

Sang Jun Lee

Staff Engineer 3, Stanford Synchrotron Radiation Lightsource

Bio

EDUCATION AND CERTIFICATIONS

- Ph.D, Seoul National University , Physics (2012)

Professional

WORK EXPERIENCE

- Postdoctoral Fellow - NASA Goddard Space Flight Center (August 20, 2012 - August 19, 2015)

Publications

PUBLICATIONS

- **Coupling Anionic Oxygen Redox with Selenium for Stable High-Voltage Sodium Layered Oxide Cathodes** *ADVANCED FUNCTIONAL MATERIALS*
Xue, Z., Bothra, N., Meng, D., Feng, G., Li, Y., Cui, T., Hao, H., Lee, S., Liu, Y., Bajdich, M., Nanda, J., Zheng, X.
2024
- **Ultrathin Boron Growth onto Nanodiamond Surfaces via Electrophilic Boron Precursors.** *Nanomaterials (Basel, Switzerland)*
Govindaraju, K., Supreme, T., Labunsky, D. N., Martin, N., Del Rosario, J. M., Washington, A., Uwadiae, E. O., Adjei, S. 2., Ladjadj, S., Melendrez, C. V., Lee, S., Altoe, M. V., Green, et al
2024; 14 (15)
- **Quantum Diamonds at the Beach: Chemical Insights into Silica Growth on Nanoscale Diamond using Multimodal Characterization and Simulation.** *ACS nanoscience Au*
Sandoval, P. J., Lopez, K., Arreola, A., Len, A., Basravi, N., Yamaguchi, P., Kawamura, R., Stokes, C. X., Melendrez, C., Simpson, D., Lee, S. J., Titus, C. J., Altoe, et al
2023; 3 (6): 462-474
- **Quantum Diamonds at the Beach: Chemical Insights into Silica Growth on Nanoscale Diamond using Multimodal Characterization and Simulation** *ACS NANOSCIENCE AU*
Sandoval, P. J., Lopez, K., Arreola, A., Len, A., Basravi, N., Yamaguchi, P., Kawamura, R., Stokes, C. X., Melendrez, C., Simpson, D., Lee, S., Titus, C., Altoe, et al
2023
- **MXene Nanosheets Functionalized with Cu Atoms for Urea Adsorption in Aqueous Media** *ACS APPLIED NANO MATERIALS*
Yen, Z., Salim, T., Boothroyd, C., Haywood, P., Kuo, C., Lee, S., Lee, J., Cho, D., Lam, Y.
2023
- **Pyridinic nitrogen induced compressed bilayer graphene for oxygen reduction reaction** *MATERIALS TODAY ENERGY*
Solati, N., Cankaya, M., Kahraman, A., Simsek, K., Titus, C., Lee, S., Nordlund, D., Ogasawara, H., Tekin, A., Kaya, S.
2023; 35
- **Correction to "Quantifying the Steric Effect on Metal-Ligand Bonding in Fe Carbene Photosensitizers with Fe 2p3d Resonant Inelastic X-ray Scattering".** *Inorganic chemistry*
Kunnus, K., Guo, M., Biasin, E., Larsen, C. B., Titus, C. J., Lee, S. J., Liu, Y., Wärnmark, K., Nordlund, D., Cordones, A. A., Uhlig, J., Gaffney, K. J.
2023

- **Regulating Cation Interactions for Zero-Strain and High-Voltage P2-type Na₂/3Li₁/6Co₁/6Mn₂/3O₂ Layered Oxide Cathodes of Sodium-Ion Batteries.** *Angewandte Chemie (International ed. in English)*
Zou, P., Yao, L., Wang, C., Lee, S. J., Li, T., Xin, H. L.
2023: e202304628
- **Combinatorial Synthesis of Cation-Disordered Manganese Tin Nitride MnSnN₂ Thin Films with Magnetic and Semiconducting Properties** *CHEMISTRY OF MATERIALS*
Rom, C. L., Smaha, R. W., Melamed, C. L., Schnepf, R., Heinselman, K. N., Mangum, J. S., Lee, S., Lany, S., Schelhas, L. T., Greenaway, A. L., Neilson, J., Bauers, S. R., Tamboli, et al
2023
- **P2-Type Moisture-Stable and High-Voltage-Tolerable Cathodes for High-Energy and Long-Life Sodium-Ion Batteries.** *Nano letters*
Yuan, S., Yu, L., Qian, G., Xie, Y., Guo, P., Cui, G., Ma, J., Ren, X., Xu, Z., Lee, S., Lee, J., Liu, Y., Ren, et al
2023
- **Toward High-Performance Mg-S Batteries via a Copper Phosphide Modified Separator.** *ACS nano*
Yang, Y., Fu, W., Zhang, D., Ren, W., Zhang, S., Yan, Y., Zhang, Y., Lee, S., Lee, J., Ma, Z., Yang, J., Wang, J., NuLi, et al
2022
- **Tuning discharge voltage by Schottky electron barrier in P2-Na₂/ 3Mg_{0.205}Ni_{0.1}Fe_{0.05}Mn_{0.645}O₂** *ENERGY STORAGE MATERIALS*
Wang, Y., Shadike, Z., Fitzhugh, W., Wu, F., Lee, S., Lee, J., Chen, X., Long, Y., Hu, E., Li, X.
2023; 55: 587-596
- **Compositionally complex doping for zero-strain zero-cobalt layered cathodes.** *Nature*
Zhang, R., Wang, C., Zou, P., Lin, R., Ma, L., Yin, L., Li, T., Xu, W., Jia, H., Li, Q., Sainio, S., Kisslinger, K., Trask, et al
2022
- **A broken translational symmetry state in an infinite-layer nickelate** *NATURE PHYSICS*
Rossi, M., Osada, M., Choi, J., Agrestini, S., Jost, D., Lee, Y., Lu, H., Wang, B., Lee, K., Nag, A., Chuang, Y., Kuo, C., Lee, et al
2022
- **Synthesis and electronic properties of epitaxial SrNiO₃/SrTiO₃ superlattices** *PHYSICAL REVIEW MATERIALS*
Wang, L., Zhao, J., Kuo, C., Matthews, B. E., Oostrom, M. T., Spurgeon, S. R., Yang, Z., Bowden, M. E., Wangoh, L. W., Lee, S., Lee, J., Guo, E., Wang, et al
2022; 6 (7)
- **Orientation-Controlled Anisotropy in Single Crystals of Quasi-1D BaTiS₃** *CHEMISTRY OF MATERIALS*
Zhao, B., Bin Hoque, M., Jung, G., Mei, H., Singh, S., Ren, G., Milich, M., Zhao, Q., Wang, N., Chen, H., Niu, S., Lee, S., Kuo, et al
2022
- **Revisiting the capacity-fading mechanism of P2-type sodium layered oxide cathode materials during high-voltage cycling** *JOURNAL OF ENERGY CHEMISTRY*
Jiang, M., Qian, G., Liao, X., Ren, Z., Dong, Q., Meng, D., Cui, G., Yuan, S., Lee, S., Qin, T., Liu, X., Shen, Y., He, et al
2022; 69: 16-25
- **Superconducting detectors for rare event searches in experimental astroparticle physics** *SUPERCONDUCTOR SCIENCE & TECHNOLOGY*
Kim, Y., Lee, S., Yang, B.
2022; 35 (6)
- **Structural, Dynamic, and Chemical Complexities in Zinc Anode of an Operating Aqueous Zn-Ion Battery** *ADVANCED ENERGY MATERIALS*
Qian, G., Zan, G., Li, J., Lee, S., Wang, Y., Zhu, Y., Gul, S., Vine, D. J., Lewis, S., Yun, W., Ma, Z., Pianetta, P., Lee, et al
2022
- **Generic character of charge and spin density waves in superconducting cuprates.** *Proceedings of the National Academy of Sciences of the United States of America*
Lee, S., Huang, E. W., Johnson, T. A., Guo, X., Husain, A. A., Mitrano, M., Lu, K., Zakrzewski, A. V., de la Peña, G. A., Peng, Y., Huang, H., Lee, S. J., Jang, et al
2022; 119 (15): e2119429119
- **Characterization of photoinduced normal state through charge density wave in superconducting YBa₂Cu₃O_{6.67}.** *Science advances*
Jang, H., Song, S., Kihara, T., Liu, Y., Lee, S., Park, S., Kim, M., Kim, H., Coslovich, G., Nakata, S., Kubota, Y., Inoue, I., Tamasaku, et al

2022; 8 (6): eabk0832

- **Thermal-healing of lattice defects for high-energy single-crystalline battery cathodes.** *Nature communications*
Li, S., Qian, G., He, X., Huang, X., Lee, S., Jiang, Z., Yang, Y., Wang, W., Meng, D., Yu, C., Lee, J., Chu, Y. S., Ma, et al
2022; 13 (1): 704
- **Metastable Brominated Nanodiamond Surface Enables Room Temperature and Catalysis-Free Amine Chemistry.** *The journal of physical chemistry letters*
Melendrez, C., Lopez-Rosas, J. A., Stokes, C. X., Cheung, T. C., Lee, S., Titus, C. J., Valenzuela, J., Jeanpierre, G., Muhammad, H., Tran, P., Sandoval, P. J., Supreme, T., Altoe, et al
1800: 1147-1158
- **Quantifying the Steric Effect on Metal-Ligand Bonding in Fe Carbene Photosensitizers with Fe 2p3d Resonant Inelastic X-ray Scattering.** *Inorganic chemistry*
Kunnus, K., Guo, M., Biasin, E., Larsen, C. B., Titus, C. J., Lee, S. J., Nordlund, D., Cordones, A. A., Uhlig, J., Gaffney, K. J.
1800
- **The role of structural defects in commercial lithium-ion batteries** *CELL REPORTS PHYSICAL SCIENCE*
Qian, G., Monaco, F., Meng, D., Lee, S., Zan, G., Li, J., Karpov, D., Gul, S., Vine, D., Stripe, B., Zhang, J., Lee, J., Ma, et al
2021; 2 (9)
- **Multiphase, Multiscale Chemomechanics at Extreme Low Temperatures: Battery Electrodes for Operation in a Wide Temperature Range** *ADVANCED ENERGY MATERIALS*
Li, J., Li, S., Zhang, Y., Yang, Y., Russi, S., Qian, G., Mu, L., Lee, S., Yang, Z., Lee, J., Pianetta, P., Qiu, J., Ratner, et al
2021
- **Chemical Modulation of Local Transition Metal Environment Enables Reversible Oxygen Redox in Mn-Based Layered Cathodes** *ACS ENERGY LETTERS*
Rahman, M., McGuigan, S., Li, S., Gao, L., Hou, D., Yang, Z., Xu, Z., Lee, S., Sun, C., Liu, J., Huang, X., Xiao, X., Chu, et al
2021; 6 (8): 2882-2890
- **Reversible Mn/Cr dual redox in cation-disordered Li-excess cathode materials for stable lithium ion batteries** *ACTA MATERIALIA*
Zheng, X., Xu, Z., Li, S., Zhang, Y., Zhang, J., Kuai, C., Tao, L., Rahman, M., Zhang, Y., Lee, S., Sun, C., Li, L., Hu, et al
2021; 212
- **Selective dopant segregation modulates mesoscale reaction kinetics in layered transition metal oxide** *NANO ENERGY*
Qian, G., Huang, H., Hou, F., Wang, W., Wang, Y., Lin, J., Lee, S., Yan, H., Chu, Y. S., Pianetta, P., Huang, X., Ma, Z., Li, et al
2021; 84
- **Depth-dependent valence stratification driven by oxygen redox in lithium-rich layered oxide.** *Nature communications*
Zhang, J., Wang, Q., Li, S., Jiang, Z., Tan, S., Wang, X., Zhang, K., Yuan, Q., Lee, S., Titus, C. J., Irwin, K. D., Nordlund, D., Lee, et al
2020; 11 (1): 6342
- **Operando Tailoring of Defects and Strains in Corrugated beta-Ni(OH)₂ Nanosheets for Stable and High-Rate Energy Storage.** *Advanced materials (Deerfield Beach, Fla.)*
Li, S., Sharma, N., Yu, C., Zhang, Y., Wan, G., Fu, R., Huang, H., Sun, X., Lee, S., Lee, J., Nordlund, D., Pianetta, P., Zhao, et al
2020: e2006147
- **Mutual modulation between surface chemistry and bulk microstructure within secondary particles of nickel-rich layered oxides.** *Nature communications*
Li, S., Jiang, Z., Han, J., Xu, Z., Wang, C., Huang, H., Yu, C., Lee, S., Pianetta, P., Ohldag, H., Qiu, J., Lee, J., Lin, et al
2020; 11 (1): 4433
- **Detection of the Chiral Spin Structure in Ferromagnetic SrRuO₃ Thin Film** *ACS APPLIED MATERIALS & INTERFACES*
Huang, H., Lee, S., Kim, B., Sohn, B., Kim, C., Kao, C., Lee, J.
2020; 12 (33): 37757-63
- **Chemical control of competing electron transfer pathways in iron tetracyano-polypyridyl photosensitizers** *CHEMICAL SCIENCE*
Kunnus, K., Li, L., Titus, C., Lee, S., Reinhard, M. E., Koroidov, S., Kjaer, K. S., Hong, K., Ledbetter, K., Doriese, W. B., O'Neil, G. C., Swetz, D. S., Ullom, et al
2020; 11 (17): 4360-73

- **Enabling Stable Cycling of 4.2 V High-Voltage All-Solid-State Batteries with PEO-Based Solid Electrolyte** *ADVANCED FUNCTIONAL MATERIALS*
Qiu, J., Liu, X., Chen, R., Li, Q., Wang, Y., Chen, P., Gan, L., Lee, S., Nordlund, D., Liu, Y., Yu, X., Bai, X., Li, et al
2020; 30 (22)
- **Chemical control of competing electron transfer pathways in iron tetracyano-polypyridyl photosensitizers.** *Chemical science*
Kunnus, K., Li, L., Titus, C. J., Lee, S. J., Reinhard, M. E., Koroidov, S., Kjær, K. S., Hong, K., Ledbetter, K., Doriese, W. B., O'Neil, G. C., Swetz, D. S., Ullom, et al
2020; 11 (17): 4360-4373
- **Operando Revealing Dynamic Reconstruction of NiCo Carbonate Hydroxide for High-Rate Energy Storage** *JOULE*
Li, S., Zhang, Y., Liu, N., Yu, C., Lee, S., Zhou, S., Fu, R., Yang, J., Guo, W., Huang, H., Lee, J., Wang, C., Kim, et al
2020; 4 (3): 673-87
- **The Myth of d8 Copper(III).** *Journal of the American Chemical Society*
DiMucci, I. M., Lukens, J. T., Chatterjee, S., Carsch, K. M., Titus, C. J., Lee, S. J., Nordlund, D., Betley, T. A., MacMillan, S. N., Lancaster, K. M.
2019
- **Synthesis of a copper-supported triplet nitrene complex pertinent to copper-catalyzed amination.** *Science (New York, N.Y.)*
Carsch, K. M., DiMucci, I. M., Iovan, D. A., Li, A., Zheng, S., Titus, C. J., Lee, S. J., Irwin, K. D., Nordlund, D., Lancaster, K. M., Betley, T. A.
2019; 365 (6458): 1138-43
- **Use of Transition Models to Design High Performance TESs for the LCLS-II Soft X-Ray Spectrometer** *IEEE TRANSACTIONS ON APPLIED SUPERCONDUCTIVITY*
Morgan, K. M., Becker, D. T., Bennett, D., Doriese, W. B., Gard, J. D., Irwin, K. D., Lee, S., Li, D., Mates, J. A. B., Pappas, C. G., Schmidt, D. R., Titus, C. J., Van Winkle, et al
2019; 29 (5)
- **In-situ functionalization of tetrahedral amorphous carbon by filtered cathodic arc deposition** *AIP ADVANCES*
Sainio, S., Wester, N., Titus, C. J., Nordlund, D., Lee, S., Koskinen, J., Laurila, T.
2019; 9 (8)
- **Quantification of Heterogeneous Degradation in Li-Ion Batteries** *ADVANCED ENERGY MATERIALS*
Yang, Y., Xu, R., Zhang, K., Lee, S., Mu, L., Liu, P., Waters, C. K., Spence, S., Xu, Z., Wei, C., Kautz, D. J., Yuan, Q., Dong, et al
2019; 9 (25)
- **Hybrid X-ray Spectroscopy-Based Approach To Acquire Chemical and Structural Information of Single-Walled Carbon Nanotubes with Superior Sensitivity** *JOURNAL OF PHYSICAL CHEMISTRY C*
Sainio, S., Wester, N., Titus, C. J., Liao, Y., Zhang, Q., Nordlund, D., Sokaras, D., Lee, S., Irwin, K. D., Doriese, W. B., O'Neil, G. C., Swetz, D. S., Ullom, et al
2019; 123 (10): 6114-20
- **Surface-to-Bulk Redox Coupling through Thermally Driven Li Redistribution in Li- and Mn-Rich Layered Cathode Materials.** *Journal of the American Chemical Society*
Li, S. n., Lee, S. J., Wang, X. n., Yang, W. n., Huang, H. n., Swetz, D. S., Doriese, W. B., O'Neil, G. C., Ullom, J. N., Titus, C. J., Irwin, K. D., Lee, H. K., Nordlund, et al
2019
- **Use of Transition Models to Design High Performance TESs for the LCLS-II Soft X-Ray Spectrometer.** *IEEE transactions on applied superconductivity : a publication of the IEEE Superconductivity Committee*
Morgan, K. M., Becker, D. T., Bennett, D. A., Doriese, W. B., Gard, J. D., Irwin, K. D., Lee, S. J., Li, D., Mates, J. A., Pappas, C. G., Schmidt, D. R., Titus, C. J., Van Winkle, et al
2019; 29 (5)
- **Soft X-ray spectroscopy with transition-edge sensors at Stanford Synchrotron Radiation Lightsource beamline 10-1.** *The Review of scientific instruments*
Lee, S. J., Titus, C. J., Alonso Mori, R. n., Baker, M. L., Bennett, D. A., Cho, H. M., Doriese, W. B., Fowler, J. W., Gaffney, K. J., Gallo, A. n., Gard, J. D., Hilton, G. C., Jang, et al
2019; 90 (11): 113101
- **Thermally driven mesoscale chemomechanical interplay in Li_{0.5}Ni_{0.6}Mn_{0.2}Co_{0.2}O₂ cathode materials** *JOURNAL OF MATERIALS CHEMISTRY A*

Wei, C., Zhang, Y., Lee, S., Mu, L., Liu, J., Wang, C., Yang, Y., Doeff, M., Pianetta, P., Nordlund, D., Du, X., Tian, Y., Zhao, et al
2018; 6 (45): 23055–61

- **L-edge spectroscopy of dilute, radiation-sensitive systems using a transition-edge-sensor array** *JOURNAL OF CHEMICAL PHYSICS*
Titus, C. J., Baker, M. L., Lee, S., Cho, H., Doriese, W. B., Fowler, J. W., Gaffney, K., Gard, J. D., Hilton, G. C., Kenney, C., Knight, J., Li, D., Marks, et al
2017; 147 (21): 214201
- **High count-rate study of two TES x-ray microcalorimeters with different transition temperatures** *SUPERCONDUCTOR SCIENCE & TECHNOLOGY*
Lee, S., Adams, J. S., Bandler, S. R., Betancourt-Martinez, G. L., Chervenak, J. A., Eckart, M. E., Finkbeiner, F. M., Kelley, R. L., Kilbourne, C. A., Porter, F. S., Sadleir, J. E., Smith, S. J., Wassell, et al
2017; 30 (10)
- **Parametric Characterization of TES Detectors Under DC Bias** *IEEE TRANSACTIONS ON APPLIED SUPERCONDUCTIVITY*
Chiao, M. P., Smith, S. J., Kilbourne, C. A., Adams, J. S., Bandler, S. R., Betancourt-Martinez, G. L., Chervenak, J. A., Datesman, A. M., Eckart, M. E., Ewin, A. J., Finkbeiner, F. M., Figueroa-Feliciano, E., Kelley, et al
2017; 27 (4)
- **Determination of differential orbital covalency of heme active sites by L-edge spectroscopy**
Baker, M., Alpert, B., Cho, H., Denison, E., Doriese, W., Fowler, J., Gaffney, K., Gard, J., Gao, B., Hilton, G., Irwin, K., Joe, Y., Kenney, et al
AMER CHEMICAL SOC.2017
- **Ultra sensitive probing of the local electronic structure based on state-of-the-art Transition-Edge Sensor (TES) technology and soft x-ray spectroscopy**
Nordlund, D., Alpert, B., Baker, M., Cho, H., Denison, E., Doriese, W., Fowler, J., Gaffney, K., Gao, B., Gard, J., Hilton, G., Irwin, K., Joe, et al
AMER CHEMICAL SOC.2017
- **Probing the local electronic structure of dilute bioinorganic active sites using ultra-sensitive soft X-ray detectors**
Titus, C., Alpert, B., Baker, M., Cho, H., Denison, E., Doriese, W., Fowler, J., Gaffney, K., Gao, B., Gard, J., Hilton, G., Irwin, K., Joe, et al
AMER CHEMICAL SOC.2017
- **Ultrasensitive probing of the local electronic structure of nitrogen doped carbon and its applications to 2D electronics, catalysis and bio-physics**
Lee, S., Mori, R., Alpert, B., Baker, M., Berry, J., Cho, H., Denison, E., Doriese, W., Fowler, J., Gaffney, K., Gao, B., Gard, J., Hilton, et al
AMER CHEMICAL SOC.2017
- **XESCA: X-ray emission spectroscopy for chemical analysis**
Lee, S.
AMER CHEMICAL SOC.2017
- **Development of x-ray microcalorimeter imaging spectrometers for the X-ray Surveyor mission concept**
Bandler, S. R., Adams, J. S., Chervenak, J. A., Datesman, A. M., Eckart, M. E., Finkbeiner, F. M., Kelley, R. L., Kilbourne, C. A., Betancourt-Martinez, G., Miniussi, A. R., Porter, F. S., Sadleir, J. E., Sakai, et al
edited by DenHerder, J. W., Takahashi, T., Bautz, M.
SPIE-INT SOC OPTICAL ENGINEERING.2016