

MYUNGSOO KIM

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RESEARCH INTEREST

Thin Film Transistor and Non-Volatile Memory based on 2D Materials
High Frequency Applications based on Nanomaterials
Nanoelectronics & Nanofabrication

PROFESSIONAL APPOINTMENTS

- Aug 2021 – Present **Assistant Professor**, *Ulsan National Institute of Science and Technology (UNIST)*
College of Information-Bio Convergence Engineering
Department of Electrical Engineering
- Jan 2021 – July 2021 **R&D Device Characterization Engineer**, *Micron Technology, Inc.*, Boise, Idaho, USA
• Develop and debug test programs that enable the testing of advanced semiconductor memory devices
- Aug 2016 – Dec 2020 **Graduate Research Assistant**, *The University of Texas at Austin*
• Characterized and analyzed electrical properties of memory devices based on 2D materials
• High-frequency measurement of RF switch based on vertical structure 2D material electronics
• Designed and fabricated bio-integrated and flexible electronics based on advanced materials
• Advisor: Prof. Deji Akinwande

Academic Activities

- TPC member of *IEEE Electron Devices Technology and Manufacturing (EDTM)*, 2023
- Session Chair
 - The 29TH Korean Conference on Semiconductors (KCS 2022, KCS 2023)
 - The International Conference on Electronic Materials and Nanotechnology for Green Environment (ENGE 2022)
- Review Works: npj 2D materials and applications
- Organizer of the KOFST (Korean Federation of Science and Technology Societies) 2022 BrainLink
 - Global Technology Networking for System Semiconductor Innovation

EDUCATION

- Dec 2020 **Ph.D.**, *The University of Texas at Austin, Austin, TX, USA*
Department of Electrical and Computer Engineering
- May 2019 **M.S.E.**, *The University of Texas at Austin, Austin, TX, USA*
Department of Electrical and Computer Engineering
- May 2016 **B.S.**, *Sungkyunkwan University (SKKU), Suwon, Korea*
Department of Electronics and Electrical Engineering

HONORS & SCHOLARSHIPS

- Jan 2022 **Ben Streetman Award, Senior Award, 2020-2021**
UT Austin, A prestigious university-wide annual prize presented to a Graduate student who is an exceptional contributor to the area of electronic or photonic materials and devices.
- Dec 2019 **Professional Development Award**
UT Austin Graduate School
- Sep 2019 **Best Paper Award in the area of Engineering**
KSEA (Korean-American Scientists and Engineers Association) Austin Chapter
- Jul 2016 –
Dec 2020 **Overseas Graduate Students Scholarship**
Kwanjeong Educational Foundation, Seoul, Korea
- 2010-2015 **Samsung Science Scholarship**
SKKU, Department of Electronics and Electrical Engineering

PUBLICATION

1. Joon-Seok Kim*, Nikhilesh Maity, **Myungsoo Kim**, Suyu Fu, Rinkle Juneja, Abhishek Singh*, Deji Akinwande*, and Jung-Fu Lin*, “Strain-Modulated Interlayer Charge and Energy Transfers in MoS₂/WS₂ Heterobilayer”; *ACS Applied Materials & Interfaces*, (2022).
2. **Myungsoo Kim**, Guillaume Ducournau, Simon Skrzypczak, Sung Jun Yang, Pascal Szczygier, Nicolas Wainstein, Keren Stern, Henri Happy, Eilam Yalon, Emiliano Pallecchi and Deji Akinwande, “**Monolayer molybdenum disulfide switches for 6G communication systems**”; *Nature Electronics*, (2022).
News Media coverage: [Nature Electronics Research Briefing](#), [UT-Austin Press Release](#), [The Daily Texan](#), [UNIST News](#), [IEEE Media Coverage](#)
3. Joon-Seok Kim, Nikhilesh Maity, **Myungsoo Kim**, Suyu Fu, Rinkle Juneja, Abhishek K Singh, Deji Akinwande, Jung-Fu Lin, “**Strain-Modulated Interlayer Charge and Energy Transfers in MoS₂/WS₂ Heterobilayer**”; *Arxiv*, (2021).
4. Yung-Bin Chung, Dmitry Kireev, **Myungsoo Kim**, Deji Akinwande, Sung-Joo Kwon, “**Enhanced heat dissipation performance of chemical-doped graphene for flexible devices**”; *Journal of the Korean Physical Society*, (2021).
5. **Myungsoo Kim**, Emiliano Pallecchi, Ruijing Ge, Xiaohan Wu, Guillaume Ducournau, Jack C. Lee, Henri Happy and Deji Akinwande, “**Analogue Switches made from Boron Nitride Monolayers for Application in 5G and Terahertz Communication Systems**”; *Nature Electronics*, (2020).
 - News Media coverage: [Live TV interview](#) on the public importance, [Public Radio interview](#) and [Texas Standard transcript](#), [NPR on KUT](#), [IEEE Spectrum News](#), [UT-Austin Press Release](#), [UK Daily Mail](#), [PhysicsWorld](#), [Army Press Release](#), [Federal News Network](#), [Nature News](#), [Yahoo](#), [Redditt Commentary](#)
6. **Myungsoo Kim***, Ruijing Ge*, Xiaohan Wu*, Xing Lan, Dr. Jesse Tice, Jack C. Lee and Deji Akinwande, “**Zero-static power RF Switches Based on MoS₂ Atomrystals**”; *Nature Communications*, (2018) (*Editor’s Choice*)
7. Shideh Kabiri Ameri, **Myungsoo Kim**, Irene AgnesKuang, Withanage K. Perera, Mohammed Alshiekh, Hyoyoung Jeong, Ufuk Topcu, Deji Akinwande and Nanshu Lu, “**Imperceptible Electrooculography Sensor System for Human-Robot Interface**”; *npj 2D Materials and Applications*, (2018)
8. Ruijing Ge*, Xiaohan Wu*, **Myungsoo Kim**, Jianping Shi, Sushant Sonde, Li Tao, Yanfeng Zhang, Jack C. Lee, and Deji Akinwande, “**Atomrystal: Nonvolatile Resistance Switching in Atomic Sheets of Transition Metal Dichalcogenides**”; *Nano letters*, (2017) (*ACS Editor’s Choice*)
 - News Media coverage: [UT News Release](#), [IEEE Spectrum](#), [Nature Nanotechnology](#), [Chemistry & Engineering News \(C&EN\)](#), [Nanowerk News](#), [Science Policy News](#)
9. Ruijing Ge*, Xiaohan Wu*, **Myungsoo Kim**, Harry Chou, Sushant Sonde, Li Tao, Jack C. Lee, and Deji Akinwande, “**Towards Universal Non-volatile Resistance Switching in Non-metallic Monolayer Atomic Sheets**”; *arXiv*, (2017)

10. Dong-Ho Kang*, **Myung-Soo Kim***, Jaewoo Shim, Jeaho Jeon, Hyung-Youl Park, Woo-Shik Jung, Hyun-Yong Yu, Chang-Hyun Pang, Sungjoo Lee and Jin-Hong Park, “**High-Performance Transition Metal Dichalcogenide Photodetectors Enhanced by Self-Assembled Monolayer Doping**”; *Advanced Functional Materials*, 25, (2015)

CONFERENCE PRESENTATIONS

1. **Myungsoo Kim**, “Towards Non-volatile 6G Switches Using Atomic-layers”; The International Conference on Electronic Materials and Nanotechnology for Green Environment (*ENGE 2022*), Jeju, Korea (2022) (Invited)
2. **Myungsoo Kim**, “2D Atomic Sheets based Non-volatile 6G Switches”; *2nd Global Summit and Expo on Graphene and 2D Materials (2DMAT2022)*, Edinburgh, Schotland (2022) (Invited)
3. **Myungsoo Kim**, Guillaume Ducournau, Simon Skrzypczak, Pascal Szriftgiser, Sung Jun Yang, Nicolas Wainstein, Keren Stern, Henri Happy, Eilam Yalon, Emiliano Pallecchi and Deji Akinwande, “**Towards 500 GHz Non-volatile Monolayer 6G Switches**”; *IEEE/MTT-S International Microwave Symposium (IMS)*, Denver, CO, USA (2022)
4. **Myungsoo Kim**, Emiliano Pallecchi, Henri Happy and Deji Akinwande, “**Single-Pole-Double-Throw RF switches based on monolayer MoS₂**”; *79th Device Research Conference (DRC)* (2021)
5. Simon Skrzypczak, **Myungsoo Kim**, Guillaume Ducournau, Dominique Vignaud, Remy Gassilloud, Alessandro Cresti, Julien David-Viffantzeff, Yves Deblock, Vanessa Avramovic, Henri Happy, Deji Akinwande, and Emiliano Pallecchi “**Switch RF based on 2d materials**”; *Graphene and 2DM Online Conference (GO2021)*
6. **Myungsoo Kim**, Emiliano Pallecchi, Guillaume Ducournau, Henri Happy and Deji Akinwande, “**Analog Switches Based on Boron Nitride Memristors for Application in 5G and Terahertz Communication Systems**”; *IEEE 5th Electron Devices Technology and Manufacturing Conference (EDTM)*, Chengdu, China. (2021)
7. Emiliano Pallecchi, **Myungsoo Kim**, Henri Happy, and Deji Akinwande, “**Non-volatile switches based on 2D materials for 5G/6G applications**”; *American Physical Society Meeting (APS)*, USA (2021)
8. Xiaohan Wu, Ruijing Ge, **Myungsoo Kim**, Deji Akinwande and Jack C. Lee, “**Atomristors: Non-Volatile Resistance Switching in 2D Monolayers**”; *Pan Pacific Microelectronics Symposium (Pan Pacific)*, Hawaii, USA (2020)
9. **Myungsoo Kim**, Emiliano Pallecchi, Ruijing Ge, Xiaohan Wu, Vanessa Avramovic, Etienne Okada, Jack C. Lee, Henri Happy and Deji Akinwande, “**Nonvolatile RF and mm-wave Switches Based on Monolayer hBN**”; *IEEE International Electron Devices Meeting (IEDM)*, San Francisco, CA, USA (2019)
10. Ruijing Ge*, Xiaohan Wu*, **Myungsoo Kim***, Po-An Chen, Jianping Shi, Junho Choi, Xiaoqin Li, Yanfeng Zhang, Meng-Hsueh Chiang, Jack C. Lee, and Deji Akinwande, “**Atomristor: Memory effect in Atomically-thin sheets and Record RF Switches**”; *IEEE International Electron Devices Meeting (IEDM)*, San Francisco, CA, USA (2018)
11. **Myungsoo Kim**, Saungeun Park, Atresh Sanne, Sanjay Banerjee and Deji Akinwande, “**Towards mm-wave nanoelectronics and RF switches using MoS₂ 2D semiconductor**”; *IEEE/MTT-S International Microwave Symposium (IMS)*, Philadelphia, PA, USA (2018)
12. **Myungsoo Kim** and Deji Akinwande, “**2D Non-Volatile RF switches**”; *American International Meeting on Electrochemistry and Solid State Science (AiMES)*, Cancun, Mexico (2018)
13. Ruijing Ge, Xiaohan Wu, **Myungsoo Kim**, Jack C. Lee and Deji Akinwande, “**Atomristors: Universal Non-Volatile Resistance Switching in Monolayer Atomic Sheets of Transition Metal Dichalcogenides**”; *Electrochemical Society Meeting (ECS)*, Seattle, WA, USA (2018)
14. Ruijing Ge, Xiaohan Wu, **Myungsoo Kim**, Jack C. Lee and Deji Akinwande, “**Universal Non-Volatile Resistance Switching Phenomenon in Atomic Monolayers**”; *American Physical Society Meeting (APS)*, Los Angeles, CA, USA (2018)

BOOK CHAPTER

1. Ruijing Ge, Xiaohan Wu, **Myungsoo Kim**, Jack C. Lee, and Deji Akinwande, “**1 - Two-dimensional materials-based nonvolatile resistive memories and radio frequency switches**”; *Emerging 2D Materials and*

Devices for the Internet of Things: Information, Sensing and Energy Applications, Elsevier, USA (2020)

INVITED TALK

1. **Myungsoo Kim**, “Non-volatile 2D atomic memory and RF applications,” POSTECH seminar, April 20, 2022
2. **Myungsoo Kim**, “2D Materials based Atomic Memory and RF Applications,” GIST colloquium, Online seminar, March 11, 2022
3. **Myungsoo Kim**, “2D Non-volatile memory devices and RF/5G switches,” Sookmyung Women’s University, Online seminar, Jan 28, 2022
4. **Myungsoo Kim**, “Memory Switches based Atomic Memory and RF Switches,” The 29th Korean Conference on Semiconductor, Jan 25, 2022
5. **Myungsoo Kim**, “Atomic memory and RF Switches based on 2D materials,” Sungkyunkwan University, 2D Nano Semiconductor Device Workshop, Dec 29, 2021
6. **Myungsoo Kim**, “2D Non-volatile memory devices and RF/5G switches,” UNIST Graduate School of Semiconductor Materials and Device Engineering, Online seminar, Oct 1, 2021
7. **Myungsoo Kim**, “Atomristor: Atomic memory and high-frequency analog switches,” UNIST Graduate School of Electrical Engineering, Online colloquium, Sep 8, 2021
8. **Myungsoo Kim**, “Memory effect and RF switch applications based on two-dimensional materials,” KSEA (Korean-American Scientists and Engineers Association) Austin Chapter, Oct 25, 2019

TEACHING EXPERIENCE

Spring 2022	Instructor , <i>Ulsan National Institute of Science and Technology (UNIST)</i> <ul style="list-style-type: none">• Semiconductor Engineering (EE 30401)• Advanced Semiconductor Device Engineering (EE 57801)
Fall 2021	Instructor , <i>Ulsan National Institute of Science and Technology (UNIST)</i> <ul style="list-style-type: none">• Nanoscale Electronic Devices (EE 77201)
Spring 2019	Graduate Teaching Assistant , <i>The University of Texas at Austin</i>
Fall 2019	<ul style="list-style-type: none">• Carbon and 2D devices (EE 396V)
Sp,Fall 2017	Graduate Teaching Assistant , <i>The University of Texas at Austin</i>
Fall 2016	<ul style="list-style-type: none">• Circuit Theory (EE 411)