MinJae Kim

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Education

Korea Advanced Institute of Science and Technology (KAIST) *Daejeon, Korea*

Undergraduate, Department of Materials Science and Engineering *Feb. 2019 - Present*

- KAIST Presidential Fellowship (2021 - Present), Honor Student (Mar. 2021 - Present)
- Total GPA of 4.23/4.3 (99.3/100), Acquired credits: 147/136 (including 27 graduate-level coursework credits)
- Department Honor Scholarship (top 4 in department): 3 times, Dean's List (top 3% in department): 5 times
- College of Engineering (CoE) Leadership Award (Recognition for research excellence): 2 times
- Served Korean military duty (Mar. 2021 –Sep. 2022)

Research Experience

Integrated Organic Electronics Lab., KAIST *Daejeon, Korea*

Undergraduate Researcher (Advisor: Prof. Seunghyup Yoo) *Feb. 2024 –Present*

- Project title: Near-planar light outcoupling structure for ultra-efficient organic light-emitting diodes
  - Conceived and developed unique optical structure capable of efficiently outcoupling substrate mode of organic light-emitting diodes through trans-scale optical approach
  - With the intrusiveness identical to closest-packed hemispheric microlens, the proposed optical structure rivals macro half-ball lens in light outcoupling efficiency
  - Granted KAIST Undergraduate Research Program
- Project title: Ultralow-power wearable pCO_2 sensor for seamless healthcare monitoring
  - Enabled flexible sensor capable of physiological pCO_2 monitoring with ultralow power consumption and operational stability

Wellman Center for Photomedicine, Massachusetts General Hospital *Boston, MA*

Research Intern (Advisor: Prof. Conor L. Evans) *Jun. 2023 –Aug. 2023*

- Project title: Intrinsically stretchable pCO_2 sensor enabled by multi-functional block copolymer matrices
  - Devised and synthesized novel block copolymer matrices for realization of stretchable pCO_2 sensors with excellent sensing capability and mechanical properties
  - Awarded People's Choice Award at poster session of Harvard-MIT Summer Institute at MGH

Next-Generation Optoelectronic Nanomaterials Lab., KAIST *Daejeon, Korea*

Undergraduate researcher (Advisor: Prof. Himchan Cho) *Jul. 2022 –Dec. 2023*

- Project title: Development of highly luminescent and stable quasi-2D perovskites based on multi-functional asymmetric spacers
  - Devised and validated geometrically and electronically asymmetric spacer for Dion-Jacobson phase quasi-2D perovskite
  - Granted KAIST Undergraduate Research Program, Awarded Grand Prix at 2023 Undergraduate Research Program Workshop
  - Awarded Best Poster Presentation Award at 2023 Spring Meeting of Korean Institute of Materials and Metals (Apr. 2023)
- Project title: Effective passivation of quasi-2D perovskites enabled by π-conjugated planar molecules
  - Delivered oral presentation at 7th International Conference on Advanced Electromaterials (Nov. 2023)

Presentations

Oral

2024 **Near-Planar Light Outcoupling Structure for Ultra-Efficient Organic Light-Emitting Diodes**, Optics and Photonics Congress 2024 *Jeju, Korea*

2023 **Effective Passivation of Quasi-2D Perovskites Enabled by π-conjugated Planar Molecules**, 7th International Conference on Advanced Electromaterials (ICAE 2023) *Jeju, Korea*

2020 **Application of PEDOT:PSS Thin Film Fabricated via Hot-casting as Hole Transport Layer of Perovskite Solar Cell**, Stockholm International Youth Science Seminar (SIYSS) *On-line*

Poster

2023 **Intrinsically Stretchable pCO_2 Sensor Enabled by Multi-functional Block Copolymer Matrices**, Harvard-MIT Summer Institute at MGH *Boston, MA*

2023 **Highly Luminescent and Stable Quasi-2D Perovskites based on Multi-functional Asymmetric Spacer**, Spring Meeting of Korean Institute of Metals and Materials *Jeju, Korea*

Patents

2023	Passivation agents donating pi-conjugated electron density, inorganic semiconductors and perovskites including the same, and methods for producing the same	*Pending (10-2023-0167999)*	*Korea*
2023	Perovskite material including multi-functional asymmetric organic spacer and light-emitting device including the same	*Pending (10-2023-0118990)*	*Korea*

Honors & Awards (Selected)

Scholarships

2023	**Yeonghan Kim Global Leader Scholarship**, KAIST	*Daejeon, Korea*
2023	**Woonhae Scholarship (2023-2024)**, Woonhae Foundation	*Changwon, Korea*
2022	**Dream Supporter Scholarship (2022-2024)**, Global Hansang Dream Foundation	*Ulsan, Korea*
2021	**KAIST Presidential Fellowship (2021-2024)**, KAIST	*Daejeon, Korea*
2019	**National Presidential Science Scholarship (2019-2024)**, Korea Student Aid Foundation	*Seoul, Korea*

Honors

2024	**National Delegate, 73rd Lindau Nobel Laureate Meeting**, Council for the Lindau Nobel Laureate Meetings	*Bavaria, Germany*
2024	**National University of Singapore Young Fellow**, National University of Singapore	*Singapore*
2023	**Young Future Energy Leader**, Khalifa University	*Abu Dhabi, UAE*
2023	**Representative of KAIST, Young Engineers Honor Society**, National Academy of Engineering of Korea	*Seoul, Korea*
2020	**National Delegate and Nobel Ceremony Guest**, Stockholm International Youth Science Seminar (SIYSS)	*On-line*
2020	**Cadet of Research Officer for National Defense (과학기술전문사관)**, Ministry of Science and ICT	*Seoul, Korea*

Awards

2023	**Donggyo Injae Award (동교인재상)**, Surim Foundation	*Seoul, Korea*
2023	**Grand Prix, Undergraduate Research Participation (URP) Workshop**, KAIST	*Daejeon, Korea*
2023	**Best Poster Presentation Award**, 2023 Spring Meeting, Korean Institute of Metals and Materials	*Jeju, Korea*
2021	**Talent Award of Korea (대한민국 인재상)**, Ministry of Education	*Seoul, Korea*
2021	**Youth Hero Prize**, Korea Scout Association	*Seoul, Korea*
2020	**Excellence in Mentorship Award**, Samsung Welfare Foundation	*Ansan, Korea*

Extracurricular Activities

Young Engineers Honor Society, National Academy of Engineering of Korea — *Seoul, Korea*

2023 Representative of KAIST, Full Member (Registration no. Y34-14) — *Sep. 2020 –Present*

- Served as representative of KAIST (Jan. 2023 - Dec. 2023)
- Hosted Junior Engineering Classes for elementary and middle school students, and delivered lectures at Specialty Info Sessions for high school students

KAIST Center for Excellence in Learning and Teaching — *Daejeon, Korea*

Special Lecture Speaker — *Nov. 2022*

- Delivered a special lecture entitled “Connecting dots in your undergraduate life” at KAIST Tip Talk program
- Lecture video was shared on Youtube and KAIST Learning Management System (KLMS)

References

Seunghyup Yoo, Ph.D.
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