**Dr. Sunkook Kim**

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**Academic Education**

Ph.D. October 2002 – May 2009 Electrical and Computer Engineering, Purdue University, USA

B. S. March 1994- Feb. 2002Physics, Korea University, Seoul, Korea

**CAREER EXPERIENCES**

Associate Professor, March 2016-Current

**Sungkyunkwan University (SKKU)**, Material Science and Engineering (Kyeonggi Do, Korea)

Assistant Professor, March 2012- Feb. 2016

**Kyung Hee University**, Electrical and Computer Engineering (Kyeonggi Do, Korea)

R&D Staff Member, October 2009 – February 2012

**SAMSUNG Advanced Institute of Technology,** Display Lab (Kyeonggi Do, Korea)

* + - Seamless/foldable active matrix organic light-emitting diode(AMOLED) display
    - High mobility transition metal dichalcogenide layered transistor (MoS2, WS2)

Front End Yield Engineer, February 2009 – September 2009

**INTEL**, D1DR Division (Portland, Oregon)

* + - Front-end defect metrology for 32nm technology for I7 CPU

R&D Staff Member, May 2008 – December 2008

**INTEL,** COMPONENT RESEARCH (Santa Clara, CA)

* Realization of tera-byte ferroelectric hard-driver

**Honors and Awards**

2015 **Young Scientist (from Korea President prize) 한림원 젊은과학자상**

2013 **Scientist of Month (January 2013)**, National Research Foundation of Korea

2010 **Display Challenger Awards**, Samsung Electronics, 11/2010.

2002 BakWoon Awards (graduate first in Physics Dept.), Korea University, 02/2002.

**Editorial Works**

Editor, Journal of Alloys and Compounds (Elsevier, Impact Factor ~ 6.371)

Editorial Board, Communications Materials (Springer Nature, Impact Factor ~ 7.8)

Section Editor, Materials Today Electronics (Elsevier, 2022 New Journal)

Editorial Board, Discover Nano (Springer Nature, New Journal)

**Selected Publications (Total ~ 170 papers)**

Pavan Pujar, Haewon Cho, Young-Hoon Kim, Nicolò Zagni, Jeonghyeon Oh, Eunha Lee, Srinivas Gandla, Pavan Nukala\*, Young-Min Kim\*, Muhammad Ashraful Alam\*, Sunkook Kim\*, “An aqueous route to oxygen-deficient wake-up–free La-doped HfO2 ferroelectrics for negative capacitance field effect transistors”, ACS NANO (2023)

Riya Dutta, Arindam Bala, Anamika Sen, Michael Ross Spinazze, Heekyeong Park\*, Woong Choi\*, Youngki Yoon\*, and Sunkook Kim\*, “Optical Enhancement of Indirect Bandgap Two-Dimensional Transition Metal Dichalcogenides for Multi-functional Optoelectronic Sensors”, Advanced Materials​​​, 2303272​ (2023).

Arindam Bala,​ Anamika Sen, Junoh Shim, Srinivas Gandla, Sunkook​ Kim\*, “Back-End-of-Line Compatible Large-Area Molybdenum Disulfide Grown on Flexible Substrate: Enabling High-Performance Low-Power Memristor Applications”, ACS Nano,​​ 17, 14 (2023).

Anamika Sen, Junoh Shim, Arindam Bala, Heekyeong Park\*, and Sunkook Kim\*, “Boosting Sensitivity and Reliability in Field-Effect Transistor-Based Biosensors with Nanoporous MoS2 Encapsulated by Non-planar Al2O3”, Advanced Functional Materials​​​​, 2301919 (accepted as cover page - 2023)​.

Haewon Cho, Mayuri Sritharan, Younghyun Ju, Pavan Pujar, Riya Dutta, Woosung Jang, Youngmin Kim\*, Seongin Hong\*, Youngki Yoon\*, and Sunkook Kim\*, “Se-vacancy Healing with Substitutional Oxygen in WSe2 for High Mobility p-type Field-Effect Transistors​”, ACS Nano​​, 17, 12​ (accepted as cover page - 2023)​

Heekyeong Park, Anamika Sen, Manasa Kaniselvan, AbdulAziz AlMutairi, Arindam Bala, Luke P. Lee\*, Youngki Yoon\*, and Sunkook Kim\*, “Wafer-scale Nanoporous 2D Active Pixel Image Sensor Matrix with High Uniformity, High sensitivity, and Rapid Switching​”, Advanced Materials​​​, 2210715,​ (accepted as Cover page ​- 2023)

Srinivas Gandla, Changgyun Moon, Seungho Baek, Hogun Park\*, Sunkook Kim\*, “Laser-induced carbonization for anticounterfeiting tags”, Advanced Functional Materials​​​​, 2211762​​​, (accepted as Cover page ​- 2023).

Arindam​ Bala, Byungjun​ So, Pavan​ Pujar, Changgyun​ Moon, Sunkook​ Kim\*, “In situ Synthesis of Two-Dimensional Lateral Semiconducting-Mo:Se//Metallic-Mo Junctions using controlled diffusion of Se for high-performance large-scaled Memristor​​​​​​​​”, ​ACS Nano​​​, 17, 5, (accepted as Cover page ​- 2023)

Anamika Sen, Heekyeong Park, Pavan Pujar, Arindam Bala, Haewon Cho, Na Liu, Srinivas Gandla, Sunkook​ Kim, “Probing the Efficacy of Large-Scale Nonporous IGZO for Visible-to-NIR Detection Capability: An Approach Towards High-Performance Image Sensor Circuitry”, ACS Nano,​​ (accepted - 2022)

Seongin Hong, Nicolò Zagni, Sooho Choo, Na Liu, Seungho Baek, Arindam Bala, Hocheon Yoo, Byung Ha Kang, Hyun Jae Kim, Hyung Joong Yun, Muhammad Ashraful Alam and Sunkook Kim, “Highly Sensitive Active Pixel Image Sensor Array Driven by Large-area Bilayer MoS2 Transistor Circuitry”, Nature Communications​​, 12, 3559 (2021)

Srinivas Gandla, Hyeok Ju Chae, Hyuk-Jun Kwon, Yoochan Won, Hyeonjun Park, Sangheum Lee, Jaewoo Song, Seungho Baek, Young-Dae Hong, Donghan Kim, and Sunkook Kim, “Ultrafast Prototyping of Large-Area Stretchable Electronic Systems by Laser Ablation Technique for Controllable Robotic Arm Operations”, IEEE Transactions on Industrial Electronics​​, (2021)

Healin Im, Jinsik Yoon, Jinho Choi, Jinsang Kim, Dong Hyuk Park, Wook Park, and Sunkook Kim, “Chaotic Organic Crystal Phosphorescent Patterns for Physical Unclonable Functions​” Advanced Materials (2021)

Muhammad Naqi, Bosung Kim, Sang-Woo Kim, and Sunkook Kim, “Pulsed Gate Switching of MoS2 Field-Effect Transistor Based on Flexible Polyimide Substrate for Ultrasonic Detectors”, Advanced Functional Materials, 2007389 (2021).

“Active-matrix monolithic gas sensor array based on MoS2 thin-film transistors”, Sehwan Kim, Heekyeong Park, Sooho Choo, Seongho Baek, Yena Kwon, Na Liu, Jeong Yong Yang, Cheol-Woong Yang, Geonwook Yoo, and Sunkook Kim, NPG Communications Materials, 1, 86 (2020).

“Sensory Adaptation and Neuromorphic Phototransistors Based on CsPb(Br1-xIx)3 ​Perovskite and MoS2 Hybrid Structure”, Seongin Hong, Seung Hee Choi, Jongsun Park, Hocheon Yoo, Joo Youn Oh, Euyheon Hwang, Dae Ho Yoon, and Sunkook Kim, ACS Nano**, accepted as Cover page** (2020)

“All-day Mobile Healthcare Monitoring System Based on Heterogeneous Stretchable Sensors for Medical Emergency”, Sungho Lee, Srinivas Gandla, Muhammad Naqi, Uihyun Jung, Sunju Kang, Hyoung Soon Yoon, Dogi Pyun, Yumie Rhee, Hyuk-Jun Kwon, Heejeong Kim, Min Goo Lee and Sunkook Kim, IEEE Transactions on Industrial Electronics, 67(10), 8808-8816 (2020)

“A Colorimetric Multifunctional Sensing Method for Durability Health Monitoring Systems​”, Healin Im, Seongin Hong, Yunsu Lee, Han-Seung Lee, and Sunkook Kim​, Advanced materials​, 1807552, **accepted as Cover Page** (2019)

“MoS2 field-effect transistor-Amyloid-β1-42 hybrid device for signal amplified detection of MMP-9”, Heekyeong Park, Hyungbeen Lee, Seok Hwan Jeong, Eunjin Lee, Wonseok Lee, Na Liu, Dae Sung Yoon, Sang Woo Lee and Sunkook Kim, Analytical Chemistry, 91(13), 8252 (2019)

“Interstitial Mo-Assisted Photovoltaic Effect in Multilayer MoSe2 Phototransistors”, Sunkook Kim, Jesse Maassen, Seung Min Kim, Jiyoul Lee, Gyuchull Han, Junyeon Kwon, Seongin Hong, Jozeph Park, Na Liu, Yun Chang Park, Inturu Omkaram, Jong-Soo Rhyee, Young Ki Hong, and Youngki Yoon, Advanced Materials, 30(12), 1705542 (2018)

Won Geon Song, Hyuk Jun Kwon, Jozeph Park, Junyeob Yeo, Minjung Kim, Suntak Park, Sungryul Yun, Ki Uk Kyung, Costas P. Grigoropoulos, **Sunkook Kim\*** and Young Ki Hong\*, "High-Performance Flexible Multilayer MoS2 Transistors on Solution-Based Polyimide Substrates", *Advanced Functional Materials*, 26, pp.2426-2434 (2016). **accepted as Cover page**

Jong-Soo Rhyee, Junyeon Kwon, Jin Hee Kim, Seung Min Kim, Joseph Park, Young Ki Hong, Wongeon Song, Inturu Omkaram, Muhammad A. Alam\*, and **Sunkook Kim\***, “High-mobility transistors based on large-area and highly crystalline CVD-grown MoSe2 films on insulating substrates”. *Advanced Materials*, 28,2316-2321 (2016). **accepted as Cover page**

Junyeon Kwon, Young Ki Hong, Gyuchull Han, Inturu Omkaram, Woong Choi\*, Youngki Yoon\*, and **Sunkook Kim**, “Giant Photoamplification in Indirect-Bandgap Multilayer MoS2 Phototransistors with Local Bottom-Gate Structures”, *Advanced Materials* **27**, pp. 2224-2230, **accepted as Cover Page** (2015).

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W. Choi, M. Joe, A. Konar, G. Cha, S. C. Hong, S. Kim, J. Kim, D. Jena, J. Joo, and **S. Kim**, “High-Detectivity Multilayer MoS2 Phototransistors with Spectral Response from Ultraviolet to Infrared”, *Advanced Materials* 24, 5832, **accepted as Cover Page** (2012).

**S. Kim**, J. Lee, J. Lee, J. Choi, S. Lee, D. Jena, W. Choi “High-Mobility, Low-Power Thin-Film Transistor Based on Multilayer MoS2 Crystals”, *Nature Communications* (2012).

N. Tayebi, **S. Kim**, R. J. Chen, N. Franklin, H. S. Kim, Y. Nishi, Q. Ma, and V. Rao, “Tuning the Built-in Electric Field in Ferroelectric Pb(Zr0.2Ti0.8)O3 Films for Long Term Stability of Single-Digit Nanometer Inverted Domains”, *Nano Letters*, 12, 5455-5463 (2012)

**S. Kim**, H. J. Kwon, S. Lee, H. Shim, Y. Choi, J. Kwack, D. Han, L. Lee, Y. Chun, I. Kee, Sl. Kim, S. Mohammadi, and S. Lee, “Low Power Flexible Organic Light Emitting Diode (OLED) Display Device”, *Advanced Materials*, vol. 23, pp3511-3516, **accepted as Cover Page,** (2011).

**S. Kim**, S. Kim, J. Park, S. Ju, and S. Mohammadi, “Fully transparent pixel circuits driven by random network Carbon nanotube transistor circuitry”, *ACS NANO* 4, 2994~2998 (2010). **highlighted Nanotation Podcast at ACS.**

J. H. Back, C-L Tsai, **S. Kim,** S. Mohammadi, and M. Shim, “Manifestation of Kohn Anomaly in 1/*f* Fluctuations in Metallic Carbon Nanotubes”, *Physical Review Letters* 103**,** 215501 (2009).

**S. Kim**, S. Ju, J. H. Back, Y. Xuan, P. D. Ye, M. Shim, D. B. Janes, and S. Mohammadi, “Fully transparent thin film transistors based on aligned single-walled carbon nanotube arrays and indium tin oxide electrodes”, *Advanced Materials* 20, 1-5 (2009).