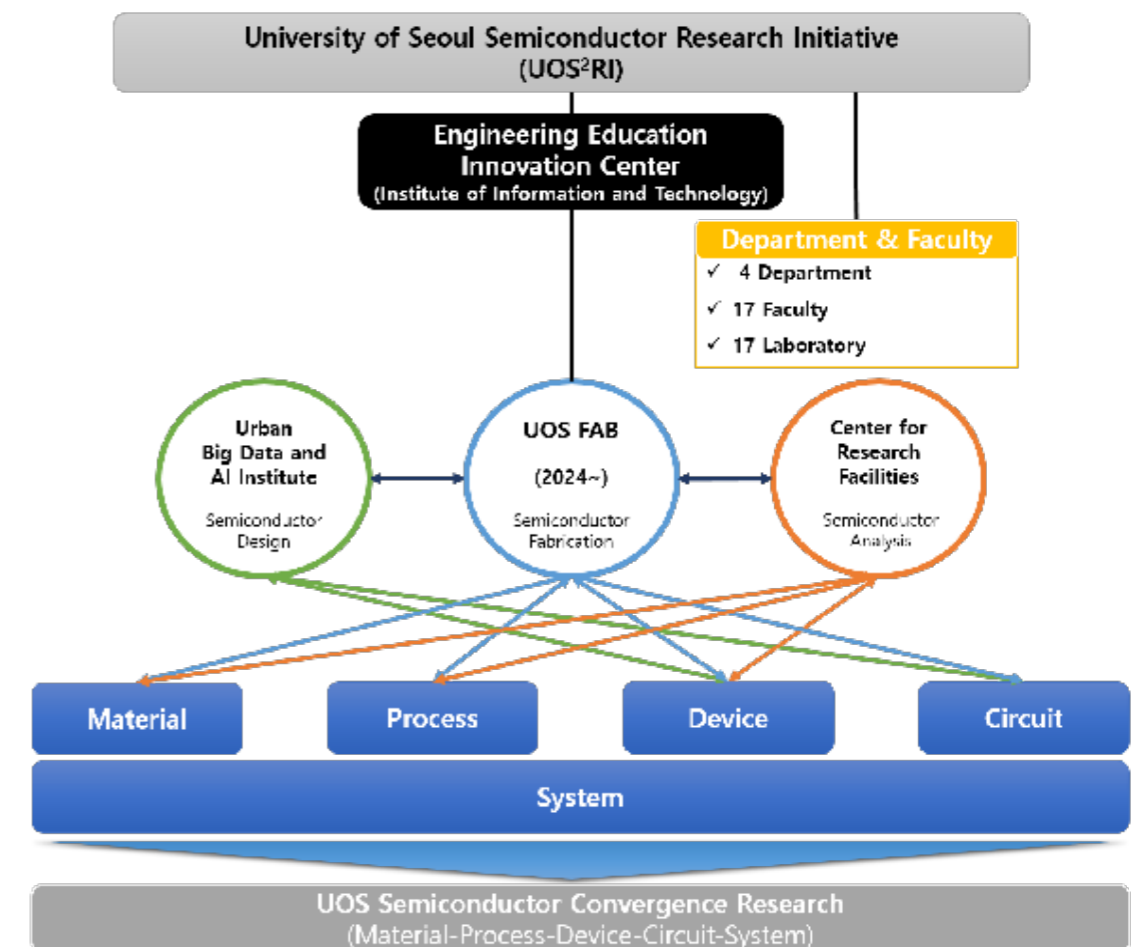




# Organization



# Faculty

## Material

- 1 **Young Jun Chang** Department of Physics
- 2 **Suk Bum Chung** Department of Physics
- 3 **Sang-il Kim** Department of Materials Science and Engineering
- 4 **Hyun-Sik Kim** Department of Materials Science and Engineering

## Process

- 5 **Jung Hyeun Kim** Department of Chemical Engineering
- 6 **Ohsung Song** Department of Materials Science and Engineering
- 7 **Jae Pil Jung** Department of Materials Science and Engineering
- 8 **Byung Jun Jung** Department of Materials Science and Engineering
- 9 **Hyosun Lee** Department of Materials Science and Engineering

## Device

- 10 **Dong-Wook Park** School of Electrical and Computer Engineering
- 11 **Hyeok Kim** School of Electrical and Computer Engineering
- 12 **Yoon Kim** School of Electrical and Computer Engineering
- 13 **Jung Hwa Seo** Department of Physics

## Circuit

- 14 **Joongho Choi** School of Electrical and Computer Engineering
- 15 **Yongsam Moon** School of Electrical and Computer Engineering
- 16 **Moon-Que Lee** School of Electrical and Computer Engineering
- 17 **Seung-Hwan Lee** School of Electrical and Computer Engineering



## Young Jun Chang (장영준 교수)

- Department** Department of Physics / Smart Cities / Intelligent Semiconductor
- Lab** Smart Film Laboratory
- Ph.D.** Seoul National University, 2008
- Research** Quantum materials and functional thin films
- E-mail** yjchang@uos.ac.kr
- Homepage** sites.google.com/site/youngjunchanglab

### Key Words

2D semiconductor materials, Energy-application materials, Molecular beam epitaxy (MBE), ARPES, APXPS, XMCD, Sputter, Machine-learning, Spectroscopic ellipsometry, CV analysis

### Areas of Research

#### 2D Quantum Materials

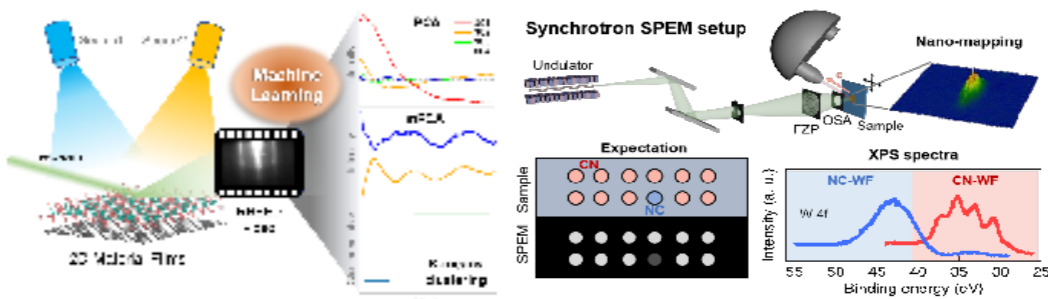
- Molecular Beam Epitaxy Synthesis of Chalcogenide and Oxide films
- Quantum materials: ARPES / AP-XPS / Synchrotron-based analysis

#### Semiconductor Technology

- Optical, Electrical, Spectroscopic analysis for 3D NAND DRAM technology
- Defect study of charge trap layer for Flash memory

#### Energy Application Materials

- E-efficiency: efficient next-generation power transistor (GaN, TCO)
- E-generation: electrochemical catalytic electrode (Ir-compounds, WOx)



<Machine learning on quantum material growth(left), Synchrotron analysis of 3D NAND structure(right)>

### Recent Publications & Projects

- Nano Convergence, “Machine-learning-assisted analysis of TMDC thin-film growth” (2023)
- Applied Surface Science, “Direct observation of trapped charges at ReSe2 and graphene” (2022)
- ACS Nano, “Controlling spin-orbit coupling to tailor type-II Dirac bands” (2022)
- MSIT “Charge-spin ordering and electronic structure dynamics in chalcogenide epitaxial films” (~2025)
- MSIT “Advanced Quantum Material Synchrotron Research Center” (~2025)
- MSIT “Extreme Quantum Functional Material Research Center” (~2030)
- Samsung Electronics Co. “Multi-modal analysis for reliability improvement in CTF devices” (~2024)

### Honors & Awards

- [Award] Applied Physics Academic Award, Korean Physical Society (2022)



## Suk Bum Chung (정석범 교수)

**Department** Department of Physics  
**Lab** Quantum Material Properties Laboratory  
**Ph.D.** University of Illinois Urbana-Champaign, 2008  
**Research** Condensed Matter Theory (superconductor, magnetism, topological insulator)  
**E-mail** sbchung0@uos.ac.kr  
**Homepage** nsri.uos.ac.kr/faculty

### Key Words

Condensed Matter and Statistical Physics, Topological States of Condensed Matter, Superconductor

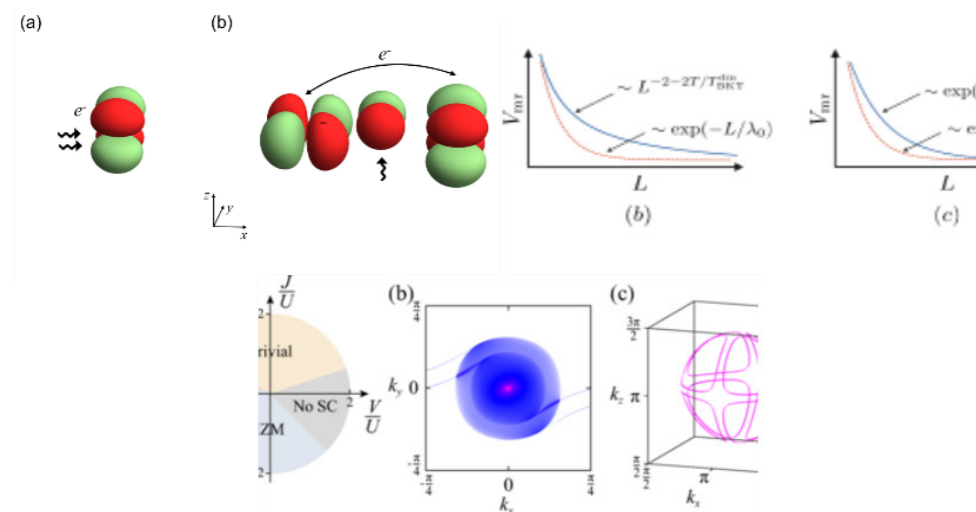
### Areas of Research

#### Superconductivity in semiconductor / semimetal

- Theory of superconductivity in doped quantum paraelectrics
- Topological multiband s-wave superconductivity in coupled multifold fermions

#### Spintronics in magnets / superconductor

- Spin transport in 2D magnets
- Vortex effect on spin transport in superconductor
- Phonon-mediated spin transport in quantum paraelectrics



<Superconductivity in quantum paraelectrics, Vortex effect on superconducting spintronics, Superconductivity in topological semimetals>

### Recent Publications & Projects

- npj Quantum Materials, "Theory of superconductivity in doped quantum paraelectrics" (2022)
- SciPost Physics Core, "Berezinskii-Kosterlitz-Thouless transition transport in spin-triplet superconductor" (2022)
- Physical Review B, "Topological multiband s-wave superconductivity in coupled multifold fermions" (2021)
- MSIT, Republic of Korea "Natural Science Research Institute" (~2027)

### Honors & Awards

- [Award] Outstanding Young Researcher Award, Association of Korean Physicists in America (2013)



## Sang-il Kim (김상일 교수)

**Department** Department of Materials Science and Engineering  
**Lab** Advanced Energy Materials Laboratory  
**Ph.D.** University of Wisconsin-Madison, 2007  
**Research** Thermoelectricity, 2D Materials  
**E-mail** sang1.kim@uos.ac.kr  
**Homepage** campus.uos.ac.kr/aeml

### Key Words

Materials Science, Thermoelectrics, Energy Materials, Superconductivity, Thin films

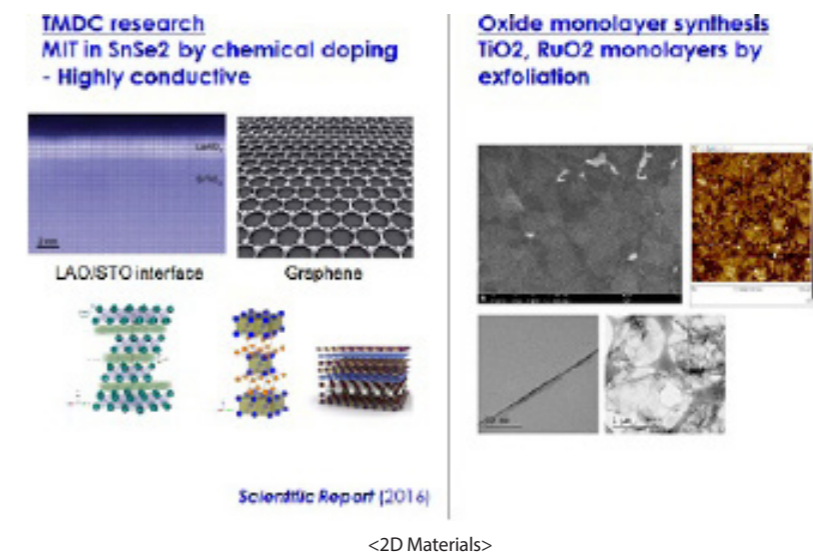
### Areas of Research

#### Thermoelectricity

- Thermoelectricity, Thermoelectric materials, Applied thermoelectric materials

#### 2D Materials Research

- Transition metal dichalcogenide
- Post-transition metal dichalcogenide
- 2D oxide monolayers (TiO<sub>2</sub>, RuO<sub>2</sub>....)



<2D Materials>

### Recent Publications & Projects

- Journal of Alloys and Compounds, "Impact of resonant state formation and band convergence in In and Sr co-doped SnTe thermoelectric material evaluated via the single parabolic band model" (2023)
- Solid State Sciences, "Phase formation and thermoelectric properties of FeSe<sub>2</sub>-CoSe<sub>2</sub> system" (2023)
- Advanced Functional Materials, "Approach to Determine the Density-of-States Effective Mass with Carrier Concentration-Dependent Seebeck Coefficient" (2022)
- Acta Materialia, "Nanoparticles in Bi<sub>0.5</sub>Sb<sub>1.5</sub>Te<sub>3</sub>: a prerequisite defect structure to scatter the mid-wavelength phonons between Rayleigh and geometry scattering" (2022)

### Honors & Awards

- [수상] 2023년 과총 제33회 과학기술우수논문상



## Hyun-Sik Kim (김현식 교수)

**Department** Department of Materials Science and Engineering  
**Lab** Electronic Materials Engineering Laboratory  
**Ph.D.** California Institute of Technology, 2016  
**Research** Ceramic materials  
**E-mail** hyunsik.kim@uos.ac.kr  
**Homepage** emelab.uos.ac.kr

### Key Words

Dielectric material, Thermoelectric materials

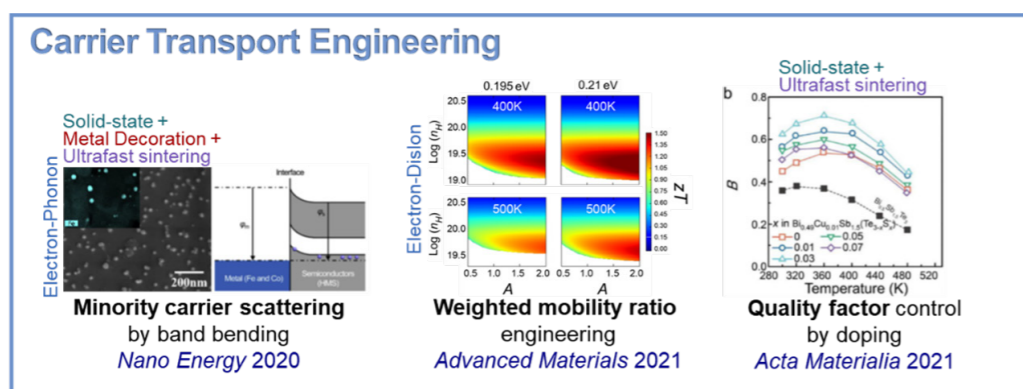
### Areas of Research

#### Dielectric materials

- Core/shell nanostructure engineering (BaTiO<sub>3</sub>-, SrTiO<sub>3</sub>-based core/shell)
- Selective diffusion length engineering (shell composition gradient control)
- Surface defect engineering (nucleation growth control)

#### Thermoelectric materials

- Phonon engineering (atomic-scale defect, nanoparticle, dislocation)
- Band engineering (band flattening, band convergence, band hybridization, carrier tuning)



<Carrier transport engineering for thermoelectric performance improvement>

### Recent Publications & Projects

- Advanced Functional Materials, "Approach to Determine the Density-of-States Effective Mass with Carrier Concentration-Dependent Seebeck Coefficient" (2022)
- Advanced Materials, "Weighted mobility ratio engineering for high-performance Bi-Te-based thermoelectric materials via suppression of minority carrier transport" (2021)
- ACS Energy Letters, "More than 9% efficient ZnSeTe quantum dot-based blue electroluminescent devices" (2020)
- Nano Energy, "Synchronized enhancement of thermoelectric properties of higher manganese silicide by introducing Fe and Co nanoparticles" (2020)
- 과기부, "산소 공공 제어 및 실시간 모자이크 표면 생성을 통한 고효율 고온용 산화물 열전발전 소재" (~2027)

### Honors & Awards

- [수상] 한국세라믹학회 대주신진과학자상 (2021)



## Jung Hyeun Kim (김정현 교수)

**Department** Department of Chemical Engineering  
**Lab** Nanosystem Applications Laboratory  
**Ph.D.** University of Maryland, College Park, 2003  
**Research** Photocatalyst  
**E-mail** jhkimad@uos.ac.kr  
**Homepage** sites.google.com/view/uosnsal

### Key Words

Polyurethane foam, Photocatalyst, Photoelectrochemical cell, Shape memory elastomer

### Areas of Research

#### Polyurethane foam Seat pad

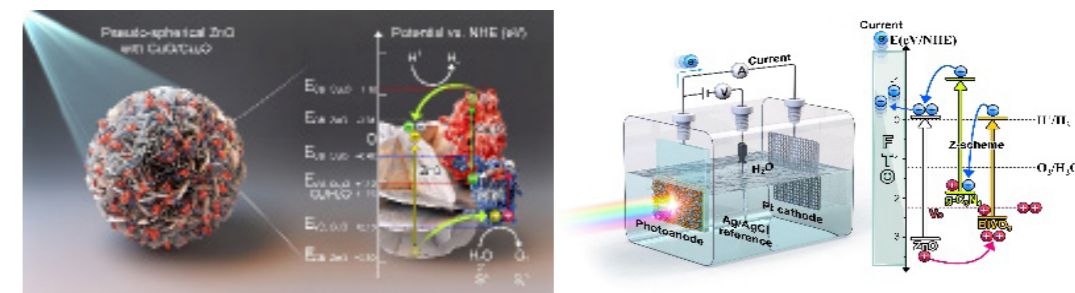
- Polyurethane foams (PUF) has a good formability and light weight, and are widely used in various industries such as automobiles.

#### Polyurethane foam Sound absorption material

- FFlexible polyurethane (FPU) foams are widely used as sound absorption materials of automobiles because of the light weight, ease of production and high sound absorption efficiency

#### Photocatalyst, Photoelectrochemical cell

- Photocatalyst materials for photochemical hydrogen production through water splitting under the sunlight



<Photocatalyst(left), Photoelectrochemical cell(right)>

#### Shape memory elastomer

- It has the ability to fix a temporarily deformed shape and recover its original shape through external stimuli.

### Recent Publications & Projects

- Journal of Environmental Chemical Engineering, "Hydrothermal synthesis of the CdS nanorods on electrochemically deposited Fe<sub>2</sub>O<sub>3</sub> thin film for improving photoelectrochemical performance" (2023)
- Polymer Testing, "Performance evaluations of flexible polyurethane foams manufactured with castor oil-based bio-polyol" (2023)
- Applied Surface Science, "Hierarchically interconnected g-C<sub>3</sub>N<sub>4</sub>/BiVO<sub>4</sub>/ZnO arrays via spin coating for high photoelectrochemical performance" (2022)
- Green Energy & Environment, "High Performance of TiO<sub>2</sub>/Cu<sub>2</sub>O Photoelectrodes for Regenerative Solar Energy Storage in a Vanadium Photoelectrochemical Cell" (2022)
- 과기부, "전하 분리 효율화 광촉매 개발 및 광전기화학적 에너지 저장" (~2024)

### Honors & Awards

- [Award] 학술연구지원사업 우수성과 50선 교육부장관 표창 (2022)



## Ohsung Song (송오성 교수)

**Department** Department of Materials Science and Engineering  
**Lab** Information Materials Laboratory  
**Ph.D.** Massachusetts Institute of Technology, 1994  
**Research** Solar Cells, Semiconductor Processing, Precious Metal Recovery, Diamond Related Materials  
**E-mail** songos@uos.ac.kr  
**Homepage** campus.uos.ac.kr/songos

### Key Words

Solar Cells, Semiconductor Processing, Precious Metal Recovery, Diamond Related Materials

### Areas of Research

#### Semiconductor Process

- From photo process specialization to advanced packaging process, Plasma etching process

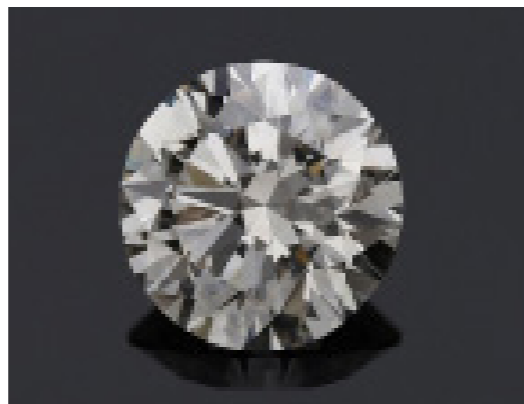
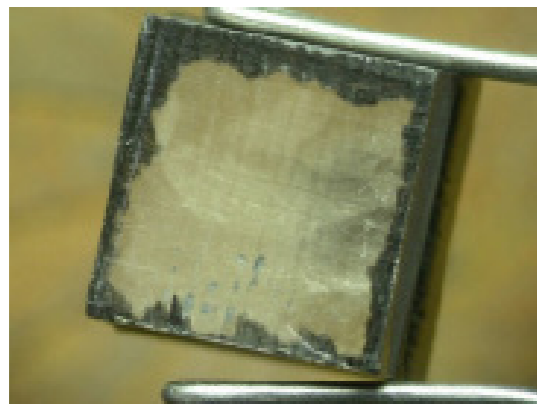
#### Energy Conversion Efficiency enhancement for Perovskite Solar Cells

#### Precious Metal Group, Ruthenium/Iridium/Palladium, Recovery Process

#### Diamond Growing with MP CVD and HPHT

#### Large diameter Diamond Substrate

#### Diamond Characterization



< A10mm single crystal diamond substrate(left), 1.27ct brilliant cut diamond(right)>

### Recent Publications & Projects

- Journal of Asian Ceramic Societies, "Propertise of foamed glass upon addition of polysiloxane" (2020)
- Journal of Asian Ceramic Societies, "Properties of basalt-fiber reinforced foam glass" (2020)
- Journal of Asian Ceramic Societies, "Properties of foamed glass upon addtion of nanocarbon and sintering temperatures" (2020)

### Honors & Awards

- [기술이전] 합성다이아몬드의 제조와 감별기술 (2021), Getter를 이용한 가스 정화 기술 (2020)
- [표창] 중소기업 기술혁신 유공자 산업통상자원부장관상 (2016)
- [표창] 산학연협력부문 서울지방중소기업청장 표창장 (2016)



## Jae Pil Jung (정재필 교수)

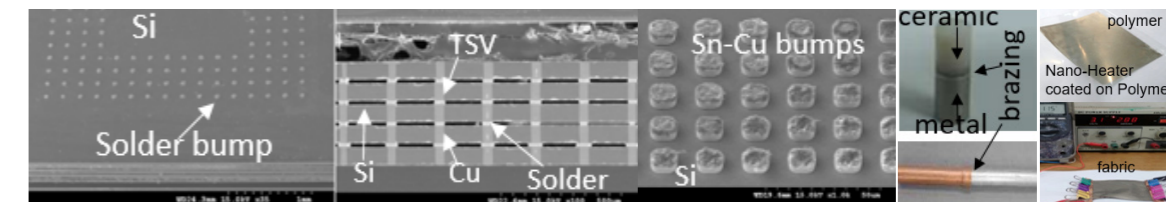
**Department** Department of Materials Science and Engineering  
**Lab** Micro Joining & Semiconductor Packaging Laboratory  
**Ph.D.** Seoul National University, 1992  
**Research** Semiconductor packaging, Micro Joining  
**E-mail** jpjung@uos.ac.kr  
**Homepage** sites.google.com/view/uosmjlab

### Key Words

Soldering, Brazing, Micro-joining, Electroplating, Packaging

### Areas of Research

- Soldering and Pb-free solders, Packaging
- Brazing, Micro-joining process
- Electro-/ Electroless plating



<Soldering, Brazing, Plating, Packaging, Flexible nano-heater>

### Recent Publications & Projects

- Journal of Electronic Materials, "Intermediate Low-Melting-Temperature Solder Thermal Cycling Enhancement Using Bismuth and Indium Microalloying" (2023)
- Journal of Materials Science: Materials in Electronics, "Investigating the physical, mechanical, and reliability study of high entropy alloy reinforced Sn-3.0Ag-0.5Cu solder using 1608 chip capacitor/ENIG joints" (2022)
- Journal of Materials Engineering and Performance, "Ultrasonic-Assisted Dispersion of ZnO Nanoparticles to Sn-Bi Solder: A Study on Microstructure, Spreading, and Mechanical Properties" (2021)
- Metals and Materials International, "Recent Advances in Active Metal Brazing of Ceramics and Process" (2020)
- 산업부, "수송기기용 고강도 경량 소재 표면처리 시생산 기반 구축" (~2025)
- 산업부, "미니-LED 미세전극 접합을 위한 도전성 나노소재 기술 개발" (~2024)

### Honors & Awards

- [표창] 중소벤처기업부 장관 표창 (2023)
- [수상] KISWEL Award 대한용접접합학회 (2023)
- [수상] 영국 왕립공학학술원 (Royal Academy of Engineering) Distinguished Visiting Fellowship (2017)
- [수상] 학술상 대한용접접합학회 (2015)
- [수상] Highly Commended Award Emerald LiteratiNetwork (UK) (2013)
- [수상] 공학한림원 산업부 2020년 대한민국 미래 100대 기술과 주역- 3차원 패키징 (2013)
- [기업 기술이전] 무연솔더, 브레이징 합금, 면상발열체, 고순도 도금액 등



## Byung Jun Jung (정병준 교수)

**Department** Department of Materials Science and Engineering  
**Lab** Organic Electronics Materials Laboratory  
**Ph.D.** Korea Advanced Institute of Science & Technology, 2004  
**Research** Polymer material, Display process & devices  
**E-mail** jungbj@uos.ac.kr  
**Homepage** campus.uos.ac.kr/osc

### Key Words

Polymer material, Display process & devices, Organic electronics, OLED, Photolithography

### Areas of Research

The research of OEM group is focused on organic electronics such as OLED and OTFT. From materials to devices, we are studying the relationship between molecular structure and electrical performance. Currently, we are developing new photolithography process for OLED pixel patterning. Also, we have investigated EUV photoresist patterns.



<Organic Electronics Materials Laboratory Equipment>

### Recent Publications & Projects

- ACS Applied Polymer Materials, "Photoinduced Solubility Modulation in the Copolymers of Fluoroalkyl, Spiropyran, and Isobornyl Methacrylates" (2023)
- Dyes and Pigments, "Efficient TADF from carbon-carbon bonded donor-acceptor molecules based on boron-carbonyl hybrid acceptor" (2023)
- SPIE Proc., "Fluoroalkylated tin-oxo nano clusters as resist candidates for extreme UV lithography" (2023)
- Polymer Chemistry, "Photo-cleavable perfluoroalkylated copolymers for tailoring quantum dot thin films" (2020)
- Micromachines, "Two-Color Pixel Patterning for High-Resolution Organic Light-Emitting Displays Using Photolithography" (2020)
- Microelectronic Engineering, "Descumming fluorine solution for photolithographic patterning of organic light-emitting diodes" (2020)
- 산업통상자원부, "리소그래피(Lithography) 공정에 의한 OLED 화소 형성 기술 개발" (2000~2024)
- 삼성미래기술육성사업, "극자외선 리소그래피 (EUVL)용 레지스트 및 적용공정 개발" (2021~2024)

### Honors & Awards

- [기술이전] 고분소화 포토레지스트와 이를 이용한 유기전자소자의 제조방법 (2023)
- [수상] International Meeting on Information Display (IMID 2022) 우수 포스터 논문상 (2022)



## Hyosun Lee (이효선 교수)

**Department** Department of Materials Science and Engineering  
**Lab** Advanced Nanomaterials for Energy Conversion Laboratory  
**Ph.D.** Korea Advanced Institute of Science & Technology, 2017  
**Research** Analysis of surface and interface in semiconductor processing  
**E-mail** hyosunlee@uos.ac.kr  
**Homepage** www.anec.uos.ac.kr

### Key Words

Nanoparticle, Interfacial effect, Surface composition, 3D support structure, Selective reaction, Liquid phase reaction

### Areas of Research

- Metal nanoparticles on oxide support
- Hollow oxide nanoreactors
- Nanoporous metal with oxide
- Single atom catalysts
- Oxide heterostructures
- Inorganic-organic hybrid porous materials
- Photo-thermal reaction system
- Photocatalysis



<Advanced Nanomaterials for Energy Conversion Laboratory Research Theme>

### Recent Publications & Projects

- The Journal of Physical Chemistry Letters, "Hot Electron Phenomena at Solid-Liquid Interfaces" (2022)
- Nature Communications, "Controlling hot electron flux and catalytic selectivity with nanoscale metal-oxide interfaces" (2021)
- ACS Catalysis, "Dilute Pd/Au Alloys Replace Au/TiO<sub>2</sub> Interface for Selective Oxidation Reactions" (2020)
- 과기부, "미세플라스틱 응집 및 제거를 위한 친환경/고성능 마이크로 모터 시스템 개발" (~2024)

### Honors & Awards

- Joined the Editorial board of the journal "Surface Science and Technology" (2023)



## Dong-Wook Park (박동욱 교수)

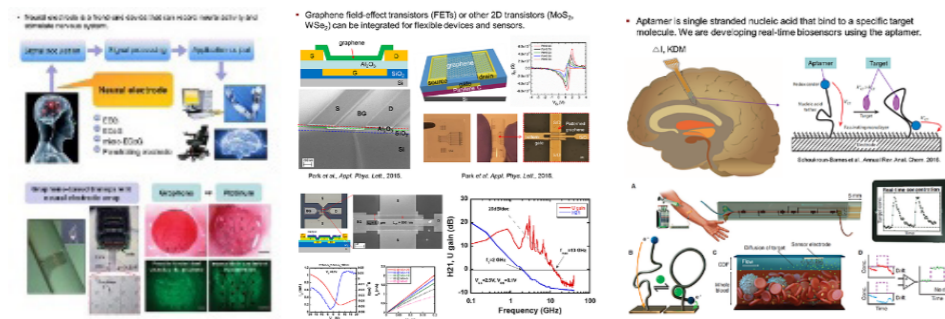
**Department** School of Electrical and Computer Engineering  
**Lab** Bio-Nano Electronics Laboratory  
**Ph.D.** University of Wisconsin-Madison, 2015  
**Research** Biomedical devices and biosensors  
**E-mail** dwpark31@uos.ac.kr  
**Homepage** bionano.uos.ac.kr

### Key Words

Biomedical devices, Biosensors, Transparent Neural electrode, Flexible and Stretchable Devices, DNA Aptamer Sensors

### Areas of Research

- The BNEL is a professional academic who believes in in-depth research and hands-on teaching. Drawing from thorough academic training and extensive research experience, we develop emerging biomedical devices and systems using novel materials and nanotechnologies
- Emerging biomedical devices and biosensors using novel materials and nanotechnology, flexible electronics, neuromorphic devices, and field-effect transistors integrated in microfluidics



<Transparent Neural electrode(left), Flexible and Stretchable Devices(center), DNA Aptamer Sensors(right)>

### Recent Publications & Projects

- Journal of Semiconductor Technology and Science, "Development of Organic Thin-film Transistors on a Biocompatible Parylene-C Substrate" (2023)
- IEEE Electron Device Letters, "Physics-based compact model of current stress-induced threshold voltage shift in top-gate self-aligned amorphous InGaZnO thin-film transistors" (2022)
- Applied Physics Letters, "Trench field-effect transistors integrated in a microfluidic channel and design considerations for charge detection" (2022)
- ACS Nano, "Electrical neural stimulation and simultaneous in vivo monitoring with transparent graphene electrode arrays implanted in GCaMP6f mice" (2018)
- 과기부, "고성능 고신뢰성 생체이식형 유무기 하이브리드 투명 바이오전극 개발" (~2024)
- 산업부, "차세대시스템반도체설계전문인력양성사업" (~2026)
- 과기부, "지능형 사물 에너지 (IoT) 반도체 시스템 융합 다빈치형 인력양성센터" (~2026)

### Honors & Awards

- [기술이전] 뇌 심부 자극 투명 전극 어레이 및 이를 이용한 신경 신호 검출 방법 (2021)
- [수상] 서울시립대학교 우수강의교수상 (2017, 2018, 2019, 2021)
- [수상] 반도체학술대회 우수 포스터 논문상 (2022)
- [수상] 한국전기전자학회 우수 포스터 논문상 (2021)



## Hyeok Kim (김혁 교수)

**Department** School of Electrical and Computer Engineering  
**Lab** Display & Flexible Electronics Laboratory  
**Ph.D.** CNRS & U. Paris 7, 2015  
**Research** Semiconductor devices  
**E-mail** hyeok.kim@uos.ac.kr  
**Homepage** nobel.uos.ac.kr

### Key Words

Semiconductor devices (diode, transistor), Display/sensor/energy semiconductor devices

### Areas of Research

- Display Optoelectronics (TFT for OLED/QLED, Perovskite LED)
- Bioelectronics (Artificial Skin, Biosensor, Biochip)
- Advanced Nano Semiconductor Device
- Flexible Nanoelectronics
- Eco-friendly Energy Device (Energy Harvesting, Solar Cell)



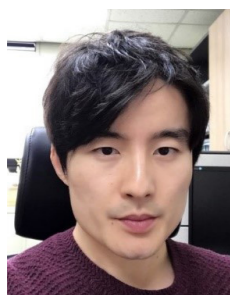
<Solar Panel(left), Flexible Display(center), Convergent Sensors(right)>

### Recent Publications & Projects

- Advanced Functional Materials, "Surface Reconstruction of Ni-Fe Layered Double Hydroxide Inducing Chloride Ion Blocking Materials for Outstanding Overall Seawater Splitting" (2023)
- Solar RRL, "Top-Gate Field Effect Transistor as a Testbed for Evaluating the Photostability of Organic Photovoltaic Polymers" (2022)
- Advanced Energy Materials, "Rational Design of Highly Efficient Semi-Transparent Organic Photovoltaics with Silver Nanowire Top Electrode via 3D Optical Simulation Study" (2021)
- Advanced Materials Interfaces, "Universal Elaboration of Al-Doped TiO<sub>2</sub> as an Electron Extraction Layer in Inorganic-Organic Hybrid Perovskite and Organic Solar Cells" (2020)
- 과기부, "초민감 증폭형 유기 및 페로브스카이트 광센서 연구와 이를 활용한 트랜지스터 어레이 집적회로 개발" (~2026)
- 과기부, "고유연성 폴리머 기반 고민감도 촉각센서 개발" (~2023)

### Honors & Awards

- [기술이전] 유연성 압력센서를 포함하는 스마트 장갑 (2020), 절전형 나노 에너지 하베스터 외 2건 (2020), 자가충전형 저전력 광센서 제조 기술 (2020)



## Yoon Kim (김윤 교수)

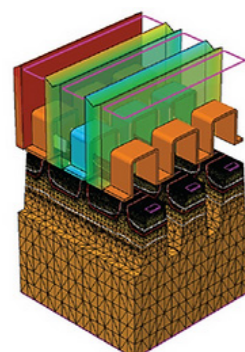
**Department** School of Electrical and Computer Engineering  
**Lab** Advanced Semiconductor Device&Circuit Laboratory  
**Ph.D.** Seoul National University, 2012  
**Research** Semiconductor Transistor  
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### Key Words

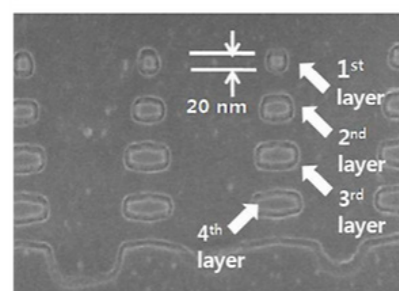
Nano-scale Semiconductor Transistor, Nano-scale Semiconductor Transistor, Neuromorphic Device and System

### Areas of Research

Semiconductors are called rice in the electronics industry. Semiconductor-based transistors are used as core components in all electronic products we use. We are conducting research on the design, manufacturing and analysis of next-generation semiconductor devices and circuits

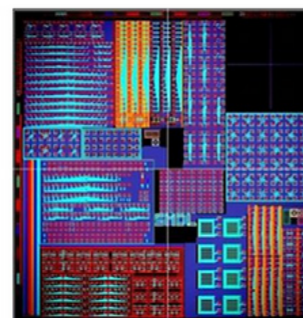


Device TCAD Simulation



3D Nano Device Fabrication

<Nano-scale Semiconductor Transistor>



Device Design

### Recent Publications & Projects

- IEEE Access, "Short- and Long-term Memory Based on a Floating-Gate IGZO Synaptic Transistor" (2023)
- IEEE Transactions on Electron Devices, "Fowler-Nordheim Stress-Induced Degradation of Buried-Channel-Array Transistors in DRAM Cell for Cryogenic Memory Applications" (2022)
- Nano Energy, "Implementation of convolutional neural network and 8-bit reservoir computing in CMOS compatible VRRAM" (2022)
- IEEE Journal of the Electron Devices Society, "NOR-Type Three-dimensional Synapse Array Architecture Based on Charge-Trap Flash Memory" (2022)
- IEEE Access, "Flexible Parylene C-Based RRAM Array for Neuromorphic Applications" (2022)
- 과기부, "전하저장형 메모리 기반 PIM 개발" (~2024)
- 과기부, "실리콘 기반 PIM 특화 소자, 회로, 응용 기술 개발" (~2024)
- 과기부, "인메모리 컴퓨팅 응용을 위한 하이브리드 메모리소자 및 아키텍처 개발" (~2024)

### Honors & Awards

- [수상] 제 31 회 대한전자공학회 해동젊은공학인상 수상 (2021)
- 대한전자공학회(IEEK) 평생회원
- IEEE Member



## Jung Hwa Seo (서정화 교수)

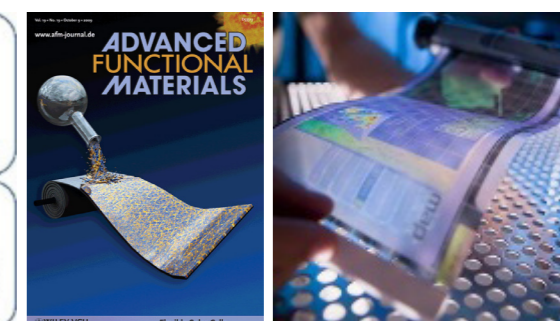
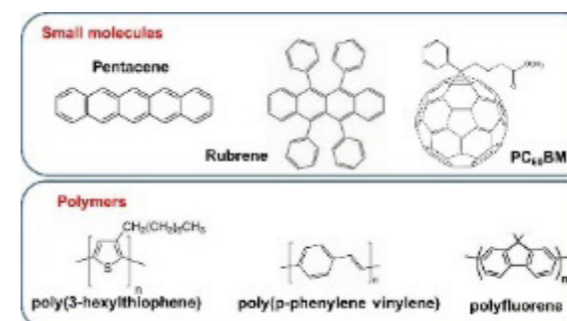
**Department** Department of Physics  
**Lab** Nano materials and devices Laboratory  
**Ph.D.** Yonsei University, 2007  
**Research** Semiconductor materials and electronic devices  
**E-mail** seojh@uos.ac.kr  
**Homepage** sites.google.com/view/lcomofuos

### Key Words

Organic Materials, Organic Solar Cells, Organic Transistors, Organic Light-Emitting Transistors, Spectroscopy, Molecular Simulations

### Areas of Research

Prof. Jung Hwa Seo is a professor at the Department of Physics in University of Seoul. Her research conducts on organic and inorganic hybrid solar cells, transistors, and light-emitting transistors and photoelectron spectroscopy (x-ray and ultraviolet). Her lab employs a range of experimental techniques such as thin film deposition, device fabrication, and spectroscopy to explore the electrical and optical properties of these materials and their behavior at the nanoscale.



<Organic Materials(left), Organic Solar cells(center), Organic Transistors(right)>

### Recent Publications & Projects

- Advanced Materials Interfaces, "Soulution-Processed Metal Ion Polyelectrolytes as Hole Transport Materials for Efficient Inverted Perovskite Solar Cells" (2023).
- Advanced Materials Interfaces, "Improved Hole injection in Hybrid Light-Emitting Transistors Incorporating Lithium and Copper(II) Poly(Styrene Sulfonate)" (2023)
- Journal of Materials Chemistry C, "Highly Efficient Hybrid Light-Emitting Transistors incorporating MoOx/Ag/MoOx Semi-Transparent Electrodes" (2022)
- Applied Surface Science, "Organic cation-polystyrene sulfonate polyelectrolytes as hole transporting interfacial layers in perovskite solar cells" (2022)
- Advanced Functional Materials, "A Simple Cu(II) Polyelectrolyte as a Method to Increase the Work Function of Electrodes and Form Effective p-Type Contacts in Perovskite Solar Cells" (2021)
- 과기부, "이온소재의 도핑 제어를 이용한 유기 homojunction 소자 개발" (~2024)

### Honors & Awards

- [수상] 과학기술상 (여성과학자상) (2018)



## Joongho Choi (최종호 교수)

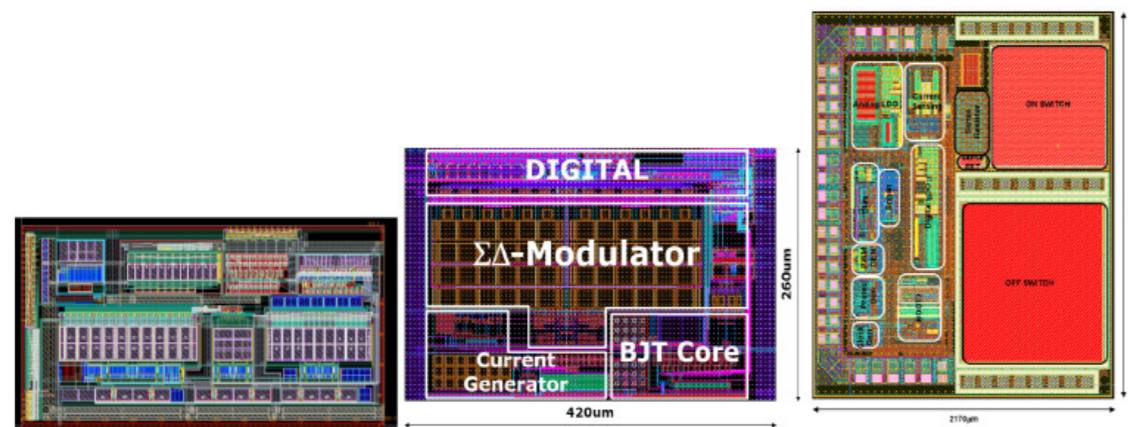
**Department** School of Electrical and Computer Engineering  
**Lab** Integrated Circuit Design Laboratory  
**Ph.D.** University of Southern California, 1993  
**Research** Analog Integrated Circuit Design  
**E-mail** jchoi@uos.ac.kr  
**Homepage** www.iclab02.uos.ac.kr

### Key Words

High performance analog filter design, ADC, DAC, Oversampling data converter, PMIC (Power Management IC)

### Areas of Research

Analog and mixed-signal integrated circuit design has been studied in this lab since 1998. The main research area is design of high-performance analog front-end (filter and amplifier), analog-to-digital converter, digital-to-analog converter, oversampling data converter, and PMIC (power management IC). Various IC design works and research results are available through many government and industrial projects as well as technical consultants.



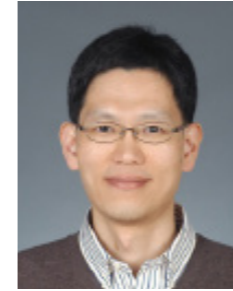
<ADC Communications for IoT(left), H/W performance monitoring sensor(center), Mobile power management IC(right)>

### Recent Publications & Projects

- Journal. of Semiconductor Technology and Science, "An 11-bit 50-MS/s Pipelined ADC using Circuit-sharing Techniques" (2019)
- 파두, 전력 손실 방지를 위한 전력 관리 IC 설계 (~2024)
- 산업부, "600V급 GaN 소자 집적 고효율 지능형 태양광 에너지 변환 시스템 개발" (~2024)
- 산업부, "차세대 시스템반도체 설계 전문인력 양성사업" (~2026)
- 과기부, "지능형 사물 에너지 (iEoT) 반도체 시스템 융합 다빈치형 인력양성센터" (~2026)

### Honors & Awards

- [반도체의 날 "근정포장"] 저전력 아날로그, 디지털 변환기 설계자상(IP) 개발, 기술 자문 대통령 근정포장 (2022)
- [기술이전] 전력 관리 IC 설계 (2023), 센서용 고해상도 ADC 설계 (2020), 모바일 스마트 기기를 위한 전력관리 IC 설계기술 (2017), 고해상도 ADC 설계 기술 (2017), 센서 응용 저전력 ADC IP 설계 기술 (2017)



## Yongsam Moon (문용삼 교수)

**Department** School of Electrical and Computer Engineering  
**Lab** Integrated Systems Laboratory  
**Ph.D.** Seoul National University, 2001  
**Research** Semiconductor Circuit Design  
**E-mail** ysmoon001@uos.ac.kr  
**Homepage** campus.uos.ac.kr/isl

### Key Words

High-Speed Interface(SATA, PCIe, GE, FC, HDMI) Circuit, Clock and Data Recovery(CDR, PLL) Circuit

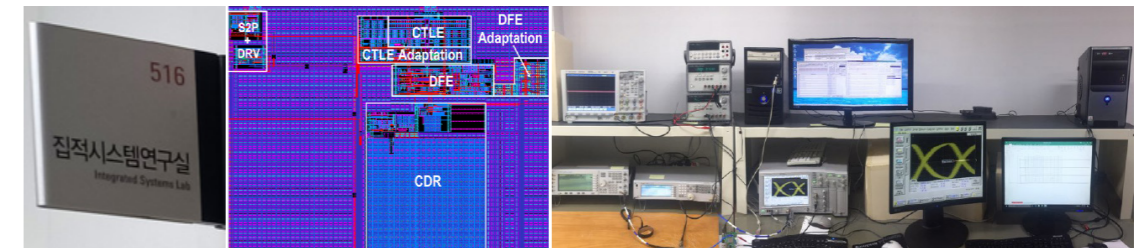
### Areas of Research

#### Core Research Areas

- Analog Circuit Design
- Integrated Circuit Design for PC/Network/CE/Storage/Display Systems

#### Detailed Research Areas

- High-speed interface for chip-to-chip and system-to-system data-communication circuit
- Clock generation circuit based on PLL/DLL(phase-/delay-locked loop)
- Clock and data recovery (CDR) to extract the clean clock and data from distorted data
- Cable Equalizer to compensate for data attenuation caused when passing through a cable



<Integrated Systems Laboratory Equipment>

### Recent Publications & Projects

- Journal of Semiconductor Technology and Science, "A 28-nm CMOS 11.2-Gbps Receiver Based on Adaptive CTLE and Adaptive 3-Tap DFE With Hysteresis Low-Pass Filter" (2021)
- 삼성전자, "56-Gbps PAMx Transceiver 설계" (~2024)
- 과기부, "수직 적층 인공지능 플랫폼을 위한 신소자 기반 초고집적 적응형 시냅스 어레이 및 CMOS 집적회로" (~2023)

### Honors & Awards

- [발전기여 특별공로상] 서울시립대학교 2023년 대학발전포럼 반도체 분야 특별공로상 (2023)
- [기술이전] HD-SDI Transmitter 기술 (2018), HD-SDI Phase-Locked Loop 기술 (2018), HD-SDI Receiver 기술 (2018), HD-SDI Equalizer 기술 (2019), HD-SDI Bi-Directional Transceiver 기술 (2019)



## Moon-Que Lee (이문규 교수)

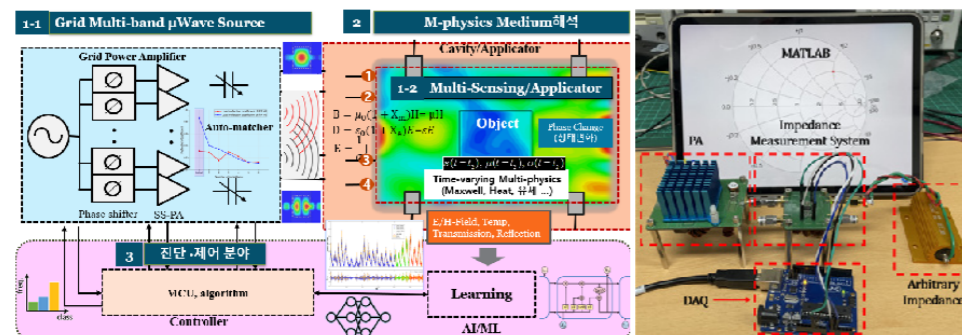
**Department** School of Electrical and Computer Engineering  
**Lab** Intelligent RF energy center  
**Ph.D.** Seoul National University, 1999  
**Research** Analog Integrated Circuit Design  
**E-mail** mqlee@uos.ac.kr  
**Homepage** cafe.naver.com/mwm

### Key Words

RF/Microwave energy applications (plasma, heating, and wireless power transfer), RF System Design, RF/mmWave Circuit and System Design, Satellite RF/Microwave payload design

### Areas of Research

- RF/Microwave heating system design (RF source, applicator, sensor)
- RF/Microwave generator and V/I sensor for plasma generation
- RF active and passive components design (e.g., Switching-mode power amplifier, auto-matcher, RF/microwave IC, Ceramic Filter/Duplexer, etc.)



### Recent Publications & Projects

- IEEE Access "High Power Microwave Signal Generation Based on Recursive Balanced Power Amplifier" (2023)
- International Journal of RF and Microwave Computer-Aided Engineering, "Wide E-Plane Beamwidth Microstrip Patch Antenna Using H-Shaped Gap-Coupling with Three Parasitic Patches for the K-Band" (2023)
- 과기부, "ISM 응용을 위한 지능형 마이크로파 에너지 시스템 핵심·원천 기술 개발" (~2030)
- 과기부, "전자기파를 활용한 알츠하이머 치료 기술 연구" (~2025)
- 과기부, "다중 무선 충전을 위한 근역 자기장 성형 기술 개발" (~2025)
- 과기부, "차세대 위성 핵심기술 개발" (~2024)

### Honors & Awards

- [수상] The 14th Global Symposium on Millimeter-Waves & Terahertz (GSMM) Best Paper Awards (2022), 제7회 전자파측정 논문경진대회 (2022), 제33차 한국전자파학회 정기총회 및 추계학술대회 학술상 수상 (2021), IEEE RFID conference Best-paper award (2013년)
- [표창] 장관표창 (2021)-주파수업무-면허/비면허(2021), 전파산업활성화(2015), 서울지방중소벤처기업청장상 (2022)
- [기술이전] 선택적 전력 분배 기능을 갖는 전력 분배기 (2021), 근접장 응용을 위한 RFID 신호 처리 장치 (2020), Ceramic Filter/Duplexer (2023)
- 국가주파수심의위원, 비면허 실무위원회 위원, 국가심 ICT융합전문위원 등



## Seung-Hwan Lee (이승환 교수)

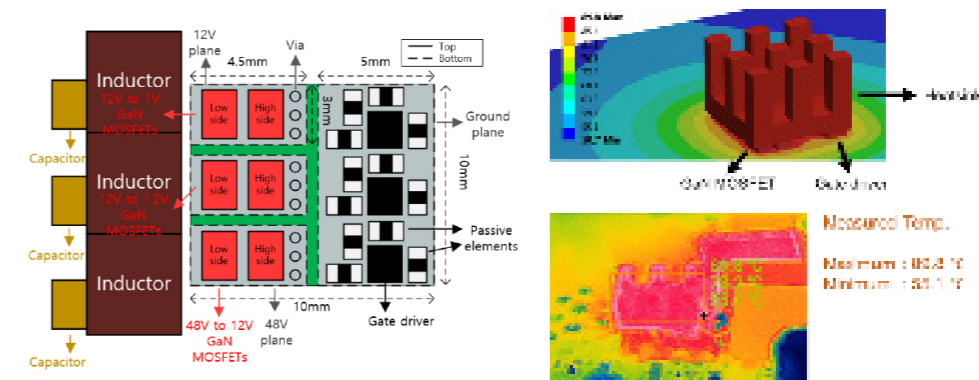
**Department** School of Electrical and Computer Engineering  
**Lab** Power Electronics & Energy Transfer Systems Laboratory  
**Ph.D.** University of Wisconsin-Madison, 2013  
**Research** Power Electronics, Wireless Power Transmission  
**E-mail** seunghlee16@uos.ac.kr  
**Homepage** sites.google.com/site/uospeets

### Key Words

Power electronics, Resonant wireless power transfer system design, High frequency resonant inverter/converter, High frequency magnetic component, Intelligent power electronics transformer

### Areas of Research

- Resonant wireless power transfer system design
- High efficiency, high power density converter design
- High-frequency magnetic component (inductor, transformer) design
- High-frequency PV system design
- PMIC thermal management



### Recent Publications & Projects

- IEEE Trans. on Industrial Electronics, "Sensorless Control of Series-Series Tuned Inductive Power Transfer System" (2022)
- IEEE Trans. on Industry Applications, "A Novel Solid-State Transformer with Loosely Coupled Resonant Dual-Active-Bridge Converters" (2021)
- IEEE Trans. on Industrial Electronics, "Load Voltage and Current Observers for Series-Series Wireless Power Transfer System" (2021)
- 과기부, "중전압(Medium-Voltage)계통 직결위안 Xformerless, Sensorless 멀티레벨 무선전력전송 시스템 연구" (~2025)
- 산업부, "차세대시스템반도체설계전문인력양성사업" (~2026)
- 과기부, "지능형 사물 에너지 (iEoT) 반도체 시스템 융합 다빈치형 인력양성센터" (~2026)

### Honors & Awards

- [수상] 2020 IEEE PELS Workshop on Emerging Technologies: Wireless Power Transfer Best Paper Awards (2022)
- [수상] 2021년 우수강의교수상 (2022)