

Professor Kathy Lu's Group Publications and Invited Talks

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Patent:

1. K. Lu, M. K. Mahapatra, "Barium Oxide, Calcium Oxide, Magnesia, and Alkali Oxide Free Glass," US8,541,327, September 2013.
2. K. Lu, F. Shen, Tri-Layer CO₃O₄-SDC Protective Coating for Solid Oxide Fuel Cell Interconnects, U.S. Patent Application No: 62/318,369, April 2016.

Publications:

Books:

1. K. Lu, Nanoparticulate Materials-Synthesis, Characterization, and Processing, John Wiley & Sons, Inc., Hoboken, New Jersey, ISBN: 978-1-1182-9142-9, 464 pages, October 2012.
2. K. Lu, Materials in Energy Conversion, Harvesting, and Storage, John Wiley & Sons, Inc., Hoboken, New Jersey, ISBN: 978-1-118-88910-7, 448 pages, September 2014.

Books Edited:

1. N. P. Bansal, J. P. Singh, A. Bhalla, M. M. Mahmoud, N. Jose Manjooran, G. Singh, K. Lu, G. Brennecka, Processing and Properties of Advanced Ceramics and Composites VI, Ceramic Transactions, Volume 249, ISBN: 978-1-118-99549-5, 375 pages, September 2014, Wiley.
2. K. Lu, N. J. Manjooran, R. Murakam, and G. Pickrell, Advances in Synthesis, Processing and Applications of Nanostructures, Ceramic Transactions, Volume 238; ISBN: 978-1-1182-7327-2, August 2012, Wiley.
3. K. Lu, N. Manjooran, M. Radovic, G. Pickrell, E. Medvedovski, E. A. Olevsky, C. Li, G. Singh, and N. Chopra, Advances in Nanomaterials and Nanostructures, Ceramic Transactions, Volume 229, ISBN: 978-1-118-06002-5, August 2011, Wiley.
4. K. Lu, C. Li, E. Medvedovski, E. A. Olevsky, Processing of Nanoparticle Materials and Nanostructured Films, Ceramic Transactions, Volume 223, 2010, ISBN 978-0-470-92731-1, Wiley.
5. T. Hinklin, K. Lu, Processing of Nanoparticle Structures and Composites: Ceramic Transactions, Volume 208, ISBN: 978-0-470-40846-9, August 2009, Wiley.

Book Chapters:

6. K. Lu, W. Li, and B. Chen, "Sintering of Porous Materials," Sintering: Mechanisms of Convention Nanodensification and Field Assisted Processes, Editors: Ricardo H. R. Castro, Klaus van Benthem, Springer, Engineering Materials 35, 2013, Volume 35, 115-136, DOI: 10.1007/978-3-642-31009-6_6.
7. K. Lu, "Shaping of 3D Nanoceramics and Their Composites," *Handbook of Nanoceramics and Their Based Devices*, American Scientific Publishers, Edited by T.Y. Tseng and H. S. Nalwa, vol. 2, p 151-177, ISBN:1-58883-116-7, Stevenson Ranch, CA, 2009.
8. K. Lu and X. Zhu, "Liquid Nanoparticles: Synthesis and Characterization," *Encyclopedia of Nanoscience and Nanotechnology*, American Scientific Publishers, Stevenson Ranch, CA, 2010. Editor: H. S. Nalwa, ISBN: 1-58883-146-7, Volume 15, 537-574, 2010.

Journal papers:

142. D. Erb, K. Lu, "Effect of Additive Structure and Size on SiO₂ Formation in Polymer Derived SiOC Ceramics," *Journal of the American Ceramic Society*, accepted.
141. K. Ning, H. Ju, K. Lu, "Effects of ceramic types on evolution of micron-sized features during sintering," *Journal of the American Ceramic Society*, accepted.
140. K. Bawane, K. Ning, K. Lu, "High Temperature Oxidation Behavior of Silicon Carbide-Carbon Coated Nanostructured Ferritic Alloy Composites in Water Vapor Environment," *Corrosion Science*, accepted.
139. K. Lu, L. Wang, "Accelerated Polymer to SiOC Nanocomposite Conversion," *Annals of Materials Science and Engineering*, accepted.
138. K. Ning, K. Lu, "Water vapor thermal treatment of silicon carbide-nanostructured ferritic steel alloy (SiC-NFA) composite materials," *Applied Surface Science*, accepted.
137. K. Ning, D. Bai, K. Lu, "Study of self-ion irradiated nanostructured ferritic alloy (NFA) and silicon carbide-nanostructured ferritic alloy (SiC-NFA) cladding materials," *Nucl. Instr. Meth. Phys. Res. B*, accepted.
136. D. Erb, K. Lu, "Effect of SiO₂-forming Additive in Polysiloxane Derived SiOC Ceramics," *Microporous and Mesoporous Materials*, accepted.
135. K. Ning, K. Lu, "Ion Irradiation Effect on Spark Plasma Sintered Silicon Carbide Ceramics with Nanostructured Ferritic Alloy Aid," *Journal of the American Ceramic Society*, accepted.
134. D. Erb, K. Lu, "Influence of Vinyl Bonds from PDMS on the Pore Structure of Polymer Derived Ceramics," *Materials Chemistry and Physics*, 209, 217-226, 2018.
133. K. Ning, K. Lu, "Water Vapor Thermal Treatment Effects on Spark Plasma Sintered Nanostructured Ferritic Alloy-Silicon Carbide Systems," *Journal of the American Ceramic Society*, 101, 2208–2215, 2018.
132. K. Lu, D. Erb, "Polymer Derived Silicon Oxycarbide Coatings," *International Materials Reviews*, 63 (3), 139–161, 2018.
131. K. Bawane, K. Ning, K. Lu, "High Temperature Treatment of Cr₃C₂@SiC-NFA Composites in Water Vapor Environment," *Corrosion Science*, 131, 365-375, 2018.
130. G. Li, M. R. von Spakovsky, F. Shen, K. Lu, "Multi-scale Transient and Steady State Study of the Influence of Microstructure Degradation and Chromium Oxide Poisoning on SOFC Cathode Performance," *Journal of Non-equilibrium Thermodynamics*, J. Non-Equilib. Thermodyn. 2018; 43(1): 21–42.
129. H. Ju, K. Ning, K. Lu, "Sintering Behaviors of Micron-Sized Ceramic Rod Feature," *Acta Materialia*, 144 (1) 534-542, 2018.
128. K. Ning, Z. Hu, K. Lu, "Spark Plasma Sintering of SiC-NFA Composites with Carbon Barrier Layer," *Journal of Nuclear Materials*, 498, 50-59, 2018.
127. H. Ju, K. Ning, K. Lu, "Centrifuge-aided Micromolding of Micron- and Submicron-sized Patterns," *Journal of the European Ceramic Society*, 38 (2), 637-645, 2018.
127. H. Ju, K. Ning, K. Lu, "Roughening and Destructive Effect of Sintering on Micron-Sized ZnO Features," *Acta Materialia*, 141, 352-359, 2017.
125. J. Zhao, Y. Li, Y. Wu, S. Lv, K. Lu, "Microstructure of TiO₂ Porous Ceramics by Freeze Casting of Nanoparticle Suspensions," *Ceramics International*, 43 (17), 14593-14598, 2017.
124. M. Gervasio, K. Lu, "Suspension-based Imprint Lithography of ZnO-PMMA Hybrids," *Soft Matter*, 13, 5569 – 5579, 2017.

123. K. Lu, D. Erb, "Additive and Pyrolysis Atmosphere Effects on Polysiloxane-Derived Porous SiOC Ceramics," *Journal of the European Ceramic Society*, 37 (15), 4547-4557, 2017.
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120. M. Gervasio, K. Lu, "PMMA-ZnO Hybrid Arrays Using In-situ Polymerization and Imprint Lithography," *Journal of Materials Chemistry C*, 121 (21), 11862-11871, 2017.
119. M. Yao, J. Zhao, S. Lv, Kathy Lu, "Preparation and hydrogenation of urchin-like titanium using a one-step hydrothermal method," *Ceramics International*, 43, 6925-6931, 2017.
118. K. T. Faber, T. Asefa, M. Backhaus-Ricoult, R. Brow, J. Chan, S. Dillon, W. Fahrenholtz, M. W. Finnis, J. E. Garay, E. Garcia, Y. Gogotsi, S. M. Haile, J. Halloran, J. Hu, L. Huang, S. Jacobsen, E. Lara-Curzio, J. LeBeau, W. E. Lee, C. G. Levi, I. Levin, J. A. Lewis, D. M. Lipkin, K. Lu, J. Luo, J.-P. Maria, L. W. Martin, S. Martin, G. Messing, A. Navrotsky, N. Padture, C. Randall, G. S. Rohrer, A. Rozenflanz, T. Schaedler, D. Schlom, A. Sehrliglu, A. Stevensen, T. Tani, V. Tikare, S. Trolier-McKinstry, H. Wang, and B. Yildiz, "The Role of Ceramic and Glass Science Research in Meeting Societal Challenges: A Report from an NSF-Sponsored Workshop on Emerging Opportunities," *Journal of the American Ceramic Society*, 100, 1777-1803, 2017.
117. F. Shen, K. Lu, "Co₃O₄/Sm-doped CeO₂ (SDC)/Co₃O₄ Tri-layer Coating on AISI 441 Interconnect for Solid Oxide Fuel Cells," *ACS Applied Materials & Interfaces*, 9 (7), 6022-6029, 2017.
116. Z. Hu, K. Ning, K. Lu, "Spark Plasma Sintered Silicon Carbide Ceramics with Nanostructured Ferritic Alloy as Sintering Aid," *Materials Science and Engineering A*, 682, 586-592, 2017.
115. F. Shen, K. Lu, "Co_xFe_{1-x} Oxide Coatings on AISI 441 for Solid Oxide Fuel Cells," *Journal of Power Sources*, 330, 231-239, 2016.
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106. K. Lu, "Porous and High Surface Area SiOC Materials-A Review," *Materials Science and Engineering-R*, 97, 23–49, 2015.
105. M. Gervasio, K. Lu, R. Davis, "Experimental and Modeling Study of Solvent Diffusion in PDMS Stamp for Nanoparticle-Polymer Co-suspensions," *Langmuir*, 31(36), 9809–9816, 2015.
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101. K. Lu, M. Liu, M. Gervasio, "Nanoparticle and Poly(methyl methacrylate) Co-dispersion in Anisole," *Journal of Materials Science*, 50(14), 4836-4844, 2015.
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Conference Proceedings:

Technical papers:

22. K. Ning, Z. Hu, K. Lu, "Fabrication of New NFA-SiC Composites for Nuclear Applications," 2016 American Nuclear Society Winter Meeting Proceeding, ISBN: 978-0-89448-732-3.
21. K. Lu, W. Li, G. Li, "Understanding Diamond Nanoparticle Evolution During Zirconia Spark Plasma Sintering," *Proceeding of the 38th Int'l Conf & Expo on Advanced Ceramics & Composites (ICACC 2014)*, Daytona Beach, Florida, January 26-31, 2014. Editors: A. Gyekenyesi, M. Halbig.
20. W. Li, M. Anderson, K. Lu, J. Y. Walz, "Fabrication of Porous Mullite by Freeze Casting and Sintering of Alumina-Silica Nanoparticles," *Advances in Synthesis, Processing, and Applications of Nanostructures*, *Proceeding of Materials Science & Technology 2011 Conference and Exhibit (MS&T '11)*, October 16-20, 2011, Columbus, OH, Ceramic

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19. K. Lu, B. Chen, "Single Nanometer TiO₂ Particle Synthesis and Soft Lithographic Molding," Proceedings of 2011 NSF Engineering Research and Innovation Conference, Atlanta, Georgia, January 4-7, 2011.
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 17. W. Li, K. Lu, J. Y. Walz, "Freezing Behavior and Properties Of Freeze Cast Kaolinite-Silica Porous Nanocomposite," Ceramic Transactions, Proceeding of Materials Science & Technology 2010 Conference and Exhibit (MS&T '10), October 17-21, 2010, Houston, TX, John Wiley & Sons, 2011, p57-68.
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 12. K. Lu, X. Zhu, "Ni-B Nanolayer Evolution on Boron Carbide Particle Surfaces at High Temperatures," Processing of Nanoparticle Structures and Composites: Ceramic Transactions, Vol. 208, 133-141, Editors: T. Hinklin, K. Lu, 2009, John Wiley & Sons.
 11. K. Lu, C. Hammond, "Nanoparticle-based Bulk Material Templating," Processing of Nanoparticle Structures and Composites: Ceramic Transactions, Vol. 208, 1-10, Editors: T. Hinklin, K. Lu, 2009, John Wiley & Sons.
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Teaching papers:

2. C. B. Burgoyne, M. Roman, C. Evia, C. Suchicital, K. Lu, J. Jinscheck, "Work-in-Progress: Development and Implementation of a Web-Based Teaching Resource Site to Prepare International Teaching and Research Faculty for the American Classroom," Proceeding of ASEE/IEEE Frontiers in Education Conference (San Diego, CA, October 28-31, 2006), pp. M4G1-M4G2.
1. K. Lu, C. S. Kessler, "Nanotechnology Readiness among a Diverse Student Population," Proceeding of Mid-Atlantic Conference on the Scholarship of Diversity, Roanoke, VA, March 17-18, 2005.

Invited Talks

33. K. Lu, "Sintering Behaviors of Micron- and Submicron-sized Features," Lehigh University MSE Departmental Seminar speaker, March 27, 2018.
32. K. Lu, Donald Erb, "Effect of Reactive Additives on Polysiloxane Derived SiOC Porous Ceramics," 42nd International Conference and Exposition on Advanced Ceramics and Composites, January 21-26, Daytona Beach, FL, 2018.
31. K. Lu, H. Ju, "Sintering Behaviors of Micron- and Submicron-Sized ZnO Features," International Conference on Sintering 2017, San Diego, CA, November 12-16, 2017.
30. K. Lu, K. Ning, "SiC-NFA Composites for Nuclear Cladding Applications," Frontiers in Materials Processing Applications, Research and Technology, Bordeaux, France, July 9-12, 2017.
29. K. Lu, D. Erb, "Additive and Pyrolysis Atmosphere Effects on High Surface Area Silicon Oxycarbides," Frontiers in Materials Processing Applications, Research and Technology, Bordeaux, France, July 9-12, 2017.

28. K. Lu, "Solid Oxide Fuel Cell Interconnect Coatings," 12th Pacific Rim Conference on Ceramic and Glass Technology, Waikaloa, HI, May 21-26, 2017.
27. K. Lu, "Polysiloxane-Derived Porous SiOC Ceramics," 12th Pacific Rim Conference on Ceramic and Glass Technology, Waikaloa, HI, May 21-26, 2017.
27. K. Lu, K. Ning, K. Bawane, "Fabrication of Novel NFA-SiC Composites for Nuclear Applications," AFC Integration Meeting, Oak Ridge, TN, March 28-30, 2017.
26. K. Lu, "Polymer Derived Ceramics and a World of Possibilities on Research, Education, and Friendship," Humboldt Colloquium: Global Research in the 21st Century: Perspectives of the U.S. Humboldt Network, Washington D.C., March 2-4, 2017.
25. K. Lu, "Material Needs and Developments in Energy Conversion, Harvesting, and Storage," Fifth Biennial Conference of the Combined Australian Materials Societies 2016, Melbourne, Australia, December 6-8, 2016 (Keynote).
24. K. Lu, "Understanding Current State of Materials Education for a Successful Career Tomorrow," Materials Science & Technology 2016, Salt Lake City, UT, October 23-27, 2016.
23. K. Lu, K. Shen, "Study of Cathodes and Interconnect Coatings for Solid Oxide Fuel Cells," Materials Day Symposium-Ceramics for Energy, Darmstadt, Germany, April 29, 2016.
22. K. Lu, K. Shen, "Perovskite-type Cathode Materials and Coatings for Solid Oxide Fuel Cells," 2016 145th TMS Annual Meeting & Exhibition, Nashville, TN, February 14-18, 2016.
21. K. Lu, "FIB Guided Anodization Patterning, Morphology Control, and Feature Array Transfer," University of North Carolina, Charlotte, 2/17/2016-2/18/2016.
22. K. Lu, "Growing Materials Education Diversity for a Successful Career Tomorrow," Materials Science and Engineering 2015 Conference, Columbus, OH, October 4-8, 2015.
20. K. Lu, Z. Tang, Z. Hu, "Silicon Carbide and Oxide Dispersion Strengthened Steel Cladding Materials for Nuclear Applications," Materials Science and Engineering 2015 Conference, Columbus, OH, October 4-8, 2015.
19. F. Shen, K. Lu, "Properties of Electrodeposition Co and Electrophoresis $\text{Sm}_{0.2}\text{Ce}_{0.8}\text{O}_{1.9}$ Protective Layer on AISI 441 for Solid Oxide Fuel Cells," Materials Science and Engineering 2015 Conference, Columbus, OH, October 4-8, 2015.
18. K. Lu, K. Shen, "Study of Different New Cathode Materials and Electrocatalyst Incorporation in Solid Oxide Fuel Cells," The 11th International Conference of Pacific Rim Ceramic Societies (PacRim-11), Jeju Island, South Korea, August 30-September 4, 2015.
17. K. Lu, F. Shen, " $(\text{La}_{0.6}\text{Sr}_{0.4})_x\text{Co}_{0.2}\text{Fe}_{0.8}\text{O}_3$ and Related Cathode Materials in Solid Oxide Fuel Cells," 2015 TMS 144th Annual Meeting & Exhibition, Walt Disney World, Orlando, FL, March 15-19, 2015.
16. K. Lu, "3D Microstructure Characterization of Nanoparticle-based Material Sintering," the International Conference on Sintering 2014, Dresden, Germany, August 24-28, 2014 (Keynote).
15. K. Lu, "Patterning, Morphology Control, and Feature Array Transfer through Focused Ion Beam Guided Anodization," University of Virginia, Charlottesville, VA, April 14, 2014.
14. K. Lu, M. Gervasio, "Formation and Characterization of Nanoparticle based Sub-micron Structures," 38th International Conference and Expo on Advanced Ceramics and Composites, Daytona Beach, FL, January 26-31, 2014.
13. K. Lu, W. Li, "Different Cathode Interactions and Performance Behaviors in Solid Oxide Fuel Cells," 10th Pacific Rim Conference on Ceramic and Glass Technology, San Diego, California, June 2-7, 2013.

12. K. Lu, "Development of a Nanoparticle-based Surface Templating Approach," 12th International Conference on Ceramic Processing Science, Portland, Oregon, August 4-7, 2013.
11. K. Lu, "Material Uses and Challenges in Solid Oxide Fuel Cells," Departmental seminar at Technische Universität Darmstadt, Darmstadt, Germany, November 2012.
10. K. Lu, B. Chen, K. Ramsburg, "ZnO Nanoparticle-based Surface Templating," 36th International Conference and Expo on Advanced Ceramics and Composites, Daytona Beach, Florida, January 22-27, 2012.
9. K. Lu, T. Jin, "Interactions of Electrolyte-(La_{0.8}Sr_{0.2})_xMnO₃ Air Electrode Interconnect Tri-layers for Solid Oxide Fuel Cells," 36th International Conference and Expo on Advanced Ceramics and Composites, Daytona Beach, Florida, January 22-27, 2012.
8. K. Lu, W. Li, J. Walz, "Understanding of Silica-Kaolinite Composite Sintering," Materials Science & Technology 2011 Conference and Exhibit (MS&T '11), Columbus, OH, October 16-20, 2011.
7. K. Lu, B. Chen, Z. Tian, "Understanding Effect of Surface Morphology during Focused Ion Beam Guided Anodization," 35th International Conference & Exposition on Advanced Ceramics & Composites, Daytona Beach, FL, January 23-28, 2011,.
6. K. Lu, "Search and Study of a Solid Oxide Fuel Cell Seal Material," 2011 TMS Annual Meeting & Exhibition, San Diego, CA, February 27-March 3, 2011.
5. K. Lu, "Nanoparticle-Based Material Processing and Templating," Ohio State University, Columbus, OH, May 22, 2009.
4. K. Lu, "Energy and Nanoscale Materials," University of Maryland at Baltimore County, Baltimore, MD, May 9, 2008.
3. K. Lu, "Correlating Microscopic and Macroscopic Aspects in Solid-State Sintering," Extrude Hone Corporation, Irwin, PA, November 30, 2004.
2. K. Lu, "Particle Packing, Strength Evolution, and Densification in Solid-State Sintering," Naval Research Laboratory, Arlington, VA, October 22, 2004.
1. K. Lu, "Battery Research and Technology," Advanced Materials Laboratory at Sandia National Lab, March 15, 2004.