

台灣

歐盟 450mm晶圓



技術研討會

EU-Taiwan Workshop on transition to 450mm wafer processing
March 24, 2009

Abstract Book

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台北市敦化南路二段201號

Date: Tuesday, March 24, 2009

Venue: B1, East Gate, Far Eastern Plaza Hotel
No. 201, Sec. 2, Dun-Hua S. Rd. Taipei



EU-Taiwan Workshop

on Transition to 450mm Wafer Processing

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EU-Taiwan Workshop

on Transition to 450mm Wafer Processing

Conference Information

It is our pleasure to invite you to the “**EU-Taiwan Workshop on Transition to 450mm Wafer Processing**,” jointly organized by the National Science Council of Taiwan and European Economic and Trade Office.

Date

March 24, 2009

Venue

B1 East Gate, Far Eastern Plaza Hotel
No. 201, Sec. 2, Dun-Hua South Rd., Taipei 106, Taiwan, R.O.C.

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<http://NanoSiOE.ee.ntu.edu.tw/EU-TW-450mm/>

Sponsors

National Science Council, Taiwan
European Economic and Trade Office
Department of Industrial Technology, MOEA, Taiwan

Organizers

National Taiwan University, Taiwan
EU-FP7 National Contact Point-Taiwan Office
Industrial Technology Research Institute, Taiwan
National Taiwan University of Science and Technology, Taiwan



EU-Taiwan Workshop

on Transition to 450mm Wafer Processing

AGENDA

Tuesday, March 24, 9:00 – 12:15

09:00 – 09:30	Registration
09:30 – 09:45	Welcome Remarks Mr. Lou-Chuang Lee, Minister, National Science Council, Taiwan Mr. Guy Ledoux, Head of Office, European Economic and Trade Office, Taiwan Dr. Wen-Hsin Chan, Advisor, DOIT, MOEA, Taiwan (Hosted by Prof. Chee Wee Liu, National Taiwan University, Taiwan)
Session I	Chair: Dr. Fu-Liang Yang, General Director, National Nano Device Laboratories, Taiwan
09:45 – 10:00	"Introduction: The European Commission's Work Programme on 450mm" Mrs. Gisele Roesems, Deputy Head of Unit, DG INFSO, European Commission
10:00 – 10:30	"The Next Generation Manufacturing Era - 450mm Fab" Dr. John Lin, Director, TSMC, Taiwan
10:30 – 11:00	"Collaboration Opportunities for 450mm Development" Mr. Tsuyoshi Abe, Director, Intel Technology & Manufacturing Group, Japan
11:00 - 11:15	Coffee Break
Session II	Chair: Prof. Jenn-Gwo Hwu, National Taiwan University, Taiwan
11:15 – 11:45	"The Role of European Research Institutes in the 450mm Wafer Transition Process" Dr. Luc Van den hove, Executive Vice President and COO, IMEC, Belgium
11:45 – 12:15	"A Win-Win Strategy in 450mm Collaboration Buildup" Dr. John Jahn, Director, Electronics & Information Industry Division, IKE/ITRI, Taiwan



EU-Taiwan Workshop

on Transition to 450mm Wafer Processing

AGENDA

Tuesday, March 24, 12:15 – 16:30

12:15 - 13:15 Lunch

Session III Chair: Prof. Horng-Chih Lin, National Chiao Tung University, Taiwan

13:15 – 13:45 "The View of Equipment Suppliers on the 450mm Wafer Transition Process"

Mr. Jefferson Chang, General Manager, RECIF Technologies, Taiwan

13:45 – 14:15 "The View of Equipment Suppliers on the 450mm Wafer Transition Process"

Mr. Tony Chao, Managing Director, ASML Taiwan

14:15 – 14:45 "450mm FOUP/FOSB Development Status in Taiwan"

Dr. Poshin Lee, Technical Manager, Gudeng Precision Industrial, Taiwan

14:45 - 15:00 Coffee Break

Session IV Chair: Prof. Jeng-Ywan Jeng, National Taiwan University of Science and Technology, Taiwan

15:00 – 15:30 "The Challenge of Metrology in the 450mm Wafer Transition Process"

Prof. Lothar Pfitzner, Fraunhofer Gesellschaft, IISB, Germany

15:30 – 16:00 "The European 450mm E&M Initiative"

Mr. Bas van Nooten, Director European Cooperative Programs, ASM, Netherlands

16:00 – 16:30 Conclusion

Dr. Georg Kelm, Head of Sector, DG INFSO, European Commission

Prof. Chee Wee Liu, National Taiwan University, Taiwan

∞ Session I ∞

Chair: Dr. Fu-Liang Yang, General Director,
National Nano Device Laboratories, Taiwan

9:45 ~ 11:00

Introduction: The European Commission's Work Program on 450mm

Mrs. Gisele Roesems, Deputy Head of Unit, DG INFSO,
European Commission

The Next Generation Manufacturing Era - 450mm Fab

Dr. John Lin, Director, TSMC, Taiwan

Collaboration Opportunities for 450mm Development

Mr. Tsuyoshi Abe, Director, Intel Technology &
Manufacturing Group, Japan

Session I: 09:45 – 10:00

Introduction: The European Commission's Work Program on 450mm

Gisele Roesems, Deputy Head of Unit, DG INFSO, European Commission



Curriculum Vitae

Gisele Roesems–Kerremans received her Master degree in Engineering in Computer Sciences from the Catholic University Leuven (B) in 1977.

After more than 15 years of industrial experience in system engineering in the telecommunication and automotive industry, she started working for the European Commission as a Scientific Officer in the domain of Software Technologies within the IT related research program “Esprit”. After 5 years, she continued as a Scientific Officer in the domain of Micro/Nanosystems within the framework of the ICT specific research program.

Since 2004 she has occupied the position of Deputy Head of Unit Nanoelectronics in the Directorate General "Information Society and Media". In addition to contributing to the research policy and strategy in the domain, she is dealing in particular with International Cooperation, Technology Transfer, interface with trade and competition related issues and Nanotechnologies.

Session I: 10:00 – 10:30

The Next Generation Manufacturing Era - 450mm Fab

John Lin, Director, TSMC, Taiwan



Curriculum Vitae

John Lin received his Ph.D. degree in Opto-Electronic Engineering from University of Oxford in 1994.

He has worked on Semiconductor technology development in Industrial Technology Research Institute and then in Vanguard International Semiconductor Corporation from 1994 to 1998.

Since Oct. 1998, he joined Taiwan Semiconductor Manufacturing Company as Department Manager of Mask and Lithography technology development for a few generations through 0.25um down to 45nm. Since Feb. 2006, He has been the Director of Manufacturing Technology Center.

Since 2004, he continuously served as a section chair, panelist or program committee at PMJ, SPIE, BACUS, MNE, and IEDM international conferences. He has given a few invited talks at "Immersion Lithography", and "450mm Wafer Strategy", and issued 34 US patents, author or co-author of 25 technical papers. He also awarded to the National Excellent Young Engineer in 2004 and the National Outstanding Engineer in 2008 by the Chinese Institute of Engineers.

Session I: 10:30 – 11:00

Collaboration Opportunities for 450mm Development

Tsuyoshi Abe, Director, Intel Technology & Manufacturing Group, Japan



Curriculum Vitae

Tsuyoshi Abe is Director of Technology and Manufacturing Group, Japan. He is responsible for managing the Japanese supplier base to provide Intel with leadership technology, affordability, and industry-leading quality. He joined Intel Japan in 1985 and has served 22 years in the Sales and Marketing Group in a variety of positions including Customer Engineer, Applications Engineer, Field Applications Manager, Press Relation Manager, and Director of Intel Architecture Technology Group and Marketing headquarter in Intel Japan.

⌘ Session II ⌘

Chair: Prof. Jenn-Gwo Hwu, National Taiwan University, Taiwan

11:15 ~ 12:15

The Role of European Research Institutes in the 450mm Wafer Transition Process

Dr. Luc Van den hove, Executive Vice President and COO, IMEC, Belgium

A Win-Win Strategy in 450mm Collaboration Buildup

Dr. John Jahn, Director, Electronics & Information Industry Division, ITRI, Taiwan

Session II: 11:15 – 11:45

The Role of European Research Institutes in the 450mm Wafer Transition Process

Luc Van den hove, Executive Vice President and COO, IMEC, Belgium



Curriculum Vitae

Luc Van den hove, is currently Executive Vice President and Chief Operating Officer at IMEC, Leuven, Belgium. He joined IMEC in 1984. He started his career at IMEC as team leader in charge of silicide and interconnect technologies and since 1988, he was the manager of IMEC's Micro-Patterning group (lithography, dry etching). Since 1998, he became in charge of all Si technology research, as VP of the Silicon Process and Device Technology division. In Jan. 2007, he has been promoted to COO. He has received his Ph.D. in Electrical Engineering from the University of Leuven, Belgium. He has written 1 chapter of a book and authored or co-authored more than 100 publications and conference contributions.

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Abstract

A possible transition to 450nm will result in huge costs. Because of the huge cost barrier, only a limited number of companies will be able to afford the transition. Also the cost of doing R&D will increase accordingly. Hence a clear debate on how future R&D can be performed in the most effective way is required.

In this presentation the model of performing R&D through a cost sharing approach by bringing together all crucial players of the eco system will be presented. We will discuss how this model of open innovation as pioneered and successfully implemented by IMEC could be used to address some of the 450 nm R&D challenges. The presentation will also include an overview of the plans of the major European players in this field.

Session II: 11:45 – 12:15

A Win-Win Strategy in 450mm Collaboration Buildup

John Jahn, Director, Electronics & Information Industry Division, ITRI, Taiwan



Curriculum Vitae

Dr. John Jahn was appointed as Director of Electronics & Information Industry Division (IC Semiconductor, LCD Display, Wireless Communication) at IEK/ITRI in 2007.

He joined IBM in 1993 as a 3.5” pilot-line Operation Manager for IBM Storage HDD System Division in USA. After IBM, John became the Director of Strategic Business Operations at ASE Group and Senior Manager of Customer Relationship at TSMC later. His previous experience also includes various management, sales and marketing positions at IC houses.

Dr. Jahn received his Ph.D. degree in Industry Engineering Management from Purdue University in 1992 and MBA from University of Chicago in 1993.

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Abstract

The 450mm to semiconductor industry is designated to be a new collaboration platform of innovation to boost the industry value, competitiveness and efficiency. Facing today's unexpected financial turmoil and recession tsunami, oligopoly in semiconductor value chain becomes inevitable and accelerated, due to the tremendous capex and volatile market. Only very few of tier-one players will be survived and enjoying on the way to the next-generation of semiconductor scale from giga to tera within a decade. Collaborations after consolidation by regions may play a significant role to share the benefits and risks whenever the 450mm alive.

A collaboration strategy by regions and segments will be discussed. Furthermore, the innovative business model may also be presented from the demand priority by market to the win-win balance by regions.

⌘ **Session III** ⌘

Chair: Prof. Horng-Chih Lin, National Chiao Tung University, Taiwan

13:15 ~ 14:45

The View of Equipment Suppliers on the 450mm Wafer Transition Process

Mr. Jefferson Chang, General Manager, RECIF Technologies, Taiwan

The View of Equipment Suppliers on the 450mm Wafer Transition Process

Mr. Tony Chao, Managing Director, ASML Taiwan

450mm FOUP/FOSB Development Status in Taiwan

Dr. Poshin Lee, Technical Manager, Gudeng Precision Industrial Co., Taiwan

Session III: 13:15 – 13:45

The View of Equipment Suppliers on the 450mm Wafer Transition Process

Jefferson Chang, General Manager, RECIF Technologies, Taiwan



Curriculum Vitae

Jefferson Chang has more than a decade of international experience in semiconductor industry.

He started his career with a German company Steag AG. Due to company merger, he then moved to Mattson Technologies for several years, where he held several positions & products. Prior to join RECIF Technologies, he was a Regional Sales Manager of SCP technologies Asia for three years.

Jefferson finished Diploma Degree in Electronic Engineer, and then he completed his Bachelor Degree in Marketing at Curtin University Australia.

Abstract

RECIF Technologies was one of the very first companies who actively supported transition from 200mm to 300mm. Since 2000, RECIF has demonstrated a unique know how on wafer handling. As for 300mm transition, RECIF has been involved in the early developments for 450mm transition.

As a wafer handling provider, we will present what we understand as the main challenges of this new transition and our involvement in the initiatives.

We also move on possible collaborations and RECIF Technologies Taiwan involvement in this transition.

Session III: 13:45 – 14:15

The View of Equipment Suppliers on the 450mm Wafer Transition Process

Tony Chao, Managing Director, ASML Taiwan



Curriculum Vitae

ACE is ASML's newly formed corporate initiative, building on technology growth and talent incubation for the future. This center has a number of activities such as development & engineering, sourcing, applications services, worldwide training, customer technical support, global logistics, system repair and refurbishment. Tony joined ASML in June of 2005 as the Customer Support Director for China.

Prior to joining ASML, Tony was the General Manager of BOC Edwards in Taiwan, a British based semiconductor chemical and gas solution provider in systems and materials.

Before BOC Edwards, Tony was the Vice President of Sales and Marketing of Ashland Union Electronic Chemical Corporation, a joint venture between Ashland Chemical in the USA and Union Petrochemical Corp. in Taiwan, serving the semiconductor materials industry.

Tony has a Bachelor of Science degree in aeronautics and astronautics from University of Washington in Seattle. Tony also attended the Executive Development Program at the Northwestern University, Kellogg School of Management.

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Abstract

ASML's product roadmap supports current technology node requirements by driving aggressive shrink, which ASML believes is most effective use of litho development funding to drive reduction in cost per function.

However if overall cost reduction is achieved by a transition to 450mm wafers, then ASML will support our customers with lithography tooling. There are technical challenges to overcome, but more importantly, the R&D investment necessary for 450mm is not currently supported by the industry business model. Chip and equipment makers must commit together to the significant investments required to develop 450mm equipment.

Session III: 14:15 – 14:45

450mm FOUP/FOSB Development Status in Taiwan

Poshin Lee, Technical Manager, Gudeng Precision Industrial Co., Taiwan



Curriculum Vitae

- Technical manager at Gudeng Precision Industrial Company and is in charge of 450mm FOUP/FOSB and Next Generation Reticle Carrier Development Project.
- Master/Ph.D. in mechanical engineering from Particle Technology Lab at University of Minnesota
- SEMI International 450mm PIC Task Force (450mm IPIC TF) Member
- SEMI North America Shipping Box Task Force (NA SBTF) Member
- 8 years of Semiconductor/TFT-LCD industry related experience (ProMOS/Sunway/Gudeng)
- Years of experience in AMC/particle/ESD/micro-contamination control
- NEBB (National Environmental Balancing Bureau) supervisor in cleanroom performance testing
- SPIE and IEST (Institute of Environmental Science and Technology) member
- Adjunct assistant professor at National Taipei University of Technology

Working Experience:

1998-1999: IPQC Engineer at ProMOS technology.

2002-2005: Application Engineering Manager at Sunway Scientific Corporation

2005 – Now: Technical Manager at Gudeng Precision Industrial Co.

Education:

1995-1997: MS: Particle Technology Laboratory, University of Minnesota

1999-2002: Ph.D. Particle Technology Laboratory, University of Minnesota

Abstract

Gudeng Precision Industrial Co. is the world's leading semiconductor total solution provider, and its products, services and technologies help protect and transport the critical wafers and photomasks that are used to manufacture today's advanced IC technological products. Major products includes reticle SMIF pod, wafer carriers and reticle/wafer related equipment, and all the products are independently designed and manufactured locally in Taiwan. With years of experience in high precision injection molding parts manufacturing, since 2008, Gudeng participates the ITB (Interoperability Test Bed) by ISMI (International SEMATECH Initiative) and starts designing and prototyping 450mm FOUP / FOSB for early evaluation. In the mean while, Gudeng also joined SEMI International 450mm PIC Task Force to contribute ourselves in latest SEMI standard for 450mm wafer carrier.

In this presentation, we will briefly cover

- Requirement difference between 300 and 450mm wafer carrier
- Current status of 450mm FOUP SEMI Standard and development schedule
- Development status of FOUP / FOSB in Taiwan
- Related testing/metrology equipment developed in Taiwan for 450mm FOUP/FOSB
- Future challenge

⌘ **Session IV** ⌘

Chair: Prof. Jeng-Ywan Jeng, National Taiwan University of Science and Technology, Taiwan

15:00 ~ 16:30

The Challenge of Metrology in the 450mm Wafer Transition Process

Prof. Lothar Pfitzner, Fraunhofer IISB, Germany

The European 450mm Equipment and Materials Initiative

Mr. Bas van Nooten, Director European Cooperative Programs, ASM, Netherlands

Conclusion

Dr. Georg Kelm, Head of Sector, DG INFSO, European Commission

Prof. Chee Wee Liu, National Taiwan University, Taiwan

Session IV: 15:00 – 15:30

The Challenge of Metrology in the 450mm Wafer Transition Process

Lothar Pfitzner, Fraunhofer IISB, Germany



Curriculum Vitae

Lothar Pfitzner holds an M.S. (Dipl.-Ing.) degree in Materials Science and Ph.D. (Dr.-Ing.) in Electronics Engineering, both from the University of Erlangen-Nuremberg. He also studied Medicine and passed the second state examination - basis of his research activities in microelectronics for functional electrostimulation and for cochlear implants during his affiliation as an assistant lecturer at the Engineering Faculty from 1976 to 1985.

Since 1985, he has been heading the department 'Semiconductor Manufacturing' of the Fraunhofer Institute of Integrated Systems and Device Technology (IISB) in Erlangen, performing research and development in the fields of advanced process control by in situ and on-line measurement, integrated vacuum cluster tools, and contamination control. The department supports industrial companies in developing and upgrading new manufacturing equipment, materials, and relevant processes. Since 1994, research in semiconductor manufacturing techniques has been an additional field of his activities. In 1999, he founded a comprehensive R&D cooperation with an industrial wafer reclaim partner, specialized in the recycling of 300mm silicon wafers.

Since 1988, he has been lecturer on 'Semiconductor Manufacturing Techniques' for students of Mechanical Engineering and students of Electrical Engineering at the University of Erlangen-Nuremberg, being appointed Professor for Microelectronics in 2003.

Abstract

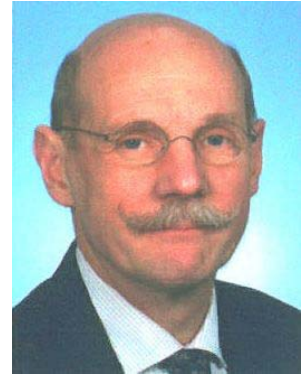
Metrology is at the onset of technology development, of equipment evaluation, and of process development and integration, but also for the continuous yield and quality control in later mass production. METROLOGY, being the science of measurement embracing both, experimental and theoretical determinations at any level of uncertainty in any field of science and technology, and CHARACTERIZATION, the description of the properties of a studied object by appropriate metrology, and INSPECTION, an organized examination or formal evaluation exercise based on measurements, are indispensable measures and the foundation for the development of 450mm technology.

Following definitions and historical reflection, the impact of 450mm especially on metrology will be presented. The transfer from first 450mm trials to initial 450mm process development, to pilot production and to final 450mm high volume production has to be accompanied by according metrology and tool development – stand alone tools as well as integrated metrology and virtual metrology. Examples in past and present technologies and priorities for 450mm metrology will be depicted. The strength in these metrology fields available in Europe, the support by Fraunhofer and the needs of global collaboration in research and industry will be highlighted.

Session IV: 15:30 – 16:00

The European 450mm Equipment and Materials Initiative

Bas van Nooten, Director European Cooperative Programs, ASM, Netherlands



Curriculum Vitae

Sebastiaan van Nooten received his master degree in electronics engineering from the Technical University of Delft in 1971. After his studies he was employed by Telefunken AG in Heilbronn, Germany, where he occupied several positions concerning the development of bipolar integrated circuits, both related to technology and circuit design.

In 1981 he returned to the Netherlands, to head the IC-design group of an ASIC design house. In 1985 he went to the European organization of the start-up semiconductor equipment supplier Anicon, where he soon became European Marketing Manager, which position he held for the CVD division after take over by the SVG group. In 1989 he was appointed by ASM International as General Manager of its German operations, based near Munich. In 1994 he returned to the Netherlands for the second time, to take the position of Sales, Service and Spares Manager Europe at ASM Europe BV. Due to healthy growth of the Dutch operations, this function evolved in Sales Manager Europe till mid 2006. Since that day he occupies his present position of Director European Cooperative Programs at ASM Europe BV.

Sebastiaan van Nooten has 3 patents on his name, of which 2 at ASM and a third one is pending.

Abstract

A 450mm Equipment and Materials Initiative, called EEMI 450, was launched in Europe with two major objectives:

- To improve the competitiveness of the European semiconductor E&M industry and therefore increase the chances to be selected by the tier 1 semiconductor companies in their future 450mm operations.
- To stimulate a European infrastructure that is leading in 450mm development and as a result will induce tier 1 companies to cooperation programs and possibly equip 450mm fabs in Europe.

In the meantime a Steering Committee has been found to coordinate the efforts. All interested European companies in the field are welcomed to the initiative. The first General Assembly of all the participants in the initiative will be held on April 20.

General target is increased cooperation between member companies on common (pre-competitive) technologies to:

- Decrease R&D efforts
- Decrease development timeframe
- Optimize equipment specifications/performance.

Therefore working groups of common interests will be defined, in which common R&D efforts and projects will be discussed, proposed and put into effect.

The EU is supporting the effort and one of the objectives is, that 450mm related project proposals will be entered into the next FP7 ICT call this summer.

Session IV: 16:00 – 16:30

Conclusions

Georg Kelm, Head of Sector, DG INFSO,
European Commission



Curriculum Vitae

Georg Kelm has received his MSc in Electronics engineering from the Electro-technical University (Faculty of Electro-Physics) in St. Petersburg, Russia, and his Ph.D. in the area of Thin Film Technology from Technical University Dresden, Germany.

He has worked for 20 years in industry related microelectronics research holding positions in various fields of process technology as thermal diffusion or thin film deposition, of basic technologies for non-volatile memories or of manufacturing equipment development and evaluation.

Since 1993 he has been working for the European Commission in Brussels, Belgium, is Head of Sector and responsible for content and management of European R&D programmes and projects in the area of micro- and nano-electronics.

Session IV: 16:00 – 16:30

Conclusions

Chee Wee Liu, National Taiwan University, Taiwan



Curriculum Vitae

- Professor of Department of Electrical Engineering, Graduate Institute of Electronics Engineering, Graduate Institute of Electro-optics engineering, and Center of Condensed Matter Sciences, National Taiwan University
- Deputy General Director, National Nano Device Labs, Hsinchu, Taiwan

Education:

- Ph.D., 1994 Electrical Engineering, Princeton University
- M.S. 1987, and B.S., 1985, National Taiwan University, Taiwan

Working experience:

- Research Director with the rank of senior full researcher, ERSO/ITRI, Feb. 2002 - Jan. 2005.
- Visiting Professor, Lucent, Bell Labs, 2001; National University of Singapore, 2004
- Researcher/consultant, IME, 2005

Honors:

1. **2003-2005 Outstanding Research Award, National Science Council, Taiwan**
2. **2003, 2004 Outstanding Research Award, ERSO/ITRI**
3. **Outstanding researcher, National Taiwan University, 2003**
4. 2002 SRC CSR award
5. Six-time recipients of research award, National Science Council, Taiwan, 1995-2000
6. **Technical program chair, 4th ISTDM, 2008; 13th SNDDT, 2006**
7. **Organizer:**
1st NSC-JST Nano Device Workshop, National Taiwan University, Taiwan, 2008
EU-Taiwan 450 nm workshop, Taipei, Taiwan, 2009

8. Invited talk:
IEEE RTP workshop, 2008; ICSICT, 2008, 2006; SPIE, 2006; 210th ECS, 2006; 205th, 206th (two talks) ECS, 2004; SNDT, 2005, 2003; OPT, 2005; Workshop on Photonic Crystals and Nano-Photonics, 2005; ISTDM, 2004; Int. Topical Meeting on Microwave Photonics, 2003
9. IEEE nanotechnology council, technical committee member on nano-optoelectronics and nano-photonics, 2006-now.
10. (sub)committee member: IEDM 2008-2009; ECS, 2008, 2006, 2004; ISCSI-V, 2007; ISCS, 2007; ICSI, 2009, 2007, 2005; ISTDM, 2003, 2004, 2006, 2008; VLSI/TSA 2003, 2004, 2008; IIT, 2004; SSDM, 2004; SMTW 2002, 2003, 2004; SNDT, 2006, 2005; IEDMS, 2002
11. IEEE senior member

Research:

- group IV photonics (emitters and detectors), SiGe(C, Sn) material and device, strained Si/Ge FETs, SOI, GOI, Ge on glass, Ge on flexible substrate, solar cell, TFT, power amplifier.
- Prof. Liu invented the MIS structure for LEDs and detectors.
- 120+ international SCI journal papers, 120+ conference papers (including 8 IEDM papers and 10 invited papers), 29 Taiwan patents, and 12 US patents.

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