Monitoring
Kiichi Niitsu
Kyoto University, Japan

13:15/**0435**
Development and In Vivo Telemetry Demonstration of Ingestible Polyaniline-Based Conductometric pH Sensor
Shinya Yoshida
Shibaura Institute of Technology, Japan

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13:30/**0440**
Design of Chemical Transducers for Bioorthogonal Signaling
Kosuke Dodo
RIKEN, Japan

13:45/**0441**
Engineering signaling systems of plant hormones as triggers and readouts of in-body avatar cells
Shigeo S Sugano
National Institute of Advanced Industrial Science and Technology, Japan

14:00/**0442**
Avatar cells production based on electromechanical poration by electrically-induced bubbles
Yoko Yamanishi
Kyushu University, Japan

14:15/**0438**
Droplet-Based Microfluidic Platform for Time-Lapse Monitoring of Cellular Responses to Nano-Artifact Exposure
Shinya Sakuma
Kyushu University, Japan

13:00-14:30 Room: Rose 2
OR1-2C Optical MEMS 1
Chair: Wei-Chen Huang, *National Yang Ming Chiao Tung University, Taiwan*

13:00/**Invited speech**
Non-volatile control for nano-optomechanical phase change metasurface
Jun-Yu Ou
University of Southampton, UK

13:20/**Invited speech**
Optical Metasurfaces for Ultrasensitive, Label-free and Real-time Biosensing
Haogang Cai
New York University, USA

13:40/**0124**
Silicon Subwavelength Grating Waveguides with High Flexibility and Low Bending Loss toward Terahertz Photonic Integrated Circuits
Kohei Chiba, Yoshiaki Kanamori
Tohoku University, Japan

13:52/**0197**
Optically Pumped GeSn Ridge Waveguide Lasers for Silicon Photonics
Radhika Bansal, Guo-En Chang
National Yang Ming Chiao Tung University, Taiwan

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14:04/**0229**
Sandwiched p-Si/PtSi/p-Si Mid-Infrared Photodetector for Efficient Hot-Career Collection at Room Temperature
Satoshi Nishita [1], Ashenafi Abadi Elyas [1], Daiji Noda [2], Ryo Ohta [2], Tetsuo Kan [1]
The University of Electro-Communications, Japan [1], Micromachine Center, Japan [2]

14:16/**0236**
Control of Strain Response in Modal-Interference-Based Plastic Optical Fiber Sensors via Double-Side Reactive Ion Etching
Motoki Kochi [1], Koyo Shibuta [1], Keito Ishida [1], Yuri Wada [2], Taiki Kumagai [3], Keita Kikuchi [2, 3], Shimbu Shirai [3], Cheng-Yao Lo [4], Heeyoung Lee [2], Yosuke Mizuno [3], Daisuke Yamane [1]
Ritsumeikan University, Japan [1], Shibaura Institute of Technology, Japan [2], Yokohama National University, Japan [3], National Tsing Hua University, Taiwan [4]

13:00-14:30 Room: Rose 3
OR1-2D Physical Sensors and MEMS/NEMS 2
Chair: Jin Chern Chiou, *National Yang Ming Chiao Tung University, Taiwan*

13:00/**Invited speech**
Beyond Piezoelectric Self-Sensing: Integrated Silicon Stress Sensors for Robust Feedback in Piezoelectric MEMS
Andrea Vergara
Tohoku University, Japan

13:20/**Invited speech**
Design and Integration of a Miniaturized Pneumatic Finger with an FPCB-Based Metallic Glass Strain Sensor
Yao-Chuan Tsai
National Chung Hsing University, Taiwan

13:40/**0257**
In-situ Interfacial Rheometry of Yield Stress Fluids via Soft MEMS Tactile Sensing: Bridging Tribology and Bulk Rheology
Ryuga Sano, Akiyoshi Kusano, Takashi Abe, Akiomi Ushida, Masayuki Sohgawa
Niigata University, Japan

13:52/**0258**
Sensitivity-Enhanced Monolithic CMOS-MEMS CMUT Receiver Front-End Using Low-Temperature ALD Alumina
Tzu-Yun Huang, Chih-Yuan Hsiao, Ming-Huang Li
National Tsing Hua University, Taiwan

14:04/**0264**
Damped Structure for Q control in CMOS-MEMS Beams
Jhih-Wei Lin, Chun-Pu Tsai, Nilabh Basu, Wei-Chang Li
National Taiwan University, Taiwan

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14:16/**0273**
Bimodal Physical Sensor for Real-Time Quantitative Softness Evaluation in Epoxy Molding Compound Packaging
Donghyun Lee, Jungwook Choi
Chung-Aug University, Korea

13:00-14:30 Room: Plum Blossom 2
OR1-2E Bio/Medical Sensors and MEMS/NEMS 2
Chair: Megan Ho, *The Chinese University of Hong Kong, Hong Kong*

13:00/**Invited speech**
Aptamer-functionalized Quartz Crystal Microbalance Sensor Integrated with Loop-Mediated Isothermal Amplification for Dengue Virus Detection
Dharmatov Rahula B. Albano
University of Santo Tomas, Philippines

13:20/**Invited speech**
3D-Printed Skin-Interfaced Microfluidic Systems for Sweat Collection
Chung-Han Wu
National Chung Hsing University, Taiwan

13:40/**0189**
Smartphone-Enabled Point-of-Care Creatinine Biosensor for Bovine Muscle Mass Monitoring in Dairy Farming
Nikhil Mathew, Yao-Luo Lin, R.K. Rakesh Kumar, Cheng-Hsin Chuang
National Sun Yat-sen University, Taiwan

13:52/**0200**
Proposal and demonstration of Multi-Chip Ion Imaging Device Enabling Measurement of Chemical Information over a Wide Area
Otono Uchizono, Toshiki Kitamura, Yasuyuki Kimura, Takeshi Hizawa, Daisuke Akai, Yoshiko Noda, Hideo Doi, Tomoko Horio, Yong-Joon Choi, Kazuhiro Takahashi, Toshihiko Noda, Kazuaki Sawada
Toyohashi University of Technology, Japan

14:04/**0201**
Enhanced Suppression of Non-Specific Adsorption of Graphene Oxide-Based Resonant Sensor for Label-Free Virus Sensing
Viet Khoa Pham [1], Laoyang Yiayee [1], Homare Yoshida [1], Sachiko Sakai [1], Ippei Akita [2], Yuki Imaizumi [3], Tatsuro Goda [3], Ik-Hyun Kwon [1], Yong-Joon Choi [1], Toshihiko Noda [1], Kazuaki Sawada [1], Kazuhiro Takahashi [1]
Toyohashi University of Technology, Japan [1], National Institute of Advanced Industrial Science and Technology, Japan [2], Toyo University, Japan [3]

14:16/**0202**
Development of a Modular Multi-Organ-on-Chip Platform for Drug Screening Applications
Jui-Wei Chen [1], Yi-Wun Ke [1], Yun-Jie Hao [1], Rou-Ya Zhao [1], Fan-Gang Tseng [1, 2]
National Tsing Hua University, Taiwan [1], Research Center for Applied Sciences, Academia Sinica, Taiwan [2]

Monday, June 22

14:30-16:00 Room: Grand Ballroom 2
Poster Session PO1
Chair: Wei-Chen Huang, *National Yang Ming Chiao Tung University, Taiwan*

PO1-01/0272
Novel Electrothermal Actuators with Large In-plane Displacement and Force for MEMS-based Pitch-tunable Diffraction Grating
Yen Nee Ho [1], Shan Lin [1], Aron Michael [1], Chee Yee Kwok [1], Cibby Pulikkaseril [2]
UNSW Sydney, Australia [1], Baraja Pty. Ltd., Australia [2]

PO1-02/0134
On-Chip Calorimetric Thermal Flow-Rate Sensor Using FEP Thin-Film for Microfluidic System
Yen-Hsi Chen, Zhong-Wei Lin, Kao-Mai Shen, Hiroyuki Fujita, Sheng-Shian Li, Kyojiro Morikawa, Takehiko Kitamori, Chihchen Chen
National Tsing Hua University, Taiwan

PO1-03/0137
Development of an Innovative Nanocomposite Electrochemical Biosensor for Monitoring Immune Cytokines Associated with PD-L1 Exosome–Mediated Immunoregulation
Wei-Zhe Jian, Yi-Kuang Yen
National Taipei University of Technology, Taiwan

PO1-04/0139
Non-Enzymatic Electrochemical Detection of Uric Acid Using a Molecularly Imprinted Polymer Electrode
Hironaga Kawai, Daigo Saito, Hiroyuki Kudo
Meiji University, Japan

PO1-05/0144
Effect of Polarity on Single-cell Electroporation in a Microfluidic device with trapping orifice
Kitipob Vijitnukoonpradit [1], Nitipong Panklang [2], Nisarut Phansiri [3], Boonchai Techaumnat [1]
Chulalongkorn University, Thailand [1], Rajamangala University of Technology Thanyaburi, Thailand [2], Ubon Ratchathani University, Thailand [3]

PO1-06/0159
Copper Ion Sensing Based on the Principle of LSPR using Au@AgNPs-Go
Fei-Li Cheng, Chun-Yu Li
National Yunlin University of Science and Technology, Taiwan

PO1-07/0163
Biodegradable MXene-Bamboo Cellulose Paper Electrodes Enabling Green Wearable Transducers and EMG-Driven Exoskeleton Control
Tung-Li Hung [1], Chia-Hao Kuo [2], Pulikkutty Subramaniyan [2], Shan-Chu Yu [1], Tzu-En Lin [2]
National Yang Ming Chiao Tung University, Taiwan [1], National Taiwan University, Taiwan [2]

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PO1-08/0171

Gold nanoparticles–modified graphene oxide for PH sensing

Yu-Hsi Chang, Chun-Yu Li
National Yunlin University of Science and Technology, Taiwan

PO1-09/0178

Non-Invasive Complex Dielectric Constant Sensing System for Real-Time Monitoring in Bioprocesses

Shih Hua En [1], Liou Ya Fu [1], Chiang Yu Wei [1], Wu Kun Ta [2], Peng Sheng Yu [3], Lin Chii Wann [1]
National Taiwan University, Taiwan [1], Industrial Technology Research Institute, Taiwan [2], National Yang Ming Chiao Tung University, Taiwan [3]

PO1-10/0180

Clinical Evaluation of a Rapid Urine Uric Acid Biosensor with Readout Circuit for Early Detection of Arthritis

Tzu Wei Chung [1], Wei Lun Yen [1], Bing Hong Chen [1], Yi Huan Chang [1], Yun Yu Hsieh [1], Wei Cheng Lin [1], Mei Ching Yu [2]
Chang Gung University, Taiwan [1], Chang Gung Memorial Hospital, Taiwan [2]

PO1-11/0195

In Vitro Validation of a Balloon Catheter MEMS Flow Sensor System Using Body Temperature Regulated Respiratory Airflow

Jun Yoshida [1], Muhammad Salman Al Farisi [1, 2], Yoshihiro Hasegawa [1], Miyoko Matsushima [3], Tsutomu Kawabe [3], Mitsuhiro Shikida [1]
Hiroshima City University, Japan [1], Kyushu Institute of Technology, Japan [2], Nagoya University, Japan [3]

PO1-12/0198

Scattered-Light-Based Optofluidic Waveguide Sensor for High-Resolution Biomedical Sensing

Devesh Barshilia [1], Guo-En Chang [2]
National Chung Cheng University, Taiwan [1], National Yang Ming Chiao Tung University, Taiwan [2]

PO1-13/0201

Enhanced Suppression of Non-Specific Adsorption of Graphene Oxide-Based Resonant Sensor for Label-Free Virus Sensing

Viet Khoa Pham [1], Laoyang Yiayee [1], Homare Yoshida [1], Sachiko Sakai [1], Ippei Akita [2], Yuki Imaizumi [3], Tatsuro Goda [3], Ik-Hyun Kwon [1], Yong-Joon Choi [1], Toshihiko Noda [1], Kazuaki Sawada [1], Kazuhiro Takahashi [1]
Toyohashi University of Technology, Japan [1], National Institute of Advanced Industrial Science and Technology, Japan [2], Toyo University, Japan [3]

PO1-14/0202

Development of a Modular Multi-Organ-on-Chip Platform for Drug Screening Applications

Jui-Wei Chen [1], Yi-Wun Ke [1], Yun-Jie Hao [1], Rou-Ya Zhao [1], Fan-Gang Tseng [1, 2]
National Tsing Hua University, Taiwan [1], Academia Sinica, Taiwan [2]

Monday, June 22

PO1-15/0204
Biofluorometric Acetone Sensor for Exhaled Breath Condensates and Its Evaluation
Geng Zhang, Kenta Ichikawa, Kenta Iitani, Yoshikazu Nakajima, Kohji Mitsubayashi
Institute of Science Tokyo, Japan

PO1-16/0237
Deep-Brain Implantable Sensor for In Vivo Extracellular Chemical Sensing in the Brain
Shogo Fukushima, Yuto Nakamura, Hiroshi Horiuchi, Yasuyuki Kimura, Hideo Doi, Takeshi Hizawa, Yoshiko Noda, Tomoko Horio, Yong-Joon Choi, Kazuhiro Takahashi, Toshihiko Noda, Kazuaki Sawada
Toyohashi University of Technology, Japan

PO1-17/0325
Single-Cell Biomarker Profiling on a Hydrogel Electromicrofluidic Device
Jesus Becerra, Jing Ding, Shih-Kang Fan
Kansas State University, USA

PO1-18/0333
Skin-Conformal Tessellated Platforms with On-Demand Switchable Adhesion for Wearable Devices
Geonjun Choi [1], Hoon Eui Jeong [2], Inkyu Park [1]
Korea Advanced Institute of Science and Technology, Korea [1], Ulsan National Institute of Science and Technology, Korea [2]

PO1-19/0109
Development of Highly Sensitive Ethanol Sensing Using MEMS Technology
Chia-Hsu Hsieh, Bo-Yan Liu, Ri-Pu Yang, Cheng-Chuan Chou
National Sun Yat-sen University, Taiwan

PO1-20/0138
A Portable Graphene/ZnO Nanocomposite Paper-Based Chemiresistive Sensor for Lead Ion Detection
Yi-En Yang, Yi-Kuang Yen
National Taipei University of Technology, Taiwan

PO1-21/0141
Enhancement of CMOS-MEMS Fringe-Field Capacitive Humidity Sensor Sensitivity via Electrode Design
Yu Lin Hsu, Yung Chen Li, Yuan Yuan Huang, Weileun Fang
National Tsing Hua University, Taiwan

PO1-22/0151
Novel MIM Thin-Film Ultraviolet Sensor
You-Jun Luo, I-Nan Chang
Feng Chia University, Taiwan

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PO1-23/0452

Influence of Magnetic Fields on the Formation Kinetics of Copper(II) Hydroxide: Quantitative Concentration Analysis via Rate-Curve Integration

Yi Lee, Chiung-Yi Huang, Che-Hsin Lin
National Sun Yat-sen University, Taiwan

PO1-24/0184

Modification of Copper Nanowire for Antibiofouling Dissolved Oxygen Sensing Devices and High Sensitivity Nitrate Detection

Brasstira Yuva wardhana [1], Chieh Li [1], Jing-Ju Ho [1], Jung-Hsin Jen [1], Pin-Hsuan Lin [2], Mia Rinawati [1], Kuan-Jung Chen [2], Min-Hsin Yeh [1]
National Taiwan University of Science and Technology, Taiwan [1], Might Electronic Co, Ltd, Taiwan [2]

PO1-25/0206

Development of CuNi-LDH/BTC/MWCNT Nanocomposite Non-enzymatic Electrochemical Sensor for Rapid Detection of Diphenylamine in Agricultural Products

Chih-Fang Lai, Yu-Chi Wang, Ren-Jei Chung
National Taipei University of Technology, Taiwan

PO1-26/0218

Dual-Mode Sweat Urea Sensor Based on $Ti_3C_2T_x$ MXene/CuO Nanocomposites with Integrated Colorimetric–Electrochemical Detection and Data-Driven Optimization

Thidarut Laochai [1], Hirotomo Nishihara [2], Jiaqian Qin [1], Manunya Okhawilai [1], Joseph Wang [3], Nadnudda Rodthongkum [1], Wiwittawin Sukmas [1]
Chulalongkorn University, Thailand [1], Tohoku University, Japan [2], University of California San Diego, USA [3]

PO1-27/0269

Laser-Induced Graphene Hybrid Sensor for Simultaneous Gas and Air flow Detection

Kenta Murakami [1], Ryusei Ando [2], Rihachiro Nakashima [2], Yoshiyuki Kaiho [1], Yoshifumi Yoshida [1], Hidetoshi Takahashi [2]
Seiko Future Creation Inc., Japan [1], Keio University, Japan [2]

PO1-28/0371

Indium Oxide Nanobrick Base Portable Gas Sensor for Indoor Environmental Ozone Monitoring

Jing-Cheng Hsu, Heh-Nan Lin
National Tsing Hua University, Taiwan

PO1-29/0152

Prognostic Value of Circulating Hybrid Cells and P-score in Colorectal Cancer: An Analysis via HD-SACA System

Po-Cheng Liu [1], Hsiang-Wei Liu [1], Jie-Yu Liu [1], Chun-Chi Lin [2], Fan-Gang Tseng [1]
National Tsing Hua University, Taiwan [1], Taipei Veterans General Hospital, Taiwan [2]

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PO1-30/0263

Piezoelectric Vibration Energy Harvester Based on Bilayer Lithium Niobate

Wei-Bin Fan [1], Chih-Yuan Hsiao [1], Yu-Sian Lin [1], Zhi-Qiang Lee [1], Huei-Chun Zeng [2], Hung-Tsai Wu [2], Ming-Huang Li [1]
National Tsing Hua University, Taiwan [1], Industrial Technology Research Institute, Taiwan [2]

PO1-31/0103

Facile Fabrication of Titanium Probes and Cantilevers via Electrolytic Etching

Yuta Takano, Yizhi Qin, Kohei Ogiwara, Naoki Soma, Masayuki Sohgawa, Takashi Abe
Niigata University, Japan

PO1-32/0110

High Performance and Long-Life Electrochemical Reference Electrode Fabricated with High-Density AgCl and AgBr Structure Transformation

Bin-Wey Lu, Che-Hsin Lin
National Sun Yat-sen University, Taiwan

PO1-33/0127

Wireless QCR Sensor with Electrodeless Electrical Feedthrough Utilizing a High-Dielectric Crystal Substrate

Tamon Yamanaka, Haruki Inaba, Sota Deto, Masayuki Sohgawa, Takashi Abe
Niigata University, Japan

PO1-34/0181

Liquid Metal Powder–Enabled Conductive Networks for Multifunctional and Versatile Electronics

Osman Gul, Inkyu Park
Korea Advanced Institute of Science and Technology, Korea

PO1-35/0188

Analysis of Aging Patterns and Mechanisms According to Temperature of BaTiO3 Multi-Layer Ceramic Capacitor

Tae-Soo YEO, Wook Jo
Ulsan National Institute of Science and Technology, Korea

PO1-36/0194

Laser Induced Graphene Thermal Airflow Sensor for Microcatheter Actuator Respiration Measurement Inside Lung Bronchioles

Aoi Hirayama [1], Muhammad Salman Al Farisi [1, 2], Yoshihiro Hasegawa [1], Miyoko Matsushima [3], Tsutomu Kawabe [3], Mitsuhiro Shikida [1]
Hiroshima City University, Japan [1], Kyushu Institute of Technology, Japan [2], Nagoya University, Japan [3]

PO1-37/0213

Fabrication of 3D Porous Sensors on Curved Surfaces Using Shear-Thinning Inks

Minseong Kang, Jongkyeong Lim
Gachon University, Korea

Monday, June 22

PO1-38/0235

Tri-Layer Soft-Rigid Stretchable Substrates for Direct Fabrication Stretchable Electronics Device

Shusuke Yamakoshi [1], Fumika Nakamura [1], Sho Sato [1], Yuji Isano [1], Yutaka Isoda [1], Tamami Takano [1], Ryosuke Matsuda [1], Naoko Namba [2], Tsuyoshi Sekitani [2], Takafumi Uemura [2], Hiroki Ota [1]
Yokohama National University, Japan [1], The University of Osaka, Japan [2]

PO1-39/0175

Surface Modification of Nanofluidic Channels and Nano-Valve for Reversed-Phase fL Chromatography

Wei-Jen Chien [1], Chihchen Chen [1], Yutaka Kazoe [2], Takehiko Kitamori [1, 3], Kyojiro Morikawa [1, 4]
National Tsing Hua University, Taiwan [1], Keio University, Japan [2], Lund University, Sweden [3], The University of Tokyo, Japan [4]

PO1-40/0183

Rapid Impedimetric Detection of Vibrio harveyi Using Aptamer-Modified Magnetic Beads in a Capillary-Driven Microfluidic Device

Avinash V Police Patil, Chia-Yu Hsieh, Ching-Chou Wu
National Chung Hsing University, Taiwan

PO1-41/0240

Liquid Flow Enhancement through the Electro-Wetting in Graphene nanochannel

Kuan Ting Chen, Jing Kai Huang
National Central University, Taiwan

PO1-42/0278

Engineering Bilayer 2D MOF/Metallic MoS_2 Nanofluidic Ion Channels Enabling Rectified Ion Transport for Ultrahigh Osmotic Energy Harvesting

Fery Prasetyo, Li-Hsien Yeh
National Taiwan University of Science and Technology, Taiwan

PO1-43/0353

On-Chip Chemical Control of the Gaseous Microenvironment for Root Growth Using an Integrated Micromixer

Tsubasa Fukunaga [1], Marcel Beier [2], Isaku Kanno [1], Hirotaka Hida [1]
Kobe University, Japan [1], Fukushima Institute for Research, Education and Innovation, Japan [2]

PO1-44/0357

Annealing-Enhanced Probabilistic Computing Enabled by Bistable MEMS Resonator

Junhui Wu, Zetong Hu, Zheng Zhang, Guangya Zhou
National University of Singapore, Singapore

Monday, June 22

PO1-45/0121
Luminance-Induced Acceleration of Degradation in Green Quantum Dot Color Conversion Layers
Chen-En Tsai, Yu-Xiang Sun, Yu-Cheng Lin, Cheng-Han Lee, Chun-Yu Li
National Yunlin University of Science and Technology, Taiwan

PO1-46/0143
CMOS-MEMS Thermoelectric IR Sensor with SHA absorber
Yu-Nuo Liu, Zhi-Xuan Dai
National Chung Hsing University, Taiwan

PO1-47/0229
Sandwiched p-Si/PtSi/p-Si Mid-Infrared Photodetector for Efficient Hot-Career Collection at Room Temperature
Satoshi Nishita [1], Ashenafi Abadi Elyas [1], Daiji Noda [2], Ryo Ohta [2], Tetsuo Kan [1]
The University of Electro-Communications, Japan [1], Micromachine Center, Japan [2]

PO1-48/0102
Biaxial Optical Cantilever by Using 2D Diffraction Grating and Sampling Moiré Method
Soya Sato [1], Shiratori Toshihiro [1], Yuki Okamoto [2], Yusuke Takei [2], Hidetoshi Takahashi [1]
Keio University, Japan [1], National Institute of Advanced Industrial Science and Technology, Japan [2]

PO1-49/0104
Enhancement of Thermal Resistance and Thermal Capacity in CMOS-MEMS Airflow Sensing Hub for Fast Response and Energy Efficiency
Ming-Hsuan Huang, Yu-Lin Hsu, Yuanyuan Huang, Yung-Chen Li, Mei-Feng Lai, Weileun Fang
National Tsing Hua University, Taiwan

PO1-50/0117
Detection Characteristics in Wide Range Gold Proof-Mass Single-Axis MEMS Capacitive Accelerometer and Its Application
Chihaya Mukaide, Torauto Yamada, Tomoyuki Kurioka, Katsuyuki Machida, Chun-Yi Chen, Tso-Fu Mark Chang, Yoshihiro Miyake, Masato Sone, Hiroyuki Ito
Institute of Science Tokyo, Japan

PO1-51/0273
Bimodal Physical Sensor for Real-Time Quantitative Softness Evaluation in Epoxy Molding Compound Packaging
Donghyun Lee, Jungwook Choi
Chung-Ang University, Korea

PO1-52/0340
High-Entropy Relaxor Ferroelectrics on Flexible mica substrate for Advanced Sensors
Yu-En Pan [1], Yu-Hao Tu [1], Mengyao Xiao [2], Ying-Hao Chu [1]
National Tsing Hua University, Hsinchu, Taiwan [1], National University of Singapore, Singapore [2]

Monday, June 22

PO1-53/0344
A Temperature-compensated Liquid-metal Flexible Strain Sensor Integrated into a Microfinger for Tactile Sensing under Temperature Variations
Kensei Hara, Yuto Hori, Satoshi Konishi
Ritsumeikan University, Japan

PO1-54/0288
CMOS-MEMS NDoF Tuned-Mass-Damper (TMD) Resonators for Multi-Frequency Applications
Chiao-Jen Hsueh, Chun-Pu Tsai, Ting-Yi Chen, Wei-Chang Li
National Taiwan University, Taiwan

PO1-55/0147
Analytical Modeling of Serpentine Spring for Gold Proof-mass Single-axis MEMS Accelerometer
Hisashi Takahata, Tomoyuki Kurioka, Torauto Yamada, Chihaya Mukaide, Katsuyuki Machida, Chang Tso-Fu Mark, Chen Chun-Yi, Yoshihiro Miyake, Hiroyuki Ito, Masato Sone
Institute of Science Tokyo, Japan

PO1-56/0192
Enhancing Transparency and Piezoelectric Property in Polycrystalline $0.4Pb(Mg_{1/3}Nb_{2/3})O_3$–$0.22PbZrO_3$-$0.38PbTiO_3$ Ceramics through Compositional Engineering and Pressureless Sintering
Yeon-Bee Han, DongHo Seo, Wook Jo
Ulsan National Institute of Science and Technology, Korea

16:00-17:30 Room: Grand Ballroom 1
OR1-3A ICSS Industrial Session
Chair: Rone Chiu, *LiDS Semiconductor Technology CO., LTD., Taiwan*
Sheng-Shian Li, *National Tsing Hua University, Taiwan*

Panelists:
Jason Wu, *Asia Pacific Microsystems, Inc.*
Yunwei Lin, *United Microelectronics Corporation (UMC)*
Yu-Ching Lin, *NextQM Inc.*
TBA

16:00-17:30 Room: Rose 1
OR1-3B Self Organized 2 In-Body/Intracellular Cybernetic Avatars
Chair: Fumihito Arai, *The University of Tokyo, Japan*

16:00/**0437**
Cyto-Transducers for Visualization of Designed Cell-Cell Communications
Niko Kimura
Tokyo University of Agriculture and Technology, Japan

Monday, June 22

16:15/**0444**
Optical Immunotransducer as an Evaluation Platform for Designed Cell-Cell Communication
Yoshitaka Shirasaki
The University of Tokyo, Japan

16:30/**0439**
Construction of Bio-Fate: A Platform Integrating Live-Cell Phenotypic Profiling and Precision Manipulation
Takashi Kamatani
Japanese Foundation for Cancer Research, Japan

16:45/**0405**
Photopatternable Drying-Resistant Conductive Hydrogel Integrated into Organ Models for Functional Evaluation of In-body Cybernetic Avatars
Hisataka Maruyama
Nagoya University, Japan

17:00/**0373**
Capsule for Intestinal Surface Sampling: Sealing Mechanism for Preventing Cross-Contamination of Collected Samples
Huaiyi Zhang
The University of Tokyo, Japan

17:15/**0445**
On-Chip Biomimetic Platform for Functional Evaluations of Avatar Cells
Takeshi Hayakawa
Chuo University, Japan

16:00-17:30 Room: Rose 2
OR1-3C Novel Application of MEMS/NEMS Systems 1
Chair: Haogang Cai, *New York University, USA*

16:00/**Invited speech**
Ultra-compliant Brain-Machine Interfaces
Wei-Chen Huang
National Yang Ming Chiao Tung University, Taiwan

16:20/**Invited speech**
Self-Healing and Self-Powered Intelligent E-Skin Systems
Ching-Te Kuo
National Sun Yat-sen University, Taiwan

16:40/**0432**
Ion Wind Electrohydrodynamic Nebulisation for Drug Delivery Application
Van Dau, Trung Hieu Vu
Griffith University, Australia

Monday, June 22

16:52/**0128**
Self-Powered Bioinspired Octopus Suckers for Underwater Object Recognition and Tactile Sensing
Feng-Chi Pai, Yi-Tsung Su, Lung-Hao Hu, Ching-Te Kuo
National Sun Yat-sen University, Taiwan

17:04/**0186**
Long-Term Stability of the Threshold Voltage of a MOS Structure with a Potassium Ion Electret
Yoshitaka Ikeda [1], Masaya Iwanaga [1], Hiroaki Honma [1], Hiroshi Toshiyoshi [2], Akio Uesugi [1], Koji Sugano [1], Yoshitada Isono [1]
Kobe University, Japan [1], The University of Tokyo, Japan [2]

17:16/**0242**
Automated System for Dispensing Solutes into Droplets with Common Concentration Difference
Shinji Bono, Kei Arai, Satoshi Konishi
Ritsumeikan University, Japan

16:00-17:30 Room: Rose 3
OR1-3D Micro/Nano Fluidics 1
Chair: Chia-Wen Tsao, *National Central University, Taiwan*

16:00/**Invited speech**
Manipulation and Sensing of Oxygen Microenvironment in Advanced in Vitro Cell Culture Models
Yi-Chung Tung
Research Fellow of Academia Sinica, Taiwan

16:20/**Invited speech**
Listening to Microdroplets: Acoustic Voiceprint Features for Label-Free Microfluidic Monitoring
Chia-Hung Dylan Tsai
National Yang Ming Chiao Tung University, Taiwan

16:40/**0361**
Phase Optimization for Efficient Three-Phase Pressure-Driven Droplet Rotation Using Real-Time Position Feedback
Masashi Kobayashi, Daiki Tanaka, Risa Fujita, Shuichi Shoji, Masahiro Furuya
Waseda University, Japan

16:52/**0384**
Low-Concentration Crosslinking Enables Stable Embedded Bioprinting Via a Gelatin–Xanthan Gum Support Bath
Sara Ito, Mizrab Fatima, Shunya Okamoto, Takayuki Shibata, Tuhin Santra, Moeto Nagai
Toyohashi University of Technology, Japan

Monday, June 22

17:04/**0387**

Microscaled Flow and Particle Adhesion on Villi in Actuated Small Intestinal Channel

Yuto Shiraiwa [1], Kazuki Komatsu [1], Satoru Kuriu [2], Naoyuki Yamamoto [3], Tadashi Ishida [1]
Institute of Science Tokyo, Japan [1], Ritsumeikan University, Japan [2], Juntendo University, Japan [3]

17:16/**0411**

Design and Fabrication of an Ultra-Thin Capillary-Assisted Microfluidic Chip for Medium Exchange in Microscopy

Jia-Lin Zhan [1], Shiuan-Jie Tsai [2], Kuan-Ju Lu [2], Ya-Yu Chiang [1]
National Taiwan University, Taiwan [1], National Chung Hsing University, Taiwan [2]

16:00-17:30 Room: Plum Blossom 2
OR1-3E Bio/Medical Sensors and MEMS/NEMS 3
Chair: Shih-Hung Lin, *National Yunlin University of Science and Technology, Taiwan*

16:00/**Invited speech**

Iontophoresis Patch with Bipolar Porous Microneedles for Transdermal Dual Delivery

Matsuhiko Nishizawa
Tohoku University, Japan

16:20/**Invited speech**

Laser-Induced Graphene–Based All-Solid-State Potentiometric Biosensing Platforms for Smart Health, Food, and Water Monitoring

Nipapan Ruecha
Chulalongkorn University, Thailand

16:40/**0108**

Sensitivity Enhancement of EGFET-Based AFP Detection via Localized Thermal Regulation using an Integrated Microheater

Chia-Hsu Hsieh, Cheng-Chuan Chou, Heng Su, Zhen-Yu Chen, I-Yu Huang
National Sun Yat-sen University, Taiwan

16:52/**0237**

Deep-Brain Implantable Sensor for In Vivo Extracellular Chemical Sensing in the Brain

Shogo Fukushima, Yuto Nakamura, Hiroshi Horiuchi, Yasuyuki Kimura, Hideo Doi, Takeshi Hizawa, Yoshiko Noda, Tomoko Horio, Yong-Joon Choi, Kazuhiro Takahashi, Toshihiko Noda, Kazuaki Sawada
Toyohashi University of Technology, Japan

17:04/**0243**

Development of a Gold Screen-Printed Electrode-Based Electrochemical Impedance Immunosensor for Rapid Detection of SAA1 as an ARDS Biomarker

Ting-Hao Chang [1], Yen-Wen Lu [1], Chao-Yuan Chang [2], Chun-Jen Huang [2], I-Lin Tsai [2]
National Taiwan University, Taiwan [1], Taipei Medical University, Taiwan [2]

Tuesday, June 23

08:30-09:20 Room: Grand Ballroom 1
Plenary speech
Chair: Sheng-Shian Li, *National Tsing Hua University, Taiwan*

Silicon Photonic MEMS for Sensing and Networking Applications
Ming Wu
University of California, Berkeley, USA

09:35-11:05 Room: Grand Ballroom 1
Special Session on International Cooperation
Chair: Hiroyuki Fujita, *National Tsing Hua University, Taiwan*
Yi Chiu, *National Yang Ming Chiao Tung University, Taiwan*

Panelists:
Hiroyuki Fujita, *National Tsing Hua University, Taiwan*
Yoshio Mita, *The University of Tokyo, Japan*
Takehiko Kitamori, *National Tsing Hua University, Taiwan*
Inkyu Park, *KAIST, Korea*
Steve Tseng, *Taiwan Semiconductor Research Institute, Taiwan*

11:15-12:25 Room: Grand Ballroom 1
OR2-1A Actuator
Chair: Tetsuji Dohi, *Chuo University, Japan*

11:15/**Keynote speech**
Enabling Next-Generation AI Edge Devices: Solid-State MEMS Speakers and Micro-Cooling Solutions
Chester Hwang
xMEMS

11:45/**0272**
Novel Electrothermal Actuators with Large In-plane Displacement and Force for MEMS-based Pitch-tunable Diffraction Grating
Yen Nee Ho [1], Shan Lin [1], Aron Michael [1], Chee Yee Kwok [1], Cibby Pulikkaseril [2]
UNSW Sydney, Australia [1], Baraja Pty. Ltd., Australia [2]

11:57/**0295**
Piezoelectric Micromachined Transducers with Heterogeneous PZT/AlN Film Stacking by Atmospheric Pressure Atomic Diffusion Bonding
Tianbo Wang, Andrea Vergara, Takehito Shimatsu, Shuji Tanaka
Tohoku University, Japan

12:09/**0336**
Fabrication of in-plane-stretchable shape memory alloy thick film actuator and SU-8 support mechanism for laterally vibrational MEMS tactile display
Yoshihiro Nagasaka, Yoshihiro Iino, Takashi Mineta
Yamagata University, Japan

Tuesday, June 23

11:15-12:25 Room: Rose 1
OR2-1B Chemical Sensors and MEMS/NEMS 2
Chair: Shih-Hung Lin, *National Yunlin University of Science and Technology, Taiwan*

11:15/**Invited speech**
Towards Ultra-Low-Power and Intelligent Gas Sensing Technologies for Mobile and IoT Applications
Incheol Cho
Tech University of Korea, Korea

11:35/**0320**
WS_2/Ga_2O_3 Nanostructured Sensor for Enhanced Hydrogen Response and Fast Recovery
Indu Sharma, Jungwook Choi
Chung-Ang University, Korea

11:47/**0305**
Translating Molecular Chirality into Electrical Signals through Contact Electrification–Driven Interfacial Electron Transfer
Hong-Wei Lin, Arnab Pal, Zong-Hong Lin
National Taiwan University, Taiwan

11:59/**0223**
Influence of Sensing Film Properties on Inorganic Taste Sensor Response
Tomoki Shinta, Hidekazu Uchida, Yuki Hasegawa
Saitama University, Japan

12:11/**0374**
Hydrogen Sensing via Stress-Induced Amplitude Modulation in Piezoelectric Multilayer Micro-Bridges
Jayden Moore, Aron Michael, Eying Sim-Wong
UNSW, Australia

11:15-12:25 Room: Rose 2
OR2-1C Novel Application of MEMS/NEMS System 2
Chair: Hidetoshi Takahashi, *Keio University, Japan*

11:15/**Invited speech**
Physical Reservoir Computing with a Biaxial Resonant MEMS Accelerometer
Alberto Corigliano
Politecnico di Milano, Italy

11:35/**0113**
Delay Free and Mask Free Reservoir Computing Using CMOS-MEMS Vibro-Impact Resonator
Nilabh Basu, Wei-Chang Li
National Taiwan University, Taiwan

Tuesday, June 23

11:47/**0191**

An AlN-Based Differential Resonant Accelerometer for In-Sensor Physical Reservoir Computing

Hsiang-Chun Hsiao, Zong-Xian Kuan, Yi Chiu
National Yang Ming Chiao Tung University, Taiwan

11:59/**0310**

Nano-Optomechanical Metasurface for Reservoir Computing Application

Ting Hou [1], Yuta Kawashima [2], Xin Zhou [3], Nobuhiko Nishiyama [4], Toshiyuki Tsuchiya [2], Yoshishige Tsuchiya [1], Jun-Yu Ou [1]
University of Southampton, United Kingdom [1], Kyoto University, Japan [2], CNRS IEMN UMR 8520 University Lille, France [3], Institute of Science Tokyo, Japan [4]

12:11/**0357**

Annealing-Enhanced Probabilistic Computing Enabled by Bistable MEMS Resonator

Junhui Wu, Zetong Hu, Zheng Zhang, Guangya Zhou
National University of Singapore, Singapore

11:15-12:25 Room: Rose 3
OR2-1D Optical MEMS 2
Chair: Guo-En Chang, *National Yang Ming Chiao Tung University, Taiwan*

11:15/**Invited speech**

Low-Cost Centimeter-Scale 3D-Printed Mirror Scanners

Jui-Che Tsai
National Taiwan University, Taiwan

11:35/**0246**

Filter-Free Optical Sensor for Centroid Wavelength Detection

Ryoma Mibu, Yong-Joon Choi, Tomoya Ide, Yasuyuki Kimura, Yosiko Noda, Daisuke Akai, Takeshi Hizawa, Toshihiko Noda, Kazuhiro Takahashi, Kazuaki Sawada
Toyohashi University of Technology, Japan

11:47/**0274**

Spectrum Estimation Method for Reflectance Spectroscopy Using Filter-Free Wavelength Sensors and Multi-Wavelength LEDs

Akinari Takaya, Yong-Joon Choi, Ik-Hyun Kwon, Yasuyuki Kimura, Toshihiko Noda, Kazuhiro Takahashi, Kazuaki Sawada
Toyohashi University of Technology, Japan

11:59/**0317**

Fabrication of Edible Segmented Micro Retroreflective Materials Using a Two-Layer Deposited Mold via Prism-Assisted 3D Lithography

Yufei Chen, Yuha Ushiyama, Natsumi Kubo, Yuji Takata, Yuya Tanaka, Hiromasa Oku, Takaaki Suzuki
Gunma University, Japan

Tuesday, June 23

12:11/**0403**
Sensitivity and Noise Characterization of MEMS-Resonator-Based Short-Wavelength Infrared Sensor with Integrated Gold Nanostructured Absorber
Shunta Ikeda, Ryohei Sakai, Takuro Seki, Hiroaki Honma, Koji Sugano, Yoshitada Isono
Kobe University, Japan

11:15-12:25 Room: Plum Blossom 2
OR2-1E Bio/Medical Sensors and MEMS/NEMS 4
Chair: Chia-Hsien Hsu, *National Health Research Institutes, Taiwan*

11:15/**Invited speech**
Single-Cell Molecular Assays via Discrete Droplets and Continuous Hydrogel Matrices
Shih-Kang Fan
Kansas State University, USA

11:35/**0254**
A Microfluidic Lab-on-a-Chip for Real-Time Stiffness Monitoring in Frozen Shoulder Model
Shamshad Abdul, Kin Fong Lei
Chang Gung University, Taiwan

11:47/**0296**
Electrical Crossover Frequency Detection for Single-Cell Characterization Using Microfluidic Impedance Sensing
Nisarut Phansiri [1], Boonchai Techaumnat [2]
Ubon Ratchathani University, Thailand [1], Chulalongkorn University, Thailand [2]

11:59/**0319**
Local Formation Process of PVC-based Ion Sensitive Membrane Using MEMS Microstructure and Inkjet Printing Technology
Hideo Doi [1], Yoko Sato [2], Asami Uramoto [2], Tomoyuki Kamakura [2], Yong-Joon Choi [1], Kazuhiro Takahashi [1], Toshihiko Noda [1], Takeshi Kokubun [2], Kazuaki Sawada [1]
Toyohashi University of Technology, Japan [1], Seiko Epson Corporation, Japan [2]

12:11/**0325**
Single-Cell Biomarker Profiling on a Hydrogel Electromicrofluidic Device
Jesus Becerra, Jing Ding, Shih-Kang Fan
Kansas State University, USA

12:25-13:15
Lunch

Tuesday, June 23

13:15-14:30 Room: Grand Ballroom 2
Poster Session PO2
Chair: Wei-Chen Huang, *National Yang Ming Chiao Tung University, Taiwan*

PO2-01/0211
Electrostatic-driven Metal Nanostructures Transferred onto Electrospun Fibers for Wearable SERS-Based Point-of-Care Cortisol Diagnosis in Sweat
Yegyu Lee, Ji-Hwan Ha
Hanbat National University, Korea

PO2-02/0215
Spatially Controlled Electrospinning on Grounded 3D Metallic Microneedle Arrays for Precision Chronotherapeutic Delivery
Jinho Jeong, Ji-Hwan Ha
Hanbat National University, Korea

PO2-03/0228
Embryo Electroporation using Microfluidic Device with Double Orifices
Nitipong Panklang [1], Boonchai Techaumnat [2], Theerawat Tharasanit [2]
Rajamangala University of Technology Thanyaburi, Thailand [1], Chulalongkorn University, Thailand [2]

PO2-04/0280
Evaluation of a Dual-Wavelength Imaging System for Multiple Volatiles Related to Alcohol Metabolism
Jihu Lim, Rintaro Miura, Kenta Ichikawa, Kenta Iitani, Masashi Ikeuchi, Kohji Mitsubayashi
Institute of Science Tokyo, Japan

PO2-05/0282
Dynamic Compression Device for Cultured Adipose Tissue
Shu Saijo, Yuya Morimoto
Waseda University, Japan

PO2-06/0299
Development of an Amplification Free Microfluidic Aptamer Based Electrochemical Biosensor for Early Detection of Ovarian Cancer via MicroRNA Biomarkers
Wendell Palaroan, Dharmatov Rahula Albano
University of Santo Tomas, Philippines

PO2-07/0306
Self-powered Smart Microfluidic Chip for Automated Exosome Quantification and Classification
Hyunjun Kim [1], June Soo Kim [2], Noah Jang [1], Da Ye Kim [1], Seong Ho Kong [1]
Kyungpook National University, Korea [1], Cheongju University, Korea [2]

Tuesday, June 23

PO2-08/0307
Wearable Triaxial Force Sensor with Sensitivity Switching Mechanism for Tonometry-Based Blood Pressure Pulse Wave Measurement
Takahisa Segoe, Riku Niitsu, Tetsuji Dohi
Chuo University, Japan

PO2-09/0326
A Microfluidic Biosensing Platform for Quantifying Coral Respiration Breaking Temperature and Bioenergetic Responses under Thermal Stress
Yu-Ming Cheng, Shih-Hao Huang
National Taiwan Ocean University, Taiwan

PO2-10/0327
De Novo Design of High-Affinity Borono-L-Phenylalanine Binding Proteins Using Deep Learning and Molecular Dynamics Validation
Yi-Te She, Yi-Fang Wu, Yu-Lin Wang
National Tsing Hua University, Taiwan

PO2-11/0349
Exploration of Surface Modification on Microwell Array Biochip
Zhen-Ting Fan [1], Pin-Xian Du [2], Guan-Da Syu [2], Tien-Chun Tsai [2], Yung-Chen Cheng [1]
National University of Tainan, Taiwan [1], National Cheng Kung University, Taiwan [2]

PO2-12/0224
Sodium Chloride Aqueous Solution Concentration Measurement Using SAW Device
Anjam Waheed [1], Yang Ye [1], Junaid Waheed [1], Tsunemasa Saiki [2], Satoshi Amaya [3], Riyanarto Sarno [4], Tadao Matsunaga [1], Sang-Seok Lee [1]
Tottori University, Japan [1], The University of Fukuchiyama, Japan [2], The University of Tokyo, Japan [3], Institut Teknologi Sepuluh Nopember, Indonesia [4]

PO2-13/0238
Development of an Upcycled Sericin/Coronene/CMC Modified Paper Substrate for Dual Mode Colorimetric and LDI-MS Detection of Histamine as a Fish Freshness Indication
Wisarttra Phamonpon [1], Juan P. Hinestroza [2], Nadnudda Rodthongkum [1]
Chulalongkorn University, Thailand [1] Cornell University, USA [2]

PO2-14/0287
Electroanalytical Screening of Phenolic Preservatives in Commercial Foodstuffs Utilizing Lanthanum Nickelate and Graphene Nanosheets
Hong-Xiang Lin [1], Parthasarathi Manimaran [1], Tse-Wei Chen [2], Bih-Show Lou [3], Shen Ming Chen [1]
National Taipei University of Technology, Taiwan [1], National University of Tainan, Taiwan [2], Chang Gung University, Taiwan [3]

Tuesday, June 23

PO2-15/0315

A Dysprosium-Titanium Oxide Nanohybrid Electrode for Trace-Level Electrochemical Determination of Flutamide in Complex Samples

Hsiu-Chen Xiao [1], Nandini Nataraj [1], Tse-Wei Chen [2], Bih-Show Lou [3], Shen Ming Chen [1]
National Taipei University of Technology, Taiwan [1], National University of Tainan, Taiwan [2], Chang Gung University, Taiwan [3]

PO2-16/0318

Synergistic Bi-doped ZnO and Nitrogen-modified Graphene Hybrids: An Advanced Electrochemical Platform for Quantifying Metol in Complex Water Matrices

Zhi-Yan Li [1], Selva priya Selvam [1], Tse-Wei Chen [2], Shen-Ming Chen [1]
National Taipei University of Technology, Taiwan [1], National University of Tainan, Taiwan [2]

PO2-17/0341

ALD-Grown Al_2O_3 Shells on SnO_2 Nanowires for Hydrogen Sensing

Eun Bi Kim, Ka Yoon Shin, Wansik Oum, Sungjoon Moon, Seonwoo Jang, Yongseong You, Taekheon Kim, Hyoun Woo Kim
Hanyang University, Korea

PO2-18/0365

Investigation of Titanium Nitride Extended-Gate Field-Effect Transistors for pH and Urea Sensing Applications

Che-Hao Liao [1], I-Ting Chen [1], Chien-Sheng Huang [1], Xiao Tang [2], Shih-Hung Lin [1]
National Yunlin University of Science and Technology, Taiwan [1]
University of Bristol, UK [2]

PO2-19/0199

Cost-Effective Hetero-Core Fiber Optic Refractive Index Sensor using Titanium Dioxide Nanoparticles/Poly-L-lysine Multilayers

Masahiko Kuroiwa, Kodai Kikuchi, Michiko Nishiyama, Kazuhiro Watanabe, Junichi Ida
Soka University, Japan

PO2-20/0209

Fluorescent Nanoclusters Preparation Using Gold Nanoparticles-Supported Titanium Oxide Catalyst

Z. Zhang, Qinzheng Lai, Hiromasa Yagyu, Mao Hamamoto
Kanto Gakuin University, Japan

PO2-21/0259

Fabrication and Mechanical Evaluation of Multi-Stiffness Silicone Composites via Sequential Curing

Ke-Yuan Wang, Che-Chin Chen ,Yu-Hsin Lin, Meng-Shiue Lee
National Yang Ming Chiao Tung University, Taiwan

Tuesday, June 23

PO2-22/0260
Engineering PDMS Substrates with Designable Mechanical and Surface Properties for Organ-on-a-Chip Applications
Kuan-Hsien Lai, Chien-Yen Chen, Meng-Shiue Lee
National Yang Ming Chiao Tung University, Taiwan

PO2-23/0286
Integration of Glucose, Dissolved Oxygen, and Temperature Sensors into a Bioreactor Microfluidic System
Wen-Cheng Kuo, Wei-Jun Hsu, Liu-Fu Wu
National Kaohsiung University of Science and Technology, Taiwan

PO2-24/0321
Overlayer-Triggered Discontinuous Dewetting (OTDD) for Open-Surface Self-Partitioning on Microstructure Arrays
Wei-Teng Lu, Meng-Shiue Lee
National Yang Ming Chiao Tung University, Taiwan

PO2-25/0324
Transient Thermal Characterization and Localized Heating Strategy of Liquid Metal Heaters in Microfluidics
Zhe-Wei Kuo, Kyojiro Morikawa, Takehiko Kitamori, Chihchen Chen
National Tsing Hua University, Taiwan

PO2-26/0230
Monolithic Integration of Visible light Communication Chip with a GaN-based Y-branch S-bend Waveguide
Huichi Hsieh, Yuwei Chen, Pingyen Tsai, Chengshiun Liou, Chingfu Tsou
Feng Chia University, Taiwan

PO2-27/0234
Suppression of DRIE-Induced Scalloping on Si{110} Wafers via Surfactant-Added TMAH Etching
Priyanka Dewangan [1], Masaki Shimofuri [2], Toshiyuki Tsuchiya [2], Vishal Sahu [1], Yogesh Kumar Srivastava [1], Prem Pal [1]
Indian Institute of Technology Hyderabad, Telangana, India [1], Kyoto University, Japan [2]

PO2-28/0261
Performance Enhancement of an All-Silicon Broadband Terahertz Half-Wave Plate via Structural Optimization
Hidemasa Yamane [1], Yoshiharu Yamada [1], Yusuke Kondo [1], Masayuki Fujita [2], Shuichi Murakami
Osaka Research Institute of Industrial Science and Technology, Japan [1]
The University of Osaka, Japan [2]

PO2-29/0176
Resistance-Modulated BJT Magneto-Transistors with Enhanced Sensitivity, Reduced Noise
Bo-Hen Lee [1], Qing-Hua Shih [2], Ching-Liang Dai [2]
National Taiwan University, Taiwan [1], Chung Hsing University, Taiwan [2]

Tuesday, June 23

PO2-30/0177

Bipolar Ferroelectric Resonance Frequency Control for Multi-Frequency Measurement Using Piezoelectric MEMS Ultrasonic Sensors on Sensitivity-Enhancing Buckled Diaphragm Structures

Kaoru Yamashita, Junpei Yamamoto
Kyoto Institute of Technology, Japan

PO2-31/0193

Flexible Airflow Sensor Using Biodegradable PLLA/W Toward Transient Implant for Respiration Monitoring

Ryusei Nakamura [1], Muhammad Salman Al Farisi [1, 2], Yoshihiro Hasegawa [1], Miyoko Matsushima [2], Tsutomu Kawabe [2], Mitsuhiro Shikida [1]
Hiroshima City University, Japan [1], Kyushu Institute of Technology, Japan [2], Nagoya University, Japan [3]

PO2-32/0196

High Sensitivity Tactile Sensor Using Laser Induced Graphene and Diaphgram Sensing Structure for Palpation During Catheterization

Kaichi Sumiyoshi [1], Muhammad Salman Al Farisi [1, 2], Yoshihiro Hasegawa [1], Miyoko Matsushima [2], Tsutomu Kawabe [2], Mitsuhiro Shikida [1]
Hiroshima City University, Japan [1], Kyushu Institute of Technology, Japan [2], Nagoya University, Japan [3]

PO2-33/0208

Design and Performance Measurement of CMOS-MEMS Microbolometer Pixels

Ruei-Cian Chu [1], Ashwini Kumari [1, 2], Pushpapraj Singh [2], Yi Chiu [1]
National Yang Ming Chiao Tung University, Taiwan [1], Indian Institute of Technology Delhi, India [2]

PO2-34/0267

An EVS-Based Particle Tracking Approach for Low-Speed Water Flow Estimation in Biologging

Takuma Shibahara, Takuto Kishimoto, Toshihiro Shiratori, Kyota Shimada, Ryusei Ando, Hidetoshi Takahashi
Keio University, Japan

PO2-35/0276

POI-MEMS Pressure Sensor with Integrated Beam-Membrane Structure

Thi Tra Giang Nguyen [1, 2], Thanh An Truong [1], Huu Cuong Nguyen [1, 2], Thanh Cong Nguyen [1], Barry Kok [1], Van Thanh Dau [1], Dzung Viet Dao [1]
Griffith University, Australia [1], Hanoi University of Science and Technology, Vietnam [2]

PO2-36/0301

A Biomimetic Capacitive Tactile Sensor with a Tilted Cilia Array for Directional Shear Forces Sensing

Eung Jun Kim [1], Hoe Joon Kim [1], Yoon Ji Yum [2]
Daegu Gyeongbuk Institute of Science and Technology, Korea [1], Seoul National University of Science and Technology, Korea [2]

Tuesday, June 23

PO2-37/0281
An Integrated IoT Sensor Network for Geotechnical Early Warning
Thanh An Truong [1], Thi Tra Giang Nguyen [1, 2], Thanh Cong Nguyen [1], Barry Kok [1], Van Thanh Dau [1], Dzung Viet Dao [1]
Griffith University, Australia [1], Hanoi University of Science and Technology, Vietnam [2]

PO2-38/0303
High-Stability Sodium-Selective EGISFET with Optimized TiO_2 Transducer Interface
Kai-Chun Huang, Guan-Ting Wu, Yu-Hsuan Hsiao, Ting-Hao Chen, Chih-Ting Lin
National Taiwan University, Taiwan

PO2-39/0359
Tracking and Localization Using Back-Propagation Neural Networks with Unscented Kalman Filters
Yu-Chun Su, Yu-Ting Yang, Hongchin Lin
National Chung Hsing University, Taiwan

PO2-40/0241
Temperature Prediction of Tool Tips for CNC AISI 1050 Dry Milling Using Passive RFID Sensing Tags and Hybrid FEA-ML Framework
Pang-Hsiang Hung, Hsuan-Yu Kao, Pei-Zen Chang, Wei-Chang Li
National Taiwan University, Taiwan

PO2-41/0313
Optimizing Phase Purity in Spiral Micro-separators: A Computational Fluid Dynamics Approach
Pichapon Boonkrong, Pin-De Lee, Bor-Yih Yu, Ya-Yu Chiang
National Taiwan University, Taiwan

PO2-42/0422
An Efficient Computational Framework for Antibody Design Targeting CEACAM6
Yu Lin Wang, Ting Yu Chang
National Tsing Hua University, Taiwan

PO2-43/0112
Geometry-Induced Field Emission Characteristics in Planar Field Emission Triodes with Different Emitter Materials
Ju-Hung Tsai, Wen-Teng Chang
National University of Kaohsiung, Taiwan

PO2-44/0351
Dual-Gate Floating-Gate van der Waals Transistor for Nonvolatile Memory and Time-Dependent AND Logic
Advaita Ghosh [1], Adam Šlechta D [2], Jiří Háze [2], Vilém Kledrowetz [2], Yen-Fu Lin [3], Shu-Ping Lin [1, 3]
National Yang Ming Chiao Tung University, Taiwan [1], Brno University of Technology, Czech Republic [2], National Chung Hsing University, Taiwan [3]

Tuesday, June 23

PO2-45/0447
Single Cell Full-Length Mitochondrial Genome Sequencing by Droplet Microfluidics
Fuyang Qu, Luoquan Li, Juan Li, Guangyao Cheng, Yi-Ping Ho
The Chinese University of Hong Kong, Hong Kong

PO2-46/0330
Nested–Tilted Folded-Beam Flexure for Mechanism-Level Extension of Stroke in MEMS Comb-Drive Actuators
Ilgar Jafarsadeghipournaki, Aron Michael, Hemanshu Pota
The University of New South Wales, Australia [1]

PO2-47/0385
Tailoring Hard Mask Selection for Precise Nanofabrication of Electrostatic Comb-Drive Diamond Actuators
Taro Ikeda, Yoshiaki Kanamori
Tohoku University, Japan

PO2-48/0154
A High-Frequency Piezoelectric MEMS Mode-Matched Gyroscope Based on Automatic Gain Control and Phase Compensation
Zi-Yi Yu, Sheng-Shian Li
National Tsing Hua University, Taiwan

PO2-49/0164
Sustainable MXene–Cellulose Aerogel Pressure Sensors Enabled by Solvent-Free Gradient Freezing for Wearable Human–Machine Interfaces
Ching-Jung Chang [1], Zhe-Yu Liu [1], Kuan-Lin Tseng [1], Pulikkutty Subramaniyan [1], Shan-Chu Yu [2], Akhil Kavanal Paulose [1], Tzu-En Lin [1]
National Taiwan University, Taiwan

PO2-50/0167
System-Level Electro-Mechanical Modeling for Noise-Induced Bias Instability Prediction in MEMS Gyroscopes
Lyu-Ran Wang, Man-Ching Huang, Chien-Ching Ho, Jen-Chieh Li, Chung-Yang Sue
Industrial Technology Research Institute, Taiwan

PO2-51/0173
Magnetic Field Sensor Utilizing Bipolar Junction Transistor Characteristics
Qing-Hua Shih, Zhi-Xuan Dai
National Chung Hsing University, Taiwan

PO2-52/0129
SAR-Controlled Digital Offset Calibration for CMOS MEMS Capacitive Accelerometer Readouts
Chin-Te Hsin [1], Yi Feng [2], Chia-Ling Wei [2], Cheng-Yang Chang [1], Sheng-Hsiang Tseng [1]
Taiwan Semiconductor Research Institute, National Institutes of Applied Research, Taiwan [1]
National Cheng Kung University, Taiwan [2]

Tuesday, June 23

PO2-53/0166
Triboiontronics Based on Metal-Dielectric Hybrid Surfaces
Simran Sharma, Tzu-En Lin, Zong-Hong Lin
National Taiwan University, Taiwan

PO2-54/0182
Acoustic-Based Estimation of Lung Deposition in Dry Powder Inhalers
Mou-Wei Chang [1], Chih-We Chiu [1], Wen-Jui Wu [2], Wei-Ren Ke [1], Chih-Hao Fan [3], Yu-Te Liao [1]
National Yang Ming Chiao Tung University, Taiwan [1], MacKay Memorial Hospital, Taiwan [2], National Taiwan University, Taiwan [3]

14:30-17:30
City Tour

18:00 – 20:30
Banquet

Wednesday, June 24

08:40-09:30 Room: Grand Ballroom 1
Plenary speech
Chair: Zong-Hong Lin, *National Taiwan University, Taiwan*

Intelligent Electrical and Optical Sensing Platforms for AI-Assisted Molecular Detection
Seong Chan Jun
Yonsei University, Korea

10:00-12:00 Room: Grand Ballroom 1
OR3-1A Micro/Nano Fluidics 2
Chair: Chia-Hsien Hsu, *National Health Research Institutes, Taiwan*

10:00/**Keynote speech**
Bridging Profiling and Monitoring: High-Precision Micro-GC for Full-Spectrum VOCs
Jung Hwan Seo
Hongik University, Korea

10:30/**0142**
Channel-Orientation-Controlled LCD 3D Printing of DIW Nozzles
Naoto Sasaki [1], Koshi Hatano [1], Shunya Okamoto [1], Takayuki Shibata [1], Moeto Nagai [1], Michinao Hashimoto [2]
Toyohashi University of Technology, Japan [1], Singapore University of Technology and Design, Singapore [2]

10:42/**0183**
Rapid Impedimetric Detection of Vibrio harveyi Using Aptamer-Modified Magnetic Beads in a Capillary-Driven Microfluidic Device
Avinash V Police Patil, Chia-Yu Hsieh, Ching-Chou Wu
National Chung Hsing University, Taiwan

10:54/**0413**
FET-based Biosensor for Detection of Acute Respiratory Distress Syndrome
Ping Hua Cheng [1], Yu Chuan Chang [1], Yu Jui Fan [2], Horn-Jiunn Sheen [1]
National Taiwan University, Taiwan [1], National Yang Ming Chiao Tung University, Taiwan [2]

11:06/**0227**
Microfluidic Platform for Non-Destructive Mechanical Characterization of Growing Roots Using Controlled Osmotic Loading
Hirotaka Hida [1], Taiki Hamada [1], Shoyo Fukui [1], Isaku Kanno [1], Michitaka Notaguchi [2]
Kobe University, Japan [1], Kyoto University, Japan [2]

11:18/**0262**
Flows Driven in Biomimetic Fluidic Device with Decoupled Features of Small Intestinal Tract
Kazuki Komatsu [1], Satoru Kuriu [2], Naoyuki Yamamoto [3], Tadashi Ishida [1]
Institute of Science Tokyo, Japan [1], The University of Tokyo, Japan [2], Juntendo University, Japan [3]

Wednesday, June 24

11:30/**0294**
UV Laser-Enhanced Yield Improvement of Dinuclear Zn(II) Complexes in a Microfluidic Platform
Daiki Tanaka [1], Masashi Kobayashi [1], Risa Fujita [1], Takashiro Akitsu [2], Takashi Tanii [1], Shuichi Shoji [1], Masahiro Furuya [1]
Waseda University, Japan [1], Tokyo University of Science, Japan [2]

11:42/**0353**
On-Chip Chemical Control of the Gaseous Microenvironment for Root Growth Using an Integrated Micromixer
Tsubasa Fukunaga [1], Marcel Beier [2], Isaku Kanno [1], Hirotaka Hida [1]
Kobe University, Japan [1], Fukushima Institute for Research, Japan [2]

10:00-12:00 Room: Rose 1
OR3-1B Theory, Design and Simulation
Chair: Tuan Sang Tran, *Griffith University, Australia*

10:00/**Invited speech**
Flexible Sensors and Actuators Through Rational Design of Microstructures
Yongrok Jeong
Kyungpook National University, Korea

10:20/**0120**
Comparative Analysis of Switching Performance and Power Loss in E-Mode GaN HEMTs with different Clamp Topologies Using Double Pulse Testing
Susmita Mistri, Hao-Chung Kuo
National Yang Ming Chiao Tung University, Taiwan

10:32/**0122**
Bandwidth Limits of Duty-Cycled CMOS-MEMS Gas Sensors: A Predictive Electro-Thermal Framework
Andrius Šukys, Chien-Fu Chen
National Taiwan University, Taiwan

11:44/**0147**
Analytical Modeling of Serpentine Spring for Gold Proof-mass Single-axis MEMS Accelerometer
Hisashi Takahata, Tomoyuki Kurioka, Torauto Yamada, Chihaya Mukaide, Katsuyuki Machida, Chang Tso-Fu Mark, Chen Chun-Yi, Yoshihiro Miyake, Hiroyuki Ito, Masato Sone
Institute of Science Tokyo, Japan

11:56/**0252**
Design of a High Voltage MEMS Oscillator for Sensing and Computing Application
En Yu Chen, Hao Chiao Hong, Yi Chiu
National Yang Ming Chiao Tung University, Taiwan

Wednesday, June 24

11:08/**0338**
Spring-Terminated Cantilever Structure: Modelling, Design and Fabrication
Ismaeel Shah, Aron Michael, Hemanshu Pota
UNSW, Australia

11:20/**0388**
An Equivalent Circuit Model for Analyzing Nonlinear Phenomena in a NEMS resonator
Kyosuke Tokuno [1], Yoshishige Tsuchiya [2], Daisuke Yamane [1]
Ritsumeikan University, Japan [1], University of Southampton, UK [2]

10:00-12:00 Room: Rose 2
OR3-1C Materials, Fabrication and Packaging 2
Chair: Incheol Cho, *Tech University of Korea, Korea*

10:00/**Invited speech**
Toward Thermally Intelligent Power Module Packaging: Thermal Path Engineering and Junction Temperature Estimation
Sang Won Yoon
Seoul National University, Korea

10:20/**Invited speech**
Ultrafast Laser Nanoscale 3D Printing and Micromachining for Photonics, Sensing, and Energy Storage
Po-Han Huang
National Tsing Hua University, Taiwan

10:40/**0212**
Engineering Interconnected Porous Structures in Battery Electrodes via Controlled Particle Assembly
Wongi Kim, H. Nam, Oh. B. Chae, Jongkyeong Lim
Gachon University, Korea

10:52/**0213**
Fabrication of 3D Porous Sensors on Curved Surfaces Using Shear-Thinning Inks
Minseong Kang, Jongkyeong Lim
Gachon University, Korea

11:04/**0235**
Tri-Layer Soft-Rigid Stretchable Substrates for Direct Fabrication Stretchable Electronics Device
Shusuke Yamakoshi [1], Fumika Nakamura [1], Sho Sato [1], Yuji Isano [1], Yutaka Isoda [1], Tamami Takano [1], Ryosuke Matsuda [1], Naoko Namba [2], Tsuyoshi Sekitani [2], Takafumi Uemura [2], Hiroki Ota [1]
Yokohama National University, Japan [1], The University of Osaka, Japan [2]

Wednesday, June 24

11:16/**0309**
Novel Deposition Technique for Fabricating Films with Customized Thickness Profiles
Chi-Yung Hsieh, Yu-Chi Lin, Xuan-Shan Huang, Jing-Ting Lin, Cheng-Sheng Huang
National Yang Ming Chiao Tung University, Taiwan

11:28/**0339**
Ultra-thin Piezoelectric Micromachined Ultrasound Transducer Based on Silicon-on-Nothing Structure
Zhengnan Tang, Andrea Vergara, Shuji Tanaka
Tohoku University, Japan

11:40/**0358**
Wrinkle-free SiO_2 Membrane Fabrication for Soft X-Ray Analysis
Ayako Mizushima, Yuuichi Nagayama, Takashi Nagata, Keiichi Inoue, Takashi Kimura, Yoshio Mita
The University of Tokyo, Japan

10:00-12:00 Room: Rose 3
OR3-1D Physical Sensors and MEMS/NEMS 3
Chair: Guo-Hua Feng, *National Tsing Hua University, Taiwan*

10:00/**Invited speech**
Magnetic Micro/Nano Devices Enabled Novel Applications: From Medical to Computing Applications
Tien-Kan "TK" Chung
National Yang Ming Chiao Tung University, Taiwan

10:20/**Invited speech**
MEMS-Based Tri-IDT Surface Acoustic Wave Atomizer for Miniaturized Aerosol Generation
Chien-Hao Liu
National Taiwan University, Taiwan

10:40/**0348**
Nanocantilever with High Figure-of-Merit for High-Speed Atomic Force Microscopy Applications
Eying Sim Wong, Aron Michael, Jayden Moore, Hemanshu Pota
University of New South Wales, Australia

10:52/**0418**
Artificial Tactile Perceptual Distance Using Mechanoreceptor-Inspired Temporal Response Models
Ryusuke Mitobe, Takashi Abe, Masayuki Sohgawa
Niigata University, Japan

11:04/**0424**
Automated Adaptive Feature Extraction for Microfluidic Droplet Voiceprint Monitoring via Heuristic Optimization
Yi Lun Lan, Chia-Hung Tsai
National Yang Ming Chiao Tung University, Taiwan

Wednesday, June 24

11:16/**0390**
Magnetic-Piezoelectric MEMS Based 3-Axial Magnetic Sensor for DC, AC 60 Hz, and AC Resonating Magnetic Field Applications
Yu-En Tsai, Duan Hao, Che-Wei Lin, Tien-Kan Chung
National Yang Ming Chiao Tung University, Taiwan

11:28/**0402**
A Quasi-Zero Stiffness MEMS Resonator with Electrically Tunable Nonlinearity
Tongtian Zhang, Junhui Wu, Xinchen Wan, Guangya Zhou
National University of Singapore, Singapore

11:40/**0454**
Innovative Thermomagnetic Ultra-Thick Film Based Target Demonstrating a Wireless Electromagnetic Induction Heating and Temperature Measurement of Lung Lesions
Yi-Hsien Wu [1], Ching-Kai Lin [2], Chen-Wei Chang [1], Chin-Chung Chen [1], Shu-Chung Lee [1], Yun-Chien Cheng [1], Tien-Kan Chung [1]
National Yang Ming Chiao Tung University, Taiwan [1], National Taiwan University Cancer Center, Taiwan [2]

10:00-12:00 Room: Plum Blossom 2
OR3-1E Self Organized 3 From Single-Cell Analysis to Biomimetic Systems
Chair: Hiromasa Yagyu, *Kanto Gakuin University, Japan*

10:00/**0443**
A Pyramidal Nanopore for ssDNA Sequencing
Jianxin Yang
The Chinese University of Hong Kong, Hong Kong SAR

10:15/**0425**
Advanced Energy Materials and Devices for Low-grade Heat Harvesting and Flexible Thermal Sensing
Dongyan Xu
The Chinese University of Hong Kong, Hong Kong SAR

10:30/**0433**
Microphysiological Muscle and Retinal Systems for Disease Modeling and Therapeutic Screening
Hon Fai Chan
The Chinese University of Hong Kong, Hong Kong SAR

10:45/**0430**
MusTer: A Generalizable Microfluidic Platform Combining Multi-Parametric Droplet Sorting and Multi-Droplet Merging in Single-Cell Sequencing
Guangyao Cheng
The Chinese University of Hong Kong, Hong Kong SAR

Wednesday, June 24

11:00/**0434**
Deformability Cytometry for Noninvasive High-throughput Characterization of Cells
Megan Yi-Ping Ho
The Chinese University of Hong Kong, Hong Kong SAR

11:15/**Invited speech**
Continuous Analysis of Mechanical and Biological Properties of a Single Cell Using MEMS Tweezers
Momoko Kumemura
Kyushu Institute of Technology, Japan

11:30/**0362**
Arrays of Neuronal Spheroids and Measurement of Neural Activity
Yuto Sato [1], Midori Kato-Negishi [2], Yuya Sato [1], Takashi Tanii [1], Yuya Morimoto [1]
Waseda University, Japan [1], Musashino University, Japan [2]

11:42/**0247**
UiO-66 MOF-Integrated Microarrays for Multiplexed and High-Throughput Detection of Cancer Biomarkers
Yi-Syuan Zeng, Hung-Wei Yang
National Cheng Kung University, Taiwan

12:00-13:00
Lunch

13:00-14:00 Room: Grand Ballroom 1
OR3-2A Physical Sensors and MEMS/NEMS 4
Chair: Chien-Hao Liu, *National Taiwan University, Taiwan*

13:00/**0312**
Moiré Pattern Vision-Based Tactile Sensor: A Robust Solution for Multidirectional Force Detection and Object Recognition
Gandha Satria Adi [1], Yongrok Jeong [2], Inkyu Park [1]
Korea Advanced Institute of Science and Technology (KAIST), Korea [1], Kyungpook National University (KNU), Korea [2]

13:12/**0279**
Enhanced Sensitivity of Flexible Laser-Induced Graphene Pressure Sensors via Hilbert-Curve Patterning for Smart Fitness Applications
Yu-Chun Lin [1], Yen-Wen Lu [1], Hsin-Fu Lin [1], Jason Tung Wu [2]
National Taiwan University, Taiwan [1], University of Minnesota Twin Cities, USA [2]

Wednesday, June 24

13:24/**0291**

A SiC Thin-film Heat Flux Sensor with Microsecond Response for Extreme High Temperature Exposure Up To 1500 °C

Yue Zhu [1, 2], Zhiwei Ye [1, 2], Ailun Yi [1], Zhongming Lu [1], Hong Zhou [1], Yi Wang [1], Xin Ou [1], Tie Li [1]
Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences, China [1]
University of Chinese Academy of Sciences, China [2]

13:36/**0300**

Roberval-Type Load Cell with a Directly Formed Piezoresistor by LASER Annealing

Tatsuki Ono, Rihachiro Nakashima, Soya Sato, Masahiro Fukuta, Hidetoshi Takahashi
Keio University, Japan

13:48/**0344**

A Temperature-compensated Liquid-metal Flexible Strain Sensor Integrated into a Microfinger for Tactile Sensing under Temperature Variations

Kensei Hara, Yuto Hori, Satoshi Konishi
Ritsumeikan University, Japan

13:00-14:00 Room: Rose 1
OR3-2B Data Processing, AI, and Novel Application
Chair: Yao-Chuan Tsai, *National Chung Hsing University, Taiwan*

13:00/**0165**

Micro-Volume Viscosity Measurement by Janus Particle-Based Rotational Diffusometry Combining Deep Learning

Soumyajit Podder [1], Tatsuhito Hasegawa [2], Han-Sheng Chuang [1]
National Cheng Kung University, Taiwan [1], University of Fukui, Japan [2]

13:12/**0152**

Prognostic Value of Circulating Hybrid Cells and P-score in Colorectal Cancer: An Analysis via HD-SACA System

Hsiang-Wei Liu [1], Po-Cheng Liu [1], Jie-Yu Liu [1], Chun-Chi Lin [2], Fan-Gang Tseng [1]
National Tsing Hua University, Taiwan [1], Taipei Veterans General Hospital, Taiwan [2]

13:24/**0370**

Charge-Modulated Conductance and Synaptic Behavior in Gr/h-BN/WSe2 van der Waals Transistors

Jing-Wei Wang [1], Yen-Fu Lin [1], Shu-Ping Lin [2]
National Chung Hsing University, Taiwan [1], National Yang Ming Chiao Tung University, Taiwan [2]

13:36/**0253**

Ring-width regulated Underfocus Real-Time Deformability Cytometry

Qinru Xiao, Guangyao Cheng, Kuan Wen Luo, Yi-Ping Ho
The Chinese University of Hong Kong, Hong Kong SAR

Wednesday, June 24

13:48/**0394**
Synchronization in Duffing MEMS Resonators and Chaos-Based Encryption
Zheng Zhang, Junhui Wu, Guangya Zhou
National University of Singapore, Singapore

13:00-14:00 Room: Rose 2
OR3-2C Materials, Fabrication and Packaging 3
Chair: Satoshi Nishita, *The University of Electro-Communications, Japan*

13:00/**0217**
Wet Bulk Micromachining of Borofloat Glass Wafers Using Ni Thin-Film/Photoresist Masks
Vishal Sahu, Priyanka Dewangan, Prem Pal
Indian Institute of Technology Hyderabad, India

13:12/**0360**
Suppression of Rubidium Loss During Thermal Decomposition in MEMS Vapor Cells Using Thin ALD-AL_2O_3 Layers
Shun Kiyose, Toshiyuki Tsuchiya, Yoshikazu Hirai
Kyoto University, Japan

13:24/**0369**
Fabrication of Aerogel-Based Transparent Haze Film for Enhanced Forward Light Scattering and Passive Radiative Cooling in Solar Cells
Gyeongwan Lee, Jungwook Choi
Chung-Ang University, Korea

13:36/**0406**
Fabrication and Integration of a 3D Micro-Lattice Electrode for Microfluidic Enzymatic Systems
Satoshi Amaya [1], Mizuki Maeda [2], Hirotaka Sugiura [1], Fumihito Arai [1], Hiroaki Sakamoto [2]
The University of Tokyo, Japan [1], University of Fukui, Japan [2]

13:48/**0157**
Nanoscale 3D Printing of Selectively Silicon-Nanocrystal-Functionalized Silica Glass Structures
Chao-Yuan Tan, Po-Han Huang
National Tsing Hua University, Taiwan

13:00-14:00 Room: Rose 3
OR3-2D Chemical/Bio/Medical Sensors and MEMS/NEMS
Chair: Chung-Han Wu, *National Chung Hsing University, Taiwan*

13:00/**0283**
Sensitivity of LSPR Sensor using Gold Nanotriangles Synthesized with Microfluidics
Yifeng Xie, Mao Hamamoto, Hiromasa Yagyu
Kanto Gakuin University, Japan

Wednesday, June 24

13:12/**0150**
Omnidirectional Spiral Surface Acoustic Wave–Driven Rapid Immunofluorescence Intensification via Porous Hydrogel Microbeads
Chun-Jui Chen [1], Wei Hsiang Chou [1], Jaesung Kwon [2], Han-Sheng Chuang [1]
National Cheng Kung University, Taiwan [1], Incheon National University, Korea [2]

13:24/**0219**
Hetero-Core Fiber Optic Localized Surface Plasmon Resonance Sensor for Evaluating the Concentration of Glucose in Aqueous Samples
Deepro Banerjee, Michiko Nishiyama
Soka University, Japan

13:36/**0368**
Development of a Clinically Reliable Platform for Noninvasive Sweat Glucose Sensing
Hsiu-Pen Lin, Yi-Ning Yeh, Pei-An Chen, Bor-Ran Li
National Yang Ming Chiao Tung University, Taiwan

13:48/**0416**
Nanostructured Biosensing Platforms for Rapid Diagnosis of Swine Viral and Bacterial Diseases
Yi-Jing Liao [1], Shu-Pin Lin [2]
National Chung Hsing University, Taiwan [1], National Yang Ming Chiao Tung University, Taiwan [2]

13:00-14:00 Room: Plum Blossom 2
OR3-2E Bio/Medical Sensors and MEMS/NEMS 5
Chair: Chia-Hung Tsai, *National Yang Ming Chiao Tung University, Taiwan*

13:00/**0205**
Application and Therapeutic Evaluation of Folic Acid–Modified Boric Acid–Poly(vinyl alcohol) Nanodrugs for Boron Neutron Capture Therapy of Pancreatic Cancer
Chi-Heng Lee [1], Chu-Yi Tang [1], Fan-Gang Tseng [1, 2]
National Tsing Hua University, Taiwan [1], Research Center for Applied Sciences, Academia Sinica, Taiwan [2]

13:12/**0372**
Acupuncture Needle-Based Conformal Sensor Platform for Deep-Tissue Oxygen Monitoring
Yeju Seo, Inkyu Park
Korea Advanced Institute of Science & Technology, Korea

13:24/**0377**
Verification of Detection Depth Control in Skin Moisture Monitoring Using Narrow-gap Interdigitated Electrode Sensors
Hisashi Ito, Yusuke Sakaue, Hiroki Ishizuka, Osamu Oshiro
The University of Osaka, Japan

Wednesday, June 24

13:36/**0379**
Reliable Single-Molecule-Level DNA Base Identification by Combining Weighted Peak Scoring and Machine Learning Analysis of SERS Spectra
Makoto Taguchi, Yuta Ogura, Shintaro Yotsuzuka, Hiroaki Honma, Koji Sugano, Yoshitada Isono
Kobe University, Japan

13:48/**0380**
Battery-Free, Wireless Multi-Axial Sensor Array for Continuous Pressure and Shear Monitoring at the Skin-Cast Interface
Jiwon Moon, Hyeonseok Han, Seokjoo Cho, Inkyu Park
KAIST, Korea

14:00 - 15:30 Room: Grand Ballroom 2
Poster Session PO3
Chair: Tien-Kan Chung, *National Yang Ming Chiao Tung University*

PO3-01/0248
Transdermal Microneedle Tyrosinase Sensor Based on Phenylboronic Acid-Modified Pt-mSiO_2 Nanorods for Early Melanoma Detection
Chien-Pin Wang, Hung-Wei Yang
National Cheng Kung University, Taiwan

PO3-02/0391
Advancing BNCT Precision Medicine Through Accelerated Aptamer Selection and AI-Driven Data Mining for High-Sensitivity Boronophenylalanine Monitoring
Yi-Fang Wu, Yi-Te She, Yu-Lin Wang
National Tsing Hua University, Taiwan

PO3-03/0393
Extracellular Potential Recording of Innervated Cultured Skin Using Flexible Parylene Electrodes
Koji Shibata [1], Midori Kato-Negishi [2], Yuya Morimoto [1]
Waseda University, Japan [1], Musashino University, Japan [2]

PO3-04/0395
AI-Driven Process-Tolerant BioFET Sensing Model for Precise Biliary Atresia Diagnosis of Infants with a Single Drop of Blood
Chia-Kai Lin, Yu-Lin Wang
National Tsing Hua University, Taiwan

PO3-05/0409
Rapid Quantification of Short-Chain Fatty Acids in Human Fecal Samples via Dual-Mechanism Electrochemical Sensing and Artificial Neural Networks
Bing-Chen Gu, Zhi-Xuan Lin, Zhung-Wen Yeh, Chia-Che Wu
National Chung Hsing University, Taiwan

Wednesday, June 24

PO3-06/0415
Development of a Microfluidic Platform for Bone Substitute Degradation Evaluation Incorporating Dynamic Squeezing Stimulation and Impedance Monitoring
Jun-Yi Huang, Bo-Ren Tu, Chun-Hao Huang
HungKuang University, Taiwan

PO3-07/0420
NH_2-Functionalized MIL-101(Fe) Metal–Organic Frameworks as an Efficient Signal-Enhancing Interface for Electrochemical Aptasensing of Vibrio harveyi
Rajesh Kumar Raghav, Chia-Yu Hsieh, Ching-Chou Wu
National Chung Hsing University, Taiwan

PO3-08/0426
Multifunctional Nanostructured Biosensor Platform Integrating Electrical, Electrochemical, and Optical Transduction Mechanisms
Hung-Hsiang Wang, Yu-Quan Chen, Chih-Ting Lin
National Taiwan University, Taiwan

PO3-09/0436
Print-Pause-Print Adaptation in Digital Light Processing 3D-Printing for Efficient Fabrication of Cell Culture and Monitoring Devices
Phong Vi Lam [1], Huei-Wen Chen [2], Pai-Shan Chen [2], Pin-Chuan Chen [1]
National Taiwan University of Science and Technology, Taiwan [1], National Taiwan University, Taiwan [2]

PO3-10/0455
Sweat Ion Sensor Based on an Ultra-Thin In_2O_3 Field-Effect Transistor
Jheng-Ru Wu, Yu-Ta Chen, Chien-Fu Chen
National Taiwan University, Taiwan

PO3-11/0457
Development and Validation of a Mechanical Sector-Scanning High-Frequency Ultrasound Imaging System for Curved Nail Unit Structures
Shing You Chou, Jian Xing Wu
National Sun Yat-sen University, Taiwan

PO3-12/0346
An Investigation into Size and Shape Effects on Al_2O_3-ISFET Performance
Chen-Chieh Tu, Tsung-Yang Chen, Feng-Cheng Chao, Pei-Yu Lin, Chih-Ting Lin
National Taiwan University, Taiwan

PO3-13/0366
Surface Modification-Based Electrode Electrochemical Sensing of Sodium Dodecyl Sulfate with Molecularly Imprinted Polypyrrole Films
Abbey Franco, Dharmatov Albano
UST Graduate School, Philippines

Wednesday, June 24

PO3-14/0386
Defect-Rich Bimetallic Layered Double Hydroxide/Graphene Nanohybrids for Voltammetric Determination of Veterinary Antibiotics in Complex Matrices
Chen Ho Wu, Francis Disouza, Gomathi Prabhakaran, Shen Ming Chen
National Taipei University of Technology, Taiwan

PO3-15/0404
Development and Investigation of Highly Selective Chemoresistive Sensing Materials for Aldehyde Gas Detection
Hui-Tzu Chang [1], Yun-Shan Tsai [2], Chung-Wei Kung [2], Shih-Han Wang [1]
National Yunlin University of Science and Technology, Taiwan [1], National Cheng Kung University, Taiwan [2]

PO3-16/0451
Arc Filament Generated Plasma Ion Source Using a Cigarette Ignition Coil for Mass Spectrometry Applications
Yun-Hsin Shih, Che-Hsin Lin
National Sun Yat-sen University, Taiwan

PO3-17/0270
A Solvent-Free Photoresist Transfer Approach for Micropattern Fabrication
Na Yoon Kim [1], Kyeong Jun Park [1], Ho Hyun Keum [2], Hoe Joon Kim [1]
DGIST, Korea [1], KITECH, Korea [2]

PO3-18/0271
Investigation of the Impact of Substrate Grating Structures on Contact Resistance in Graphene-based Field Effect Transistor
Wei-Yu Long, Yan-Yi Lin, Min-Da Yu, Po-Han Shia, Chih-Ting Lin
National Taiwan University, Taiwan

PO3-19/0277
Surface Zeta Potential and Time-Dependent Changes of Plasma-Activated Silicon Wafers for Direct Bonding
Yukio Suzuki [1], Joji Kato [2], Yuta Karasumi [2], Tatsuya Matsumoto [1], Junxiao Shen [1], Shuji Tanaka [1]
Tohoku University, Japan [1], Otsuka Electronics Co., Ltd, Japan [2];

PO3-20/0311
Preparation of Nanoclusters-supported on Titanium Oxide by Colloidal Immobilized Method
Qinzheng Lai, Zichen Zhang, Hiromasa Yagyu
Kanto Gakuin University, Japan

PO3-21/0343
Ammonia Gas Detection Using a Hetero-Core Optical Fiber Sensor Coated with Layer-by-Layer Deposited PDDA/TSPP Film
Toshiyuki Kawasaki, Masahiko Kuroiwa, Kodai Kikuchi, Michiko Nishiyama, Kazuhiro Watanabe, Junichi Ida
Soka University, Japan

Wednesday, June 24

PO3-22/0398
Optimization of Growth Parameters and Microstructural Properties of AlN Films on Sapphire Deposited by HiPIMS
Chih-Jou Tseng, Ya-Hsuan Chen, Chih-Yang Huang, Ray-Hua Horng
National Yang Ming Chiao Tung University, Taiwan

PO3-23/0335
Integrated Microfluidic Circuit with Block Diagrams in MATLAB
Yung-Hsiang Chang, Kyojiro Morikawa, Takehiko Kitamori, Chihchen Chen
National Tsing Hua University, Taiwan

PO3-24/0363
Rheological Behavior Analysis and Mechanical Phenotyping Study of Cells Passing Through Microchannels Based on Finite Element Method
Yuhang Li, Yaoqiang Liu, Xiaoling Hu, Kui Song
Xiangtan University, China

PO3-25/0412
Microchamber-Based Digital PCR for The Detection of COVID-19 Virus
Chang-Fu Huang, Yen-Heng Lin
Chang Gung University, Taiwan

PO3-26/0316
Nano-Grating-Assisted Integration of SPR and SERS for Advanced Plasmonic Sensing
Nan-Fu Chiu, Yong-Ai Wu, I-Ju Chen, Devi Taufiq Nurrohman
National Taiwan Normal University, Taiwan

PO3-27/0431
Design of Monolithic Optical Engine on GaN-on-Silicon Platform
Yu-Chia Hsu, Yu-Wei Chen, Hui-Chi Hsieh, Cheng-Shiun Liou
Feng Chia University, Taiwan

PO3-28/0119
Design and Implementation of Piezoelectric MEMS Audio Transducer with Parylene for Acoustic Performance Improvement
Zih-Song Hu, Yu-Chen Chen, Weileun Fang
National Tsing Hua University, Taiwan

PO3-29/0302
Simultaneous Measurement System of MRI, Endoscopic RGB Imaging, and Mechanical Force for Biological Observation
Reki Mukasa, Tetsuji Dohi
Chuo University, Japan

Wednesday, June 24

PO3-30/0322
A Eco-friendly and Wearable Biomechanical Sensor Design based on Triboelectrification
Shih-Min Huang, Po-Kang Yang
National Central University, Taiwan

PO3-31/0347
Evaluation of Frequency Response Characteristics of Cylindrical Hollow Hetero-core Optical Fiber Beam Accelerometer
Hiroki Kadotani, Atsuki Hirose, Michiko Nishiyama
Soka University, Japan

PO3-32/0350
Nonplanar-Feeding Microwave Fluidic Sensor for Density Identification of Ethanol-Water Solutions
Chen-Pu Chang, Chien-Hao Liu
National Taiwan University, Taiwan

PO3-33/0355
Microfluidic Pressure Sensor Utilizing FEP as the Deformable Membrane
Bao-Cheng Huang, Kao-Mai Shen, Kyojiro Morikawa, Takehiko Kitamori, Chihchen Chen
National Tsing Hua University, Taiwan

PO3-34/0356
A Compact and Scalable Multi-Resistor MEMS Pirani Gauge
Ashwini Kumari [1, 2], Piyush Kumar [1], Khanjan Joshi [1], Ruei-Cian Chu [2], Yi Chiu [2], Pushpapraj Singh [1]
Indian Institute of Technology Delhi, New Delhi, India [1], National Yang Ming Chiao Tung University, Taiwan [2]

PO3-35/0367
Sampling Moiré Method Force Plate Utilizing Pantograph Structure for Out-of-Plane Detection
Kakeru Nakayama, Mai Kawamata, Ohga Nomura, Yukitake Nakahara, Toshihiro Shiratori, Hidetoshi Takahashi
Keio University, Japan

PO3-36/0378
Real-Time In-Situ Monitoring of Plasma Etching Using Quartz Crystal Microbalance Sensors
Kyeong Jun Park [1, 2], Eun Seo Ko [3], Yongjun Kwon [3, 4], Moonsoo Bak [4], Hohyun Keum [2], Hyeong-U Kim [3, 4, 5], Hoe Joon Kim [1]
DGIST, Korea [1], KITECH, Korea [2], KIMM, Korea [3], Sungkyunkwan University, Korea [4], UST, Korea [5]

Wednesday, June 24

PO3-37/0400

Direction-Aware Piezo-Transmittance Sensor Arrays for Real-Time Human Motion Monitoring and Advanced Wearable Electronics

Byeongmin Kang [1], Kwangjun Kim [2], Jimin Gu [3], Jun-ho Jeong [4], Jong G. Ok [2], Inkyu Park [1]
Korea Advanced Institute of Science and Technology, Korea [1], Seoul National University of Science and Technology, Korea [2], University of California, Berkeley, USA [3], Korea Institute of Machinery and Materials, Korea [4]

PO3-38/0407

A Flexible Capacitive Pressure Sensor with Porous PDMS Sponge for Swelling Detection

Chin-Cheng Wu [1], Cheng Kuo [2], Chang-Lung Tsai [1], Jin-Chern Chiou [2]
National ILAN University, Taiwan [1], National Yang Ming Chiao Tung University, Taiwan [2]

PO3-39/0423

LC Repeater-Inspired Battery-free, Chipless, Flexible Body Sensor Network with Lightweight Reader

Guan-Lin Su, Ting-Wei Wang
National Tsing Hua University, Taiwan

PO3-40/0382

FET-Based Visualized Molecular Sieves for Thermal Shock-Driven Mercury Detection

Guan-Cheng Zeng, Yu-Lin Wang
National Tsing Hua University, Taiwan

PO3-41/0408

A 14.5-bit Hybrid SAR and Single-Slope Analog-to-Digital Converter with Background Calibration

Cheng-Ya Yu, Pai-Hsiang Hsu, Yueh-Ru Lee, Chung-Chih Hung, Chia-Hung Chen
National Yang Ming Chiao Tung University, Taiwan

PO3-42/0419

APTES-Functionalized EGFETs Enabled by Thermally Assisted Hg^{2+}–Molecular Sieve Complexation for Highly Sensitive Mercury Detection

Ching Yao Lan, Guan Cheng Zeng, Yu Lin Wang
National Tsing Hua University, Taiwan

PO3-43/0220

SAW Thermoacoustic Mach-Zehnder Phase Modulator for Physical Reservoir Computer

Kotaro Nose, Taiki Ijima, Masaki Shimofuri, Jun Hirotani, Toshiyuki Tsuchiya
Kyoto University, Japan

Wednesday, June 24

PO3-44/0225

A Raman Spectroscopy–Based Signal Processing and Machine Learning Framework for Robust Circulating Tumor Cell Detection

Jia-Ling Li [1], Hsien-Ting Chang [1], Wei-Wen Hu [1], I-Tsu Chyuan [2], Ming-Huang Chiu [2], Yu-Che Cheng [2], Chia-Wen Tsao [1, 2]
National Central University, Taiwan [1], Cathay General Hospital, Taipei City, Taiwan [2]

PO3-45/0292

Bridging LFP and Action Potential Representations for Learning-Based Closed-Loop Deep Brain Stimulation

Jin-Rong Lai, Shun-Chao Yang, Chiang Jung, Chia-Hung Cho, Chii-Wann Lin
National Taiwan University, Taiwan

PO3-46/0293

Enhancing Granularity Robustness in Acoustic Tool-Wear Classification for CNC Milling Using a CNN-Augmented Transformer

Shang-Yu Lin, Po-Han Chen, Pang-Hsiang Hung, Pei-Zen Chang, Wei-Chang Li
National Taiwan University, Taiwan

PO3-47/0226

A Low-Noise Amplifier with Accurate Embedded Hybrid Time-Gain Compensation for Ultrasound Receiver Front-Ends

Yu-Siang Chou [1], Chen-Hua Xu [1], Chih-Hsien Huang [2], Yu-Te Liao [1]
National Yang Ming Chiao Tung University, Taiwan [1], National Cheng Kung University, Taiwan [2]

PO3-48/0135

Design and Optimization of Thermal Management for Thin-Film Heating in Microfluidic Systems

Ping Jui Wu, Kyojiro Morikawa, Takehiko Kitamori, Chihchen Chen
National Tsing Hua University, Taiwan

PO3-49/0233

Influence of Porous Transport Layer Pore Size on the Performance of Anion Exchange Membrane Water Electrolysis: Multiphysics Simulation Investigation

Chih-Yen Kuo [1], Li-Yun Yeh [2], Yung-Liang Tung [2], Li-Da Chiu [1], Chih-Hung Chen [1], Jian-Zhang Chen [1]
National Taiwan University, Taiwan [1], Industrial Technology Research Institute, Taiwan [2]

PO3-50/0162

Bias Magnetic Field Dependence and Magnetostrictive Constant for MEMS Magnetostrictive Vibration Energy Harvesters Using Fe-Based Nanocrystalline Soft-Magnetostrictive Films

Tatsuya Sakamoto, Kohya Sano, Chiemi Oka, Junpei Sakurai, Seiichi Hata
Nagoya University, Japan

Wednesday, June 24

PO3-51/0168
Effects of a $CaCO_3$ Scattering Layer and CDCA Co-Adsorbent on the Efficiency of TiO_2 Dye-Sensitized Solar Cells
Bo Yu Huang, Chun-Yu Li
National Yunlin University of Science and Technology, Taiwan

PO3-52/0396
Piezoelectric MEMS Resonators and Oscillators in Liquid Environment for Mass Sensing Applications
Navajyoth Kummath, Sheng-Shian Li
National Tsing Hua University, Taiwan

PO3-53/0414
A 50 GHz Switched-Line RF MEMS Phase Shifter with Low Loss on Sapphire Substrate
Piyush Kumar, Ashwini Kumari, Rahul Mehra, Pushpapraj Singh
Indian Institute of Technology Delhi, India

15:30-16:20 Room: Grand Ballroom 1
OR3-3A Materials, Fabrication and Packaging 4
Chair: Yoshikazu Hirai, *Kyoto University, Japan*

15:30/**0181**
Liquid Metal Powder–Enabled Conductive Networks for Multifunctional and Versatile Electronics
Osman Gul, Inkyu Park
Korea Advanced Institute of Science and Technology, Korea

15:42/**0158**
Flexible MEMS Thermal Sensor Using Cost-Effective Metallization: Cu
Muhammad Salman Al Farisi [1, 2], Rintaro Aso [1], Yoshihiro Hasegawa [1], Mitsuhiro Shikida [1]
Hiroshima City University, Japan [1], Kyushu Institute of Technology, Japan [2]

15:54/**0161**
A TSV- and RDL-Free Infinite-Stacking 3D IC Packaging Platform with Integrated Thermoelectric and Microfluidic Thermal Management
Meenakshi Ray [1, 2], Chia-Kai Lin [2], Yu-Lin Wang [2], Zong-Hong Lin [1, 2]
National Taiwan University, Taiwan [1], National Tsing Hua University, Taiwan [2]

16:06/**0174**
Integrated Voxel Modeling and Quality Prediction for Intelligent Path Planning in Ultrafast Laser 3D Direct Writing
You-Wei Lu, Po-Han Huang
National Tsing Hua University, Taiwan

15:30-16:20 Room: Rose 1
OR3-3B Physical Sensors and MEMS/NEMS 4
Chair: Ching-Te Kuo, *National Sun Yat-sen University, Taiwan*

Wednesday, June 24

15:30/**0314**
Investigation of Electron Spin Resonance Imaging of a Hair Fragment
Kaoru Fukushima, Takahito Ono, Masaya Toda
Tohoku University, Japan

15:42/**0331**
Feasibility Study of Wind Compensation for MEMS Cantilever-Based Wave Height Sensors
Kako Koeda, Takuto Kishimoto, Kyota Shimada, Ryusei Ando, Hidetoshi Takahashi
Keio University, Japan

15:54/**0334**
Piezojunction Effect in n-3C-SiC/p-Si Heterojunction for Ultrasensitive Strain Sensing
Tuan Sang Tran, Thi Tra Giang Nguyen, Muhammad Tamoor Ansar, That Buu Ton, Cuong Nguyen, Thanh-An Truong, Duc Khanh Tran, Van Thanh Dau, Dzung Viet Dao
Griffith University, Australia

15:30-16:20 Room: Rose 2
OR3-3C Chemical Sensors and MEMS/NEMS 3
Chair: Dharmatov Rahula B. Albano, *University of Santo Tomas, Philippines*

15:30/**0269**
Laser-Induced Graphene Hybrid Sensor for Simultaneous Gas and Air flow Detection
Kenta Murakami [1], Ryusei Ando [2], Rihachiro Nakashima [2], Yoshiyuki Kaiho [1], Yoshifumi Yoshida [1], Hidetoshi Takahashi [2]
Seiko Future Creation Inc., Japan [1], Keio University, Japan [2]

15:42/**0290**
Response Evaluation of a Tip-Type Hetero-Core Fiber Optic Magnetic Field Sensor Using Magnetic Fluid
Hayato Hanada, Takaaki Abe, Deepro Banerjee, Michiko Nishiyama
Soka University, Japan

15:54/**0354**
Fabrication of Au/Ta_2O_5/AuNPs Hybrid Multilayer Hetero-Core Fiber Optic Refractive Index Sensor
Michiko Nishiyama [1], Deepro Banerjee [1], YiHsuan Chen [2], Steve Morgan [2], Sergiy Korposh [2]
Soka University, Japan [1], University of Nottingham, UK [2]

16:06/**0328**
Ag Coated Hetero-Core Fiber Optic Magnetic Field Sensor Using Oil Based Magnetic Fluid Containing 50 nm Fe_3O_4 Nanoparticles
Kazuki Inoue, Takaaki Abe, Hayato Hanada, Deepro Banerjee, Michiko Nishiyama
Soka University, Japan

Wednesday, June 24

15:30-16:20 Room: Rose 3
OR3-3D Bio/Medical Sensors and MEMS/NEMS 6
Chair: Manu Garg, *Silicon Austria Labs GmbH, Austria*

15:30/**0333**
Skin-Conformal Tessellated Platforms with On-Demand Switchable Adhesion for Wearable Devices
Geonjun Choi [1], Hoon Eui Jeong [2], Inkyu Park [1]
Korea Advanced Institute of Science and Technology, Korea [1], Ulsan National Institute of Science and Technology, Korea [2]

15:42/**0342**
Soft Microfinger Robot for Bilateral Head Stimulation and Reaction-Force Analysis in Zebrafish Larvae
Tomohiro Nakatsuka [1], Hiromi Hirata [2], Moeto Nagai [3], Satoshi Konishi [1]
Ritsumeikan University, Japan [1], Aoyama Gakuin University, Japan [2], Toyohashi University of Technology, Japan [3]

15:54/**0352**
Vertically Aligned Nanostructure-Based Biosensor for Serum Antibody Detection of Porcine Mycoplasma Arthritis and Septicemia
Wei-Ni Lee [1], Shu-Ping Lin [2]
National Chung Hsing University, Taiwan [1], National Yang Ming Chiao Tung University, Taiwan [2]

16:06/**0397**
Fabrication and Ionic Current Characterization of a Gold Nanoparticle Dimer-Integrated Nanopore for SERS-Based DNA Analysis
Yuta Ogura, Makoto Taguchi, Shintaro Yotsuzuka, Hiroaki Honma, Koji Sugano, Yoshitada Isono
Kobe University, Japan

15:30-16:20 Room: Plum Blossom 2
OR3-3E Bio/Medical Sensors and MEMS/NEMS 7
Chair: Yi-Chung Tung, *Academia Sinica, Taiwan*

15:30/**0381**
An Ultra-High Precision Refractive Index Measurement Framework Based on Surface Plasmon Resonance System with Flow-Thermal Coupling Compensation
Jian-Hong Yang, Chia-Ling Chiang, Hong-Xiang Jiang, Pien-Pien Lin, Ming-Hsien Lee, Ying-Ju Chen, Dan-Jing Chang, Tzu-Heng Wu, Nien-Tsu Huang, Chii-Wann Lin
National Taiwan University, Taiwan

Wednesday, June 24

15:42/**0410**

Surface Plasmon Resonance Imaging Sensing technique for Multiplex Detection of Acute Respiratory Infection Viruses

Yu-Shuo Yeh [1], Hao-Lun Hung [1], Han-Yun Hsieh [2], Pei-Kuen Wei [3], Yu-Jui Fan [4], Horn-Jiunn Sheen [1]

National Taiwan University, Taiwan [1], National Dong Hwa University, Taiwan [2], Research Center for Applied Sciences, Academia Sinica, Taiwan [3], National Yang Ming Chiao Tung University, Taiwan [4]

15:54/**0392**

Nanobrush-Based Electrical Biosensors for Rapid Diagnosis and Stage Differentiation of Neurodegenerative Diseases in Blood Plasma

Yi-Nuo Huang [1], Ming-Hong Chang [1], Wei-Ju Lee [2], Shu-Ping Lin [3]

National Chung Hsing University, Taiwan [1], Taichung Veterans General Hospital, Taiwan [2], National Yang Ming Chiao Tung University, Taiwan [3]

16:06/**0383**

Performance Validation of a Test Strip-Based Sensing Platform for Fecal Leukocyte Esterase Detection in IBD Monitoring

Zu-Han Yang, Dan-Ching Chang, Ying-Ju Chen, Tzu-Heng Wu, Su-Yu Chu, Shu-Chen Wei, Chii-Wann Lin

National Taiwan University, Taiwan

Awards and Closing 16:20-17:00

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THE 13TH ASIA-PACIFIC CONFERENCE OF TRANSDUCERS & MICRO-NANO TECHNOLOGY

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DATES
25–28 June 2028

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// 15 TOPICAL AREAS

01 Theory, Design & Simulation
02 Advanced Materials, Fabrication & Packaging
03 Physical Sensors & MEMS/NEMS
04 Chemical & Gas Sensors
05 Bio/Medical Sensors
06 Wearable, Flexible & Implantable Microsystems
07 Micro/Nano Fluidics & Organ-on-Chip
08 Actuators & Soft MEMS
09 RF & Millimetre-Wave MEMS/NEMS
10 Optical MEMS & Integrated Photonics
11 Energy Harvesting, Storage & Power MEMS
12 Sensor Interface, Networks & Algorithms
13 AI, Machine Learning & Neuromorphic Sensing
14 6G / NextG IoT Microsystems
15 Quantum Sensing & Emerging Nanosystems

Cross-cutting submissions are encouraged

// ABOUT GOLD COAST

Gold Coast is one of Australia's most iconic and dynamic cities, renowned for its stunning beaches, vibrant lifestyle, and subtropical climate. Located just south of Brisbane with convenient international access, the city offers everything from Lamington National Park escapes to lively Surfers Paradise waterfront precincts. With great food, entertainment, and natural beauty, Gold Coast is a perfect destination for delegate & family.

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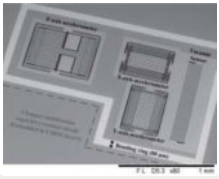
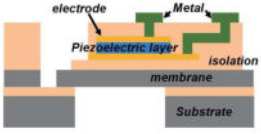
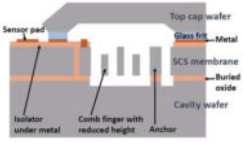
TSRI MEMS MPW Platform & Measurement Service

MEMS MPW Platforms

CMOS-MEMS (UMC)	Piezo MEMS (A*STAR IME LiF)	Silicon Inertial MEMS (X-FAB) (TBD)
Monolithic CMOS circuits and MEMS transducers in a one-stop process flow with reusable IPs	PiezoMEMS platform for movable structure and membrane for PMUTs applications	Single-crystal silicon inertial MEMS process for high-volume automotive and industrial applications







Laboratory Measurement Services

Spectrum Analyzer: up to 26.5 GHz	Oscilloscope: up to 10 GHz
Lock-in Amplifier: up to 8.5 GHz	Vacuum Box: vacuum level down to 10-6 Torr.
Polytec Vibrometer: in-plane & out-of-plane measurement	Rate Table: inertial sensor and angular motion evaluationmeasurement
SEM: MEMS structure inspection and analysis	Shaker System: vibration and dynamic response testing
Functional Testing: chip-level signal analysis	Applications: sensors, actuators, RF MEMS, and related devices

Desktop Scanning Electron Microscope (charge up reduction)

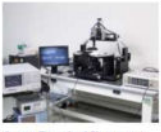
Shaker (max. acceleration: 20G)

Olympus microscopes (with multiple image alignment)

Oscilloscope (DC-10G)

Rate table(sinusoidal rotation)

Polytec measurement system (TOP+IP+OOP) measurement)



Laser Doppler Vibrometer (spot size <6um)

Vacuum box(vacuum lever: 10^-6 torr)

Lock-in Amplifier(DC-8.5GHz)

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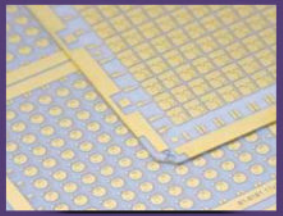
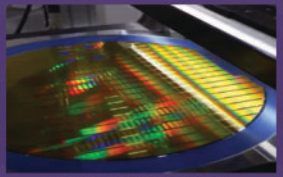


Ceramic substrate

Power devices solutions



Known Good Dies/ Recon-Wafer

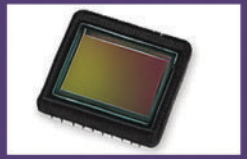
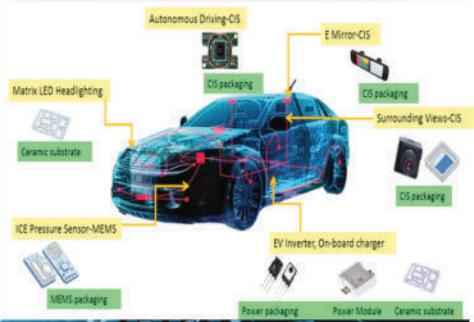
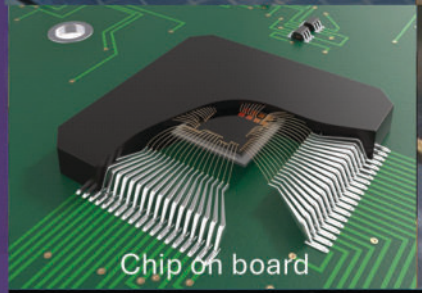


Image sensor Packages

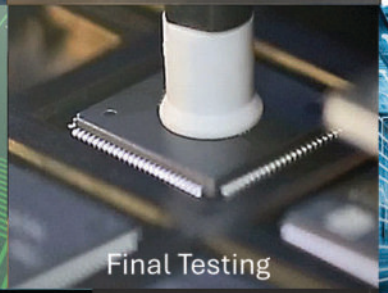
Wafer grinding, grooving and sawing

Wafer Testing

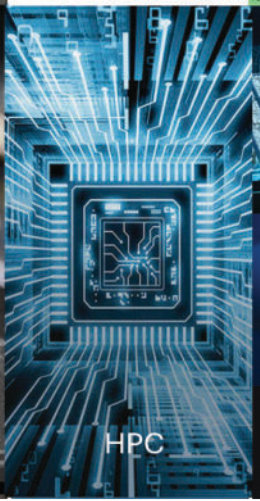




Chip on board

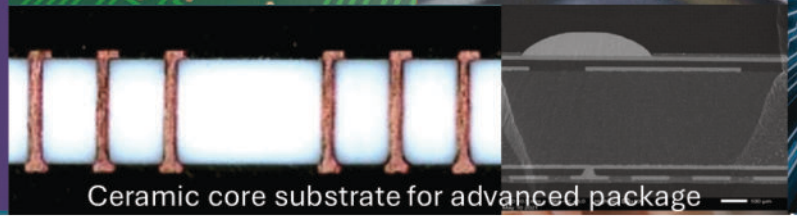


Final Testing



HPC

Power Devices



Ceramic core substrate for advanced package

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