Sunbin DENG (邓孙斌，鄧孫斌), Ph.D.

Office: Room 4140, Marcus Nanotechnology Building
345 Ferst Dr. NW
Georgia Institute of Technology
Atlanta, GA 30332, USA

Tel: +1 765-746-9154
Email: sdeng76@gatech.edu
Website: www.sunbindeng.site
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EDUCATION

- **09/2014** – **06/2020** **Ph.D.** in Electronic and Computer Engineering,
  The Hong Kong University of Science and Technology (HKUST), Hong Kong
  Supervisor: Prof. Hoi Sing KWOK & Prof. Man WONG
- **09/2010** – **06/2014** **B.Sc.** in Opto-Information Science and Technology (with Honors),
  Huazhong University of Science and Technology (HUST), Wuhan, China

RESEARCH INTERESTS

Back-end-of-line (BEOL) compatible (e.g., amorphous oxide semiconductor) **electronics** and related processing technologies **for monolithic 3D integration, alternative computing, and information displays**. All are committed to advancing **integrated circuits for artificial intelligence.**

AWARDS & HONORS

1. **Best Theme Poster Award**, *the 1st Annual Review of the Center for Heterogeneous Integration of Micro Electronic Systems (CHIMES, one of the SRC/DARPA JUMP 2.0 centers)*, 2023
2. **Member**, *SID Display Future Star Committee*, 2023
3. **Distinguished Paper Award,** *Society for Information Display's Display Week*, 2021
4. **Young Leader Award,** *SID China*, 2021
5. **Best Paper Award,** *Young Leaders in Displays (HK) and Postgraduate Workshop*, 2021
6. Student Travel Grant, *Society for Information Display's Display Week,* 2019
7. **Academic Award for PhD Students,** *School of Engineering, HKUST*, 2019
8. **Best Poster Presentation Award,** *Postgraduate Workshop on Display Research*, 2018
9. Student Travel Grant, *Society for Information Display's Display Week,* 2018
10. **Distinguished Poster Award,** *International Display Manufacturing Conference*, 2017
11. **Best Oral Presentation Award,** *Postgraduate Workshop on Display Research*, 2016
12. **PG Workshop Distinguished Paper Award,** *International Display Manufacturing Conference*, 2015
13. Full postgraduate scholarship, *HKUST*, 2014-2020
14. Outstanding Graduate, *HUST*, 2014
15. Merit Student, *HUST*, 2013
16. Undergraduate Scientific and Technological Innovation Activist, *HUST*, 2012

RESEARCH EXPERIENCE

- **09/2022** – **present** **School of Electrical and Computer Engineering, Georgia Institute of Technology (GaTech), Atlanta, USA**
  Supervisor: Prof. Suman DATTA
  Position: Postdoctoral Fellow

1. Amorphous oxide semiconductor (AOS) power transistors for on-chip voltage conversion

a) Invented BEOL-compatible AOS power transistors for 12-volt operation.
b) Monolithically co-integrated depletion- and enhancement-mode AOS power transistors.
c) Developed dual-gate AOS power transistors with boosted performance and enhanced reliability.

d) Fabricated high-breakdown-voltage superlattice MIM capacitors based on laminate fluorites.
e) Demonstrated on-chip switched-capacitor DC-DC converters for 12V-to-6V step-down conversion for heterogenous 3D integrated transformer accelerators.

2. AOS access and ferroelectric transistors for Computing in-Memory (CiM) Hardware

a) Improved reliability of AOS transistors with a dual-gate structure for memory access.
b) Explored ALD technique as mobility-reliability boosters for AOS transistors.
c) Developed asymmetric dual-gate AOS ferroelectric field-effect transistors (FeFETs) with improved area efficiency and suppressed read/write disturbance in CiM bit cells.

- **09/2021 – 08/2022 School of Materials Engineering, Purdue University, West Lafayette, USA**
  Supervisor: Prof. Shriram RAMANATHAN
  Position: Postdoctoral Researcher

1. Homotypic Mott neuromorphic electronics enabled by selective-area doping technique

a) Reported the first two-terminal VO_2-based artificial synapses.
b) Implemented selective-area extremely heavy H doping in VO_2-based neural memories for building homotypic spiking neural IC hardware.

2. Hydrogenated Mott bits for energy-efficient probabilistic computing

a) Developed sub-nm scale mapping technique of hydrogen dopant distribution in VO_2.
b) Demonstrated partially hydrogenated VO_2-based probabilistic bit (p-bit) generators.

- **07/2020 – 08/2021 State Key Laboratory of Advanced Displays and Optoelectronics Technologies (SKL of ADT), HKUST, Hong Kong**
  Supervisor: Prof. Hoi Sing KWOK & Prof. Ching Wan TANG
  Position: Postdoctoral Research Associate (in HK Research Talent Hub)

1. Research on AOS thin-film transistors (TFTs)

a) Developed cost-effective fluorination in-packaging (FiP) technique for AOS TFT reliability enhancement at a low thermal processing budget.
b) Implemented low-voltage (≤1 V) ICs with all-oxide TFTs for wearable electronics.

2. Silicon nitride shadow masking for ultra-high-resolution OLED displays

a) Develop micron-thin self-tensioned (5000 ppi) corrugated silicon nitride masks (SiNMs).
b) Demonstrated 3000-ppi 3-inch full-color OLED pixel patterns using the SiNMs.

- **09/2014 – 06/2020 SKL of ADT, HKUST, Hong Kong**
  Supervisor: Prof. Hoi Sing KWOK & Prof. Man WONG
  Position: Ph.D. Candidate

1. Hybrid-phase indium-tin-zinc oxide (hp-InSnZnO) TFT technology

a) Designed hp-InSnZnO channels by co-design of element composition and crystal morphology.
b) Developed hybrid PECVD-SiO_2 stacks as gate insulators with enhanced dielectric quality.
c) Reported gate electrode's gas permeability as an effective knob for threshold voltage modulation.
d) Fabricated high-performance hp-InSnZnO TFTs with diverse (self-aligned, vertical, etc.) structures.
e) Extracted compact models of the hp-InSnZnO TFTs.
f) Prototyped a 2.2-inch 861ppi AMOLED panel with the hp-InSnZnO TFTs.
g) Implemented digital and analog ICs applicable to sensor interfaces.

2. Bridged-grain (BG) poly-Si TFTs using laser interference lithography (LIL)

a) Built a LIL system for submicron BG strips patterning.
b) Improved electrical characteristics of poly-Si TFTs by using LIL-defined BG structure.

3. Large-area few-layered MoS_2 film deposition via magnetron sputtering

a) Sputtered high-quality few-layer MoS_2 films on 4-inch Si wafers.
b) Characterized the few-layer MoS_2 films using spectroscopic and microscopy technologies.

c) Fabricated the few-layer MoS_2 transistors.

4. Development of new-generation micro-LED displays

a) Investigated selective mass transfer and miniaturization techniques for micro-LED pixels.

b) Assembled micro-LED pixels on active-matrix backplanes with AOS TFTs.

- **05/2011** – **06/2014** **Wuhan National Laboratory for Optoelectronics (WNLO), HUST, China**
  Mentor: Prof. Jun ZHOU & Prof. Zhonglin WANG
  Position: Undergraduate Research Assistant

1. Fabricated self-cleaning flexible infrared sensors with carbon nanoparticles.
2. Developed three-dimensional ZnO porous films for self-cleaning ultraviolet detectors.
3. Demonstrated broadband photodetectors based on ZnO nanowire array and PbS quantum dots.

PROFESSIONAL ACTIVITIES

- **Participated Funding Programs**

1. 01/2023 – 12/2027, “Amorphous Oxide Semiconductor for Integrated Power Delivery & Conversion”, CHIMES-T2-3136.007, USD 1,250,000, funded by SRC/DARPA Joint University Microelectronics Program (JUMP) 2.0 Program.
2. 03/2022 – 02/2024, “Research on Thin Film Encapsulation Technology for Flexible OLED Devices”, GHP/006/20GD, HKD 1,096,250.00, funded by The Innovation and Technology Commission (ITC).
3. 11/2020 – 10/2022, “Flexible Metal-oxide Backplane Technology for RGB-Color Conversion OLED Displays”, GHP/013/19SZ, HKD995,999.47, funded by The Hong Kong Government.
4. 11/2019 – 4/2022, “Flexible photodetector array with integrated electronics based on metal-oxide”, SZSTI20EG15, HKD 1,924,371.93, funded by Shenzhen Sci & Tech Innovation Committee (SZSTI).
5. 09/2019 – 08/2021, “EMMO-Structure Metal-Oxide Thin-Film Transistor for the Next-Generation AMOLED Display”, GHP/007/18GD, HKD 1,276,700.00, funded by The Innovation and Technology Commission (ITC).
6. 04/2019 – 03/2020, “Study on InSnZnO Thin Film Transistors and its Active-Matrix Array for High Resolution AMOLED Displays”, GZSTI17EG02, HKD 283,254.02, funded by Guangzhou Municipal Sci. & Tech. Bureau.
7. 06/2017 – 05/2019, “Applications of Novel Metal-Oxide Thin-Film Transistor to Flat Panel Displays and Internet of Things (IoT)”, IGN16EG17, HKD 200,000, funded by the Hong Kong University of Science and Technology.
8. 07/2013 – 01/2049, “State Key Laboratory on Advanced Displays and Optoelectronics Technologies (HKUST)”, ITC-PSKL12EG02, HKD 98,750,000.00, funded by The Innovation and Technology Commission (ITC).
9. 01/2012 – 12/2016, “Challenges in Organic Photo-Voltaic and Light-Emitting Diodes – A Concerted Multi-Disciplinary and Multi-Institutional Effort”, T23-713/11-1, HKD 5,000,000, funded by The Hong Kong Government.
10. Other projects supported by DoE EFRC program, ARO Neuro Fund, Samsung Electronics, EMD Electronics, etc.

- **Invited Talks**

1. “BEOL-Compatible On-Chip DC-DC Converter” at *2024 IEEE International Interconnect Technology Conference (IITC)*, San Jose, USA, 06/2024.
2. “Amorphous Oxide Semiconductors for Monolithic 3D Integrated Circuits”, on *2024 IEEE Symposium on VLSI Technology & Circuits*, Honolulu, USA, 06/2024.
3. "Fluorinated Metal Oxide Thin-Film Transistors with Low Process Thermal Budgets" at 2023 International Conference on Display Technology, Nanjing, China, 03/2023.
4. "Hybrid-Phase Metal Oxide Thin-Film Transistor Technology" at *Young Leader Conference of ICDT*

2021, Beijing, China, 06/2021.

5. "Hybrid-Phase Metal Oxide Thin-Film Transistors and their Applications" at *Shanghai University League's Forum for International Young Scholars*, Shanghai, China, 05/2020.

- **Organized Conferences/Workshops**

1. TPC, *2024 National Nanotechnology Coordinated Infrastructure (NNCI) Etch Symposium*, Atlanta, USA, 2024.
2. Program committee member, *Cross-Strait Postgraduate Workshop on Display Research*, Guangzhou, China, 2016
3. Student helper, *16th International Conference on Ferroelectric Liquid Crystals*, Hong Kong, 2016
4. Student helper, *6th International Photonics and OptoElectronics Meeting*, Wuhan, China, 2013

- **Professional Affiliations**

1. Member, *Institute of Electrical and Electronics Engineers (IEEE)*
2. Member, *Society for Information Display (SID)*

- **Reviewer**

IEEE Electron Device Letters, IEEE Transactions on Electron Devices, Applied Physics Letters, Journal of the Society for Information Display, Scientific Reports, Thin Solid Films, Physical Review Applied, etc.

- **Editorial Board**

Rare Metals

- **Teaching Assistant**

1. Fundamentals of Photovoltaic and Renewable Energy (ELEC 4530), HKUST, 02/2018-06/2018
2. Digital Circuits and Systems (ELEC 2200), HKUST, 09/2015-06/2016
3. Synthesis and Characterization of Optoelectronic Materials, HUST, 09/2013-01/2014

PUBLICATIONS (citation: 880+, H-index: 16 according to Google Scholar)

- **Representative Publications**

1. **Deng, Sunbin**; Yu, Haoming; Park, Tae Joon; Islam, A. N. M. Nafiul; Manna, Sukrit; Pofelski, Alexandre; Wang, Qi; Zhu, Yimei; Sankaranarayanan, Subramanian K. R. S.; Sengupta, Abhronil; Ramanathan, Shriram. "Selective area doping for Mott neuromorphic electronics", *Science Advances,* 9.11 (2023): eade4838.
2. **Deng, Sunbin**; Kwak, Jungyoun; Lee, Junmo; Aabrar, Khandker Akif; Kim, Tae-Hyeon; Choe, Gihun; Kirtania, Sharadindu Gopal; Zhang, Chengyang; Li, Wantong; Phadke, Omkar; Yu, Shimeng; Datta, Suman. "BEOL Compatible Oxide Power Transistors for On-Chip Voltage Conversion in Heterogenous 3D (H3D) Integrated Circuits", *2023 IEEE International Electron Devices Meeting (IEDM)*, San Francisco, USA, Dec. 2023.
3. **Deng, Sunbin**; Kwak, Jungyoun; Lee, Junmo; Chakraborty, Dyutimoy; Shin, Jaewon; Phadke, Omkar; Kirtania, Sharadindu Gopal; Zhang, Chengyang; Aabrar, Khandker Akif; Yu, Shimeng; Datta, Suman. "Demonstration of On-Chip Switched-Capacitor DC-DC Converters using BEOL Compatible Oxide Power Transistors and Superlattice MIM Capacitors", *2024 IEEE Symposium on VLSI Technology & Circuits, Honolulu*, USA, June 2024.
4. **Deng, Sunbin**; Zhong, Wei; Dong, Shou-Cheng; Chen, Rongsheng; Li, Guijun; Zhang, Meng; Yeung, Fion Sze Yan; Wong, Man; Kwok, Hoi-Sing. "Thermal Budget Reduction in Metal Oxide Thin-Film Transistors via Planarization Process", *IEEE Electron Device Letters,* 42.2 (2021): 180-183.
5. **Deng, Sunbin**; Chen, Rongsheng; Li, Guijun; Zhang, Meng; Yeung, Fion Sze Yan; Wong, Man; Kwok, Hoi-Sing. "Gate Insulator Engineering in Top-Gated Indium-Tin-Oxide-Stabilized ZnO Thin-Film Transistors", *IEEE Electron Device Letters*, 40.7 (2019): 1104-1107.

- **Book Chapters**

1. Zhang, Meng; **Deng, Sunbin;** Yan, Yan; Wong, Man; Kwok, Hoi-Sing. “Fundamentals of Metal-Oxide Thin-Film Transistors”, in Semiconducting metal oxide thin-film transistors, IOP Publishing, Bristol, UK. DOI: 10.1088/978-0-7503-2556-1ch2.

- **Journal Articles** (50+ articles in total including 20 articles as first/corresponding author)

1. **Deng, Sunbin**; Kwak, Jungyoun; Lee, Junmo; Chakraborty, Dyutimoy; Shin, Jaewon; Phadke, Omkar; Kirtania, Sharadindu Gopal; Zhang, Chengyang; Aabrar, Khandker Akif; Yu, Shimeng; Datta, Suman. " Monolithic Switched-Capacitor DC-DC Voltage Converters using BEOL-Compatible Oxide Power Transistors and Superlattice MIM Capacitors", *IEEE Transactions on Electron Devices. (In revision)* **(Invited)**
2. **Deng, Sunbin**; Park, Tae Joon; Yu, Haoming; Saha, Arnob; Islam, A. N. M. Nafiul; Wang, Qi; Sengupta, Abhronil; Ramanathan, Shriram. “Hydrogenated VO_2 Bits for Probabilistic Computing”*, IEEE Electron Device Letters*, 44.10 (2023): 1776-1779.
3. **Deng, Sunbin**; Yu, Haoming; Park, Tae Joon; Islam, A. N. M. Nafiul; Manna, Sukrit; Pofelski, Alexandre; Wang, Qi; Zhu, Yimei; Sankaranarayanan, Subramanian K. R. S.; Sengupta, Abhronil; Ramanathan, Shriram. “Selective area doping for Mott neuromorphic electronics”, *Science Advances,* 9.11 (2023): eade4838.
4. Park, Tae Joon*; **Deng, Sunbin***; Manna, Sukriti; Islam, A. N. M. Nafiul; Yu, Haoming; Yuan, Yifan; Fong, Dillon D.; Chubykin, Alexander A.; Sengupta, Abhronil; Sankaranarayanan, Subramanian K. R. S.; Ramanathan, Shriram. “Complex oxides for brain-inspired computing: A review”, *Advanced Materials* (2022): 2203352. **(*Equal contribution)**
5. **Deng, Sunbin**; Dong, Shou-Cheng; Chen, Rongsheng; Zhong, Wei; Li, Guijun; Zhang, Meng; Yeung, Fion Sze Yan; Wong, Man; Kwok, Hoi-Sing. “A Cost-Effective Fluorination Method for Enhancing the Performance of Metal Oxide Thin-Film Transistors”, *Journal of the Society for Information Display*, 29.5 (2021): 318-327. **(Additional cover)**
6. **Deng, Sunbin**; Zhong, Wei; Dong, Shou-Cheng; Chen, Rongsheng; Li, Guijun; Zhang, Meng; Yeung, Fion Sze Yan; Wong, Man; Kwok, Hoi-Sing. “Thermal Budget Reduction in Metal Oxide Thin-Film Transistors via Planarization Process”, *IEEE Electron Device Letters,* 42.2 (2021): 180-183.
7. Yin, Xuemei*; **Deng, Sunbin***; Li, Guoyuan; Zhong, Wei; Chen, Rongsheng; Li, Guijun; Yeung, Fion Sze Yan; Wong, Man; Kwok, Hoi Sing. “Low Leakage Current Vertical Thin-Film Transistors with ITO-stabilized ZnO Channel”, *IEEE Electron Device Letters*, 41.2 (2020): 248-251. **(*Equal contribution)**
8. **Deng, Sunbin**; Chen, Rongsheng; Li, Guijun; Zhang, Meng; Yeung, Fion Sze Yan; Wong, Man; Kwok, Hoi-Sing. “Gate Insulator Engineering in Top-Gated Indium-Tin-Oxide-Stabilized ZnO Thin-Film Transistors”, *IEEE Electron Device Letters*, 40.7 (2019): 1104-1107.
9. Xu, Yuming*; **Deng, Sunbin***; Wu, Zhaohui; Li, Bin; Qin, Yuning; Zhong, Wei; Chen, Rongsheng; Li, Guijun; Wong, Man; Kwok, Hoi Sing. “The Implementation of Fundamental Digital Circuits With ITO-Stabilized ZnO TFTs for Transparent Electronics”, *IEEE Transactions on Electron Devices*, 65.12 (2018): 5395-5399. **(*Equal contribution)**
10. Zhong, Wei*; **Deng, Sunbin***; Wang, Kai; Li, Guijun; Li, Guoyuan; Chen, Rongsheng; Kwok, Hoi-Sing. “Feasible route for a large area few-layer MoS_2 with magnetron sputtering”, *Nanomaterials*, 8.8 (2018): 590. **(*Equal contribution)**
11. **Deng, Sunbin**; Chen, Rongsheng; Li, Guijun; Zhang, Meng; Xia, Zhihe; Wong, Man; Kwok, Hoi-Sing. “Threshold voltage adjustment in hybrid-microstructural ITO-stabilized ZnO TFTs via gate electrode engineering”, *IEEE Electron Device Letters*, 39.7 (2018): 975-978.
12. **Deng, Sunbin**; Chen, Rongsheng; Li, Guijun; Xia, Zhihe; Zhang, Meng; Zhou, Wei; Wong, Man; Kwok,

Hoi-Sing. “Hybrid-Phase Microstructural ITO-Stabilized ZnO TFTs with Self-Aligned Coplanar Architecture”, *IEEE Electron Device Letters*, 38.12 (2017): 1676-1679.

13. **Deng, Sunbin**; Chen, Rongsheng; Li, Guijun; Xia, Zhihe; Zhang, Meng; Zhou, Wei; Wong, Man; Kwok, Hoi-Sing. “Investigation of high-performance ITO-stabilized ZnO TFTs with hybrid-phase microstructural channels”, *IEEE Transactions on Electron Devices*, 64.8 (2017): 3174-3182.
14. **Deng, Sunbin**; Chen, Rongsheng; Li, Guijun; Xia, Zhihe; Zhang, Meng; Zhou, Wei; Wong, Man; Kwok, Hoi-Sing. “High-performance staggered top-gate thin-film transistors with hybrid-phase microstructural ITO-stabilized ZnO channels”, *Applied Physics Letters*, 109.18 (2016): 182105.
15. **Deng, Sunbin**; Chen, Rongsheng; Zhou, Wei; Ho, Jacob Yeuk Lung; Wong, Man; Kwok, Hoi-Sing. “Fabrication of high-performance bridged-grain polycrystalline silicon TFTs by laser interference lithography”, *IEEE Transactions on Electron Devices*, 63.3 (2016): 1085-1090.
16. Li, Hui; **Deng, Sunbin^**; Xu, Yuming; Zhong, Wei; Luo, Dongxiang; Li, Guijun; Kwok, Hoi Sing; Chen, Rongsheng. “A Differential Ring Oscillator with Tail Current Source Control Scheme Using N-Type Oxide TFTs”, *IEEE Transactions on Electron Devices*, 69.4 (2022): 1870-1875. **(^Corresponding author)**
17. Xu, Yuming; Wu, Zhaohui; Li, Bin; **Deng, Sunbin^**; Zhong, Wei; Li, Guijun; Luo, Dongxiang; Yeung, Fion Sze Yan; Kwok, Hoi Sing; Chen, Rongsheng. “Oxide TFT Frontend Amplifiers for Flexible Sensing Systems”, *IEEE Transactions on Electron Devices*, 68.12 (2021): 6190-6196. **(^Corresponding author)**
18. Xu, Yuming; Zhong, Wei; Li, Bin; **Deng, Sunbin^**; Fan, Houbo; Wu, Zhaohui; Lu, Lei; Yeung, Fion Sze Yan; Kwok, Hoi-Sing; Chen, Rongsheng. “An Integrator and Schmitt Trigger Based Voltage-to-Frequency Converter Using Unipolar Metal-Oxide Thin Film Transistors”, *IEEE Journal of the Electron Devices Society,* 9 (2021): 144-150. **(^Corresponding author)**
19. Fan, Houbo; Li, Guoyuan; **Deng, Sunbin^**; Xu, Yuming; Qin, Yuning; Liu, Yuan; Yeung, Sze Yan Fion; Wong, Man; Kwok, Hoi Sing; Chen, Rongsheng. “A High Gain Low-Noise Amplifier based on ITO-Stabilized ZnO Thin-Film Transistors”, *IEEE Transactions on Electron Devices,* 67.12 (2020): 5537-5543. **(^Corresponding author)**
20. Xu, Yuming; Li, Bin; **Deng, Sunbin^**; Qin, Yuning; Fan, Houbo; Zhong, Wei; Liu, Yuan; Wu, Zhaohui; Yeung, Fion Sze Yan; Wong, Man; Kwok, Hoi Sing; Chen, Rongsheng. “A Novel Envelope Detector Based on Unipolar Metal-Oxide TFTs”, *IEEE Transactions on Circuits and Systems II: Express Briefs*, 67.11 (2020): 2367-2371. **(^Corresponding author)**
21. Qin, Yuning; Li, Guoyuan; Xu, Yuming; Chen, Rongsheng; **Deng, Sunbin^**; Zhong, Wei; Wu, Zhaohui; Li, Bin; Li, Guijun; Yeung, Sze Yan Fion; Wong, Man; Kwok, Hoi-Sing. “Low-Power Design for Unipolar ITO-Stabilized ZnO TFT RFID Code Generator Using Differential Logic Decoder”, *IEEE Transactions on Electron Devices,* 66.11 (2019): 4768-4773. **(^Corresponding author)**
22. Zhu, Guanming; Chen, Zhiying; Zhang, Meng; Lu, Lei; **Deng, Sunbin**; Wong, Man; Kwok, Hoi-Sing. "Reliability of indium-tin-zinc-oxide thin-film transistors under dynamic drain voltage stress", *Applied Physics Letters*, 125.2 (2024): 023505.
23. Yuan, Yifan; Kotiuga, Michele; Park, Tae Joon; Patel, Ranjan; Ni, Yuanyuan; Saha, Arnob; Zhou, Hua; Sadowski, Jerzy; Al-Mahboob, Abdullah; Yu, Haoming; Du, Kai; Zhu, Minning; **Deng, Sunbin**; Bisht, Ravindra; Lyu, Xiao; Wu, Chung-Tse; Ye, Peide; Sengupta, Abhronil; Cheong, Sang-Wook; Xu, Xiaoshan; Rabe, Karin; Ramanathan, Shriram. “Hydrogen-Induced Tunable Remanent Polarization in a Perovskite Nickelate”, *Nature Communications*, 15.1 (2024): 4717.
24. Pofelski, Alexandre; Jia, Haili; **Deng, Sunbin**; Yu, Haoming; Park, Tae Joon; Manna, Sukriti; Chan, Maria K. Y.; Sankaranarayanan, Subramanian K. R. S.; Ramanathan, Shriram; Zhu, Yimei. “Sub-nanometer Scale Mapping of Hydrogen Doping in Vanadium Dioxide”, *Nano Letters*, 24.6 (2024): 1974-1980.
25. Chen, Yayi; Liu, Yuan; **Deng, Sunbin**; Chen, Rongsheng; Zhang, Jianfeng; Kwok, Hoi-Sing; Zhong,

Wei. “Low-frequency noise in InSnZnO thin film transistors with high-quality SiO2 gate oxide stacks”, *Applied Physics Letters*, 124.2 (2024): 023501.

26. Zhang, Meng; Jiang, Zhendong; **Deng, Sunbin**; Chen, Zhiying; Ma, Xiaotong; Tien, Ching-Ho; Chen, Lung-Chien; Wong, Man; Kwok, Hoi-Sing. “Hot Carrier Degradation Accompanied by Recovery in InSnZnO Thin-Film Transistors”, *IEEE Electron Device Letters*, 44.7 (2023): 1124-1127.
27. Zhu, Guanming; Zhang, Meng; Jiang, Zhendong; Huang, Jinyang; Huang, Yuxiang; **Deng, Sunbing**; Lu, Lei; Wong, Man; Kwok, Hoi-Sing. “Significant Degradation Reduction in Metal Oxide Thin-Film Transistors via the Interaction of Ionized Oxygen Vacancy Redistribution, Self-Heating Effect, and Hot Carrier Effect”, *IEEE Transactions on Electron Devices*, 70.8 (2023): 4198-4205.
28. Zhang, Jianfeng; Yao, Chuang; Liu, Xinhui; Ding, Ziyi; Liu, Yuan; Liu, Baoxing; **Deng, Sunbin**; Kwok, Hoi-Sing; Li, Guijun. “Controllable Transformation of 2D Perovskite for Multifunctional Sensing Properties”, *The Journal of Physical Chemistry C,* 127.16 (2023): 7730-7739.
29. Chen, Zhiying; Zhang, Meng; **Deng, Sunbin**; Jiang, Zhendong; Yan, Yan; Han, Suting; Zhou, Ye; Wong, Man; Kwok, Hoi-Sing. “Effect of Moisture Exchange Caused by Low-Temperature Annealing on Device Characteristics and Instability in InSnZnO Thin-Film Transistors”. *Advanced Materials Interfaces*, 9.14 (2022): 2102584. **(Inside back cover)**
30. Luo, Zhongming; Liu, Baoxing; Luo, Xi; Zheng, Ting; **Deng, Sunbin**; Chen, Rongsheng; Tian, Bingbing; Xu, Ping; Kwok, Hoi-Sing; Li, Guijun. “A Generic Protocol for Highly Reproducible Manufacturing of Efficient Perovskite Light-Emitting Diodes Using In-Situ Photoluminescence Monitoring”, *Advanced Materials Technologies*, 7.5 (2022): 2100987.
31. Jiang, Zhendong; Zhang, Meng; **Deng, Sunbing**; Yang, Yuyang; Wong, Man; Kwok, Hoi-Sing. “Evaluation of Positive-Bias-Stress-Induced Degradation in InSnZnO Thin-Film Transistors by Low Frequency Noise Measurement”, *IEEE Electron Device Letters*, 43.6 (2022): 886-889.
32. Yan, Huibo; Huang, Jincheng; Zhang, Xiaohui; Wang, Ming; Liu, Jun; Meng, Chunfeng; **Deng, Sunbin**; Lu, Lei; Xu, Ping; Kwok, Hoi-Sing; Li, Guijun. “A buried functional layer for inorganic $CsPb_{0.75}Sn_{0.25}I_2Br$ perovskite solar cells”. *Solar RRL*, 6.4 (2022): 2100899.
33. Zhong, Wei; Zhang, Jianfeng; Liu, Yuan; Tan, Lijun; Lan, Linfeng; **Deng, Sunbin**; Yeung, Fion Sze Yan; Kwok, Hoi Sing; Chen, Rongsheng. “Gate Dielectric Treated by Self-Assembled Monolayers (SAMs) to Enhance the Performance of InSnZnO Thin-Film Transistors”, *IEEE Transactions on Electron Devices*, 69.5 (2022): 2398-2403.
34. Shi, Weiwei; Hu, Lizhi; Liu, Yuan; **Deng, Sunbin**; Xu, Yuming; Kwok, Hoi-Sing; Chen, Rongsheng. “Arithmetic and Logic Circuits Based on ITO-Stabilized ZnO TFT for Transparent Electronics”, *IEEE Transactions on Circuits and Systems I: Regular Papers*, 69.1 (2022): 356-365.
35. Xu, Yuming; Li, Bin; Zhong, Wei; **Deng, Sunbin**; Fan, Houbo; Wu, Zhaohui; Yeung, Fion Sze Yan; Kwok, Hoi Sing; Chen, Rongsheng. “A Unipolar TFT-Based Amplifier with Enhanced DC Offset Suppression”, *Electronics Letters,* 57.2 (2021): 67-70.
36. Zhang, Jianfeng; Zhong, Wei; Liu, Yuan; Huang, Jincheng; **Deng, Sunbin**; Zhang, Meng; Kwok, Hoi-Sing; Li, Guijun. “A High-Performance Photodetector Based on 1D Perovskite Radial Heterostructure”, *Advanced Optical Materials*, 9.24 (2021): 2101504.
37. Luo, Xi; Zheng, Ting; Luo, Zhongming; Liu, Jun; **Deng, Sunbin**; Chen, Rongshen; Zhang, Meng; Kwok, Hoi Sing; Zhang, Jianfeng; Li, Guijun. “Visual Electrocardiogram Synchronization Monitor Using Perovskite-Based Multicolor Light-Emitting Diodes”, *ACS Photonics*, 8.11 (2021):3337-3345.
38. Zhong, Wei; Kang, Liangyun; **Deng, Sunbin**; Lu, Lei; Yao, Ruohe; Lan, Linfeng; Kwok, Hoi Sing; Chen, Rongsheng. “Effect of Sc_2O_3 Passivation Layer on the Electrical Characteristics and Stability of InSnZnO Thin-Film Transistors”, *IEEE Transactions on Electron Devices*. 68.10 (2021): 4956-4961.
39. Yin, Xuemei; Chen, Yayi; Li, Guoyuan; Zhong, Wei; **Deng, Sunbin**; Lu, Lei; Li, Guijun; Kwok, Hoi Sing; Chen, Rongsheng. “Analysis of low frequency noise in in situ fluorine-doped ZnSnO thin-film transistors”,

AIP Advances, 11.4 (2021): 045326.

40. Liu, Yuan; Huang, Yu-Xuan; **Deng, Sunbin**; Wong, Man; Kwok, Hoi-Sing; Chen, Rongsheng. "Dimension Scaling Effects on Conduction and Low Frequency Noise Characteristics of ITO-Stabilized ZnO Thin Film Transistors", *IEEE Journal of the Electron Devices Society*, 8 (2021): 435-441.
41. Huang, Jincheng; Yan, Huibo; Zhou, Dingjian; Zhang, Jianfeng; **Deng, Sunbin**; Xu, Ping; Chen, Rongsheng; Kwok, Hoi-Sing; Li, Guijun. "Introducing Ion Migration and Light-induced Secondary Ion Redistribution for Phase-stable and High-Efficiency Inorganic Perovskite Solar Cells", *ACS Applied Materials & Interfaces*, 12.36 (2020): 40364-40371.
42. Zhang, Meng; **Deng, Sunbin**; Zhou, Wei; Yan, Yan; Wong, Man; Kwok, Hoi-Sing. "Reversely-Synchronized-Stress-Induced Degradation in Polycrystalline Silicon Thin-Film Transistors and Its Suppression by a Bridged-Grain Structure", *IEEE Electron Device Letters*, 41.8 (2020): 1213-1216.
43. Zhang, Meng; Lin, Haotao; **Deng, Sunbin**; Chen, Rongsheng; Li, Guijun; Han, Su-Ting; Zhou, Ye; Yan, Yan; Zhou, Wei; Wong, Man; Kwok, Hoi-Sing. "High-Performance Polycrystalline Silicon Thin-Film Transistors without Source/Drain Doping by Utilizing Anisotropic Conductivity of Bridged-Grain Lines", *Advanced Electronic Materials*, 6.2 (2020): 1900961.
44. Zhang, Jianfeng; Ren, Beitao; **Deng, Sunbin**; Huang, Jincheng; Jiang, Le; Zhou, Dingjian; Zhang, Xulin; Zhang, Meng; Chen, Rongsheng; Yeung, Fion; Kwok, Hoi-Sing; Xu, Ping; Li, Guijun. "Voltage-dependent Multicolor Perovskite Electroluminescent Device", *Advanced Functional Materials*, 30.4 (2020): 1907074.
45. Zhang, Meng; Ma, Xiaotong; **Deng, Sunbin**; Zhou, Wei; Yan, Yan; Wong, Man; Kwok, Hoi-Sing. "Degradation Induced by Forward Synchronized Stress in Poly-Si TFTs and Its Reduction by a Bridged-Grain Structure", *IEEE Electron Device Letters*, 40.9 (2019): 1467-1470.
46. Weng, Shufeng; Chen, Rongsheng; Zhong, Wei; **Deng, Sunbin**; Li, Guijun; Yeung, Fion Sze Yan; Lan, Linfeng; Chen, Zhijian; Kwok, Hoi-Sing. "High Performance Amorphous Zinc Tin Oxide Thin Film Transistors with Low Tin Concentration", *IEEE Journal of the Electron Devices Society*, 7 (2019): 632-637.
47. Ren, Beitao; Yuen, Gancheong; **Deng, Sunbin**; Jiang, Le; Zhou, Dingjian; Gu, Leilei; Xu, Ping; Zhang, Meng; Fan, Zhiyong; Yueng, Fion Sze Yan; Chen, Rongsheng; Kwok, Hoi-Sing; Li, Guijun. "Multifunctional Optoelectronic Device Based on an Asymmetric Active Layer Structure", *Advanced Functional Materials*, 29.17 (2019): 1807894. **(Inside back cover)**
48. Zhang, Meng; Yan, Yan; Li, Guijun; **Deng, Sunbin**; Zhou, Wei; Chen, Rongsheng; Wong, Man; Kwok, Hoi-Sing. "OFF-State-Stress-Induced Instability in Switching Polycrystalline Silicon Thin-Film Transistors and Its Improvement by a Bridged-Grain Structure", *IEEE Electron Device Letters*, 39.11 (2018): 1684-1687.
49. Li, Guijun; **Deng, Sunbin**; Zhang, Meng; Chen, Rongsheng; Xu, Ping; Wong, Man; Kwok, Hoi-Sing. "Achieving High Open-Circuit Voltage for p-i-n Perovskite Solar Cells Via Anode Contact Engineering", *Solar RRL*, 2.10 (2018): 1800151.
50. Chen, Rongsheng; **Deng, Sunbin**; Liu, Yuan; Liu, Yurong; Li, Bin; Wong, Man; Kwok, Hoi-Sing. "Investigation of top gate GaN thin-film transistor fabricated by DC magnetron sputtering", *Journal of Vacuum Science & Technology B, Nanotechnology and Microelectronics: Materials, Processing, Measurement, and Phenomena*, 36.3 (2018): 032203.
51. Chen, Rongsheng; Zhou, Wei; **Deng, Sunbin**; Zhang, Meng; Wong, Man; Kwok, Hoi Sing. "Passivation of Poly-Si Thin Film Employing Si Self-Implantation and Its Application to TFTs", *IEEE Journal of the Electron Devices Society*, 6 (2018): 240-244.
52. Liu, Yuan; **Deng, Sunbin**; Chen, Rongsheng; Li, Bin; En, Yun-Fei; Chen, Yiqiang. "Low-frequency noise in hybrid-phase-microstructure ITO-stabilized ZnO thin-film transistors", *IEEE Electron Device Letters*, 39.2 (2018): 200-203.

53. Li, Guijun; Jiang, Yibin; **Deng, Sunbin**; Tam, Alwin; Xu, Ping; Wong, Man; Kwok, Hoi-Sing. “Overcoming the Limitations of Sputtered Nickel Oxide for High-Efficiency and Large-Area Perovskite Solar Cells”, *Advanced Science*, 4.12 (2017): 1700463.
54. Xia, Zhihe; Lu, Lei; Li, Jiapeng; Feng, Zhuoqun; **Deng, Sunbin**; Wang, Sisi; Kwok, Hoi Sing; Wong, Man. “Characteristics of elevated-metal metal-oxide thin-film transistors based on indium-tin-zinc oxide”, *IEEE Electron Device Letters*, 38.7 (2017): 894-897.
55. Cao, Yuanzhi; **Deng, Sunbin**; Hu, Qiyi; Zhong, Qize; Luo, Qiu-Ping; Yuan, Longyan; Zhou, Jun. “Three-dimensional ZnO porous films for self-cleaning ultraviolet photodetectors”, *RSC Advances*, 5.104 (2015): 85969-85973.

- **Conference proceedings** (40+ papers in total including 19 papers as first author)

1. **Deng, Sunbin**; Shin, Jaewon; Zhang, Chengyang; Park, Hyeonwoo; Phadke, Omkar; Kwak, Jungyoun; Yu, Shimeng; Datta, Suman. "Boosted Performance and Enhanced Reliability of BEOL-Compatible Dual-Gate Oxide Power Transistors for On-Chip DC-DC Voltage Conversion", *2024 IEEE International Electron Devices Meeting (IEDM)*, San Francisco, USA, Dec. 2024.
2. **Deng, Sunbin**; Kwak, Jungyoun; Lee, Junmo; Chakraborty, Dyutimoy; Shin, Jaewon; Phadke, Omkar; Kirtania, Sharadindu Gopal; Zhang, Chengyang; Aabrar, Khandker Akif; Yu, Shimeng; Datta, Suman. "Demonstration of On-Chip Switched-Capacitor DC-DC Converters using BEOL Compatible Oxide Power Transistors and Superlattice MIM Capacitors", *2024 IEEE Symposium on VLSI Technology & Circuits, Honolulu*, USA, June 2024.
3. **Deng, Sunbin**; Kwak, Jungyoun; Lee, Junmo; Yu, Shimeng; Datta, Suman. “BEOL-Compatible On-Chip DC-DC Converter”, *2024 IEEE International Interconnect Technology Conference (IITC)*, San Jose, USA, June 2024. **(Invited)**
4. **Deng, Sunbin**; Kwak, Jungyoun; Lee, Junmo; Aabrar, Khandker Akif; Kim, Tae-Hyeon; Choe, Gihun; Kirtania, Sharadindu Gopal; Zhang, Chengyang; Li, Wantong; Phadke, Omkar; Yu, Shimeng; Datta, Suman. "BEOL Compatible Oxide Power Transistors for On-Chip Voltage Conversion in Heterogenous 3D (H3D) Integrated Circuits", *2023 IEEE International Electron Devices Meeting (IEDM)*, San Francisco, USA, Dec. 2023.
5. **Deng, Sunbin;** Zhong, Wei; Chen, Rongsheng; Dong, Shou-Cheng; Li, Guijun; Zhang, Meng; Yeung, Fion Sze Yan; Wong, Man; Kwok, Hoi-Sing. “Fluorinated Metal Oxide Thin-Film Transistors with Low Process Thermal Budget”, *2023 International Conference on Display Technology*, Nanjing, China, March 2023. **(Invited)**
6. **Deng, Sunbin**; Park, Tae Joon; Wang, Qi; Yu, Haoming; Ramanathan, Shriram. “Hydrogenated VO_2 Switches for Neuromorphic Functions”, *23rd International Conference on Solid State Ionics (SSI-23)*, Boston, USA, July 2022.
7. **Deng, Sunbin**; Dong, Shou-Cheng; Chen, Rongsheng; Zhong, Wei; Li, Guijun; Zhang, Meng; Yeung, Fion Sze Yan; Wong, Man; Kwok, Hoi-Sing. “A Cost-Effective Fluorination Method for Enhancing the Performance of Metal Oxide Thin-Film Transistors Using a Fluorinated Planarization Layer”, *Society for Information Display’s Display Week 2021*, virtual conference, May 2021. **(Distinguished Paper Award)**
8. **Deng, Sunbin**; Chen, Rongsheng; Xu, Yuming; Zhong, Wei; Dong, Shou-Cheng; Li, Guijun; Zhang, Meng; Yeung, Fion Sze Yan; Wong, Man; Kwok, Hoi-Sing. “All-Oxide Thin-Film Transistors for Low-Voltage-Operation Circuits”, *2021 International Conference on Display Technology*, Beijing, China, May. 2021.
9. **Deng, Sunbin**; Chen, Rongsheng; Li, Guijun; Zhang, Meng; Yeung, Fion Sze Yan; Wong, Man; Kwok, Hoi-Sing. “Stacked PECVD SiO_2 Gate Insulators for Top-Gate Metal Oxide Thin-Film Transistors in Enhancement Operation Mode”, *Society for Information Display’s Display Week 2019*, San Jose, USA,

May 2019.

10. **Deng, Sunbin**; Chen, Rongsheng; Li, Guijun; Zhang, Meng; Yeung, Fion Sze Yan; Wong, Man; Kwok, Hoi-Sing. “Gate Insulator Engineering in Top-Gated ITO-Stabilized ZnO TFTs”, *2018 Postgraduate Workshop on Display Research*, Hong Kong, Dec. 2018. **(Best Poster Presentation Award)**
11. **Deng, Sunbin**; Chen, Rongsheng; Li, Guijun; Zhang, Meng; Xia, Zhihe; Wong, Man; Kwok, Hoi-Sing. “Towards High-Performance and Cost-Effective Top-Gated Oxide TFTs with Hybrid-Phase Microstructural Channels”, *Society for Information Display’s Display Week 2018*, Log Angeles, USA, May 2018.
12. **Deng, Sunbin**; Chen, Rongsheng; Li, Guijun; Zhang, Meng; Zhou, Zhichao; Xia, Zhihe; Kwok, Hoi-Sing. “Back-Channel-Etched Oxide TFTs with Hybrid-Phase Microstructural ITO-Stabilized ZnO Channels”, *2018 International Conference on Display Technology*, Guangzhou, China, Apr. 2018.
13. **Deng, Sunbin**; Chen, Rongsheng; Li, Guijun; Xia, Zhihe; Zhang, Meng; Zhou, Wei; Wong, Man; Kwok, Hoi-Sing. “A Study on Hybrid-Phase Microstructural ITO-Stabilized ZnO TFTs with Different Gate Insulators and Electrodes”, *EuroDisplay 2017*, Berlin, Germany, Nov. 2017.
14. **Deng, Sunbin**; Chen, Rongsheng; Li, Guijun; Xia, Zhihe; Zhang, Meng; Zhou, Wei; Wong, Man; Kwok, Hoi-Sing. “Self-Aligned Hybrid-Phase Microstructural ITO-Stabilized ZnO TFTs Achieved via a Combination of PECVD Processes”, *International Display Manufacturing Conference*, Taipei, Taiwan, Sept. 2017. **(Distinguished Poster Award)**
15. **Deng, Sunbin**; Chen, Rongsheng; Li, Guijun; Xia, Zhihe; Wang, Kai; Zhang, Meng; Zhou, Wei; Wong, Man; Kwok, Hoi-Sing. “Achievement of High-Performance and Environmentally Stable TFTs by Introducing Hybrid-Phase Microstructure into InSnZnO Channels”, *23rd International Display Workshops & Asian Display*, Fukuoka, Japan, Dec. 2016.
16. **Deng, Sunbin**; Wong, Man; Kwok, Hoi-Sing; Chen, Rongsheng. “Hybrid-Phase Microstructure in InSnZnO Thin Film and Its Application to High-Performance TFT”, *7th International Conference on Computer Aided Design for Thin-Film Transistors*, Beijing, China, Oct. 2016.
17. **Deng, Sunbin**; Chen, Rongsheng; Li, Guijun; Xia, Zhihe; Zhang, Meng; Zhou, Wei; Wong, Man; Kwok, Hoi-Sing. “Hybrid-Phase Microstructure in Indium-Tin-Zinc-Oxide Thin Films and Its Application to High-Performance Thin-film Transistors”, *2016 Postgraduate Workshop on Display Research*, Guangzhou, China, Sept. 2016. **(Best Oral Presentation Award)**
18. **Deng, Sunbin**; Chen, Rongsheng; Zhou, Wei; Ho, Jacob Yeuk Lung; Wong, Man; Kwok, Hoi-Sing. “Fabrication of High-Performance Bridged-Grain Polycrystalline Silicon Thin-Film Transistors with Laser Interference Lithography Technology”, *International Display Manufacturing Conference*, Taipei, Taiwan, Aug. 2015. **(PG Workshop Distinguished Paper Award)**
19. **Deng, Sunbin**; Xia, Zhihe; Wong, Man; Kwok, Hoi-Sing; Zhang, Meng; Zhou, Wei; Chen, Rongsheng. “Bridged-Grain Metal-Induced Crystallization Poly-Si TFTs with Silicon Self-Implantation”, *International Display Manufacturing Conference*, Taipei, Taiwan, Aug. 2015.
20. Kwak, Jungyoun; Shin, Jaewon; **Deng, Sunbin**; Jeong, Gyujun; Sharda, Janak; Datta, Suman; Yu, Shimeng. "Bias Temperature Instability Analysis of Oxide Power Transistors for BEOL On-chip Voltage Converter in Thermally Constrained H3D Systems", *2024 IEEE International Electron Devices Meeting (IEDM)*, San Francisco, USA, Dec. 2024.
21. Lee, Junmo; Zhang, Chengyang; Shon, Minji; Read, James; **Deng, Sunbin**; Phadke, Omkar; Ravindran, Prasanna Venkatesan; Tian, Mengkun; Luo, Yuan-Chun; Kim, Tae-Hyeon; Khan, Islam Asif; Datta, Suman; Yu, Shimeng. "BEOL-compatible Non-Volatile Capacitive Synapse with ALD W-doped In2O3 Semiconductor Layer", *2024 IEEE International Electron Devices Meeting (IEDM)*, San Francisco, USA,

Dec. 2024.

22. Datta, Suman; Yu, Shimeng; Khan, Asif; **Deng, Sunbin**; Aabrar, Khandker Akif; Kwak, Jungyoun. “Amorphous Oxide Semiconductors for Monolithic 3D Integrated Circuits”, *2024 IEEE Symposium on VLSI Technology & Circuits, Honolulu*, USA, June 2024. **(Invited)**
23. Aabrar, Khandker Akif; Park, Hyeonwoo; Kirtania, Sharadindu Gopal; Sarkar, Eknath; Al Mamun, Md Abdullah; **Deng, Sunbin**; Zhang, Chengyang; Rayner, Gilbert Bruce Jr; Cho, Kyeongjae; Datta, Suman. “On the Reliability of High-Performance Dual Gate (DG) W-doped In_2O_3 FET”, *2024 IEEE Symposium on VLSI Technology & Circuits, Honolulu*, USA, June 2024.
24. Lee, Junmo; **Deng, Sunbin**; Kwak, Jungyoun; Datta, Suman; Yu, Shimeng. “Optimization of Backside of Silicon-Compatible High Voltage Superlattice Capacitor for 12V-to-6V On-Chip Voltage Conversion”, *2024 Device Research Conference (DRC),* the University of Maryland, College Park, USA, June 2024.
25. Aabrar, Khandker Akif; Kirtania, Sharadindu Gopal; **Deng, Sunbin**; Choe, Gihun; Khan, Asif; Yu, Shimeng; Datta, Suman. “Improved Reliability and Enhanced Performance in BEOL Compatible W-doped In_2O_3 Dual-Gate Transistor”, *2023 IEEE International Electron Devices Meeting (IEDM)*, San Francisco, USA, Dec. 2023.
26. Pofelski, Alexandre; **Deng, Sunbin**; Yu, Haoming; Park, Tae Joon; Jia, Haili; Manna, Sukriti; Chan, Maria K. Y.; Sankaranarayanan, Subramanian K. R. S.; Ramanathan, Shriram; Zhu, Yimei. “Dopant Mapping of Partially Hydrogenated Vanadium Dioxide using the Energy Loss Near Edge Structure Technique”, *Microscopy and Microanalysis 2023,* Minneapolis, USA, July 2023.
27. Jiang, Zhendong; Zhang, Meng; **Deng, Sunbin**; Wong, Man; Kwok, Hoi-Sing. “Long-Term Recovery Behavior in InSnZnO Thin-Film Transistors after Negative Bias Stress”, *2023 IEEE International Symposium on the Physical and Failure Analysis of Integrated Circuits (IPFA)*, Pulau Pinang, Malaysia, July 2023.
28. Dong, Shou-Cheng; Yang, Jiye; **Deng, Sunbin**; Tam, Bryan Siu Ting; Yao, Jingwen; Tang, Ching Wan. “Ultrahigh-Resolution Corrugated Silicon Nitride Masks for Direct Patterning of OLED Microdisplays”, *Society for Information Display’s Display Week 2023*, Log Angeles, USA, May 2023.
29. Yu, Haoming; **Deng, Sunbin**; Park, Tae Joon; Wang, Qi; Mondal, Sandip; Ramanathan, Shriram. “VO_2 Insulator-Metal Phase Change Based Neuromorphic Materials and Devices”, *2022 MRS Fall Meeting & Exhibit,* Boston, MA, USA, Nov. *2022.*
30. Dong, Shou-Cheng; **Deng, Sunbin**; Yang, Jiye; Jiang, Yibin; Tang, Ching Wan. “3000-ppi Silicon Nitride Masks for Direct Patterning of OLED Microdisplays”, *2022 International Conference on Display Technology*, Fuzhou, China, Oct. 2022.
31. Xu, Yuming; Li, Bin; **Deng, Sunbin**; Zhong, Wei; Yin, Xuemei; Wu, Zhaohui; Kwok, Hoi-Sing; Chen, Rongsheng. “Frontend Amplifier with Unipolar Oxide TFTs for Heart Rate Measurements”, *2022 International Conference on Display Technology*, Fuzhou, China, Oct. 2022.
32. Xu, Yuming; **Deng, Sunbin**; Chen, Rongsheng. “Oxide TFT Frontend Amplifiers for Flexible Sensing Systems”, *Young Leaders in Displays (HK) and Postgraduate Workshop*, Hong Kong, Dec. 2021. **(Best Paper Award)**
33. Ma, Xiaotong; Zhang, Meng; Jiang, Zhendong; **Deng, Sunbin**; Yan, Yan; Li, Guijun; Chen, Rongsheng; Wong, Man; Kwok, Hoi-Sing. “Output Breakdown Characteristics and the Related Degradation Behaviors in Metal Oxide Thin Film Transistors”, *2019 IEEE 26th International Symposium on Physical and Failure Analysis of Integrated Circuits (IPFA)*, Hangzhou, China, July 2019.
34. Zhang, Meng; Ma, Xiaotong; Jiang, Zhendong; **Deng, Sunbin**; Li, Guijun; Chen, Rongsheng; Yan, Yan; Wong, Man; Kwok, Hoi-Sing. “Light-Illumination-Induced Degradation and Its Long-Term Recovery in

Indium-Tin-Zinc Oxide Thin-Film Transistors", *2019 IEEE 26th International Symposium on Physical and Failure Analysis of Integrated Circuits (IPFA)*, Hangzhou, China, July 2019.

35. Zhang, Meng; Jiang, Zhendong; **Deng, Sunbin**; Ma, Xiaotong; Yan, Yan; Li, Guijun; Chen, Rongsheng; Wong, Man; Kwok, Hoi-Sing. "Gate-Bias-Stress-Induced Instability in Hybrid-Phase Microstructural ITO-Stabilized ZnO TFTs", *Society for Information Display's Display Week 2019*, San Jose, USA, May 2019.
36. Yin, Xuemei; **Deng, Sunbin**; Li, Guoyuan; Zhong, Wei; Chen, Rongsheng; Wong, Man; Kwok, Hoi-Sing. "Vertical Channel ITO-stabilized ZnO Thin-Film Transistors", *2018 IEEE International Conference on Electron Devices and Solid-State Circuits*, Shenzhen, China, June 2018.
37. Zhang, Meng; Yan, Yan; Zhou, Wei; Chen, Rongsheng; **Deng, Sunbin**; Wong, Man; Kwok, Hoi-Sing. "Degradation Behaviors of Driving Thin-Film Transistors in Active-Matrix Organic Light-Emitting Diode Displays", *2018 IEEE International Conference on Electron Devices and Solid-State Circuits*, Shenzhen, China, June 2018.
38. Zhang, Meng; Yan, Yan; **Deng, Sunbin**; Zhou, Wei; Chen, Rongsheng; Wong, Man; Kwok, Hoi-Sing. "Characterization of Self-Aligned Top-Gate Microcrystalline Silicon Thin Film Transistors", *2018 International Conference on Display Technology*, Guangzhou, China, Apr. 2018.
39. Zhong, Wei; Li, Guoyuan; **Deng, Sunbin**; Yin, Xuemei; Lan, Linfeng; Chen, Rongsheng; Kwok, Hoi Sing. "Photoluminescence and Electrical Properties study of ITO-stabilized ZnO Thin-Film Transistors with different annealing temperatures", *2018 International Conference on Display Technology*, Guangzhou, China, Apr. 2018.
40. Xu, Yuming; Wu, Zhaohui; **Deng, Sunbin**; Qin, Yuning; Zhong, Wei; Chen, Rongsheng; Wong, Man; Kwok, Hoi-Sing. "Transparent Basic Logic Circuits with ITO-Stabilized ZnO Thin Film Transistors", *2018 International Conference on Display Technology*, Guangzhou, China, Apr. 2018.
41. Zhong, Wei; Li, Guoyuan; Chen, Rongsheng; Lan, Linfeng; Zhang, Xu; Pei, Weihua; Chen, Hongda; **Deng, Sunbin**. "A study on the bottom-gate ITO-stabilized ZnO thin-film transistors", *2017 IEEE International Conference on Electron Devices and Solid-State Circuits*, Hsinchu, Taiwan, Oct. 2017.
42. Chen, Rongsheng; **Deng, Sunbin**; Xia, Zhihe; Zhang, Meng; Zhou, Wei; Wong, Man; Kwok, Hoi-Sing. "High Performance Thin-film Transistors with Hybrid-phase ITO-stabilized ZnO Active Channel Layer", *2017 International Conference on Display Technology*, Fuzhou, China, Feb. 2017.

- **Patents (3 issued, 3 to be issued)**

1. Chen, Rongsheng; **Deng, Sunbin**; Kwok Hoi -Sing. "Method for Manufacturing a Top-Gate Self-Aligned Indium-Tin-Zinc Oxide Thin-Film Transistor", United States Patent No.: US 11,049,881 B2, Issue Date: 2021 Jun 29.
2. Chen, Rongsheng; **Deng, Sunbin**; Kwok Hoi -Sing. "Inorganic Metallic Oxide Thin Film with Composite Crystal Form and Manufacturing Method Thereof", United States Pub. No.: US 2020/0350167 A1, Pub. Date: Nov. 05, 2020.
3. 一种自对准顶栅铟锡锌氧化物薄膜晶体管及其制造方法，陈荣盛，**邓孙斌**，郭海成，Chinese Invention Patent No.: ZL 201710792095.9, Issue Date：Oct. 11, 2019.
4. 一种二硫化钼薄膜的制备方法，陈荣盛，钟伟，**邓孙斌**，李国元，吴朝晖，李斌，Chinese Invention Patent No.: ZL 201910049361.8, Issue Date: Aug. 28, 2020.
5. 垂直结构的复合晶型金属氧化物薄膜晶体管及其制造方法，陈荣盛，尹雪梅，李国元，**邓孙斌**，郭海成，Chinese patent application No.: 2019 1 0975945.8, Pub. Date: Oct. 15, 2019.
6. 一种金属氧化物薄膜晶体管及其钝化层的制备方法，陈荣盛，钟伟，**邓孙斌**，尹雪梅，郭海成，Chinese patent application No.: 2018 1 1405391.X, Pub. Date: Nov. 23, 2018.

TECHNICAL SKILLS & QUALIFICATION

- **Lab Skills**

1. Skilled in nanofabrication techniques including, but not limited to, the following:
   a) Film growth/deposition (sputtering, EBE, PLD, PECVD, ALD, thermal diffusion, implantation, etc.)
   b) Lithography (photolithography, e-beam lithography, laser-interference lithography, etc.)
   c) Dry/wet etching (RIE, ICP, DRIE, etc.) and chemical-mechanical polishing
2. Skilled in layout design (L-edit, Klayout, etc.), device characterizations (Keithley 4200A-SCS, Keysight B1500A, etc.), and data analysis
3. Experienced with material characterizations (XPS, UPS, XRD, SIMS, AFM, SEM, TEM, etc.)
4. Experienced with device modelling and circuit simulation toolkits (Silvaco TCAD, Cadence, etc.)

- **Qualification**

1. Grade II (C language) & Grade IV (Network Engineer), National Computer Rank Examination of China
2. Second-grade Referee, China Tennis Association

REFEREE INFORMATION

- **Prof. Suman Datta**
  Current affiliation: Georgia Institute of Technology
  Email: sdatta68@gatech.edu
  Tel: +1 (404) 894-6738

- **Prof. Hoi Sing Kwok**
  Current affiliation: The Hong Kong University of Science and Technology
  Email: eekwok@ust.hk
  Tel: +852 2358 7056

- **Prof. Shriram Ramanathan**
  Current affiliation: Rutgers, The State University of New Jersey
  Email: shriram.ramanathan@rutgers.edu
  Tel: +1 (848) 445-3466

- **Prof. Shimeng Yu**
  Current affiliation: Georgia Institute of Technology
  Email: shimeng.yu@ece.gatech.edu
  Tel: +1 (404) 894-2571

- **Prof. Kai Ni**
  Current affiliation: University of Notre Dame
  Email: kni@nd.edu
  Tel: +1 (574) 631-8411