

9th GOSPEL Workshop



Changchun, China
Aug 4th - Aug 6th, 2024



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Welcome Message

On behalf of the organizing committee, I sincerely invite all the great scientists, academicians, young researchers, industry delegates, and students from all over the world to attend the 9th GOSPEL Workshop from Aug 4th-6th, 2024, at Changchun, China.

GOSPEL is an international biennial research meeting dedicated to the R&D activities in the field of gas sensors based on semiconducting metal oxides. The aim is to bring together academia and industry and help the latter to identify which of the new developments are the most relevant to it. The main topics of the workshop will be: operando investigations of gas sensing; applications; novel materials/manufacturing technologies.

The topics of the GOSPEL workshop genuinely reflect the current trends, recent advances, and new approaches in the field of gas sensors based on semiconducting metal oxides. We are indeed in a time of great innovation in gas sensors, so come and enjoy the research and report your results!

All conference sessions will be held in the South Qianwei Campus of Jilin University, a national key comprehensive university under the direct administration of the Ministry of Education in China. We look forward to an extraordinary meeting with brilliant scientists from different countries worldwide and sharing epochal and exciting results in GOSPEL workshop. I wish you all a fruitful conference, and I will see you soon in Changchun, China!

Yours Sincerely



A stylized, handwritten signature in black ink, appearing to read 'Geyu Lu'.

Dr. Geyu Lu, Professor
Conference Chair, 9th GOSPEL Workshop 2024
Dean of College of Electronic Science & Engineering, Jilin University,
Changchun, China



Organizing Committees

Local Organizing Committee

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Geyu Lu, Jilin University (China)

Conference Co-Chair

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Jiaqiang Xu, Shanghai University (China)

Peng Sun, Jilin University (China)

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Jiangong Cheng, Shanghai Institute of Microsystem and Information Technology, CAS (China)

Xiuli He, Aerospace Information Research Institute, CAS (China)

Zhongqiu Hua, Peking University (China)

Han Jin, Shanghai Jiao Tong University (China)

Xiaogan Li, Dalian University of Technology (China)

Fangmeng Liu, Jilin University (China)

Huan Liu, Huazhong University of Science and Technology (China)

Fanli Meng, Northeastern University (China)

Shengbo Sang, Taiyuan University of Technology (China)

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Yan Wang, Henan Polytechnic University (China)

Di Wu, Nanjing University (China)

Lin Xu, Jilin University (China)

Yingming Xu, Heilongjiang University (China)

Pengcheng Xu, Shanghai Institute of Microsystem and Information Technology (China)

Dachi Yang, Nankai University (China)

Minghui Yang, Dalian University of Technology (China)

Zhi Yang, Shanghai Jiao Tong University (China)

Wen Zeng, Chongqing University (China)

Dongzhi Zhang, China University of Petroleum (China)

Jun Zhang, Qingdao University (China)

Tong Zhang, Jilin University (China)

Yong Zhang, Xiangtan University (China)

Zhigang Zhu, Shanghai Polytechnic University (China)

Conference Secretary

Tianshuang Wang, Jilin University (China)



Steering Committee of GOSPEL Workshop Meetings

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Barbara Fabbri, University of Ferrara (Italy)

Leah Schynowski, University of Tübingen (Germany)

Matteo Valt, Bruno Kessler Foundation (Italy)



Conference Information

Overview

Title: The 9th GOSPEL Workshop

Date: Aug 4th-6th, 2024 (Beijing Time)

Venue: Jilin University (China)

Organizer: Jilin University (China)

Conference Secretary: Tianshuang Wang wangtianshuang@jlu.edu.cn

Registration Information

Registration fee

Registration fee	Early bird (before Jun 30 th)	Standard (after Jun 30 th)
Regular	\$330	\$450
Reduced/ Students	\$165	\$225

Receipt

The official receipt for your registration can be obtained on-site. The receipt is only available for those who complete his/her payment.



Technical Program Information

Presentation Guidelines

- ◆ Microsoft **PowerPoint 2016/2021** is recommended for presentation file(s). Please note that the computers in the session rooms are being supplied with **Windows 11**.
- ◆ All presentation files will be deleted after presentation.
- ◆ **It is not allowed to use your own laptop at the session room due to technical risk and time delay.** You may supply your own laptop computer as a back-up.
- ◆ Be sure to meet the presentation time limit as below in order to be on schedule.

Plenary Presentation	Invited Presentation	Oral Presentation
40 min (including Q&A)	25 min (20+5) (including Q&A)	15 min (12+3) (including Q&A)

Preview

Location & Operating Time

Date	Session 1	Session 2
Aug 5 th	08:30-11:25 Circular Lecture Hall, 2 nd Floor	—————
Aug 5 th	13:00-18:10 Circular Lecture Hall, 2 nd Floor	13:00-18:10 Room A501, 5 th Floor
Aug 6 th	08:30-11:55 Circular Lecture Hall, 2 nd Floor	08:30-11:45 Room A501, 5 th Floor
Aug 6 th	13:30-17:30 Circular Lecture Hall, 2 nd Floor	13:30-15:30 Room A501, 5 th Floor

- ◆ Be sure to check or modify your presentation material(s) at the podium in the session room at least 30 minutes before the start of the session.

Poster Session Guidelines

- ◆ Display location: The lobby on the 2nd Floor of Circular Lecture Hall
- ◆ Operating Time: 13:00 pm-17:00 pm, Aug 6th
- ◆ Poster Size: 90 cm x 120 cm (Width x Height)
- ◆ **There is no place to print out your poster at the conference venue, please print it yourself and display at the assigned board.**
- ◆ Materials for mounting will be prepared at the reception desk near the poster session area.
- ◆ Any remaining posters left behind at the end of the day will be taken down and will be disposed. The organizers will not be responsible for saving the posters which are taken down at the end of the conference.



Social Events

Opening Ceremony

Date & Time: Aug 5th (Mon), 08:30-09:00

Venue: Circular Lecture Hall

Welcome Banquet

Date & Time: Aug 5th (Mon), 19:00-21:00

Venue: Yandu Restaurant (Near the South Gate of Jilin University)

*Please wear your name badge in order to join the banquet. All registered participants and spouses are cordially invited for the reception.

Lunch

Date & Time: Aug 5th (Mon), 11:25-13:00

Aug 6th (Tue), 11:55-13:30

Venue: Lakeside Dining Hall 2nd Floor

*Please wear your name badge and give the "Lunch Coupon" to the volunteers when entering the dining hall.

Dinner

Date & Time: Aug 6th (Tue), 17:30-19:30

Venue: Lakeside Dining Hall 2nd Floor

*Please wear your name badge and give the "Dinner Coupon" to the volunteers when entering the dining hall.

Coffee Break

Date & Time: Aug 5th (Mon), 09:45-10:15

Aug 5th (Mon), 15:10-15:30

Aug 6th (Tue), 10:10-10:30

Aug 6th (Tue), 15:45-16:00

Venue: The lobby on the 2nd Floor of Circular Lecture Hall

Closing Ceremony

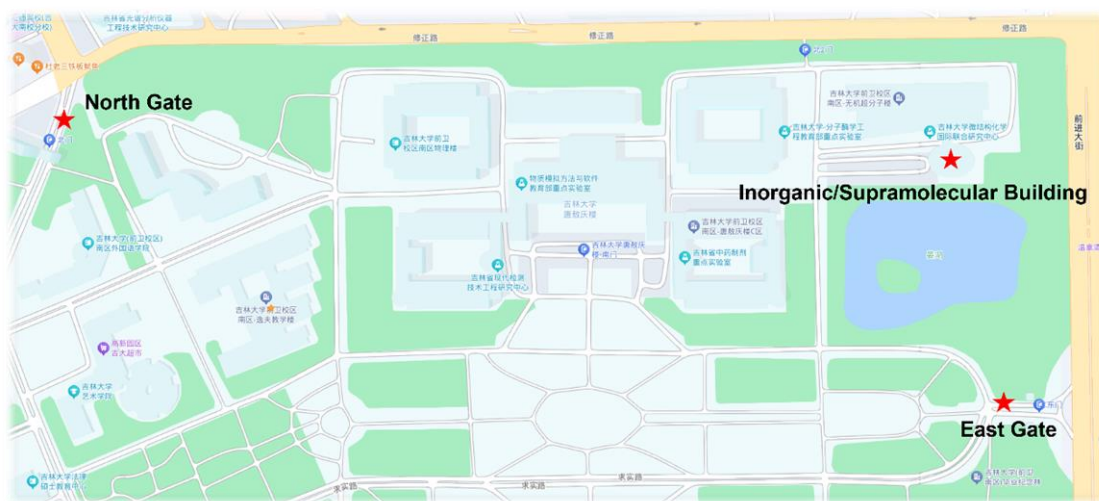
Date & Time: Aug 6th (Tue), 16:00-17:30

Venue: Circular Lecture Hall



Map and Transportation

Map of Jilin University



Transportation Service

Aug 5th (Mon)

Route: **07:50**, From Sheraton Hotel to Circular Lecture Hall

(Ferry buses are only available for individuals staying at Sheraton Hotel)

11:25, Circular Lecture Hall to Lakeside Dining Hall

12:40, Lakeside Dining Hall to Circular Lecture Hall

18:10, Circular Lecture Hall to Yandu Restaurant

21:00, Yandu Restaurant to Sheraton Hotel

Aug 6th (Tue)

Route: **07:50**, From Sheraton Hotel to Circular Lecture Hall

(Ferry buses are only available for individuals staying at Sheraton Hotel)

11:55, Circular Lecture Hall to Lakeside Dining Hall

13:10, Lakeside Dining Hall to Circular Lecture Hall

17:30, Circular Lecture Hall to Lakeside Dining Hall

19:30, Lakeside Dining Hall to Sheraton Hotel

Externalities of the venue

Circular Lecture Hall



Circular Lecture Hall is located in the south of the Inorganic/Supramolecular Building, near the east gate of Jilin University.

Session Themes

Session Theme	Session Time	Session Room
Session 1	08:30-11:25, Aug 5 th 13:00-18:10, Aug 5 th 08:30-11:55, Aug 6 th 13:30-17:30, Aug 6 th	Circular Lecture Hall
Session 2	13:00-18:10, Aug 5 th 08:30-11:45, Aug 6 th 13:30-15:30, Aug 6 th	Room A501
Session location: Inorganic/Supramolecular Building Session 1: Circular Lecture Hall, 2 nd Floor Session 2: Room A501, 5 th Floor		



Program at a glance

Aug 4 th (Sun)	Aug 5 th (Mon)	Aug 6 th (Tue)
Registration (Sheraton Hotel) (Boshuo Hotel) (08:30-23:30)	Opening Ceremony (Circular Lecture Hall) (08:30-09:00)	Invited Presentation S1/S2 (08:30-8:55)
	Photo session (09:00-09:05)	
	Plenary Presentation (9:05-9:45)	Oral Presentation S1/S2 (08:55-10:10)
	Coffee Break (9:45-10:15)	Coffee Break (10:10-10:30)
	Invited Presentation S1 (10:15-10:40)	Invited Presentation S1 (10:30-10:55)
	Oral Presentation S1 (10:40-11:25)	Oral Presentation S1 (10:55-11:55) S2 (10:30-11:45)
	Lunch (11:25-13:00)	Lunch (11:55-13:30)
	Invited Presentation S1/S2 (13:00-13:25)	Oral Presentation S1 (13:30-15:45) S2 (13:30-15:30)
	Oral Presentation S1/S2 (13:25-15:10)	
	Coffee Break (15:10-15:30)	Coffee Break (15:45-16:00)
	Invited Presentation S1/S2 (15:30-15:55)	Closing Ceremony (Circular Lecture Hall) (16:00-17:30)
	Oral Presentation S1/S2 (15:55-18:10)	
Welcome Banquet (19:00-)	Dinner (17:30-)	
Session location: Inorganic/Supramolecular Building Session 1 (S1): Circular Lecture Hall, 2 nd Floor Session 2 (S2): Room A501, 5 th Floor		



Plenary Speakers

Plenary: “Material design for semiconductor gas sensors”

Time: Aug 5th (Mon), 09:05-09:45



Prof. Kengo Shimanoe
Kyushu University, Japan

Prof. Kengo Shimanoe graduated from Faculty of Engineering (Kagoshima University) in 1983, graduated from Master course of Engineering Sciences (Kyushu University) in 1985, and received Doctor degree in Kyushu University in 1993. He was engaged as Research Associate in 1995. Since 2001, he has been a Professor of Kyushu University, where he has served as the director of Center of Advanced Instrumental Analysis. He is a member of the editorial boards of several journals, including *Sensors and Materials*, *Journal of Sensors*, *Journal of Sensor Science and Technology*. He is a research adviser for the National Institute for Material Sciences, the organizer for GOSPEL Workshop on Gas Sensors Based on Semiconducting Metal Oxides and the scientific committee for the International Workshop on Semiconductor Gas Sensors. His current research interests include the fields of functional inorganic materials such as gas sensors, defect perovskite-type oxides, electrochemical catalysts and oxygen-separation membrane.



Invited Speakers

Invited 1: “Gas sensing at room temperature”

Time: Aug 5th (Mon), 10:15-10:40



Prof. Jun Zhang
Qingdao University, China

Prof. Jun Zhang is a professor of the College of Physics at Qingdao University. He received his Ph.D. in chemistry in 2011 from Nankai University. After graduation, he started his career at University of Jinan during 2011-2014. Prior to join in Qingdao University in 2016, he worked with Prof. Nicola Pinna at Humboldt University, Berlin, in 2014-2015. The research of his group is focused on the elaboration of micro/nanostructured materials by means of chemical and physical techniques, as well as application of the materials in chemical sensors. He has published over 150 peer-reviewed papers with a personal H-index of 65, and one book chapter. He is the recipient of several awards, including 2023 Second Prize of Shandong Province Natural Science Award, 2022 RSC-Highly Cited Author, and 2020 Materials Horizons-Emerging Investigator.



Invited Speakers

Invited 2: “Exploring gas sensing mechanism of metal oxides using cutting-edge *in situ* characterization techniques”

Time: Aug 5th (Mon), 15:30-15:55



Prof. Pengcheng Xu

**Shanghai Institute of Microsystem and Information
Technology,
Chinese Academy of Sciences, China**

Prof. Pengcheng Xu is a professor and doctoral supervisor at Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences. He earned his PhD degree in Microelectronics and Solid-State Electronics from University of Chinese Academy of Sciences. Professor Xu is a member of the Youth Innovation Promotion Association of the Chinese Academy of Sciences. Additionally, he serves as a member of the TPC committee of Transducers 2023 Conference, a member of the Gas and Humidity Sensor Technology Committee of the Chinese Institute of Electronics, and a member of the Micro-Nano Devices and Systems Technology Branch of the Chinese Instrument Society. He is also an editorial board member of the Nanosensors Section of the Sensors journal. Professor Xu's research focuses on micro-nano sensors, detectors, integrated MEMS technology, and scientific instrument technology for material characterization. His groundbreaking MEMS chips have been effectively employed in diverse industries. He has authored over 170 research papers in peer-reviewed journals such as Nano Lett, Anal Chem, Small, Sens Actuators B, as well as in international conferences such as IEEE MEMS and Transducers. The total number of citations for his publications exceeds 5,300, with an H factor of 41. Professor Xu has an impressive portfolio of over 50 invention patents in the field of MEMS sensor device preparation methods and scientific instrument technology. Additionally, he has led more than ten scientific research projects, many of which were generously funded by esteemed organizations such as National Natural Science Foundation of China, National Key R&D Program of the Ministry of Science and Technology, the Chinese Academy of Sciences Instrument Project, and the Shanghai Science and Technology Commission.



Invited Speakers

Invited 3: “Portable sensing platforms, based on solid state gas sensors, for outdoor air quality monitoring: a multi-level and iterative approach for development, deployment and calibration”

Time: Aug 5th (Mon), 13:00-13:25



Prof. Andrea Gaiardo
Fondazione Bruno Kessler, Italy

Prof. Andrea Gaiardo obtained his PhD in Physics in 2018 after graduating in Chemical Sciences at the University of Ferrara. He is currently a researcher at the Bruno Kessler Foundation in Trento. His research is focused on the study and development of nanotechnologies for various applications, mainly related to gas sensors and environmental monitoring.



Invited Speakers

Invited 4: “Operando spectroscopic analysis of the gas detection mechanism of noble metal-decorated metal oxides”

Time: Aug 5th (Mon), 13:00-13:25



Prof. Tetsuya Kida
Kumamoto University, Japan

Prof. Tetsuya Kida became a professor in the Department of Materials and Biochemistry, Graduate School of Science and Technology, Kumamoto University in 2013. He is a member of the Technical Committee on Chemical Sensors of the Electrochemical Society of Japan and the Editorial Board of the Electrochemical Society of Japan, and is a guest editor of MDPI during 2018-2019. He has received the Young Scientist Award. So far, he has published more than 220 SCI papers in *Sensors & Actuators B: Chemical*, *Nano Letters*, with more than 7665 SCI citations and an H-factor of 49.



Invited Speakers

Invited 5: “Metal-oxide gas sensors: current advances in science and technology to meet challenges”

Time: Aug 5th (Mon), 15:30-15:55



Prof. Barbara Fabbri

University of Ferrara, Italy

Prof. Barbara Fabbri graduated from University of Ferrara. Her Current job position: University of Ferrara, Department of Physics and Earth Sciences, Postdoc. She has Student grant (supported by Spinner, Regione Emilia-Romagna) in “Nanoscience: materials and emerging strategies for sustainable technologies” Coordinator Prof. Elisa Molinari (University of Modena and Reggio). Her research field is Indoor monitoring of polluting gaseous molecules by semiconductors-based sensors.



Invited Speakers

Invited 6: “Colloidal quantum dots-based gas sensors”

Time: Aug 6th (Tue), 08:30-8:55



Prof. Huan Liu

Huazhong University of Science and Technology,
China

Prof. Huan Liu is a professor and PhD supervisor at the School of Integrated Circuits at Huazhong University of Science and Technology. She also holds the position of Deputy Dean of the School of Integrated Circuits. She has been recognized as a recipient of the National Excellent Youth Science Fund. Huan Liu obtained her bachelor's, master's, and doctorate degrees from Huazhong University of Science and Technology between 2001 and 2008. Subsequently, she conducted postdoctoral research in colloidal quantum dot optoelectronic functional devices at the University of Toronto, Canada from 2009 to 2011. In 2012, she was selected for the New Century Outstanding Talents Support Program by the Ministry of Education. Her research primarily focuses on intelligent sensors designed to address the requirements for high-sensitivity, low-power, and high-reliability sensors in the fields of the new generation of Internet of Things and artificial intelligence. She leads a dedicated team focused on the research and development of semiconductor olfactory chips. Huan Liu has on the took various scientific research projects, including the National Natural Science Foundation Excellent Youth Fund, the National Key Research and Development Program key special youth project, and the Ministry of Education New Century Outstanding Talents program. She has proposed and developed a novel sensor type based on the gas sensing effect of colloidal quantum dots. Huan Liu has authored 127 papers in prestigious journals such as Nature Materials, Nature Photonics, and Advanced Materials, with over 6,000 SCI citations. She also holds 33 Chinese invention patents. Furthermore, she has held positions such as the deputy director of the Professional Committee of Gas-humidity Sensing Technology of the Chinese Electronics Society and the director of the Sensor branch of the Chinese Society of Instrumentation and Micro and Nano Devices and System Technology Branch.



Invited Speakers

Invited 7: “Gas sensors using porous nanostructure oxide semiconductors”

Time: Aug 6th (Tue), 08:30-8:55



Prof. Peng Sun
Jilin University, China

Prof. Peng Sun is the recipient of the National Excellent Youth Fund and the chief of the project of the National Key Research and Development Program, and graduated from the School of Electronic Science and Engineering of Jilin University in June 2014 with a Doctor of Science degree. He was appointed as professor and doctoral supervisor in October 2017. His research focuses on how to improve the performance of semiconductor oxide gas sensors and expand their applications, focusing on the design and preparation of new sensing materials, new strategies for sensing modification and new mechanisms for sensing enhancement, and focusing on the issues of sensor sensitivity, selectivity, and lower limit of detection. Specific research directions include: the design and preparation of efficient semiconductor oxide sensitive materials, the development of new sensitive materials, the study of the sensitivity mechanism, and the construction of high-performance semiconductor oxide gas sensors. So far, he has published 112 SCI papers as the first or corresponding author. The SCI citation is 13700 times and his H-index is 70.

Invited Speakers

Invited 8: “Electronic nose system applications for EHS (environment, healthcare, safety) and standardization”

Time: Aug 6th (Tue), 10:30-10:55



Prof. Hyung-Gi Byun

Kangwon National University, Republic of Korea

Prof. Hyung-Gi Byun received the B.S. degree in electrical engineering from Myong-Ji University, Myong-Ji, Korea, in 1984, and both the M.Sc. degree in electrical engineering and electronics and the Ph.D. degree in instrumentation and analytical science from the University of Manchester Institute of Science and Technology, Manchester, U.K., in 1990 and 1995, respectively. He is with the Department of Information and Communication Engineering, Kangwon National University, Samcheok, Korea, where he is currently a Professor. His current research interests include pattern recognition and signal processing based on artificial neural networks.

Daily Program

Reception

Time: 08:30-23:30, Aug 4th, 2024
Venue: Sheraton Hotel and Boshuo Hotel

Opening Ceremony

Time: 08:30-09:00, Aug 5th, 2024
Venue: Circular Lecture Hall, 2nd Floor

9:00-9:05 **Photo Session**
Venue: Circular Lecture Hall, 2nd Floor

Plenary Session

Time: 09:05-9:45, Aug 5th, 2024
Speaker: Prof. Kengo Shimano (Kyushu University, Japan)
Title: Material design for semiconductor gas sensors
Venue: Circular Lecture Hall, 2nd Floor

Chair: Prof. Barbara Fabbri (University of Ferrara, Italy)

9:45-10:15 **Coffee Break**
Venue: Circular Lecture Hall, 2nd Floor

Chair: Prof. Kengo Shimano (Kyushu University, Japan)

I-1-1 **Jun Zhang**
(Invited) 10:15-10:40 (Qingdao University, China)
Gas sensing at room temperature

O-1-1 **Nicolae Barsan**
10:40-10:55 (University of Tübingen, German)
Novel humidity independent CO₂ sensor

O-1-2 **Vincenzo Guidi**
10:55-11:10 (University of Ferrara, Italy)
Innovative indium oxide nanostructures for enhanced CO₂ sensing for indoor monitoring applications

O-1-3 **Han Jin**
11:10-11:25 (Shanghai Jiao Tong University, China)
In vivo producing handheld gas sensor detectable breath marker: The future of induced volatolomics in cancer risk pre-warning

Lunch

Time: 11:25-13:00
Venue: Lakeside Dining Hall, 2nd Floor



Daily Program**Time: 13:00-18:10, Aug 5th, 2024****Session 1**Time: 13:00-18:10, Aug 5th, 2024Venue: Circular Lecture Hall, 2nd Floor

Chair: Prof. Jing Wei (Xi'an Jiaotong University, China)

Andrea Gaiardo (Fondazione Bruno Kessler, Italy)		
I-1-2 (Invited)	13:00-13:25	Portable sensing platforms, based on solid state gas sensors, for outdoor air quality monitoring: a multi-level and iterative approach for development, deployment and calibration
Siqi Li (Northeast Forestry University, China)		
O-1-4	13:25-13:40	Single-atom copper-doped zinc stannate-based hydrogen sulfide sensor prepared by MOF derivatization method
Eri Sarumaru (New Cosmos Electric CO., LTD., Japan)		
O-1-5	13:40-13:55	MOS acetone sensors with hot wire type structure
Ke Wu (China University of Mining and Technology, China)		
O-1-6	13:55-14:10	Cu(II) coordination MOF-303 based dual-functional sensor for precisely detecting and distinguishing humidity and temperature with multifunction applications
Zhen Wang (Beijing University of Chemical Technology, China)		
O-1-7	14:10-14:25	Highly sensitive and moisture-resistant gas sensor with Sn doping on rod Pt/CeO ₂ for n-butanol detection
Meile Wu (Shenyang University of Technology, China)		
O-1-8	14:25-14:40	A pulsed detection method for Pt-doped In ₂ O ₃ field effect H ₂ sensors
Alexey Vasiliev (Dubna State University, Russia)		
O-1-9	14:40-14:55	MO _x sensors on MEMS platform-a way for the selective detection of hydrogen containing gases
Nan Ma (Shanghai Institute of Ceramics, Chinese Academy of Sciences, China)		
O-1-10	14:55-15:10	Ferroelectric polarization induced high sensitivity and fast response of ABO ₃ humidity sensor
Coffee Break		
	15:10-15:30	Venue: Circular Lecture Hall, 2 nd Floor



Chair: Prof. Fengmin Liu (Jilin University, China)

I-1-3 (Invited)	15:30-15:55	<p>Pengcheng Xu (Shanghai Institute of Microsystem and Information Technology, China)</p> <p>Exploring gas sensing mechanism of metal oxides using cutting-edge <i>in situ</i> characterization techniques</p>
O-1-11	15:55-16:10	<p>Nikolay Samotaev (National Research Nuclear University MEPhI, Russia)</p> <p>The MO_x sensor modification for real condition of work based on experience using one in gas leakage detector</p>
O-1-12	16:10-16:25	<p>Jing Wei (Xi'an Jiaotong University, China)</p> <p>Self-template synthesis of mesoporous metal oxide spheres for enhanced gas sensing performance</p>
O-1-13	16:25-16:40	<p>Mingzhi Jiao (China University of Mining and Technology, China)</p> <p>Gas sensor array based on ZnO-Au-SnO₂: Synthesis and device application for mixture classification</p>
O-1-14	16:40-16:55	<p>Yiyang Xu (Xidian University, China)</p> <p>Flexible, wearable, room-temperature NO₂ gas sensor based on MoS₂/ZnS</p>
O-1-15	16:55-17:10	<p>Hua-Yao Li (Qiuyang Duan) (Huazhong University of Science and Technology, China)</p> <p>Electronic nose utilizing low-dimensional nanomaterials and its applications in exhaled breath analysis</p>
O-1-16	17:10-17:25	<p>Yaping Song (Jilin University, China)</p> <p>Highly sensitive and stable low humidity sensors based on polymeric ionic liquid and polybenzimidazole composites</p>
O-1-17	17:25-17:40	<p>Xianwang Yang (Jilin University, China)</p> <p>Microwave split ring resonator (SRR) sensor based on multilayered Ti₃C₂T_x MXene for room temperature ppb-Level nitrogen dioxide sensing</p>
O-1-18	17:40-17:55	<p>Yilin Wang (Jilin University, China)</p> <p>Highly selective gas sensor for rapid detection of triethylamine using PdRu alloy nanoparticles functionalized SnO₂</p>

Ning Sui

(Jilin University, China)

O-1-19 17:55-18:10 Effect of heterogenous dopant and high temperature pulse excitation on ozone sensing behavior of In_2O_3 nano-structures and an image recognition method coupled to ozone sensing Array

Welcome Banquet

Time: 19:00-21:00, Aug 5th, 2024

Venue: Yandu Restaurant



Session 2Time: 13:00-18:10, Aug 5th, 2024Venue: Room A501, 5th Floor

Chair: Prof. Ho Won Jang (Seoul National University, Korea)

Tetsuya Kida

(Kumamoto University, Japan)

I-2-4
(Invited) 13:00-13:25 Operando spectroscopic analysis of the gas detection mechanism of noble metal-decorated metal oxides

Zhuo Liu

(Northeastern University, China)

O-2-20 13:25-13:40 Synergistic etching and hydrogen bonding induced self-assembly of MXene/MOF hybrid aerogel for flexible room temperature gas sensing

Wu Wang

(University of Electronic Science and Technology of China, China)

O-2-21 13:40-13:55 Surface defects-induced specific catalysis activates 100% selective sensing towards amine gases at room temperature

Jiangxue Hu

(Zhejiang University, China)

O-2-22 13:55-14:10 Development of a sensor array for non-invasive detection of exhaled volatile organic compounds in respiratory diseases

Yiwei Jiang

(Zhejiang University, China)

O-2-23 14:10-14:25 An on-chip MOS array for malodorous gas recognition enabled by optimization strategy

Mengmeng Li

(Zhengzhou University, China)

O-2-24 14:25-14:40 Bimetallic Pd, Ce oxide modified SnO₂ for low-temperature carbon monoxide sensing

Yunlong Yu

(Jilin University, China)

O-2-25 14:40-14:55 Optimization of the PILs-based humidity sensor's response /recovery characteristics

Xukun Wang

(Jilin University, China)

O-2-26 14:55-15:10 Nanoscale MOF-74-based QCM gas sensor for CO₂ detection at room temperature

Coffee Break

15:10-15:30

Venue: Circular Lecture Hall, 2nd Floor

Chair: Prof. Tetsuya Kida (Kumamoto University, Japan)

Barbara Fabbri

(University of Ferrara, Italy)

I-2-5
(Invited) 15:30-15:55 Metal-oxide gas sensors: current advances in science and technology to meet challenges

O-2-27	15:55-16:10	Ho Won Jang (Seoul National University, Korea) Chemical sensor array using 2D materials
O-2-28	16:10-16:25	Eduard Llobet Valero (Universitat Rovira i Virgili, Spain) Gas-sensing properties of WS ₂ /WO ₃ hybrids
O-2-29	16:25-16:40	Qiuyue Zheng (Heilongjiang University, China) Preparation and NO ₂ sensing performance of WO ₃ based gas sensing materials
O-2-30	16:40-16:55	Ting Li (Heilongjiang University, China) Coordination polymers derived waxberry-like CuO and flower sphere-like Cu ₂ O/CuO: low-power Cl ₂ sensing
O-2-31	16:55-17:10	Fang Xu (Shenzhen Technology University, China) A systematic study on gas selectivity of a room temperature-operated gas sensor based on TiO ₂ burr-like nanorods
O-2-32	17:10-17:25	Yanting Tang (Huazhong University of Science and Technology, China) Thin-film transistor gas sensors employing chalcogenide semiconductor hetero-junction
O-2-33	17:25-17:40	Yongjie Zhang (Jilin University, China) Construction of hierarchical In ₂ O ₃ /In ₂ S ₃ microsphere heterostructures for TEA detection
O-2-34	17:40-17:55	Fan Li (Jilin University, China) Ultrasensitive flexible temperature sensors based on thermal-mediated ions migration dynamics in asymmetrical polymer bilayers
O-2-35	17:55-18:10	Tianrun Zheng (Jilin University, China) Y-doped spongy like zinc oxide achieves photoexcitation for room temperature detection of NO ₂

Welcome Banquet

Time: 19:00-21:00, Aug 5th, 2024

Venue: Yandu Restaurant



Daily Program**Time: 08:30-11:55, Aug 6th, 2024****Session 1**Time: 08:30-11:55, Aug 6th, 2024Venue: Circular Lecture Hall, 2nd Floor

Chair: Prof. Han Jin

(Shanghai Jiao Tong University, China)

Huan Liu		
I-1-6 (Invited)	8:30-8:55	(Huazhong University of Science and Technology, China) Colloidal quantum dots-based gas sensors
Soo Young Kim		
O-1-36	8:55-9:10	(Korea University, Korea) Chemical sensor array using 2D materials
Le-Xi Zhang		
O-1-37	9:10-9:25	(Tianjin University of Technology, China) Halide perovskites Cs ₂ SnX ₆ (X = Cl, Br, I) for robust formaldehyde and humidity sensing at room temperature
Xiao-Xue Wang		
O-1-38	9:25-9:40	(University of Tübingen, Germany) Operando Infrared spectroscopy investigations of light-excited metal oxide-based gas sensors
Kaidi Wu		
O-1-39	9:40-9:55	(Yangzhou University, China) Room temperature metal oxides-based gas sensors: Strengthen strategies and application
Yunpeng Xing		
O-1-40	9:55-10:10	(Jilin University, China) A multisite strategy to improve room-temperature DMMP sensing performances on reduced graphene oxide modulated by N-doped carbon nanoparticles and copper ions
Coffee Break		
	10:10-10:30	Venue: Circular Lecture Hall, 2 nd Floor
Chair: Prof. Hua-Yao Li		
(Huazhong University of Science and Technology, China)		
Hyung-Gi Byun		
I-1-7 (Invited)	10:30-10:55	(Kangwon National University, Republic of Korea) Electronic nose system applications for EHS (environment, healthcare, safety) and standardization



O-1-41	10:55-11:10	Zhongqiu Hua (Peking University, China) Hydrogen sniffer based on CNT-FET
O-1-42	11:10-11:25	Wenjian Zhang (Huazhong University of Science and Technology, China) Amperometric biosensor for H ₂ S high-specificity based on SOD1 enzyme modified PbS colloidal quantum dots
O-1-43	11:25-11:40	Siyuan Lv (Jilin University, China) Pattern recognition with temperature regulation: single YSZ-based mixed potential sensor classifies multiple mixtures of isoprene, N-propanol and acetone
O-1-44	11:40-11:55	Weiyi Bu (Jilin University, China) Single Pt atom functionalized ZnO nanowires for high sensitivity and rapid hydrazine gas sensor

Lunch

Time: 11:55-13:30

Venue: Lakeside Dining Hall, 2nd Floor



Session 2Time: 08:30-11:45, Aug 6th, 2024Venue: Room A501, 5th Floor

Chair: Prof. Lin Xu (Jilin University, China)

Peng Sun (Jilin University, China)		
I-2-8 (Invited)	8:30-8:55	Gas sensors using porous nanostructure oxide semiconductors
Taro Ueda (Nagasaki University, Japan)		
O-2-45	8:55-9:10	Effect of noble-metal addition to porous SnO ₂ -In ₂ O ₃ powders prepared by ultrasonic spray pyrolysis on their VOC-sensing properties
Vincent Mazzola (VSParticle, Netherlands)		
O-2-46	9:10-9:25	Toluene gas sensors based on printed zinc oxide (ZnO) nanoporous layers (NPL) generated by Spark Ablation technique
Xu Li (University of Tübingen, Germany)		
O-2-47	9:25-9:40	Comparative study on VOCs sensing performance of different indium oxide gas sensors
Shunping Zhang (Huazhong University of Science and Technology, China)		
O-2-48	9:40-9:55	Constructing an olfactory element based on catalytic membrane and gas sensing membrane stacked structure
Xiang Lu (Northeast Forestry University, China)		
O-2-49	9:55-10:10	A sensitive NH ₃ chemiresistive sensor with wide detection range: employing a MOF-derived mesoporous carbon composite with polyaniline
Coffee Break		
10:10-10:30		Venue: Circular Lecture Hall, 2 nd Floor
Chair: Prof. Noriko Saito (National Institute for Materials Science, Japan)		
Lin Xu (Jilin University, China)		
O-2-50	10:30-10:45	A multimodal sensing network based on synergistically sensitized polyaniline composites strategy for safety monitoring in pesticide spraying



Huanhuan Zhang

(Huazhong University of Science and Technology,
China)

O-2-51 10:45-11:00 Design and performance study of hydrogen sensor based on gate-sensitized field effect transistor

Ruiqin Gao

(Jilin University, China)

O-2-52 11:00-11:15 Lattice oxygen in sensing reaction

Junchen Liu

(Jilin University, China)

O-2-53 11:15-11:30 Carbon dots-modified hollow mesoporous photonic crystal materials for sensitivity and selectivity enhanced sensing of chloroform vapor

Sitong Feng

(Jilin University, China)

O-2-54 11:30-11:45 Ppb-level fuel cell type NO₂ sensor based on Nafion proton membrane and Au-Ni/CF sensitive electrode

Lunch

Time: 11:55-13:30

Venue: Lakeside Dining Hall, 2nd Floor



Daily Program**Time: 13:30-17:30, Aug 6th, 2024****Session 1**Time: 13:30-15:45, Aug 6th, 2024Venue: Circular Lecture Hall, 2nd Floor

Chair: Prof. Zhongqiu Hua (Peking University, China)

Tobias Köninger

(University of Tübingen, Germany)

O-1-55 13:30-13:45 Exploring oxygen adsorption mechanisms on SnO₂ based gas sensors using in operando infrared spectroscopy: Insights, dependencies, and comparisons

Kuniyuki Izawa

(Figaro Engineering Inc., Japan)

O-1-56 13:45-14:00 Semiconductor gas sensors with potential for early warning of thermal runaway in lithium-ion battery

Qiang Jing

(Shandong University of Technology, China)

O-1-57 14:00-14:15 The clinical diagnosis/monitoring of asthma, lung cancer and uremia using metal oxides semiconductor-based gas sensors

Haocheng Li

(Northeastern University, China)

O-1-58 14:15-14:30 Portable precursor chemicals detection instrument based on metal oxide gas sensor array

Jianxun Dai

(Dalian University of Technology, China)

O-1-59 14:30-14:45 A room-temperature dual-mode humidity /ammonia sensor based on gallium oxide for breath analysis

Yong Liu

(Jilin University, China)

O-1-60 14:45-15:00 Multilayer fluorine-free MoBTx MBene with hydrophilic structural-modulating for the Fabrication of a low-resistance and high-resolution humidity sensor

Yuan Qu

(Northeast Forestry University, China)

O-1-61 15:00-15:15 Pt-modified hollow tube-like polyaniline-based NH₃ sensor

Qisong Jia

(Jilin University, China)

O-1-62 15:15-15:30 Wearable multimodal chemical sensor with deep learning and neural networks based on the same material for monitoring human health and outdoor UV recognition



Jiayu Li

O-1-63 15:30-15:45 (Jilin University, China)
Olivine-type cadmium germanate for gas sensor

15:45-16:00 Coffee Break
Venue: Circular Lecture Hall, 2nd Floor

Closing Ceremony

Time: 16:00-17:30, Aug 6th, 2024
Venue: Circular Lecture Hall, 2nd Floor

Dinner

Time: 17:30-19:30, Aug 6th, 2024
Venue: Lakeside Dining Hall, 2nd Floor



Session 2

Time: 13:30-15:30, Aug 6th, 2024

Venue: Room A501, 5th Floor

Chair: Prof. Ke Wu

(China University of Mining and Technology, China)

Noriko Saito

O-2-64 13:30-13:45 (National Institute for Materials Science, Japan)
Ion-implanted WS₂ nanosheets for Gas sensing

Jianhua Yang

O-2-65 13:45-14:00 (Shanghai Jiao Tong University, China)
Inductance-capacitance (LC) based wireless gas sensors for portable applications

Krivetskiy Valeriy

O-2-66 14:00-14:15 (Lomonosov Moscow State University, Russia)
Stabilizing MEMS MOS gas sensors response through working temperature modulation and signal processing

Vishal Baloria

O-2-67 14:15-14:30 (BML Munjal University, India)
Enhanced and selective CO detection using SnO₂ thin film

Haoshuang Zhang

O-2-68 14:30-14:45 (Jilin University, China)
Pd single atoms supported on defective WS₂ nanosheets for ultra-low and high-performance methanol detection at room temperature

Zizhuo Sun

O-2-69 14:45-15:00 (Jilin University, China)
E-field enhanced microwave sensor for high sensitive trimethylamine detection

Quan Jin

O-2-70 15:00-15:15 (Jilin University, China)
Design and synthesis of microwave sensor sensitive materials based on waveguide resonator

Jiayin Han

O-2-71 15:15-15:30 (Jilin University, China)
High-performance NO₂ gas sensor enabled by Fe, N co-doped GQDs modification and pulse-driven temperature modulation

15:45-16:00

Coffee Break

Venue: Circular Lecture Hall, 2nd Floor

Closing Ceremony

Time: 16:00-17:30, Aug 6th, 2024

Venue: Circular Lecture Hall, 2nd Floor

Dinner

Time: 17:30-19:30, Aug 6th, 2024

Venue: Lakeside Dining Hall, 2nd Floor

Poster Session

9th GOSPEL Workshop

Time: 13:00-17:00, Aug 6th, 2024

Venue: The lobby on the 2nd Floor of Circular Lecture Hall
Jilin University, China

P-01	Exclusive detection of NH ₃ at room temperature by using porous CuBr thin films Byeong-Hun Yu (Jeonbuk National University, Korea)
P-02	A flexible smart healthcare platform conjugated with artificial epidermis assembled by three-dimensionally conductive MOF network for multimodal signals sensing Qingqing Zhou (Jilin University, China)
P-03	Development and Application of an Intelligent E-nose for Malodor detection based on gas sensor micro-array Yao Zhou (Zhejiang University, China)
P-04	Nb-doped WO ₃ spheres for selective detection of acetone Jiho Park (Jeonbuk National University, Korea)
P-05	Hetero-Interface Enabled Highly Responsive Acetone Gas Sensor based on MOF-Derived Co ₃ O ₄ /In ₂ O ₃ composite Na Liu (Jilin University, China)
P-06	Enhancement of nitric oxide sensing performance via oxygen vacancy promotion on strontium-doped LaFeO ₃ perovskites Jie Wang (Ningbo University, China)
P-07	Improved NO ₂ sensing performance of ZnO–Ti ₃ C ₂ T _x MXene nanocomposites using microwave treatment Ka Yoon Shin (Hanyang University, Korea)
P-08	Construction of Mg-ZnO hierarchical structure gas sensor for ethanol detection Tiantian Zhou (Jilin University, China)
P-09	A pulsed detection method for Pt-doped In ₂ O ₃ field effect H ₂ sensors Hefei Chen (Shenyang University of Technology, China)
P-10	Enhancement of NO ₂ sensing performance through Xe ⁺ irradiation on SnO ₂ nanowires Wansik Oum (Hanyang University, Korea)
P-11	Research based on NASICON solid electrolyte equilibrium potential CO ₂ sensors Xiaoyong Sun (Jilin University, China)
P-12	A room temperature NO ₂ paper-based sensor with ultra-low detection limit Wenfang Xiao (Zhejiang University, China)
P-13	Facets and oxygen vacancies dual-engineering of CeO ₂ -rGO nanocomposites for low-temperature NO ₂ detection: experimental and DFT studies Weirong Zhou (Jilin University, China)

P-14	The LC sensor array is used for flexible wearable multimodal information monitoring Wenjiang Han (Jilin University, China)
P-15	Metal-organic framework-derived metal oxide and their application in VOCs gas sensing properties Shuang Li (Northeastern University, China)
P-16	Sn ²⁺ doped NiO hollow nanofibers to improve triethylamine sensing performance through tuning oxygen defects Jiaqi Yang (Shanxi University, China)
P-17	Increasing the catalytic activity of Co ₃ O ₄ via boron doping and chemical reduction for enhanced acetone detection Liang Zhao (Jilin University, China)
P-18	Janus Conductive Mechanism: An Innovative Strategy Enabling Ultra-Wide Linearity Range Pressure Sensing for Multi-Scenario Applications Xiuzhu Lin (Jilin University, China)
P-19	Development of breath acetone monitoring device using high performance acetone sensing materials In-Sung Hwang (Sentech GMI, Korea)
P-20	Study of screen-printed Pt-doped In ₂ O ₃ sensors and the effect of voltage excitation on the sensing characteristics Hefei Chen (Shenyang University of Technology, China)
P-21	Ce-SnS@SnS ₂ gas sensor array for highly sensitive and accurate O ₃ detection Long Li (Huazhong University of Science and Technology, China)
P-22	Construction of hierarchical SnO ₂ @Co ₃ O ₄ core-shell nanofiber/nanosheets nano-composites for high efficiency acetone detection Jinwu Hu (University of Shanghai for Science and Technology, China)
P-23	Sensing-memory-computing integration in ferroelectric materials for bio-Inspired olfactory systems Xinyi Chen (Huazhong University of Science and Technology, China)
P-24	Pd induced SnO@Sn ₂ O ₃ heterojunction with rich oxygen vacancy Gas sensors for ultrasensitive ppb-level hydrogen detection Shuyang Ye (Huazhong University of Science and Technology, China)
P-25	WO ₃ nanoparticles supported by Nb ₂ CT _x MXene for superior acetone detection under high humidity Peng Wang (Huazhong University of Science and Technology, China)
P-26	Highly responsive n-butanol gas sensor based on double-shell ZnO hollow microspheres Ziwen Ding (Northeast Forestry University, China)



