Keon Jae Lee, Ph.D

Chair Professor, Dept. of Materials Science and Engineering, KAIST
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Education

Ph.D degree in University of Illinois at Urbana-Champaign, May, 2006.

Experience

2022-current: **KAIST endowed Chair Professor**
2009-current: **Professor,** Department of Materials Science and Engineering, KAIST
2021-current: **Director,** Office of Industrial Liaison Center, KAIST (ILC, 산학협력센터장)
2020-current: **Editorial Board Member**, Advanced Materials (Wiley, Impact Factor=30.8)
2021-*current:* **Director,** KAIST Industrial Liaison Program (https://ilp.kaist.ac.kr)
2021-*current:* **Director,** Strategic Collaboration R&D of Materials, Parts and Equipments
2016-current: **Chief Technology Officer,** FRONICS Inc. (KAIST Start-up Company)
2020-current: **Director,** Humanplus Artificial Intelligent Sensor Center
2018-2021: **Young KAST member**, Korea Academy of Science and Technology
2020-2021: **Guest Editor,** Advanced Materials (IF=30.8), 'Special Issue on KAIST 50th Anniversary'
2018. 05: **Chair**, 4th International Conference on Nanogenerator and Piezotronics (NGPT)
2019. 05: **Guest Editor,** Nano Energy (IF=18), 'Special Issue on Nanogenerator and Piezotronics'
2019-2020: **Visiting Professor,** Brain Science Institute, KIST
2013-2014: **Visiting Professor,** Harvard Medical School (MGH), Harvard University.
2012-2015: **Director,** Flexible and Nanobio National Research Laboratory (NRL)

Research Interests

Flexible piezoelectric acoustic sensors
Flexible GaN/GaAs microLED for display and biomedical applications
Flexible large scale integration (LSI) & Flexible memory (memristor and phase change memory)
Laser material interactions for flexible electronics
Stretchable healthcare sensors, Self-powered flexible electronic systems

Honors and Awards

2022 Prof. Lee is appointed as KAIST endowed Chair Professor.
2021 Prof. Lee won Vice Prime Minister's Award (National Merits) for University-Industry Liaison
2022 Prof. Lee won 'KAIST Impact Research Award' for top 1% citation among KAIST professors
2019 Prof. Lee won 'KAIST 2019 Technology Innovation Award'
2017 Prof. Lee won Outstanding Paper Award from Nano Convergence
2017 Prof. Lee won KAIST Institute Fusion Research Award
2015-2016 Invited talk at IEDM (Washington 2015) & ISSCC (San Francisco 2016)
2015 Prof. Lee won 'Advanced Materials Scientist Award' from IAAM.
2015 Prof. Lee won '2014 KAIST Top 10 Research Award'
2014 Prof. Lee gave an invited talk at Summer Davos Forum as KAIST Representative.
2014 Prof. Lee won Minister's Award from Ministry of Science, ICT and Future Planning
2012 Flexible battery is highlighted in Nature as ' The Most Viewed Papers in Science'
2012 Prof. Lee won '2012 Merck Young Scientists Awards'
2012 Selected for National Research Lab. from National Research Foundation of Korea.
2012 'Keynote Speaker' at International SPIE Conference in San Diego
2012 'Plenary Speaker' at International CSMNT Conference
2011 Prof. Lee won 'KAIST 2011 Technology Innovation Award'
2010 Thin Film Nanogenerator is selected as 'Top 10 Lifestyle Innovation Technology', Donga Science

2009 George Smith Award for the best paper published in IEEE Elect. Dev. Lett.
2006 Three dimensional chips are published in Science
2006 Printed semiconductor technology won "2006 Innovation Award" from Wall Street Journal
2006 Printed semiconductor technology is licensed to Semprius Inc.

Publications (last 3 years)

~120 SCI papers including *Science, Nature Materials, Nature Comm., Sci Adv., Adv. Mater., Nano Letters, ACS Nano, Adv. Energy Mater., Energy Environ. Sci., Adv. Func. Mater., Nano Energy etc.*

1. "Flash-Induced Robust Cu Electrode on Glass Substrates and its Application for Thin-Film μLED", **Adv. Mater**., 33, 2007186, 2021 [IF=30.8]
2. "Multidisciplinary Materials Research in KAIST over Last 50 Years", **Adv. Mater.,** 32, 2000696, 2020 [IF=30.8]
3. "Progress in Brain-Compatible Interfaces with Soft Nanomaterials", **Adv. Mater**., 32, 1907522, 2020 [IF=30.8]
4. "Flexible Piezoelectric Acoustic Sensor and Machine Learning for Speech Processing", **Adv. Mater.,** 32, 1904020, 2020 [IF=30.8]
5. "Monolithic Flexible Vertical GaN Light-Emitting Diodes for Transparent Wireless Brain Optical Stimulator", 30, 1800649, 2018, **Adv. Mater.** [IF=30.8]
6. "Laser irradiation of metal oxide films and nanostructures: applications and advances", **Adv. Mater.,** 30, 1870094, 2018 [IF=30.8]
7. "Self-Powered Real-Time Arterial Pulse Monitoring using Ultrathin Epidermal Piezoelectric Sensors", **Adv. Mater.,** 29, 1702308, 2017 [IF=30.8]
8. "Flash Light Millisecond Self-Assembly of High χ Block Copolymers for Wafer-Scale Sub-10 nm Nanopatterning", **Adv. Mater.,** 29, 1700595, 2017. [IF=30.8]
9. "Laser Material Interactions for Flexible Applications" **Adv. Mater.,** 29, 1606586, 2017.
10. "Flashlight-material Interaction for Wearable and Flexible Electronics" **Materials Today,** 51, 525, 2021. [IF=31]
11. "Metastable Quantum Dot for Photoelectric Devices via Flash-induced One-step Sequential Self-formation", **Nano Energy**, 84, 105889, 2021 [IF=18]
12. "Machine Learning-based Self-powered Acoustic Sensor for Speaker Recognition", **Nano Energy**, 53, 658, 2018 [IF=18]
13. "Wireless Powered Wearable Micro Light-Emitting Diodes", **Nano Energy**, 55, 454, 2019
14. "Optogenetic Control of Body Movements via Flexible Vertical Light-Emitting Diodes on Brain Surface", **Nano Energy**, 44, 447, 2018 [IF=18]
15. "Biomimetic and Flexible Piezoelectric Mobile Acoustic Sensors with Multi-Resonant Ultrathin Structures for Machine Learning Biometrics", **Sci. Adv.,** 7, eabe5683, 2021 [IF=14]
16. "Micro Light-Emitting Diodes for Display and Biomedical Applications", **Adv. Funct. Mater,** 29, 1808075, 2019 [IF=18.8]
17. "Flexible Crossbar-Structured Phase Change Memory Array via Mo-based Interfacial Physical Lift-Off", **Adv. Funct. Mater,** 29, 1806338, 2019 [IF=18.8]
18. "Plasmonic-Tuned Flash Cu Nanowelding for Ultrafast Photochemical-Reducing and Interlocking on Flexible Plastics", **Adv. Funct. Mater.,** 27, 1701138, 2017. [IF=18.8]
19. "In Vivo Self-Powered Wireless Transmission Using Biocompatible Flexible Energy Harvesters", **Adv. Funct. Mater.,** 27, 1700341, 2017. [IF=18.8]
20. "Novel Electronics for Flexible and Neuromorphic Computing", **Adv. Funct. Mater.** 28, 1801690, 2018 [IF=18.8]
21. "Trichogenic Photostimulation Using Monolithic Flexible Vertical AlGaInP Light-Emitting Diodes", **ACS Nano**, 12, 9587, 2018 [IF=16]
22. "Flash-Induced Stretchable Cu Conductor via Multiscale-Interfacial Couplings", **Adv. Sci.,** 5, 1801146, 2018 [IF=16.8]

Patents

~150 patents in the field of flexible and nanoelectronics. More than 70 of these are licensed.