Sung Joo Kim

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PROFESSIONAL EXPERIENCE

Independent Website Developer
Greensboro, NC Dec 2023 - Present

- Design and build an educational website to deliver comprehensive knowledge on Li-ion batteries, covering their fundamental chemistry and industrial utilizations.
- Developed the website using Python Dash and Plotly, incorporating interactive features to enhance user engagement and educational value. Scheduled for initial release in late 2024, with an aim of providing a comprehesive resource for both general and specialized audiences.

Assistant Director Director: Xiaoqing Pan
Center for Complex and Active Materials (CCAM), University of California-Irvine May 2021 - Nov 2023

- Performed professional and administrative tasks for the $18 million NSF-funded Materials Research Science and Engineering Center and tracks outcomes from research and education/outreach activities of 60 Center participants.
- Directed, organized, and participated in NSF annual report preparation.
- Actively coordinated with technical staff in Irvine Materials Research Institute (IMRI), a key enabler of CCAM, for various research/education programs and workshops.
- Prepared contents for the bimonthly CCAM newsletter (open rate: $>$50%) and updates the Center website regularly to keep the contents up to date.
- Coordinated the successful execution of annual events, including Center workshops and advisory board meetings.
- **Independent research work:** Conducted a study on the structural degradation mechanism of electrochemically cycled $LiNi_xMn_yCo_zO_2$ cathodes using an aberration-corrected electron microscope

Post-doctoral Research Associate Supervisors: Esther S. Takeuchi & Yimei Zhu
Brookhaven National Laboratory (Interdisciplinary Science) Apr 2019 - May 2021

- Conducted electron microscopy characterization of aqueous Zn-ion battery cathode systems such as manganese oxides and vanadate.
  - ▷ Identified the reaction mechanisms of as-cycled $Na_{1+x}V_3O_8$ and K_xMnO_2 cathodes using ex-situ HR-STEM imaging, EDS, and EELS. Also, conducted in-situ TEM to study the zincation dynamics of the cathodes.
- Worked with multiple PIs in the DOE-funded Energy Frontier Research Center jointly operated by SBU/BNL.
  - ▷ Prepared biweekly progress reports and published/presented research outcomes via journal publication and EFRC annual meetings.

Post-doctoral Research Fellow Supervisor: Kisuk Kang
Seoul National University (Research Institute of Advanced Materials) Sep 2017 - Apr 2019

- Elucidated the nucleation and growth mechanism of lithium sulfide inside C/TiO_2-TiN hollow nanospheres for the high-performance Li-S battery via in-situ graphene liquid cell TEM and EDS.
- Proposed a new mechanism of the solid-electrolyte interphase formation upon using novel aqueous electrolyte system for the high-stability and high-voltage aqueous Na batteries via TEM, EELS, and EDS.
- Investigated the sodium and solvent co-intercalation mechanism and identified the structural origin of high cycle stability of Na-TiS_2 batteries by employing HRTEM and EDS.
- Optimized and performed in-situ electrochemistry TEM using the Protochips liquid-cell holder and investigated the reaction dynamics of the Li-S and aqueous Li/Na batteries.

Post-doctoral Researcher Supervisor: Jeongyong Lee
Korea Advanced Institute of Science &Technology (Institute of Applied Science) Sep. 2015 - Aug. 2017

- Performed in-situ TEM experiment on electrode systems for Li-ion and multi-valent ion battery application using a graphene liquid cell.
  - ▷ Proposed phase transformation mechanisms and identified structural changes associated with chemical lithiation via electron beam irradiation via electron diffraction and HRTEM imaging.

- ▷ Performed in-situ TEM magnesiation and ex-situ electrochemical testing of Sn nanoparticles for Mg ion batteries.

- Investigated the metallic nanoparticle behaviors inside liquid using TEM.
  - ▷ Studied sublimation kinetics and the Kirkendall effect of Ag nanoparticles from oxidative etching.

Graduate Research Assistant Advisor: Xiaoqing Pan
University of Michigan, Ann Arbor Sep 2009 - Aug 2015

- Performed in-situ open-cell TEM experiments on Si and various polymorphs of TiO_2 for Li-ion battery application.
  - ▷ Identified phase transformation mechanisms and morphological changes associated with lithiation and delithiation upon applying electrical bias.
- Performed structural investigation of II-VI/III-V QD semiconductor materials.
  - ▷ Studied the compositions of tandem GaSb/GaAs QD & InAs/GaAs thin-films using XEDS and HRTEM.
  - ▷ Characterized and elucidated QD formation mechanism for ZnTe/ZnSe & InAs/GaAs QD films: Conducted GPA analysis on the cross-sectional TEM specimen to identify the interlayer misfit strain.
  - ▷ Performed in-situ opto-electrical study on GaSb/GaAs thin-films (externally controlled light illumination and electrical biasing).

Undergraduate Research Assistant Advisor: Siu-Wai Chan
Columbia University, New York Oct 2007 - Aug 2009

- Synthesized and analyzed the three-way catalyst systems including Pd-doped CeO_2: Obtained the emission data for CO, NO, NO_2, NO_x, etc. using ENERAC.
- Prepared synthesis and performed TEM analysis of different nano-sized CeO_2. Determined the lattice parameter of CeO_2 and bulk modulus. Projected the relationship between bulk modulus and the size of the particle. The work was acknowledged in publication: Siu-Wai Chan et al., "Size dependent compressibility of nano-ceria: Minimum near 33nm", *Appl. Phys. Lett.,* **106**, 163101 (2015)

EDUCATION

University of Michigan, Ann Arbor, MI, USA
Ph.D in Materials Science Engineering Aug 2015
Thesis title: *''Real-time atomic-resolution probing of lithium ion intercalation in TiO_2 –related anodes using transmission electron microscopy"*

Columbia University, New York, NY, USA
B.S. in Materials Science & Engineering, Minor: Economics May 2009
Thesis title: *''Pressure-induced Study of Cerium Oxide: Bulk Modulus Calculation for nano and bulk Ceria"*

TEACHING EXPERIENCE

University of Michigan, Ann Arbor
Graduate Student Instructor, Winter 2013 (MSE 562: Electron Microscopy I)

University of Michigan, Ann Arbor
Graduate Student Instructor, Fall 2014 (MSE 560: Structure of Materials)

Columbia University, NY
Teaching Assistant, Fall 2008, Spring 2009 (MATH1201: Calculus III)

PUBLICATIONS

2022

- J. Park*, **S. J. Kim***, K. Lim, J. Cho, K. Kang "Reconfiguring Sodium Intercalation Process of TiS_2 Electrode for Sodium-Ion Batteries by a Partial Solvent Cointercalation", *ACS Energy Lett.*, 7, 3718-3726 (2022)
- M. H. Lee, G. Kwon, H. Lim, J. Kim, **S. J. Kim**, S. Lee, H. Kim, D. Eum, J. Song, H. Park, W. M. Seong, Y. Jung, K. Kang "High-Energy and Long-Lasting Organic Electrode for a Rechargeable Aqueous Battery", *ACS Energy Lett.*, 7, 3637-3645 (2022)

- **S. J. Kim**, J. Y. Park, Y. Shim, D. Chang, J. H. Chang, K. S. Dae, J. M. Yuk "Microscopic Insight into Tin Nanoparticle Magnesiation", *ACS Appl. Energy Mater.*, 5, 7944-7949 (2022)
- D. Eum, B. Kim, J. Song, H. Park, H. Jang, **S. J. Kim**, S. Cho, M. H. Lee, J. H. Heo, J. Park, Y. Ko, S. K. Park, J. Kim, K. Oh, D. Kim, S. J. Kang, K. Kang "Coupling structural evolution and oxygen-redox electrochemistry in layered transition metal oxides", *Nature Mater.*, 6, 664-672 (2022)

2021

- **S. J. Kim**, D. Wu, L. M. Housel, L. Wu, K. J. Takeuchi, A. C. Marschilok, E. S. Takeuchi, Y. Zhu "Toward the Understanding of the Reaction Mechanism of Zn/MnO_2 Batteries Using Non-alkaline Aqueous Electrolytes", *Chem. Mater.*, 33, 7283-7289 (2021)
- C. Tang, G. Singh, L Housel, **S. J. Kim**, C. D. Quilty, Y. Zhu, L. Wang, K.J. Takeuchi, E. S. Takeuchi, A. C. Marchilok "Impact of Sodium Vanadium Oxide (NaV_3O_8, NVO) Material Syntehsis Conditions on Charge Storage Mechanism in Zn-ion Aqueous Batteries", *Phys. Chem. Chem. Phys.*, 23, 8607-8617 (2021)
- J. H. Chang, J. Y. Cheong, Y. Shim, J. Y. Park, **S. J. Kim**, J. Lee, H. J. Lee, H. Lim, W. Liu, Q. Zhang, O. Teraksaki, C. -W. Lee, I. -D. Kim, J. M. Yuk "Unravelling high volumetric capacity of Co3O4 nanograin-interconnected secondary particles for lithium-ion battery anodes", *J. Mater. Chem.* A, 9, 6242-6251 (2021)

2020

- **S. J. Kim**, D. Wu, N. Sadique, C. D. Quilty, L. Wu, A. C. Marschilok, K. J. Takeuchi, E. S. Takeuchi, Y. Zhu "Unraveling the Dissolution-Mediated Reaction Mechanism of α-MnO_2 Cathodes for Aqueous Zn-Ion Batteries", *Small*, 16, 2005406 (2020) (Front Cover)
- D. Wu, L. M. Housel, **S. J. Kim**, N. Sadique, C. D. Quilty, L. Wu, R. Tappero, S. L. Nicholas, S. Ehrlich, Y. Zhu, A. C. Marschilok, E. S. Takeuchi, D. C. Bock, K. J. Takeuchi "Quantitative temporarily and spatially resolved X-ray fluorescence microprobe characterization of the manganese dissolution-deposition mechanism in aqueous Zn/α-MnO_2", *Energy Environ. Sci.*, 13, 4322-4333 (2020)
- **S. J. Kim**, C. R. Tang, G. Singh, L. M. Housel, S. Yang, K. J. Takeuchi, "New insights into the reaction mechanism of sodium vanadate for an aqueous Zn ion battery", *Chem. Mater.*, 32, 2053-2060 (2020)
- S.-Z. Yang, K. R. Tallman, P. Liu, D. M. Lutz, B. Zhang, **S. J. Kim**, L. Wu, A. C. Marschilok, E. S. Takeuchi, K. J. Takeuchi, Y. Zhu "The effects of vanadium substitution on one-dimensional tunnel structures of cryptomelane: Combined TEM and DFT study", *Nano Energy*, 71, 104571 (2020)
- D. Eum, B. Kim, **S. J. Kim**, H. Park, J. Wu, S. -P. Cho, G. Yoon, M. H. Lee, S. -K. Jung, W. Yang, W. M. Seong, K. Ku, O. Tamwattana, S. K. Park, I. Hwang, K. Kang, "Voltage decay and redox asymmetry mitigation by reversible cation migration in lithium-rich layered oxide electrodes", *Nature Mater.*, 19, 419-427 (2020)
- Y. Ko, H. Park, K. Lee, **S. J. Kim**, H. Park, Y. Bae, J. Kim, S. Y. Park, J. E. Kwon, K. Kang, "Anchored Mediate Enabling Shuttle-Free Redox Mediation in Lithium-Oxygen Batteries", *Angew. Chem.*, 132, 5414-5418 (2020)
- S. -K. Jung, I. Hwang, D. Chang, K. -Y. Park, **S. J. Kim**, W. M. Seong, D. Eum, J. Park, B. Kim, J. Kim, J. H. Heo, K. Kang, "Nanoscale Phenomena in Lithium-Ion Batteries", *Chem. Rev.*, 120, 6684-6737 (2020)

2019

- D. Kim, **S. J. Kim**, J. M. Yuk, "One-step synthesis of Pt/a-CoO_x core/shell nanocomposites", *Appl. Microsc.*, 49, 1, 1-5 (2019)
- Z. L. Xu*, **S. J. Kim***, D. Chang*, K. -Y Park, K. S. Dae, K. P. Dao, J. M. Yuk, K. Kang, "Visualization of regulated nucleation and growth of lithium sulfides for high energy lithium sulfur batteries", *Energy Environ. Sci.*, 12, 3144-3155 (2019)
- J. H. Chang, J. Y. Cheong, **S. J. Kim**, Y. Shim, J. Y. Park, H. K. Seo, K. S. Dae, C. Lee, I. Kim, J. M. Yuk, "Graphene liquid cell electron microscopy of initial lithiation of Co3O4 nanoparticles", *ACS Omega*, 4, 6784-6788 (2019)
- M. H. Lee*, **S. J. Kim*** D. Chang, J. Kim, S. Moon, K. Oh, K. Park, W. M Seong, H. Park, G. Kwon, B. Lee, K. Kang, "Toward a low-cost high-voltage sodium aqueous rechargeable battery", *Mater. Today*, 29, 26-36 (2019)
- J. Y. Park, **S. J. Kim**, K. Yim, K. S. Dae, Y. Lee, K. P. Dao, J. S. Park, H. B. Jeong, J. H Chang, H. K. Seo, C. W. Ahn, J. M. Yuk, "Pulverization-tolerance and capacity recovery of copper sulfide for high-performance sodium storage", *Adv. Sci.*, 6, 1900624 (2019)

2018

- D. Chang, K. Oh, **S. J. Kim**, K. Kang, "Super-Ionic Conduction in Solid-State $Li_7P_3S_{11}$-Type Sulfide Electrolytes", *Chem. Mater.*, 30, 8764-8770 (2018)

- **S. J. Kim***, D. Chang*, K. Zhang, G. Graham, A. Van der Ven, X. Pan, "Accordion Strain Accommodation Mechanism within the Epitaxially Constrained Electrode", *ACS Energy Lett.*, 3, 1848-1853 (2018) (* equal contribution)
- J. Y. Park*, **S. J. Kim***, J. H. Chang, H. K. Seo, J. Y. Lee, J. M. Yuk, "Atomic visualizaion of a non-equilibrium sodiation pathway in CuS", *Nature Commun.*, 9, 922 (2018) (* equal contribution) (Editors' Highlights)

2017

- J. H. Chang, J. Y. Cheong, J. M. Yuk, **S. J. Kim**, J. Jung, C. Kim, H. K. Seo, J. W. Shin, J. M. Yuk, I. Kim, J. Y. Lee, "Real Time Observation of Initial Conversion of Co_3O_4 Nanoparticles using Graphene Liquid Cell Electron Microscopy", *Microsc. Microanal.,*, 23, 1968 (2017)
- J. H. Chang, J. Y. Cheong, J. M. Yuk, C. Kim, **S. J. Kim** H. K. Seo, I. Kim, and J. Y. Lee, "Direct realization of complete conversion and agglomeration dynamics of SnO_2 nanoparticles in liquid electrolyte", *ACS Omega*, 29, 6329-6336 (2017)
- **S. J. Kim**, K. S. Dae, J. Y. Park, J. Y. Lee, J. M. Yuk, "Hollow Ag_2S nanosphere formation via electron beam-assisted oxidative etching of Ag nanoparticles", *Chem. Commun.*, 53, 11122 (2017) (Back Cover)
- **S. J. Kim**, P. Lei, K. Zhang, C. Zhou, G. Graham, X. Pan, "Tunable, endotaxial inclusion of crystalline Pt-based nanoparticles inside a high-quality bronze TiO_2 matrix", *Chem. Mater.*, 29, 2016-2023 (2017)

2015

- **S. J. Kim**, A. Kargar, D. Wang, G. W. Graham, X. Pan, "Lithiation of Rutile TiO_2-Coated Si NWs Observed by in Situ TEM", *Chem. Mater.*, 27 (20), 6929-6933 (2015)
- **S. J. Kim**, K. Zhang, M. B. Katz, B. Li, G. W. Graham, and X. Pan, "Atomic structure of defects and interfaces in TiO_2-B and Ca:TiO_2-B ($CaTi_5O_{11}$)", *Cryst. Eng. Comm.*, 17, 4309-4315 (2015)
- K. Zhang, X. Du, M. B. Katz, B. Li, **S. J. Kim**, K. Song, G. W. Graham, X. Pan, "Creating high quality Ca:TiO_2-B ($CaTi_5O_{11}$) and TiO_2-B epitaxial thin films by pulsed laser deposition", *Chem. Commun.*, 51, 8584-8587 (2015)
- A. Kargar, **S. J. Kim**, P. Allameh, C. Choi, N. Park, H. Jeong, Y. Pak, G. Y. Jung, X. Pan, D. Wang, S. Jin, "p-Si/SnO_2/Fe_2O_3", *Adv. Funct. Mater.*, 25, 2609-2615 (2015)

2014

- T. Kawamoto, K. Fujita, I. Yamada, T. Matoba, **S. J. Kim**, P. Gao, X. Pan, S. D Findlay, C. Tassel, H. Kageyama, A. J Studer, J. Hester, T. Irifune, H. Akamatsu, K. Tanaka, "Room-Temperature Polar Ferromagnet $ScFeO_3$ Transformed from a High-Pressure Orthorhombic Perovskite Phase", *J. Am. Chem. Soc.*, 136, 15291-15299 (2014)
- K. Zhang, M. B. Katz, B. L,; **S. J. Kim**, X. Du, X. Hao, J. R. Jokisaari, S. Zhang, G. W. Graham, X. Pan, "Water-Free Titania-Bronze Thin Films with Superfast Lithium-Ion Transport", *Adv. Mater.*, 26, 7365-7370 (2014)
- **S. J. Kim**, S. Noh, A. Kargar, D. Wang, G. W. Graham, X. Pan, " *In situ* TEM observation of the structural transformation of rutile TiO_2 nanowire during electrochemical lithiation", *Chem. Commun.*, 50, 9932-9935 (2014)
- **S. J. Kim**, S. Huang, X. Pan, and R. S. Goldman, "Origins of interlayer formation and misfit dislocation displacement in vicinity of InAs/GaAs quantum dots", *Appl. Phys. Lett.*, 105, 032107 (2014)
- S. Wang, B. Kavaipatti, **S. Kim**, X. Pan, R. Ramesh, J. W. Ager III, L. Wang, "Atomic and electronic structures of lattice mismatched Cu_2O/TiO_2 interfaces", *Appl. Phys. Lett.*, 104, 211605 (2014)
- K. Zhang, **S. J. Kim**, Y. Zhang, T. Heeg, D. Schlom, W. Shen, X. Pan, "Epitaxial Growth of ZnO on (111) Si Free of an Amorphous Interlayer", *J. Phys. D*, 47, 105302 (2014)

2013

- A. Kargar, Y. Jing, **S. J. Kim**, C. T. Riley, X. Pan, and D. Wang, "ZnO/CuO Heterojunction Branched Nanowires for Photoelectrochemical Hydrogen Generation", *ACS Nano*, 7, 11112-11120 (2013)
- L. Li, P. Gao, C. T. Nelson, J. R. Jokisaari, Y. Zhang, **S. J. Kim**, A. Melville, C.Adamo, D. G. Schlom, X. Pan, "Atomic Scale Structure Changes Induced by Charged Domain Walls in Ferroelectric Materials", *Nano Lett.*, 13, 5218-5223 (2013)
- S. Huang, **S. J. Kim**, R. Levy, X. Q. Pan, and R. S. Goldman, "Mechanisms of InAs/GaAs Quantum Dot Formation during Annealing of In Islands", *Appl. Phys. Lett.*, 103, 132104 (2013)
- A. Kargar, K. Sung, **S.J. Kim**, D. Lu, Y. Jing, Z. Liu, X. Pan, and D. Wang, "Three-dimensional ZnO/Si broom-like nanowire heterostructures as photoelectrochemical anodes for solar energy conversion", *Phys. Status Solidi A* , 12, 2561-2568 (2013)
- P. Sahoo, Y. Liu, J. Makongo, X. Su, **S. J. Kim**, T. Nathan, H. Chi, C. Uher, X. Pan, P. Poudeu, "Enhancing Thermopower and Hole Mobility in Bulk p-type Half-Heuslers using Full-Heusler nanostructures", *Nanoscale*, 5, 9419-9427 (2013).

- Y. Liu, P. Sahoo, J. Makongo, X. Zhou **S. J. Kim**; H. Chi, C. Uher, X. Pan, and P. F. Poudeu, "Large Enhancements of Thermopower and Carrier Mobility in Quantum Dots Engineered Bulk Semiconductors", *J. Am. Chem. Soc.*, 135(20) (2013)
- C. Chen, **S. J. Kim**, X. Pan, and J. D. Phillips, "Epitaxial Growth of ZnTe on GaSb(100) using In Situ $ZnCl_2$ surface clean", *J.Vac. Sci. Technol. B*, 31, 03C118 (2013)

2012

- **S. Kim**, B. -C. Juang, W. Wang, J. R. Jokisaari, C. -Y. Chen, J. D. Phillips, and X. Pan, "Evolution of self-assembled type-II ZnTe/ZnSe nanostructures: Structural and electronic properties", *J. Appl. Phys.*, 111, 093524 (2012)
- A. J. Martin, T. W. Saucer, K. Sun, **S. J. Kim**, G. Ran, G. V. Rodriguez, X. Pan, V. Sih, and J. Millunchick, "Analysis of defect-free GaSb/GaAs(001) quantum dots grown on the Sb-terminated (2x8) surface", *J. Vac. Sci. Technol.* B, 30, 02B112 (2012)

2011

- A. I. Khan, D. Bhowmik, P. Yu, **S. J. Kim**, X. Pan, R. Ramesh, S. Salahuddin, "Experimental evidence of ferroelectric negative capacitance in nanoscale heterostructures", *Appl. Phys. Lett.*, 99, 113501 (2011)
- W. Wang, J. D. Phillips, **S. J. Kim**, X. Pan, "ZnO/ZnSe/ZnTe Heterojunctions for ZnTe-Based Solar Cells", *J. Electron. Mater.*, 40, 1674-1678 (2011)
- C. T. Nelson, B. Winchester, Y. Zhang, **S. -J. Kim**, A. Melville, C. Adamo, C. M. Folkman, S. -H. Baek, C. -B. Eom, D. G. Schlom, L. Chen, and X. Pan, "Spontaneous Vortex Nanodomain Arrays at Ferroelectric Heterointerfaces", *Nano Lett.*, 11, 828-834 (2011)

REFREED ARCHIVAL CONFERENCE PROCEEDINGS

2019

- J. Y. Park, J. H. Chang, **S. J. Kim**, H. K. Seo, J. M. Yuk, "Facile in situ lithiation and sodiation observation in TEM employing MF (M=Li, Na)", *Microscopy & Microanalysis* 25 (suppl2), 1860-1861 (2019)

2017

- F. J. Mweta, J. H. Chang, H. K. Seo, **S. J. Kim**, J. Y. Cheong, I. -D. Kim, J. M. Yuk, J. Y. Lee, "In Situ Transmission Electron Microscopy Graphene Liquid Cell on Chemical Sodiation of Nickel Oxide Nanoparticle", *Microscopy & Microanalysis* 23 (suppl1), 204-205 (2017)

2016

- F. J. Mweta, **S. J. Kim**, J. H. Chang, J. Y. Cheong, H. K. Seo, I. Kim, J. Y. Lee, "Case Examination on Volume Expansion of Crystalline Si Nanoparticles under Sodiation: In Situ TEM Study Using Graphene Liquid Cells", *Microscopy & Microanalysis* 22 (suppl3), 1370-1371 (2016)

2014

- **S. J. Kim**, A. Kargar, D. Wang, and X. Pan, "In-situ TEM Observation of Electrochemical Cycling of a Si/TiO_2 Composite NW", *Microscopy & Microanalysis* 20 (suppl3), 454-455 (2014)
- **H. C. Kuo**, T. S. Oh, Gawn Ho Jung, Mark Hedrix, **S. J. Kim**, Max Shtein, X. Pan, and P. -C. Ku, "MOCVD-Grown InGaN Nanowires for Photovoltaic Applications", *Photovoltaic Specialist Conference*, IEEE 40th (2014)

2013

- **S. J. Kim**, J. R, Jokisaari, A. Kargar, D. Wang, and X. Pan, "In-situ TEM Study of Optical and Mechanical Effects on Electrical Properties of CuO Nanowires", *Microscopy & Microanalysis* 19 (suppl2), 1496-1497 (2013)
- L. Li, P. Gao, C. Nelson, Y. Zhang, **S. -J. Kim**, A. Melville, C. Adamo, D. Schlom, and X. Pan, "Atomic Structure and Properties of Charged Domain Walls in $BiFeO_3$ Films", *Microscopy & Microanalysis* 19 (suppl2), 1654-1655 (2013)

2011

- **S. Kim**, W. Wang, J. Phillips, and X. Pan, "Atomic Resolution TEM Study on Quantum Dots in ZnSe/ZnTe Heterostructure", *Microscopy & Microanalysis* 17 (suppl2), 1646-1647 (2011)
- X. Pan, C. Nelson, Y. Zhang, **S. Kim**, B. Winchester, L. Chen, A. Melville, C. Adamo, D. Schlom, C. Folkman, S. Baek, C. Eom, "2-D Mapping of Ferroelectric Domains by Transmission Electron Microscopy", *Microscopy & Microanalysis* 17 (suppl2), 1356-1357 (2011)

- J. Jokisaari, C. Nelson, **S. Kim**, P. Gao, S. Baek, C. Eom, X. Pan, "Study of Thin-Film Ferroelectric Heterostructures by TEM and PFM", *Microscopy & Microanalysis* 17 (suppl2), 1448-1449 (2011)

PATENTS

1. "Aqueous secondary battery"
   Kisuk Kang, Myeong Hwan Lee, Sung Joo Kim — Registration Number (KR): 1023622890000, Application Number (US): 16811204
2. "Sodium ion storage material"
   Jongmin Yuk, Jae Yeol Park, Sung Joo Kim — Registration Number (KR): 1021285300000, Application Number (US): 16633164

CONFERENCE PRESENTATIONS

1. "Understanding the Reaction Mechanism of Sodium Vanadate for an Aqueous Zn Ion Battery by Transmission Electron Microscopy"
   Materials Research Society Fall Meeting & Exhibit — Nov. 27 - Dec. 4, 2020, Virtual
2. "Mg Insertion into Sn Nanoparticles Observed by In Situ TEM"
   Materials Research Society Fall Meeting & Exhibit — Nov. 27 - Dec. 2, 2016, Boston, MA
3. "In-situ TEM observation of electrochemical lithiation of a rutile TiO_2 NW"
   Materials Research Society Spring Meeting & Exhibit — Apr. 6 - 10, 2015, San Francisco, CA
4. "Structural and Optial Studies of Self-Assembled ZnTe Quantum Dot in ZnTe/ZnSe Heterostructure"
   Materials Research Society Fall Meeting & Exhibit — Nov. 28 - Dec. 1, 2011, Boston, MA
5. "Microstructural Studies of Quantum Dots in a ZnSe/ZnTe Heterostructure"
   Materials Science & Technology Conference & Exhibition — Oct. 16 - 20, 2011, Columbus, OH
6. "Atomic resolution structural and electrical study of thin-film and nanostructured conversion systems using high-resolution transmission electron microscopy"
   Energy Frontier Research Center External Workshop — Oct. 2, 2012, Ann Arbor, MI
7. "Structural and optical studies of Type-II quantum dots in a ZnTe/ZnSe heterostruture"
   Energy Frontier Research Center External Workshop — Oct. 2, 2012, Ann Arbor, MI
8. "Study on the Evolution of $In_xGa_{1-x}N$ Nanowires by Vapor-liquid-solid Method and Development for In-situ TEM Experiments" *Energy Frontier Research Center Internal Workshop* — Jun. 28, 2012, Ann Arbor, MI
9. "High-Resolution Transmission Electron Microscopy of Oxide Semiconductor Heterojunction Solar Cell"
   Engineering Graduate Symposium — Nov. 11, 2010, Ann Arbor MI

AWARDS

- 2017 — BK21 Fellowship, *Seoul National University Chapter* — Seoul, Korea
- 2013 — Student Paper Award, *Microscopy & Microanalysis Conference* — Indianapolis, IN, USA
- 2011 — Poster Award, *American Vacuum Society, MI Chapter* — Detroit, MI, USA
- 2006-2008 — Dean's List *Columbia University* — New York, NY, USA

SKILLS

- TEM/STEM/EDS/EELS/In-situ techniques (JEOL JEM-ARM 300F, ARM 200CF, 2100F, 2800F, FEI Talos 200x)
- SEM (w/FIB) (Tescan GAIA3 SEM-FIB, JEOL JSM-7600F, Hitachi 4800)
- X-ray Diffraction (Rigaku Smartlab, Ultima III)
- Electrochemistry tests

OTHER PROFESSIONAL ACTIVITIES

Track chair (Materials Science) — Aug. 2013 - Nov. 2013
Symposium committee, Engineering Graduate Symposium, *University of Michigan* — Ann Arbor, MI

- Reviewed abstract submission from materials science and engineering department
- Invited judges for graduate student poster evaluation

Intern Consultant Jun. 2009 - Aug. 2009
Technovation Partners Seoul, Korea
- Participated in a government-led project on ”future promising green technology” in collaboration with Korea Institute of Science and Technology (KIST) and Korean Government Ministry of Environment.
- Conducted a full market research (market abroad) & patent and paper search & mapping.

General/Bibliographical Assistant Sept. 2007 - May 2009
Butler (Main) Library *Columbia University* New York, NY
- Working at a library reserves section