

Juhee Ko

291 Daehak-ro, N7-4 3113
Daejeon, Republic of Korea 34141
☎ (010) 5134 8239
✉ juheeko@kaist.ac.kr
📧 mnil.kaist.ac.kr



Education

- 2019.03– **Masters of Science in Mechanical Engineering,**
2021.02 *Korea Advanced Institute of Science and Technology.*
Advisor: Prof. Jungchul Lee
- 2015.03– **Bachelor of Mechanical Engineering,**
2019.02 *Sogang University, GPA – 4.2/4.5.*
Summa Cum Laude

Research Area

- Nanomechanical sensing with heater-integrated microchannel resonator (Master-Ph.D)
- Hydrogel-modified resonating physical/chemical resonating sensor (Undergraduate-Master)

Awards

- Sep. 20, 2023 **Best Poster Presentation Award, The 14th Japan-China-Korea Joint Conference on MEMS/NEMS (JCK MEMS/NEMS).**
Juhee Ko, Jungchul Lee
- Hyper-multimodal measurements with heater-integrated fluidic resonators to analyze quaternary liquid mixtures
- May. 18, 2023 **Outstanding Student Oral Presentation Award, The 18th International Conference on Nano/Micro Engineered and Molecular Systems (IEEE NEMS 2023).**
Juhee Ko, Jungchul Lee
- Real-time viscosity measurement under temperature modulation by heater-integrated fluidic resonators
- May. 12, 2023 **Outstanding Poster Presentation Award, Spring conference of Korean Society of Mechanical Engineering – Micro/Nano division.**
Taeyeon Kim, **Juhee Ko,** Jungchul Lee
- Top-down mass production of uniform silicon nanoparticles via high temperature annealing
- Jan. 19, 2023 **Outstanding Student Oral Presentation Award Finalist, The 36th IEEE International Conference on Micro Electro Mechanical Systems (IEEE MEMS 2023).**
Juhee Ko, Bong Jae Lee, Jungchul Lee
- Advanced Thermophysical Properties Measurements using Heater-integrated Fluidic Resonators

- Aug. 10, 2022 **Best Online Poster Award**, *18th International Workshop on Nanomechanical Sensing (NMC 2022)*.
Juhee Ko, Bong Jae Lee, Jungchul Lee
 - Heated fluidic resonators thermophysical properties and phase transition measurements of ultrasmall liquid volume
- Aug. 26, 2022 **Best Paper Award**, *2022 Fall Conference of the Korean Sensors Society*.
Juhee Ko, Bong Jae Lee, Jungchul Lee
 - Vacuum operation of heated microchannel resonators for sensitivity enhancement upon thermophysical properties measurements
- May. 19, 2022 **Best Paper Award**, *2022 Spring KSME conference – Micro Nano Division*.
Juhee Ko, Bong Jae Lee, Jungchul Lee
 - 마이크로채널 공진기를 이용한 100 피코리터 이하 액상 이원화 혼합물의 질량 밀도와 몰분율 동시 측정
- Feb. 7, 2022 **Silver Award**, *Samsung Humantech Paper Award*.
Juhee Ko
 - Heated microchannel resonator: A new experimental platform for microscale heat transfer
- Nov. 20, 2020 **Encouragement Award**, *KSME-SEMES Open Innovation Challenge*.
Juhee Ko, Jungchul Lee, Taeyeong Kim, Bong Jae Lee
 - 초고분해능 인쇄 전자 소자를 위한 가열 전극이 통합된 캔틸레버 기반 패터닝 기술
- May. 23, 2019 **Encouragement Award**, *Photo Contest in KSME*.
Juhee Ko
 - "Manufacturing and Instrumentation Laboratory (MNIL)"
- Dec. 13, 2018 **Silver Award**, *KSME-SEMES Open Innovation Challenge*.
 Dasom Yang, **Juhee Ko**
 - FinFET sidewall 이미징을 위한 초고종횡비 CNT/고분자 팁 기반 Quartz Tuning Fork 스캐닝 기술
- Feb. 7, 2018 **Gold Award**, *Samsung Humantech Paper Award*.
 Bora Lee, Yeowon Yoon, **Juhee Ko**
 - Batch fabrication of photocurable polymeric probes in separable and reusable microfluidic mold assembly
- Nov. 02, 2017 **Silver Award**, *KSME-SEMES Open Innovation Challenge*.
 Jungchul Lee, Seokbeom Kim, Yeowon Yoon, Bora Lee, **Juhee Ko**
 - 차세대 반도체 생산 라인 인라인 분석을 위한 고속 내마모 원자현미경 탐침 상용화 기술
- Jul. 14, 2017 **Best Poster Award**, *Nano Korea 2017*.
Juhee Ko, Seokbeom Kim, Yeowon Yoon, Jungchul Lee
 - Hydrogel tip attached quartz tuning fork by using a mold fabricated from electrochemically etched tungsten wire

Publications

1. **Juhee Ko**, Hyunjoon Son, Bong Jae Lee, Gun Ho Kim, Jungchul Lee, "Subcutaneous temperature prediction during cryogenic jet cooling by surface temperature measurements and RNNs, Applied Thermal Engineering (IF 6.4), Submitted (2023).
2. **Juhee Ko**, Bong Jae Lee, Jungchul Lee, "Advanced operation of heated fluidic resonators via mechanical and thermal loss reduction in vacuo, Microsystems and Nanoengineering (IF 7.9), accepted (2023). doi:10.1038/s41378-023-00575-3
3. Anna Danielak, **Juhee Ko**, Aminul Islam, David Bue Pedersen, Jungchul Lee, "Hydrophobic surface for direct PEGDA micro-pattern fabrication, Micro and Nano

- Systems Letters (IF 3.6), **11**, 4 (2023). doi:10.1186/s40486-023-00169-8
4. **Juhee Ko**, Ben Fredj Nada, Adhawiyah Rafita Erli, Jungchul Lee, "Nozzle-based precision patterning with micro/nano-fluidics integrated cantilevers", Journal of Mechanical Science and Technology (IF 1.6), **37** 887-900 (2023). doi:10.1007/s12206-023-0130-5
 5. **Juhee Ko**, Faheem Khan, Youngsuk Nam, Bong Jae Lee, Jungchul Lee, "Nanomechanical sensing using heater-integrated fluidic resonators" Nano Letters (IF 10.8), **22** (19), 7768-7775 (2022). doi:10.1021/acs.nanolett.2c01572
Selected as a Front Cover
 6. **Juhee Ko**, Bong Jae Lee, Jungchul Lee, "Towards highly specific measurement of binary mixtures by tandem operation of nanomechanical sensing system and micro-Raman spectroscopy" Sensors and Actuators: B-Chemical (IF 8.4) **367**, 132133 (2022). doi:10.1016/j.snb.2022.132133
 7. Taeyeong Kim⁺, **Juhee Ko**⁺, Jungchul Lee, "Self-assembled silicon membrane resonator for high vacuum pressure sensing" Vacuum (IF 4.0) **201**, 111101 (2022). doi: 10.1016/j.vacuum.2022.111101
 8. **Juhee Ko**, Jaewoo Jeong, Sukbom Son, Jungchul Lee, "Cellular and biomolecular detection based on suspended microchannel resonators" Biomedical Engineering Letters (IF 4.6), **11**, 367-382 (2021). doi: 10.1007/s13534-021-00207-7
 9. Danny Wong, Osama Abuzalat, **Juhee Ko**, Jungchul Lee, Seonghwan Kim, Simon S. Park, "Intense pulsed light-treated near-field electrospun nanofiber on a quartz tuning fork for multimodal gas sensors" ACS Applied Materials & Interfaces (IF 9.5), **12**, 21, 24308-24318 (2020). doi: 10.1021/acsami.0c02263
 10. **Juhee Ko**, Donghyuk Lee, Bong Jae Lee, Sang Ken Kauh, Jungchul Lee, "Micropipette resonator enabling targeted aspiration and mass measurement of single particles and cells" ACS Sensors (IF 8.9), **4**, 3275-3282 (2019). doi: 10.1021/acssensors.9b01843
Selected as a Back Cover
 11. **Juhee Ko**, Amun Jarzembski, Keunhan Park, Jungchul Lee, "Hydrogel tip attached quartz tuning fork for shear force microscopy" Micro and Nano Systems Letters (IF 3.6) **6**, 8 (2018). doi: 10.1186/s40486-018-0071-4
 12. **Juhee Ko**, Yeowon Yoon, Jungchul Lee, "Quartz tuning forks with hydrogel patterned by dynamic mask lithography for humidity sensing" Sensors and Actuators: B-Chemical (IF 8.4) **273**, 10, 821-825 (2018). doi: 10.1016/j.snb.2018.06.099
 13. Jaeseol Lee, Doyoun Kim, Yeowon Yoon, Bora Lee, **Juhee Ko**, Jungchul Lee, "Hydrogel tip integration onto tipless silicon cantilevers for atomic force microscopy and its facile regeneration" Journal of Microelectromechanical Systems (IF 2.7) **27**, 125-126 (2018). doi: 10.1109/JMEMS.2018.2805778

Patents

- Mar. 2022 **압력 측정장치와 이를 이용한 압력 측정방법** (Pressure sensing device and pressure sensing method using the same)
Jungchul Lee, Taeyeong Kim, **Juhee Ko** / Korean Patent, 10-2022-0029553
- Aug. 2021 **미소량유체의 열물성 측정장치 및 측정방법** (Microchannel resonator device for thermophysical properties measurement and its methodology)
Jungchul Lee, **Juhee Ko**, Bong Jae Lee / Korean Patent, 10-2022-0001182

- May. 2021 **입자 측정장치 및 입자 측정방법** (Sensor integration of interferometric and resonance measurement systems for identifying heterogeneous viruses)
Jungchul Lee, **Juhee Ko**, Taeyeong Kim / Korean Patent, 10-2021-0066499 (application), 10-2469917 (publication)
- Feb. 2021 **가열식 캔틸레버 구조 유동 채널을 갖는 인쇄용 잉크 디스펜싱 장치 및 이의 제조 방법** (Viscosity control and high resolution printing technology with printed electronics inks using heating electrode and flow channel integrated resonator)
Jungchul Lee, **Juhee Ko**, Faheem Khan / Korean Patent, 10-2021-0026592
- Jun. 2019 **대형 사이즈 하이드로젤 탐침 생산방법 및 하이드로젤 탐침**
Jungchul Lee, **Juhee Ko**, Keunhan Park, Amun Jarzembksi / Korean Patent, 10-2017-0159925 (application), 10-2019-0061489 (publication)

Conferences

- Sep. 2023 **The 14th Japan-China-Korea Joint Conference on MEMS/NEMS (JCK MEMS/NEMS)**, Jeju, Korea
(Poster) **Juhee Ko**, Jungchul Lee
Hyper-multimodal measurements with heater-integrated fluidic resonators to analyze quaternary liquid mixtures
- June. 2023 **The 22nd International Conference on Solid-State Sensors, Actuators and Microsystems**, Kyoto, Japan
(Poster) **Juhee Ko**, Hyunjoon Son, Seongjin Kim, Gun-Ho Kim, Jungchul Lee
Sub-skin temperature prediction from skin temperature distribution for frostbite-free cryo-anesthesia
- May. 2023 **18th IEEE International Conference on Nano/Micro Engineered and Molecular Systems (IEEE NEMS 2023)**, Jeju Island
(Oral) **Juhee Ko**, Jungchul Lee
Real-time viscosity measurement under temperature modulation by heater-integrated fluidic resonators
- May. 2023 **18th IEEE International Conference on Nano/Micro Engineered and Molecular Systems (IEEE NEMS 2023)**, Jeju Island
(Poster) Rafita Erli Adhawiya, **Juhee Ko**, Jungchul Lee
Electroless Gold Deposition and 4-Mercaptopyridine Modification onto The Tipless Cantilever for Mercury Ion Detection
- Mar. 2023 **The 25th Korean MEMS Conference (KMEMS 2023)**, Jeju Island
(Poster) **Juhee Ko**, Hyunjoon Son, Seongjin Kim, Gun-Ho Kim, Jungchul Lee
Subsurface temperature prediction by neural networks with in-situ surface temperature measurement during skin cryo-anesthesia
- Jan. 2023 **The 36th IEEE International Conference on Micro Electro Mechanical Systems (IEEE MEMS 2023)**, Munich, Germany
(Oral) **Juhee Ko**, Bong Jae Lee, Jungchul Lee
Advanced thermophysical properties measurements using heater-integrated fluidic resonators

- Nov. 2022 **2022 Fall conference of Micro Nano Systems (MNS)**, Gwangju
(Poster) **Juhee Ko**, Jungchul Lee
Uncertainty analysis for fast and synchronized multimodal measurements using a microscope heater-integrated fluidic resonator
- Nov. 2022 **2022 Fall conference of Korean Society of Mechanical Engineering (KSME)**,
(Oral) Jeju Island
Juhee Ko, Bong Jae Lee, Jungchul Lee
가열 소자 통합 채널 공진기의 액체 열물성 측정 성능 개선을 위한 진공 환경 구동
- Aug. 2022 **2022 Fall Conference of the Korean Sensors Society (KSS)**, Yeosu
(Poster) **Juhee Ko**, Bong Jae Lee, Jungchul Lee
Vacuum operation of heated microchannel resonators for sensitivity enhancement upon thermophysical properties measurements
- Aug. 2022 **18th International Workshop on Nanomechanical sensing (NMC2022)**, Bangalore, India (Hybrid)
(Poster) **Juhee Ko**, Bong Jae Lee, Jungchul Lee
Heated fluidic resonators for thermophysical properties and phase transition measurements of ultrasmall liquid volume
- Apr. 2022 **The 24th Korean MEMS Conference (KMEMS 2022)**, Jeju Island
(Poster) **Juhee Ko**, Youngsuk Nam, Bong Jae Lee, Jungchul Lee
-Thermophysical properties and phase change measurements for ultrasmall volume liquids using heater integrated microchannel resonators
- Apr. 2022 **The 24th Korean MEMS Conference (KMEMS 2022)**, Jeju Island
(Poster) Taeyeong Kim, **Juhee Ko**, Jungchul Lee
-High-vacuum pressure sensor with silicon-on-nothing (SON) membrane resonators
- Jan. 2022 **Spring conference of Nano Convergence Conference (NCC)**, Gwangju
(Oral) **Juhee Ko**, Bong Jae Lee, Jungchul Lee
-Revealing thermophysical properties of 20 pL liquids using microchannel resonators with a built-in heater
- Nov. 2021 **Micro Nano Systems Conference**, An-myeon Island
(Poster) **Juhee Ko**, Bong Jae Lee, Jungchul Lee
-액체 밀도 및 분자 지문의 동시 측정 및 시료 구별 성능의 향상을 위한 공진 주파수 및 라만 측정 시스템의 통합
- Nov. 2021 **Fall Conference of Korean Society of Mechanical Engineers (KSME)**, Gwangju
(Oral) **Juhee Ko**, Bong Jae Lee, Jungchul Lee
-Simultaneous measurement of mass density and mole fraction for sub-100 picoliter liquid binary mixture inside microchannel resonators"
- Nov. 2021 **Fall Conference of Korean Society of Mechanical Engineers-Thermal Engineering Division (KSME)**, Gwangju
(Poster) Jeongmin Nam, **Juhee Ko**, Bong Jae Lee, Jungchul Lee
-Precise temperature measurement of a micro-heater by high-resolution infrared thermometry

- May. 2021 **Spring Conference of Korean Society of Mechanical Engineers-Thermal Engineering Division (KSME)**, Jeju Island
(Poster) **Juhee Ko**, Bong Jae Lee, Jungchul Lee
-Thermal properties measurements of liquids using pulse operation with heater integrated microchannel resonators
- Apr. 2021 **The 23rd Korean MEMS Conference (KMEMS 2021)**, Buyeo
(Oral) **Juhee Ko**, Bong Jae Lee, Jungchul Lee
-Dynamic inertial imaging of heater integrated microchannel dispensers for real-time monitoring of bubble jet
- Apr. 2021 **The 23rd Korean MEMS Conference (KMEMS 2020)**, Buyeo
(Poster) **Juhee Ko**, Bong Jae Lee, Jungchul Lee
-Thermal properties measurements of liquids using pulse operation with heater integrated microchannel resonators
- Jan. 2021 **The 34th International Conference on Micro Electro Mechanical Systems**, Munich(Online), Germany
(Poster) **Juhee Ko**, Faheem Khan, Bong Jae Lee, Jungchul Lee
-Precision printing and microstructure fabrication using microcantilevers with fluidic channel and dispensing nozzle
- Dec. 2020 **Fall Conference of Korean Society of Mechanical Engineers (KSME)**, Jeongseon
(Poster) **Juhee Ko**, Bong Jae Lee, Jungchul Lee
-Real-time resonance frequency monitoring for microbubble nucleation and evolution inside heater integrated microchannel cantilever
- Aug. 2020 **The 22nd Korean MEMS Conference (KMEMS 2020)**, Pyeongchang
(Oral) **Juhee Ko**, Bong Jae Lee, Jungchul Lee
-Fabrication and characterization of high resolution suspended micro channel dispensers with an integrated heater
- Jun. 2019 **The 21st Korean MEMS Conference (KMEMS 2019)**, Jeju
(Oral) **Juhee Ko**, Faheem Khan, Bong Jae Lee, Jungchul Lee
-Selective aspiration and in-situ mass measurement for microparticles and unicellular Organisms by micropipette resonators
- Jun. 2019 **2019 20th International Conference on Solid-State Sensors, Actuators and Microsystems and Eurosensors XXXIII (TRANSDUCERS and EUROSENSORS XXXIII)**, Berlin, Germany
(Oral) **Juhee Ko**, Faheem Khan, Bong Jae Lee, Jungchul Lee
-Aspiration and mass measurements of microparticles and unicellular organisms via micropipette resonators, doi: 10.1109/TRANSDUCERS.2019.8808552
- Jan. 2019 **The 32nd International Conference on Micro Electro Mechanical Systems**, Seoul, Korea
(Open Poster) **Juhee Ko**, Amun Jarzembski, Yeowon Yoon, Keunhan Park, Bong Jae Lee, Jungchul Lee
-Modifying quartz tuning forks for shear force microscopy and humidity sensing

Jan. 2018 **The 31st International Conference on Micro Electro Mechanical Systems**
(Poster) **(MEMS 2018)**, United Kingdom
Juhee Ko, Amun Jarzembski, Keunhan Park, Jungchul Lee,
-Hydrogel tip attached quartz tuning fork using elastomeric tip mold replicated from
electrochemically etched tungsten wire, doi:10.1109/MEMSYS.2018.8346691