

# Shiwoo Lee

3610 Collins Ferry Rd., Morgantown, WV 26507, USA

[Shiwoo.Lee@netl.doe.gov](mailto:Shiwoo.Lee@netl.doe.gov)

(Office) 304-285-4594; (Cell) 215-820-4477

Senior research scientist and manager with expertise in materials and process development for electrochemical energy systems

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## PROFESSIONAL CAREER

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### U.S. DOE National Energy Technology Laboratory / LRST (Morgantown, WV)

Jan. 5<sup>th</sup>, 2015 – present

- Lead materials and process development for innovative electrode engineering of electrochemical energy conversion systems including solid oxide fuel cells, reversible fuel cells, and ion transport membrane.
- Lead scale-up and technology transfer of the developed electrode activation/stabilization technology for industrial partners' solid oxide fuel cell application.

### U.S. DOE National Energy Technology Laboratory / NRC Senior Research Fellow

Jan. 4<sup>th</sup>, 2010 – Jan. 3<sup>rd</sup>, 2015

### University of Pennsylvania / Postdoctoral Researcher (Philadelphia, PA)

Aug. 2007 - Dec. 2009

### University of Science and Technology (UST) / Adjunct Professor (Daejeon, Korea)

Sep. 2006 - Aug. 2008

### Korea Institute of Energy Research (KIER) / Senior Researcher (Daejeon, Korea)

Sep. 2003 - Aug. 2008

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## EDUCATION

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### Ph.D. in Materials Science and Engineering

**KAIST (Korea Advanced Institute of Science and Technology)** - Daejeon, Korea Feb. 2003

- Dissertation: *Permeation Properties and Structural Stability of Oxygen Permeable  $La_{1-x}Sr_xB_{1-y}Fe_yO_3$  ( $B=Co, Ga$ ) Perovskite Membrane.*

### M.S. in Materials Science and Engineering

**KAIST (Korea Advanced Institute of Science and Technology)** - Daejeon, Korea Feb. 1997

- Dissertation: *Preparation and Characterization of  $Si_3N_4/BN$  Ceramic Laminates and Fibrous Monolithic Ceramics.*

### B.S. in Ceramics Science and Engineering

**Yonsei University** - Seoul, Korea

Aug. 1992

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## ACHIEVEMENTS SUMMARY

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- Developed an innovative manufacturing method, single-step electrode infiltration technique that significantly improves the efficiency of SOFC: Patents, Awards (Presidential Early Career Awards for Scientists and Engineers (PECASE), Energy Leadership Award,

Innovation in Energy – Carnegie Science Award, etc.), and Technology commercialization with industry partners.

- Identified highly active/stable mixed ionic-electronic conducting materials through electrochemical properties characterization using a constructed ionic conductivity measurement system and/or impedance analysis: Patents and Publication
- Developed and demonstrated a lab-scale oxygen transport membrane system
- Patented 15+ inventions regarding novel functional materials and energy-related systems
- Published 50+ technical papers in scientific journals

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## AWARDS

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- Presidential Early Career Awards for Scientists and Engineers (The White House, 2019)
- Carnegie Science Award (as a team) – Advanced Manufacturing and Materials Award (Carnegie Science Center, 2017)
- The AECOM Excellence Awards – Individual winner in Dream category (AECOM, 2016)
- Carnegie Science Award – Innovation in Energy (Carnegie Science Center, 2016)
- The 2015 Energy Leadership Award – Pittsburgh Business Times (Manufacturing category) (2015)
- NRC (National Research Council) Senior Research Fellowship (2009-2014)

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## PUBLIC SERVICE / PROFESSIONAL ACTIVITY

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- Technical review panelist for DOE programs:
  - DOE SBIR/STTR on Advanced coal research
  - DOE SBIR/STTR on Crosscutting fossil energy research
  - DOE SBIR/STTR on Fuel cell technologies for central power generation with coal
  - DOE SOFC Core technology program
- Reviewer for prominent scientific/technical journals:
  - Journal of the Electrochemical Society
  - Journal of Solid State Electrochemistry
  - Chemistry of Materials
  - Journal of Power Sources
  - Journal of Materials Engineering and Performance
  - International Journal of Hydrogen Energy
  - Journal of Materials Research
  - Applied Catalyst B
  - Progress in Energy and Combustion Science
  - Journal of Solid State Chemistry
  - Journal of European Ceramic Society
- Active member of the Electrochemical Society and TMS.