

# SUNGHWAN LEE

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## ***EDUCATION & TRAINING***

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Cambridge, MA	<b>Harvard University</b> Postdoctoral Fellow in Materials Science & Applied Physics Advisor: Shriram Ramanathan Teaching Fellow in Applied Physics	Aug. 2014-Aug. 2015 Jan. 2015-Jul. 2015
Cambridge, MA	<b>Massachusetts Institute of Technology (M.I.T)</b> Postdoctoral Associate in Chemical Engineering Advisor: Karen K. Gleason	Feb. 2013-Aug. 2014
Providence, RI	<b>Brown University</b> Ph.D. in Materials Science (minor: Electrical Engineering) Advisor: David C. Paine (Visiting graduate student in the School of Engineering, Feb. 2007-Sep. 2007)	Feb. 2013
Daejeon, Korea	<b>KAIST (Korea Advanced Institute of Science and Technology)</b> M.S. in Materials Science and Engineering Advisor: Kwangsoo No	Feb. 2008
Seoul, Korea	<b>University of Seoul</b> B.S. in Materials Science and Engineering (Summa Cum Laude)	Feb. 2006

## ***APPOINTMENTS***

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01/19 – present: Assistant Professor, School of Engineering Technology, **Purdue University**, West Lafayette, IN  
08/15 – 12/18: Assistant Professor, Department of Mechanical Engineering, **Baylor University**, Waco, TX  
05/17 – 08/17: Visiting Professor, Materials Science and Chemistry, **Harvard University**, Cambridge, MA  
08/14 – 08/15: Research Fellow, John A. Paulson School of Engineering and Applied Sciences, **Harvard University**, Cambridge, MA  
02/13 – 08/14: Postdoctoral Research Associate, Department of Chemical Engineering, **Massachusetts Institute of Technology (M.I.T)**, Cambridge, MA  
08/08 – 02/13: Research Assistant, School of Engineering, **Brown University**, Providence, RI  
02/06 – 02/08: Research Assistant, Department of Materials Science and Engineering, **KAIST (Korea Advanced Institute of Science and Technology)**, Daejeon, Korea

## ***HONORS / SCHOLARSHIP***

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- Purdue Summer Faculty Development Scholarship, 2021-2022
- Purdue IMPACT Fellow, 2021
- The OVPR Collaborative Research Partnership Award, Baylor University, 2018-2019
- Baylor Rising Stars (2016-2018)
- Best Presentation (Gold) Award, 7<sup>th</sup> Symposium on Transparent Oxide Thin Films for Electronics and Optics (TOEO-7) (2011)
- National Study Abroad Program Fellowship, Korea Research Foundation (KRF) (2007)

## ***JOURNAL PUBLICATIONS***

[Research Report in Google Scholar (<http://scholar.google.com/citations?user=0d4M1zIAAAAJ&hl=en>) as of 07/01/2023:

Sum of the Times Cited: 1860; (2) h-index (Hirsch factor): 22; (3) i10-index: 32]

- Asterisk (\*) denotes corresponding authorship.

64. Fei Qin, Yuxuan Zhang, Ziqi Guo, Tae Joon Park, Chung Soo Kim, Jeongmin Park, Xingyu Fu, Kwangsoo No, Han Wook Song, Xiulin Ruan, and Sunghwan Lee "CMOS-compatible high performance SiO<sub>2</sub>-based memristors for neuromorphic computing: Understanding the switching mechanisms through theoretical and electrochemical aspects" *ACS Nano* (2023; Under review)
63. Yuxuan Zhang, Han Wook Song, Kyle R. Crompton, Xixian Yang, Kejie Zhao, Sunghwan Lee\* "A Sulfur Cathode Design Strategy for Polysulfide Restrictions and Kinetic Enhancements in Li-S Batteries through Oxidative Chemical Vapor Deposition" *Nano Energy* (2023; In revision)
62. Jinwook Baek, Yujie Shan, Mitesh Mylvaganan, Fei Qin, Han Wook Song, Huachao, Mao, Sunghwan Lee\* "Mold-Free Manufacturing of Highly Sensitive and Fast Response Pressure Sensors through High-Resolution 3D Printing and Conformal Oxidative Chemical Vapor Deposition Polymers" *Advanced Materials* (2023; In revision)
61. Yuxuan Zhang and Sunghwan Lee\* "Copolymers for Electronic, Optical, and Sensing Applications with Engineered Physical Properties" *Applied Physics Letters*, (2023; Accepted)
60. Mohammad Mostafa Al Mahfuz, Junsung Park, Rock Huebner, Sunghwan Lee, Dong-Kyun Ko "Schottky Photodiodes Based on Mid-Wavelength Infrared Intraband Colloidal Quantum Dots–Surface Ligand and Metal Contact Studies" *Journal of Materials Chemistry C*, 11, 7714-7721 (2023) (DOI: <https://doi.org/10.1039/D3TC00648D>)
59. Fei Qin, Yuxuan Zhang, Han Wook Song, Sunghwan Lee\* "Enhancing Memristor Fundamentals through Instrumental Characterizations and Understanding Reliability Issues" *Materials Advances* 4, 1850-1875 (2023) (DOI: <https://doi.org/10.1039/D3MA00069A>)
58. Yuxuan Zhang, Jae Chul Kim, Han Wook Song, Sunghwan Lee\* "Recent achievements toward the development of Ni-based layered oxide cathodes for fast-charging Li-ion batteries" *Nanoscale*, 15, 4195 - 4218 (2023) (DOI: [10.1039/D2NR05701H](https://doi.org/10.1039/D2NR05701H))
57. Lisa Bosman, Esteban Soto, Jason Ostanek, Jose Garcia-Bravo, Sunghwan Lee, Walter Leon-Salas "NSF REU entrepreneurially minded applied energy program evaluation: traditional delivery versus alternative delivery (implemented during COVID-19)" *Journal of Applied Research in Higher Education* (2023; In press) (DOI: <https://doi.org/10.1108/JARHE-01-2023-0047>)
56. Dong Hun Lee#, Yuxuan Zhang#, Sung-Jin Chang, Honghwi Park, Chung Soo Kim, Jinwook Baek, Jeongmin Park, Kwangsoo No, Han Wook Song, Hongsik Park, and Sunghwan Lee\* "Multimodal encapsulation to selectively permeate hydrogen and engineer channel conduction for p-type SnO<sub>x</sub> thin film transistor applications" *ACS Applied Materials & Interfaces*, 14 (48), 53999–54011 (2022) (DOI: <https://doi.org/10.1021/acsami.2c15719>)  
# contributed equally to this work
55. Hyeonhun Kim, Molly Rothschild, Dong Hun Lee, Chung Soo Kim, Jeongmin Park, Byung-Cheol Min, Sunghwan Lee\* "Bias-Switchable Photodetector From Broadband to UV-Selective Detection Mode Leveraging Nanolayered Dual-Schottky Junction" *ACS Applied Nano Materials*, 5 (12), 17891–17899 (2022) (DOI: <https://doi.org/10.1021/acsanm.2c03852>)
52. Fei Qin, Yuxuan Zhang, Honghwi Park, Chung Soo Kim, Dong Hun Lee, Zhong-Tao Jiang, Jeongmin Park, Kwangsoo No, Hongsik Park, Han Wook Song, and Sunghwan Lee\* "Factors Determining the Resistive Switching Behavior of Transparent InGaZnO-based Memristors" *Physica Status Solidi (RRL) – Rapid Research Letters*, 16(7) 2200075 (2022) (DOI: <https://doi.org/10.1002/pssr.202200075>)

51. Hyeonhuh Kim, Yuxuan Zhang, Molly Rothschild, Kwangdong Roh, Yunseok Kim, Ho Seong Jang, Byung-Cheol Min, Sunghwan Lee\* “Hybrid Silicon-Polymer Photodetector Engineered Using Oxidative Chemical Vapor Deposition for High-Performance and Bias-Switchable Multi-Functionality” *Advanced Functional Materials*, 32 (17) 2201641, (2022) (DOI: <https://doi.org/10.1002/adfm.202201641>)
50. Honghui Park, Junyeong Lee, Chang-Ju Lee, Jaewoon Kang, Jiyeong Yun, Hyowoong Noh, Minsu Park, Jonghyung Lee, Youngjin Park, Jonghoo Park, Muhan Choi, **Sunghwan Lee**, Hongsik Park “Simultaneous Extraction of the Grain size, Single-Crystalline Grain Sheet Resistance, and Grain Boundary Resistivity of Polycrystalline Monolayer Graphene” *Nanomaterials*, 12 (2), 206 (2022) (DOI: <https://doi.org/10.3390/nano12020206>)
49. Mingyuan Liu, Fei Qin, Molly Rothschild, Yuxuan Zhang, Dong Hun Lee, Kwangsoo No, Han Wook Song, **Sunghwan Lee**\* "The effect of bias stress on the performance of amorphous InAlZnO-based thin film transistors" *Journal of Electronic Materials*, 51, 1813–1819 (2022) (DOI: <https://doi.org/10.1007/s11664-022-09453-6>)
48. Yuxuan Zhang, Chung Soo Kim, Han Wook Song, Sung-Jin Chang, Hyeonhuh Kim, Jeongmin Park, Shan Hu, Kejie Zhao, **Sunghwan Lee**\* "Ultrahigh active material content and highly stable Ni-rich cathode leveraged by oxidative chemical vapor deposition" *Energy Storage Materials*, 48, 1-11 (2022) (DOI: <https://doi.org/10.1016/j.ensm.2022.03.001>)
47. E. Mohammadpour, WYH Liew, N. Mondinos, M. Altarawneh, **S. Lee**, N. Radevski, M. Minakshi, A. Amri, H. N. Lim, Z.-T. Jiang "Enhancement of thermal and mechanical stabilities of silicon doped titanium nitride coating by manipulation of sputtering conditions" *Journal of Materials Research and Technology*, 17, 1122-1131 (2022) (DOI: <https://doi.org/10.1016/j.jmrt.2022.01.039>)
46. Honghui Park, Jaedong Jung, Mingyuan Liu, Yuxuan Zhang, Jonghyung Lee, Hyowoong Noh, Muhan Choi, **Sunghwan Lee**,\* and Hongsik Park\* “Effects of thermally-induced phase transition on the negative thermo-optic properties of atomic-layer-deposited TiO<sub>2</sub> films” *ACS Applied Electronic Materials*, 4 (2), 651–662 (2022) (DOI: <https://doi.org/10.1021/acsaelm.1c01041>)
45. D.H. Lee, H. Park, M. Clevenger, H. Kim, C.S. Kim, M. Liu, G. Kim, H.W. Song, K. No, S.Y. Kim, D-K. Ko, A. Lucietto, H. Park, and **S. Lee**\*, “High performance oxide-based p-n heterojunctions integrating p-SnOx and n-InGaZnO” *ACS Applied Materials & Interfaces*, 13, 46, 55676-55686 (2021) (DOI: [10.1021/acsaemi.1c16222](https://doi.org/10.1021/acsaemi.1c16222))
44. Honghui Park, Heungsop Won, Changhee Lim, Yuxuan Zhang, Hyunseok Kim, Won Seok Han, Sung-Bum Bae, Chang-Ju Lee, Yeho Noh, Junyeong Lee, Sunghwan Jung, Muhan Choi, **Sunghwan Lee**, Hongsik Park\*, “Layer-resolved spalling technique for separation and transfer of single-crystalline III-V heteroepitaxial layers” *Science Advances*, 8 (3), eabl6406 (2022) (DOI: [10.1126/sciadv.abl6406](https://doi.org/10.1126/sciadv.abl6406))
43. Shihab Bin Hafiz, Mohammad M. Al Mahfuz, **Sunghwan Lee**, Dong-Kyun Ko “Mid-Wavelength Infrared p-n Heterojunction Diodes Based on Intraband Colloidal Quantum Dots” *ACS Applied Materials & Interfaces*, 13 (41), 49043–49049 (2021) (<https://doi.org/10.1021/acsaemi.1c14749>)
42. Michael Clevenger#, Hyeonhuh Kim#, Han Wook Song, Kwangsoo No, **Sunghwan Lee**\*, “Binder-Free Printed PEDOT Wearable Sensors on Everyday Fabrics Using Oxidative Chemical Vapor Deposition” *Science Advances*, 7 (42), eabj8958 (2021) (DOI: [10.1126/sciadv.abj8958](https://doi.org/10.1126/sciadv.abj8958))
41. Mingyuan Liu#, Hyeonhuh Kim#, Xingyu Wang, Han Wook Song, Kwangsoo No, **Sunghwan Lee**\* “Carrier density-tunable work function buffer at the channel/metallization interface for amorphous oxide thin film transistors” *ACS Applied Electronic Materials*, 3 (6), 2703–2711 (2021) (DOI: [10.1021/acsaelm.1c00284](https://doi.org/10.1021/acsaelm.1c00284))
40. Mingyuan Liu, Xingyu Wang, Han Wook Song, Hyeonhuh Kim, Michael Clevenger, Dong-Kyun Ko, Kwangsoo No, and **Sunghwan Lee**\* “Origin of an unintended increase in carrier density of ternary cation-based amorphous oxide semiconductors” *Applied Surface Science*, 556, 149676 (2021) (DOI: [10.1016/j.apsusc.2021.149676](https://doi.org/10.1016/j.apsusc.2021.149676))
39. E. Mohammadpour, WYH. Liew, N. Radevski, **S. Lee**, N. Mondinos, M. Altarawneh, M. Minakshi, A. Amri, M. Rowles, H. Lim, and Z-T. Jiang\*, “High temperature (up to 1200 °C) thermal-mechanical stability of Si

and Ni doped CrN framework coatings” *Journal of Materials Research and Technology*, 14, 2406-2419 (2021) (DOI: [doi.org/10.1016/j.jmrt.2021.07.130](https://doi.org/10.1016/j.jmrt.2021.07.130))

38. Honghwi Park, Jaedong Jung, Mingyuan Liu, **Sunghwan Lee\***, and Hongsik Park\*, “Influence of Amorphous-to-Crystalline Transformation on the Negative Thermo-Optic Properties of TiO<sub>2</sub> Films” *ECS Transactions* 102 (2), 151 (2021) (DOI: [10.1149/10202.0151ecst](https://doi.org/10.1149/10202.0151ecst))
37. Austin Reed, Chandon Stone, Kwangdong Roh, Han Wook Song, Xingyu Wang, Mingyuan Liu, Dong-Kyun Ko, Kwangsoo No, **Sunghwan Lee\*** “The Role of Third Cation Doping on Phase Stability, Carrier Transport and Carrier Suppression in Amorphous Oxide Semiconductors” *Journal of Materials Chemistry C*, 8, 13798-13810 (2020) (DOI: [10.1039/D0TC02655G](https://doi.org/10.1039/D0TC02655G)) (*Times Cited: 1*)
36. Grant Drewelow, Han Wook Song, Zhong-Tao Jiang, **Sunghwan Lee\***, “Factors Controlling Conductivity of PEDOT Deposited Using Oxidative Chemical Vapor Deposition” *Applied Surface Science*, 501, 144105 (2020) (*Times Cited: 6*) (DOI: [10.1016/j.apsusc.2019.144105](https://doi.org/10.1016/j.apsusc.2019.144105)) (*Times Cited: 6*)
35. Shihab Bin Hafiz, Mohammad M Al Mahfuz, Michael R Scimeca, **Sunghwan Lee**, Soong Ju Oh, Ayaskanta Sahu, Dong-Kyun Ko “Ligand engineering of mid-infrared Ag<sub>2</sub>Se colloidal quantum dots”, *Physica E: Low-dimensional Systems and Nanostructures*, 124, 114223 (2020) (DOI: [10.1016/j.physe.2020.114223](https://doi.org/10.1016/j.physe.2020.114223)) (*Times Cited: 3*)
34. **Sunghwan Lee\***, Han Wook Song, Jae Yong Cho, Nik Radevski, Linh Nguyen Thi Truc, Tae Hyun Sung, Zhong-Tao Jiang, Kwangsoo No “Mobility of Air-Stable p-type Polythiophene Field-Effect Transistors Fabricated Using Oxidative Chemical Vapor Deposition” *Journal of Electronic Materials* 46 (6), 3465-3471 (2020) (DOI: [10.1007/s11664-020-07967-5](https://doi.org/10.1007/s11664-020-07967-5))
33. Linh Nguyen Thi Truc\*, Chien Tran Minh, Seungbum Hong, Kwangsoo No and **Sunghwan Lee\***, “Phytoremediation of heavy metal contaminated wastewater by *Acrostichum aureum* L. plants grown in activated carbon” *International Journal of Phytoremediation*, (2020) (DOI: [10.1080/15226514.2020.1813074](https://doi.org/10.1080/15226514.2020.1813074))
32. C. Oh, S. Kim, H. Kim, G. Park, J. Kim, J. Ryu, P. Li, S. Lee, K. No, S. Hong\*, "Effects of membrane thickness on the performance of ionic polymer-metal composite actuators" *RSC Advances*, 9 (26), 14621–14626 (2019) (*Times Cited: 7*) (DOI: [10.1039/C9RA01751H](https://doi.org/10.1039/C9RA01751H))
31. Grant Drewelow, Austin S. Reed, Chandon Stone, Kwangdong Roh, Z-T. Ziang, H. Park, **Sunghwan Lee\***, “Work function investigations of Al-doped ZnO for band-alignment in electronic and optoelectronic” *Applied Surface Science*, 484, 990-998 (2019) (*Times Cited: 8*) (DOI: [10.1016/j.apsusc.2019.04.079](https://doi.org/10.1016/j.apsusc.2019.04.079))
30. S. Patel, E. Mohammadpour, N. Mondinos, X. Zhao, J-P. Veder, Z-F. Zhou, T. S. Y. Moh, W. Liew, S. Lee and Z-T. Jiang, "High temperature in-situ phase stability of sputtered TiAl<sub>x</sub>N coatings" *Journal of Alloys and Compounds*, 786, 507-514 (2019) (*Times Cited: 1*) (DOI: [10.1016/j.jallcom.2019.01.379](https://doi.org/10.1016/j.jallcom.2019.01.379))
29. Xiaoxue Wang, Xu Zhang, Lei Sun, Dongwook Lee, **Sunghwan Lee**, Yang Shao-Horn, Mircea Dincă, Tomas Palacios, Karen K. Gleason\*, "High Electrical Conductivity and Carrier Mobility in oCVD PEDOT Thin Films by Engineered Crystallization and Acid Treatment" *Science Advances* 4 (9) (2018) (*Times Cited: 54*) (DOI: [10.1126/sciadv.aat5780](https://doi.org/10.1126/sciadv.aat5780))
28. Sang Bok Kim, Ashwin Jayaraman, Danny Chua, Luke M. Davis, Shao-Liang Zheng, Xizhu Zhao, **Sunghwan Lee**, and Roy G. Gordon, “Obtaining a Low and Wide Atomic Layer Deposition Window (150-275 °C) for In<sub>2</sub>O<sub>3</sub> Films using an In<sup>III</sup> amidinate and H<sub>2</sub>O” *Chemistry-A European Journal*, 24 (38), 9525-9529 (2018) (*Times Cited: 9*) (DOI: [10.1002/chem.201802317](https://doi.org/10.1002/chem.201802317))
27. **Sunghwan Lee\***, David C. Borrelli, Won Jun Jo, Austin S. Reed and Karen K. Gleason\*, "Nanostructured unsubstituted polythiophene films deposited using oxidative chemical vapor deposition: hopping conduction and thermal stability" *Advanced Materials Interfaces*, 5, 1701513 (2018) (*Times Cited: 10*) (DOI: [10.1002/admi.201701513](https://doi.org/10.1002/admi.201701513))

\*selected as a Frontispiece of *Advanced Materials Interfaces*

26. **Sunghwan Lee\***, Yang Song, Hongsik Park, Alexander Zaslavsky and David C. Paine, "Channel scaling and

- field-effect mobility extraction in amorphous InZnO thin film transistors" *Solid-State Electronics*, 135, 94-99 (2017) (*Times Cited: 11*) (DOI: 10.1016/j.sse.2017.06.033)
25. **Sunghwan Lee\*** and Xiaofei Guan, Cerium silicate-based thin film apatites: high conductivity and solid oxide fuel cell application" *MRS Communications*, 7, 199-205 (2017) (*Times Cited: 6*) (DOI:10.1557/mrc.2017.24)
  24. **Hongjun Kim, Sunghwan Lee\***, Suran Kim, **Chungik Oh**, Jeongjae Ryu, Jaegyu Kim, Eugene Park, Seungbum Hong and Kwangsoo No\*, "Enhanced ethanol-cross-over by the incorporation of phosphotungstic acid in Nafion membrane for direct ethanol fuel cells" *Journal of Materials Science*, 52, 2400-2412 (2017) (*Times Cited: 9*) (DOI: 10.1007/s10853-016-0534-z)
  23. **Austin S. Reed**, David C. Paine and **Sunghwan Lee\***, "Effect of O<sub>2</sub> fraction in the sputter gas on the electrical properties of amorphous In-Zn-O and the thin film transistor performance" *Journal of Electronic Materials*, 45, 6310-6316 (2016) (*Times Cited: 1*) (DOI 10.1007/s11664-016-5008-1)
  22. **Sunghwan Lee**, David C. Borrelli, and Karen K. Gleason\*, "Air-stable polythiophene-based thin film transistors processed using oxidative chemical vapor deposition: carrier transport and channel/metallization contact interface" *Organic Electronics*, 33, 253-262 (2016) (*Times Cited: 14*) (DOI: 10.1016/j.orgel.2016.03.034)
  21. **Sunghwan Lee\***, Xiaofei Guan, and Shriram Ramanathan, "Synthesis of thin film oxy-apatites and solid state fuel cells" *Journal of the Electrochemical Society* 163, 7 (2016) (*Times Cited: 2*) (DOI: 10.1149/2.1361607jes)
  20. **Sunghwan Lee\*** and David C. Paine, "Scaling Behavior of Amorphous In-Zn-O Thin Film Transistors with High Mobility over 35 cm<sup>2</sup>/Vsec" *ECS Transactions* 72(5), 59-65 (2016) (*Times Cited: 3*) (DOI: 10.1149/07205.0059ecst)
  19. **Sunghwan Lee** and Karen K. Gleason\*, "Enhanced optical property with tunable band gap of cross-linked amorphous PEDOT copolymers via oxidative chemical vapor deposition" *Advanced Functional Materials*, 25, 85-93 (2015) (*Times Cited: 40*) (DOI: 10.1002/adfm.201402924)
  18. Nan Chen, Peter Kovacic, Rachel Howden, Xiaxue Wang, **Sunghwan Lee**, and Karen K. Gleason\*, "Low-substrate-temperature Encapsulation for Flexible Electrodes and Organic Photovoltaics" *Advanced Energy Materials*, 5, 1401442 (2015) (*Times Cited: 17*) (DOI: 10.1002/aenm.201401442)
- \*selected as a Frontispiece of *Advanced Energy Materials*
17. **Sunghwan Lee**, David C. Paine, and Karen K. Gleason\*, "Heavily doped poly(3,4-ethylenedioxythiophene) thin films with high carrier mobility deposited using oxidative CVD: conductivity stability and carrier transport" *Advanced Functional Materials*, 24, 7187-7196 (2014) (*Times Cited: 41*) (DOI: 10.1002/adfm.201401282)
  16. **Sunghwan Lee†**, David C. Borrelli†, and Karen K. Gleason\*, "Optoelectronic properties of polythiophene thin films and organic TFTs fabricated by oxidative chemical vapor deposition" *Journal of Materials Chemistry C*, 2, 7223-7231 (2014) (*Times Cited: 31*) (DOI: 10.1039/c4tc00881b)
- [†] equal contribution
15. **Sunghwan Lee\***, and David C. Paine, "Metallization selection and the performance of amorphous In-Zn-O thin film transistors" *Applied Physics Letters*, 104, 252103 (2014) (*Times Cited: 5*) (DOI: 10.1063/1.4885118)
  14. Anna Maria Coclite, Rachel M. Howden, David Borrelli, Christy D. Petruczok, Rong Yang, Jose Luis Yagüe, Asli Ugur, Nan Chen, **Sunghwan Lee**, Won Jun Jo, Andong Liu, Xiaoxue Wang, and Karen K Gleason\*, "CVD Polymers: A new paradigm for surface modification and device fabrication" *Advanced Materials*, 25, 5392 (2013) (*Times Cited: 164*) (DOI: 10.1002/adma.201301878)
  13. S. Cosentino, S. Mirabella, Pei Liu, Son T. Le, M. Miritello, **S. Lee**, I. Crupi, G. Nicotra, C. Spinella, D. Paine, A. Terrasi, A. Zaslavsky, D. Pacifici\*, "Role of Ge nanoclusters in the performance of photodetectors compatible with Si technology" *Thin Solid Films*, 548, 551 (2013) (*Times Cited: 12*) (DOI: 10.1016/j.tsf.2013.09.028)
  12. **Sunghwan Lee** and David C. Paine\*, "Identification of the native defect doping mechanism in amorphous indium zinc oxide thin films studied using ultra high pressure oxidation" *Applied Physics Letters*, 102, 052101



(2013) (*Times Cited*: 42) (DOI: 10.1063/1.4790187)

11. Jonghun Lee, **Sunghwan Lee**, Guanglai Li, Melissa Petruska, David C. Paine and Shouheng Sun\*, “A Facile Solution-Phase Approach to Transparent and Conducting ITO Nanocrystal Assemblies” *Journal of the American Chemical Society*, 134, 13410 (2012) (*Times Cited*: 105) (DOI: 10.1021/ja3044807)

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\*highlighted in *Brown news* (<https://news.brown.edu/pressreleases/2012/08/touch>) and *SolidStateTechnology* (<http://electroiq.com/blog/2012/08/spincast-solution-based-ito-could-enable-cheaper-display-manufacturing/>), Aug. 7, 2012

10. **Sunghwan Lee**, Keunhan Park and David C. Paine\*, “Metallization Strategies for In<sub>2</sub>O<sub>3</sub>-based amorphous oxide semiconductor materials” *Journal of Materials Research*, 27, 2299 (2012) (*Times Cited*: 15) (DOI: 10.1557/jmr.2012.141)
9. **Sunghwan Lee**\*, Seung-Hyun Kim, Youngha Kim, Angus I. Kingon, David C. Paine and Kwangsoo No, “Structural and electrical properties of transparent conducting Al<sub>2</sub>O<sub>3</sub>-doped ZnO thin films using off-axis DC magnetron sputtering” *Materials Letters*, 85, 88 (2012) (*Times Cited*: 20) (DOI: 10.1016/j.matlet.2012.06.094)
8. Pei Liu, S. Cosentino, Son T. Le, **S. Lee**, D. Paine, A. Zaslavsky, D. Pacifici\*, S. Mirabella, M. Miritello, I. Crupi, A. Terrasi, “Transient photoresponse and incident power dependence of high-efficiency germanium quantum dot photodetectors” *Journal of Applied Physics*, 112, 083103 (2012) (*Times Cited*: 42) (DOI: 10.1063/1.4759252)
7. **Sunghwan Lee**, Hongsik Park and David C. Paine\*, “The effect of metallization contact resistance on the measurement of the field effect mobility of amorphous IZO thin film transistors” *Thin Solid Films*, 520, 3769 (2012) (*Times Cited*: 21) (DOI: 10.1016/j.tsf.2011.11.067)
6. **Sunghwan Lee** and David C. Paine\*, “On the effect of Ti on the stability of amorphous indium zinc oxide used in thin film transistor applications” *Applied Physics Letters*, 98, 262108 (2011) (*Times Cited*: 23) (DOI: 10.1063/1.3605589)
5. **Sunghwan Lee**, Brian Bierig, David C. Paine\*, “Amorphous structure and electrical performance of low-temperature annealed amorphous IZO transparent TFT’s” *Thin Solid Films*, 520, 3764 (2012) (online available as of 30 June, 2011) (*Times Cited*: 33) (DOI: 10.1016/j.tsf.2011.06.082)
4. S. Cosentino, P. Liu, Son Le, **S. Lee**, D. Paine, A. Zaslavsky, D. Pacifici\*, S. Mirabella, M. Miritello, I. Crupi, A. Terrasi, “High-efficiency CMOS-compatible photodetectors based on Ge quantum dots” *Applied Physics Letters*, 98, 221107 (2011) (*Times Cited*: 58) (DOI: 10.1063/1.3597360)
3. **Sunghwan Lee**, Hongsik Park, David C. Paine\*, “A study of the specific contact resistance and channel resistivity of amorphous IZO thin film transistors with IZO source-drain metallization” *Journal of Applied Physics*, 109, 063702 (2011) (*Times Cited*: 63) (DOI: 10.1063/1.3549810)
2. Jongin Hong\*, Hanjong Paik, Hosung Hwang, **Sunghwan Lee**, Andrew J. deMello, Kwangsoo No, “The effect of growth temperature on physical properties of heavily doped ZnO:Al films” *Physica Status Solidi A*, 206, 697 (2009) (*Times Cited*: 31) (DOI: 10.1002/pssa.200824291)
1. David C. Paine\*, Burag Yaglioglu, Zach Beily, and **Sunghwan Lee**, “Amorphous IZO-based Transparent Thin Film Transistors” *Thin Solid Films*, 516, 5894 (2008) (*Times Cited*: 236) (DOI: 10.1016/j.tsf.2007.10.081)

## **PATENTS**

4. Kim, H., Sohn J. J., Lee, S\* “BIAS TRIGGERED MODE-SWITCHABLE PHOTODETECTOR FROM BROADBAND TO NIR-SELECTIVE” (Provisional Application in Preparation by PRF; to be submitted in 2022)
3. Lee, S.\*, Kim, H., Clevenger, M. V. "FABRICS CONFORMALLY COATED WITH CONJUGATED POLYMERS, DISPOSABLE HEALTH MONITORING SENSORS USING THE SAME, AND FABRICATION METHOD THEREOF." (Application: June 17, 2022), US Patent App. 17843570.

2. Lee, S.\*, Zhang, Y. "Design and Manufacturing of Sustainable Battery Electrode with High Active Material Content." (Provisional Application: December 12, 2021), US Patent App. 63/292,368.
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## **REFEREED CONFERENCE PROCEEDINGS/ABSTRACTS**

69. Yuxuan Zhang and Sunghwan Lee "Enabling High-Rate Long-lifespan Lithium-Sulfur Batteries via Stereolithography Technique and Oxidative Chemical Vapor Deposition" 64th Electronic Materials Conference (EMC), June 29-July 1, 2022, The Ohio State University, Columbus, Ohio
68. Yuxuan Zhang and Sunghwan Lee "Engineering Ion Migration at Cathode Electrolyte Interfaces for High Performance All-Solid-State Batteries" 64th Electronic Materials Conference (EMC), June 29-July 1, 2022, The Ohio State University, Columbus, Ohio
67. Fei Qin and Sunghwan Lee "Influence of Oxygen Vacancy and Top Electrode on Switching Behavior of InGaZnO Based Resistive Random Access Memory" 64th Electronic Materials Conference (EMC), June 29-July 1, 2022, The Ohio State University, Columbus, Ohio
66. Dong Hun Lee, Han Wook Song, Molly Rothschild, Junsoo Choi, and Sunghwan Lee "Facile Processing and Properties of P-Type SnOx and Oxide-based p-n Heterojunction Application with n-InGaZnO" 64th Electronic Materials Conference (EMC), June 29-July 1, 2022, The Ohio State University, Columbus, Ohio
65. Sunghwan Lee, Dong Hun Lee, Fei Qin, Yuxuan Zhang, Han Wook Song, Kwangsoo No "Oxide Electronics and Recent Progress in Bipolar Applications" 241st Electrochemical Society (ECS) Meeting, May 29 – June 2, 2022, Vancouver, BC, Canada
64. Fei Qin and Sunghwan Lee "Investigation of Top Electrodes Impact on the Performance of Transparent a-IGZO-based Resistive Random Access Memory" 241st Electrochemical Society (ECS) Meeting, May 29 – June 2, 2022, Vancouver, BC, Canada
63. Yuxuan Zhang, Thomas Kivevele, Han Wook Song, Sunghwan Lee "Accelerating the conversion process of polysulfides in high mass loading sulfur cathode for the longevity Li-S battery" 241st Electrochemical Society (ECS) Meeting, May 29 – June 2, 2022, Vancouver, BC, Canada
62. Yuxuan Zhang, Thomas Kivevele, Han Wook Song, Sunghwan Lee "Activating the ion transmission at the cathode-electrolyte interface in all-solid-state batteries" 241st Electrochemical Society (ECS) Meeting, May 29 – June 2, 2022, Vancouver, BC, Canada
61. Mike Clevenger and **Sunghwan Lee** "Multifunctional Fabric Devices for Oil/Water Separation and Metallic Ion Detection" *Materials Research Society (MRS)*, Spring Meeting, Honolulu, Hawaii, USA (May 8-13, 2022)
60. Dong Hun Lee and **Sunghwan Lee** "The effect of intrinsic layer on the performance of oxide-based p-i-n heterojunctions integrating p-SnOx and n-InGaZnO" *Materials Research Society (MRS)*, Spring Meeting, Honolulu, Hawaii, USA (May 8-13, 2022)
59. Yuxuan Zhang, Han Wook Song and **Sunghwan Lee** "Universal Cathode Design Strategies to Engineer Cathode Electrolyte Interfaces for High Performance All Solid-State Batteries" *Materials Research Society (MRS)*, Spring Meeting, Honolulu, Hawaii, USA (May 8-13, 2022)
58. Yuxuan Zhang, Han Wook Song and **Sunghwan Lee** "Sulfur Cathode Design Strategies Enabled by Stereolithography Technique and Oxidative Chemical Vapor Deposition" *Materials Research Society (MRS)*, Spring Meeting, Honolulu, Hawaii, USA (May 8-13, 2022)
57. Fei Qin and **Sunghwan Lee** "Transparent InGaZnO-Based Resistive Random Access Memory", *Materials Research Society (MRS)*, Spring Meeting, Honolulu, Hawaii, USA (May 8-13, 2022)
56. Dong Hun Lee, and **Sunghwan Lee** "Facile processing of p-type oxides and oxide-based p-n heterojunction applications" *240th Electrochemical Society (ECS)* Meeting, Orlando, FL, USA (October 10-14, 2021)
55. Mingyuan Liu, Hyeonghun Kim, Han Wook Song, and **Sunghwan Lee** "Strategies to Enhance the Capability

- of Carrier Injection to the Effective Channel for Bottom-gated Amorphous Oxide Thin Films Transistors” *Materials Research Society (MRS)*, Fall Meeting, Boston, MA, USA (Nov. 23-Dec. 3, 2021)
54. Yuxuan Zhang, Kejie Zhao and **Sunghwan Lee** “Multifunctional polymer coating strategies for cathode tailoring through oxidative chemical vapor deposition” *Materials Research Society (MRS)*, Fall Meeting, Boston, MA, USA (Nov. 23-Dec. 3, 2021)
  53. Hyeonhun Kim, Michael Clevenger, and **Sunghwan Lee**, “Binder-Free Printing Ultra-Stable PEDOT Sensor on Multiple Fabrics Using Oxidative Chemical Vapor Deposition” *240th Electrochemical Society (ECS) Meeting*, Orlando, FL, USA (October 10-14, 2021)
  52. Yuxuan Zhang, Kejie Zhao, and **Sunghwan Lee**, “Multifunctional Conformal Polymer Coating By Oxidative Chemical Vapor Deposition for High Specific Energy Ni-Rich Cathode” *240th Electrochemical Society (ECS) Meeting*, Orlando, FL, USA (October 10-14, 2021)
  51. Mingyuan Liu, Han Wook Song, **Sunghwan Lee**, “Thermal and Bias Stability of InAlZnO-based Amorphous Thin Film Transistors” *63rd Electronic Materials Conference*, Columbus, OH (June 23-25, 2021) (Under review)
  50. Hyeonhun Kim, Woonchul Kim, Yusin Pak, Gun Young Jung, **Sunghwan Lee**, "Bias-Modulated Multicolor Discrimination Enabled By Perovskite Photodetector with Back-to-Back Diode Configuration", *239th Electrochemical Society (ECS) Meeting* with the 18th International Meeting on Chemical Sensors (IMCS), Spring Meeting, Chicago, IL, USA (May 30-June 3, 2021) (Accepted)
  49. Michael Clevenger, Han Wook Song, and **Sunghwan Lee**, "Performance of Poly(3,4-ethylenedioxythiophene) Thin Films on Fabrics for Wearable Device Applications using Oxidative Chemical Vapor Deposition", *239th Electrochemical Society (ECS) Meeting* with the 18th International Meeting on Chemical Sensors (IMCS), Spring Meeting, Chicago, IL, USA (May 30-June 3, 2021) (Accepted)
  48. Honghwi Park, Jaedong Jung, Mingyuan Liu, Heungsup Won, Muhan Choi, **Sunghwan Lee**, and Hongsik Park, "Effects of Phase Transformation on Negative Thermo-Optic Properties of Atomic-Layer-Deposited TiO<sub>2</sub> Films" *239th Electrochemical Society (ECS) Meeting* with the 18th International Meeting on Chemical Sensors (IMCS), Spring Meeting, Chicago, IL, USA (May 30-June 3, 2021) (Accepted)
  47. Mingyuan Liu, Han Wook Song, and **Sunghwan Lee**, "Enhanced Phase Stability and Carrier Suppression of Ternary Cation-Based Amorphous Oxide Semiconductor Thin Film Transistors", *239th Electrochemical Society (ECS) Meeting* with the 18th International Meeting on Chemical Sensors (IMCS), Spring Meeting, Chicago, IL, USA (May 30-June 3, 2021) (Accepted)
  46. Katherine Klokkevold, Weston Keeven, Michael Clevenger, Mingyuan Liu, Han Wook Song and **Sunghwan Lee**, "The effect of thin interfacial layer on the mechanical properties of metal/Zerodur heterogeneous bonding", *239th Electrochemical Society (ECS) Meeting* with the 18th International Meeting on Chemical Sensors (IMCS), Spring Meeting, Chicago, IL, USA (May 30-June 3, 2021) (Accepted)
  45. Mingyuan Liu, Molly Rothschild, Han Wook Song, and **Sunghwan Lee**, "Mechanisms of Carrier Density Increase of Ternary Cation-Based Amorphous Oxide Semiconductors for Thin Film Transistor Applications", *239th Electrochemical Society (ECS) Meeting* with the 18th International Meeting on Chemical Sensors (IMCS), Spring Meeting, Chicago, IL, USA (May 30-June 3, 2021) (Accepted)
  44. Michael Clevenger and **Sunghwan Lee** “Vapor-deposited Polymeric Thin Films on Fabrics for Breathable Wearable Device Application” *Materials Research Society (MRS)*, Spring Meeting, Seattle, WA, USA (April 18-23, 2021) (Accepted)
  43. Xingyu Wang, Austin Reed, Han Wook Song, **Sunghwan Lee** “The Role of Third Cation Doping on Phase Stability, Carrier Transport and Carrier Suppression in Amorphous Oxide Semiconductors” *Materials Research Society (MRS)*, Fall Meeting, Boston, MA, USA (Nov 27-Dec 4, 2020) (virtual)
  42. (INVITED) **Sunghwan Lee** "Crystallization and Stability of Flexible P-Type Semiconductors and Their Thin Film Transistor Application", PRiME 2020, *Electrochemical Society (ECS) Meeting*, Honolulu, HI (October 4-9, 2020) (virtual)



41. (INVITED) **Sunghwan Lee** and Michael Clevenger, "Vapor-printed p-type organic semiconductors for flexible thin film transistor applications", *13th International Symposium on Flexible Organic Electronics (ISFOE20)*, Thessaloniki, Greece (July 6-9, 2020) (virtual)
40. Huachao Mao, **Sunghwan Lee** "A novel resin vat design to accelerate the resin flow in quasi-continuous vat photopolymerization" *3rd International Conference on 3D Printing, 3D Bioprinting, Digital and Additive Manufacturing (I3D20)*, Thessaloniki, Greece (July 8-9, 2020) (virtual)
39. (INVITED) **Sunghwan Lee**, Huachao Mao, and Xingyu Wang "Thermodynamic-based synthetic strategies of p-type oxides for thin film transistor applications", *17th International Conference on Nanosciences & Nanotechnologies (NN20)*, Thessaloniki, Greece (July 7-10, 2020) (virtual)
38. Michael Clevenger, Jung Joo Sohn and **Sunghwan Lee** "Vapor-deposited Polymeric Thin Films on Fabrics for Breathable Wearable Device Application" *62th Electronic Materials Conference*, Columbus, OH (June 24-26, 2020) (virtual)
37. **Sunghwan Lee** and Michael Clevenger "Crystallization, Carrier Transport and Device Performance of Vapor-deposited Conjugated Polymers" *62th Electronic Materials Conference*, Columbus, OH (June 24-26, 2020) (virtual)
36. **Sunghwan Lee**, Michael V. Clevenger and Xingyu Wang "Integrated Polymer Manufacturing and Clothing Electronic Application Through Multidisciplinary Team-based Learning and Research", *Polytechnic Summit 2020*, Dublin, Ireland (June 3-5, 2020) (canceled)
35. (INVITED) **Sunghwan Lee**, "Crystallization and Stability of Flexible P-Type Semiconductors and Their Thin Film Transistor Application", *237th ECS Meeting with the 18th International Meeting on Chemical Sensors (IMCS 2020)*, Montreal, Canada (May 10-15, 2020)
34. (INVITED) **Sunghwan Lee**, "Thermodynamic-based synthetic strategies of p-type oxides", *US-Korea Conference (UKC)* on Science, Technology, and Entrepreneurship, Chicago, IL, (08, 2019)
33. **Sunghwan Lee** and Grant Drewelow "High Performance and Air-stable Polymeric Thin Film Transistors", *61th Electronic Materials Conference*, Ann Arbor, MI (06/27, 2019)
32. **Sunghwan Lee**, Grant Drewelow, and Austin S. Reed "Facile Engineering of Bandgap, Optical Properties and Morphology of Conjugated Polymers", *60th Electronic Materials Conference*, Santa Barbara, CA, USA (06/29, 2018)
31. Samantha Dayawansa, Ethan A. Benardete, Patrick T. Noonan, Linda Olafsen, Jeffrey Olafsen, Sunghwan Lee, Keith E. Schubert, Jason H. Huang, "ENDOSURGICAL REMODELING OF ANEURYSMS and USE OF A PROGRAMMABLE SURGICAL WIRE", *the 2018 Annual Meeting - Texas Association of Neurological Surgeons (TANS 2018)*, Houston, Texas, USA (02, 2018)
30. (INVITED) Austin S. Reed, Chandon L. Stone, and **Sunghwan Lee**, "Enhanced Carrier Transport of Amorphous In-Al-Zn-O: The Effect of Al Doping", *14th Energy Materials Conference*, Dallas, Texas, USA (12, 2017)
29. **Sunghwan Lee**, David C. Borrelli, Austin S. Reed, and Karen K. Gleason, "Nanostructured unsubstituted polythiophene films deposited using oxidative chemical vapor deposition: hopping conduction and thermal stability" *Materials Research Society (MRS)*, Fall Meeting, Boston, MA, USA (2017)
28. **Sunghwan Lee** and Shriram Ramanathan "Intermediate temperature synthesis and SOFC anode application of cerium silicate-based oxy-apatites", *232nd Electrochemical Society (ECS) Meeting*, October 1-5, National Harbor, MD, USA (2017)
27. Hongjun Kim, **Sunghwan Lee**, Kwangsoo No, "Composite membranes with dispersed ceramic nanoparticles for direct ethanol fuel cells", *American Ceramic Society (ACerS) Meetings: 41st International Conference and Expo on Advanced Ceramics and Composites*, Daytona Beach, FL, USA (01. 2017)
26. **Sunghwan Lee**, Xiaofei Guan and Shriram Ramanathan, "Metastable apatite anodes for solid oxide fuel cells", *Materials Research Society (MRS)*, Fall Meeting, Boston, MA, USA (2016)

25. **Sunghwan Lee**, and David C. Paine, “Factors controlling the threshold voltage in amorphous indium oxide-based thin film transistors”, *58th Electronic Materials Conference*, June 22-24, Newark, DE, USA (2016)
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23. **Sunghwan Lee**, David Borrelli, and Karen Gleason, “Chemical-vapor-deposited polythiophene thin films and organic thin film transistor applications”, *Materials Research Society (MRS), Spring meeting*, Phoenix, Arizona, USA (2016).
22. **Sunghwan Lee**, and Shriram Ramanathan, “Thin film oxy-apatites for solid oxide fuel cells”, *20th Solid State Ionics (SSI)*, Keystone, CO, USA (06, 2015)
21. Won Jun Jo, Youngwoo Son, **Sunghwan Lee**, Justin Nelson, Vladimir Bulovic, Shriram Ramanathan, Michael Strano, Karen Gleason, “Vapor Printing of Neutral Hole Transporting Polymer for Enhanced Efficiency and Stability of Organic Photovoltaics”, *Materials Research Society (MRS), Spring meeting*, San Francisco, CA, USA (2015)
20. **Sunghwan Lee**, and Karen K. Gleason, “Bandgap tunable cross-linked PEDOT copolymers with superior optical property via oxidative chemical vapor deposition”, *AICHE*, Atlanta, GA, USA (11. 2014)
19. **Sunghwan Lee**, and Karen K. Gleason, “Simultaneous synthesis, deposition and doping of PEDOT transparent conducting polymer using oxidative CVD: conductivity stability and carrier transport”, *AICHE*, Atlanta, GA, USA (11. 2014)
18. **Sunghwan Lee**, Karen K. Gleason, and David C. Paine, “High mobility amorphous oxide semiconductors for transparent thin film transistor (TFT) applications: Metallization selection and TFT device performance”, *AICHE*, Atlanta, GA, USA (11. 2014)
17. **Sunghwan Lee**, and Karen K. Gleason, “Conformal CVD coatings on 3D substrates”, *MIT Industrial Liaison Program*, Cambridge, MA, USA (04. 2014)
16. **Sunghwan Lee** and Karen K. Gleason, “Transparent CVD polymer electrodes: conductivity stability, carrier transport and 100% monomer doping”, *PPST MIT Polymer Day 2014*, MIT, Cambridge, MA, USA (03. 2014)
15. Nan Chen, Rachel Howden, Xiaoxue Wang, **Sunghwan Lee** and Karen K Gleason, “Low Surface Temperature Encapsulation”, *Materials Research Society (MRS), Fall meeting*, Boston, MA, USA (2013)
14. **Sunghwan Lee** and David C. Paine, “A study of the oxygen-pressure-dependent native doping in amorphous indium zinc oxide (a-IZO) thin films using high pressure oxidation annealing”, *Materials Research Society (MRS), Fall meeting*, Boston, MA, USA (2012)
13. **Sunghwan Lee** and David C. Paine, “Thermodynamics-based Metallization Strategies for  $\text{In}_2\text{O}_3$ -based Amorphous Oxide Semiconductor Thin Film Transistors”, *Materials Research Society (MRS), Fall meeting*, Boston, MA, USA (2012)
12. P Liu, S. Cosentino, Son T. Le, **S. Lee**, D. Paine, A. Zaslavsky, S. Mirabella, M. Miritello, I. Crupi, A. Terrasi, D. Pacifici, “Fast, high-efficiency Germanium quantum dot photodetectors”, *Materials Research Society (MRS), Fall meeting*, Boston, MA, USA (2012)
11. **Sunghwan Lee** and David C. Paine, “High field effect mobility amorphous In-Zn-O thin film transistors: contact resistance and metallization strategy” *IEEE EDS Lester Eastman Conference on High Performance Devices*, Brown University, Providence, RI, USA (2012)
10. P. Liu, S. T. Le, **S. Lee**, D. Paine, A. Zaslavsky, D. Pacifici, S. Cosentino, S. Mirabella, M. Miritello, I. Crupi, A. Terrasi, “Fast, High-efficiency Germanium Quantum Dot Photodetectors” *Proceedings IEEE EDS on High Performance Devices* 1-3 (2012)
9. S. Cosentino, Pei Liu, S. Mirabella, I. Crupi, S. T. Le, M. Miritello, **S. Lee**, D. Paine, A. Terrasi<sup>2</sup>, A. Zaslavsky, D. Pacifici, “Response properties of high efficiency photodetectors based on Ge quantum dots” *E-MRS, Spring meeting*, Strasbourg, France (2012)

8. **Sunghwan Lee**, Brian Bierig and David C. Paine, “Specific Contact Resistance, Channel Conductance, and Thin Film Transistor Threshold Voltage Instability in IZO-Based Amorphous Oxide Semiconductors Metalized with Ti” *Materials Research Society (MRS), Fall meeting*, Boston, MA, USA (2011)
7. S. Cosentino, Pei Liu, Son T. Le, **S. Lee**, D. Paine, A. Zaslavsky, S. Mirabella, M. Miritello, I. Crupi, A. Terrasi and D. Pacifici, “High-Efficiency Silicon-Compatible Photodetectors Based on Ge Quantum Dots” *Materials Research Society (MRS), Fall meeting*, Boston, MA, USA (2011)
6. **Sunghwan Lee** and David C. Paine, “Contact Modulation of Compositionally Homogeneous IZO/IZO Channel Metallization Thin Film Transistors” *7<sup>th</sup> symposium on Transparent Oxide Thin Films for Electronics and Optics (TOEO-7)*, Waseda University, Tokyo, Japan (2011)
5. David C. Paine, Brian Bierig, and **Sunghwan Lee**, “Properties and Performance of IZO Amorphous Oxide Semiconductors Used in TFT Applications” *7<sup>th</sup> symposium on Transparent Oxide Thin Films for Electronics and Optics (TOEO-7)*, Waseda University, Tokyo, Japan (2011)
4. **Sunghwan Lee**, Jordan Chesin, Hongsik Park, Kathryn Schwink, Julia Edel and David C. Paine, “A Study of the Effect of ZnO Content on the Transport Properties of Transparent amorphous In<sub>2</sub>O<sub>3</sub> - ZnO thin film transistors” *Materials Research Society (MRS), Fall meeting*, Boston, MA, USA (2009)
3. David C. Paine, **Sunghwan Lee**, Jordan Chesin and Kathryn Schwink, “Understanding Doping in Indium-Based Channel Materials Using Ultrahigh Pressure Oxidation” *6<sup>th</sup> symposium on Transparent Oxide Thin Films for Electronics and Optics (TOEO-6)*, Tokyo, Japan (2009)
2. Hosung Hwang, Hanjong Paik, Youngha Kim, **Sunghwan Lee**, and Kwangsoo No, “Influence of the Deposition Temperature on the Electrical and Optical Properties of ZnO:Al thin films” *Korean Ceramic Society, Fall Symposium*, Daegu, South Korea (2006)
1. Hanjong Paik, **Sunghwan Lee**, and Kwangsoo No, “Magnetic and Ferroelectric Properties of (Bi<sub>0.9</sub>,La<sub>0.1</sub>)FeO<sub>3</sub>-Ba(Fe<sub>0.5</sub>Nb<sub>0.5</sub>)O<sub>3</sub> Solid Solution System at Room Temperature” *Korean Ceramic Society, Fall Symposium*, Daegu, South Korea (2006)

## **ACADEMIC/PROFESSIONAL SERVICES**

### SERVICE FOR GRANT PROPOSALS

- Proposal reviewer for: NSF CBET, 2018; NSF ECCS/EPMD, 2019, 2021; ACS PRF, 2021

### SERVICE FOR INTERNATIONAL JOURNALS

- Journal reviewer for:  
Nature Communications, Science Advances, Advanced Materials, Advanced Functional Materials, ACS Nano, Macromolecules, Scientific Report, Nano Energy, Journal of Materials Chemistry series, Applied Physics Letters, Journal of Applied Physics, Thin Solid Films, Materials Letters, Ceramics International, and many others

### CONFERENCE COMMITTEE/CHAIR/ORGANIZER

- Electrochemical Society (ECS) Meeting Committee and Session Chair, 2020-present
- Electrochemical Society (ECS) Meeting (Symposium: I02 - Ionic and Mixed Conducting Ceramics), 2017
- Energy Materials Nanotechnology (Session: Nanomaterials as Transparent Electrode), 2016

### PROFESSIONAL MEMBERSHIP

- |  |              |
|--|--------------|
| • Materials Research Society (MRS)                 | 2008-present |
| • American Institute of Chemical Engineers (AIChE) | 2014-present |
| • Electrochemical Society (ECS)                    | 2015-present |