

Seokhoon Jang

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<https://scholar.google.com/citations?user=wrY8z8oAAAAJ/>

EDUCATION

The Pennsylvania State University, State College, PA, USA	Chemical Engineering	PhD	2019 – 2024
Inha University, Incheon, Korea	Chemical Engineering	MS	2016 – 2018
Inha University, Incheon, Korea	Chemical Engineering	BS	2011 – 2016

EMPLOYMENTS

Postdoctoral Research Associate, Oak Ridge National Laboratory (ORNL), Oak Ridge, TN, USA	July 2024 – Present
Research Intern, Oak Ridge National Laboratory (ORNL), Oak Ridge, TN, USA	Jan 2024 – May 2024

HONORS AND AWARDS

Elmer E. Klaus Fellowship on Society of Tribologists and Lubrication Engineers (STLE), Long Beach, CA, USA	2023
Research Article Featured on the Front Cover (S. Jang <i>et al</i> , ACS Applied Materials & Interfaces 2023 , 15, 31, 37997-38007)	2023
Silver Poster Award, STLE Student and Early Career Poster Competition, Long Beach, CA, USA	2023
Best Poster Award, Gordon Research Conference on Tribology, ME, USA	2022

RESEARCH AREAS

Investigating the tribological (friction, wear, and lubrication), electrical, and thermal properties of diverse carbon materials—including diamond-like carbon (DLC), carbon nanotube (CNT), graphene, graphite, and pyrolytic carbon—through advanced surface characterization techniques

PUBLICATIONS during PhD Study

As first-author:

Key Research Topic:

“Understanding the origin of superlubricity of hydrogenated diamond-like carbon (HDLC)”

The importance of this study:

“Such fundamental understanding is a prerequisite for advanced lubricants in engineering devices, including lubricating coatings on top of burls for extreme ultraviolet (EUV) lithographic projection apparatus to prevent mechanical failures”.

1. **Seokhoon Jang**, Zhe Chen, Seong H. Kim, “Environmental effects on superlubricity of hydrogenated diamond-like carbon: Understanding tribochemical kinetics in O₂ and H₂O environments” *Applied Surface Science* **2022**, 580, 152299
2. **Seokhoon Jang** and Seong H. Kim, “Distinct effects of endogenous hydrogen content and exogenous hydrogen supply on superlubricity of diamond-like carbon” *Carbon* **2023**, 202, 61-69

3. **Seokhoon Jang**, Muztoba Rabbani, Andrew L. Ogrinc, Maxwell T. Wetherington, Ashlie Martini, and Seong H. Kim, “Tribochemistry of diamond-like carbon: Interplay between hydrogen content in the film and oxidizing gas in the environment” *ACS Applied Materials & Interfaces* **2023**, 15, 31, 37997-38007 (**Featured on the Front Cover**)
4. **Seokhoon Jang**, Ana G. Colliton, Hind S. Flaih, Eskil M.K. Irgens, Lucas J. Kramarczuk, Griffin D. Rauber, Jordan Vickers, Andrew L. Ogrinc, Zhenxi Zhang, Zhenbing Gong, Zhe Chen, Brian P. Borovsky, and Seong H. Kim, “Why is superlubricity of diamond-like carbon rare at nanoscale?” *Small* **2024**, 20, 2400513
5. **Seokhoon Jang**, Zhe Chen, and Seong H. Kim, “Origin of superlubricity of diamond-like carbon (DLC)” *Friction* **2025**, 13, 1
6. **Seokhoon Jang**, Ruichan Yuan, Yu-Sheng Li, Andrew L. Ogrinc, Jihyeong Ryu, and Seong H. Kim, “Superlubricity of amorphous carbons” *Submitted to Tribology Letters* **2025**
7. **Seokhoon Jang**, Andrew L. Ogrinc, and Seong H. Kim, “Effects of CO₂ on the superlubricity of diamond-like carbon: Removing chemically-reactive sites at the shear plane” *In preparation* **2025**

As co-author:

1. Michele Fromel, Devon M. Sweeder, **Seokhoon Jang**, Teague A. Williams, Seong H. Kim, and Christian W. Pester “Superhydrophilic Polymer Brushes as Durable Anti-Fogging Coatings” *ACS Applied Polymer Materials* **2021**, 3, 5291–5301.
2. Yu-Sheng Li, **Seokhoon Jang**, Fakhrul Hasan Bhuiyan, Ashlie Martini, and Seong H. Kim “Molecular structure and environment dependence of shear-driven chemical reactions: Tribopolymerization of methylcyclopentane, cyclohexane and cyclohexene on stainless steel” *Tribology Letters* **2022**, 71, 2, 49
3. Yu-Sheng Li, **Seokhoon Jang**, Arman Khan, Q. Jane Wang, Ashlie Martini, Yip-Wah Chung, and Seong H. Kim “Possible origin of D- and G-band features in Raman spectra of tribofilms” *Tribology Letters* **2022**, 71, 2, 57
4. Wenmeng Yan, Fakhrul H. Bhuiyan, Chuan Tang, Liang Wei, Yilong Jiang, **Seokhoon Jang**, Yangqin Liu, Jiang Wu, Wen Wang, Yang Wang, Ashlie Martini, Linmao Qian, Seong H. Kim, and Lei Chen “Understanding and preventing lubrication failure at the carbon atomic steps” *Small* **2023**, 2301515
5. Yen-Ting Lin, Andrew L. Ogrinc, Ava Zoba, Jongcheol Lee, **Seokhoon Jang**, Nicholas Smith, Joy Banerjee, Andrew Antony, Gabriel Agnello, and Seong H. Kim “Revealing ‘invisible’ subsurface structural change/damage in silicate glass made by ‘nearly-elastic contact’ with a spherical smooth surface” *Acta Materialia* **2024**, 264, 119571
6. Jia-Ruey Ai, **Seokhoon Jang**, Wyatt Fink, Seong H. Kim, and Bryan Vogt “Role of polymer interactions in core-shell filaments on mechanical properties of 3D printed objects” *RSC Applied Polymers* **2024**, 2, 105-116

PUBLICATIONS during MS Study

As first-author:

1. **Seokhoon Jang**, Jieun Kim, Eunbeen Na, Mingyu Song, Jinkyu Choi, KyongHwa Song, Sung-Hyeon Baeck, and Sang Eun Shim “Facile synthesis of mesoporous and highly nitrogen/sulfur dual-doped graphene and its ultrahigh discharge capacity in non-aqueous lithium oxygen batteries” *Carbon Letters* **2019**, 29(3), 297-305

As co-author:

1. Minjae Kim, Pillaiyar Puthiaraj, Yingjie Qian, Yeongseon Kim, **Seokhoon Jang**, Sosan Hwang, Eunbeen Na, Wha-Seung Ahn, and Sang Eun Shim “High performance carbon supercapacitor electrodes derived from a triazine-based covalent organic polymer with regular porosity” *Electrochimica Acta* **2018**, 284, 98-107
2. Jaechul Ju, Minjae Kim, **Seokhoon Jang**, Yeongseon Kim, Yongheum Choi, Sung-Hyeon Baeck, and Sang Eun Shim “3D in-situ hollow carbon fiber/carbon nanosheet/Fe₃C&Fe₃O₄ by solventless one-step synthesis and its superior supercapacitor performance” *Electrochimica Acta* **2017**, 252, 215-225
3. Eunsoo Lee, Minjae Kim, Jaechul Ju, **Seokhoon Jang**, Sung-Hyeon Baeck, and Sang Eun Shim “The electrochemical enhancement due to the aligned structural effect of carbon nanofibers in a supercapacitor electrode” *Synthetic Metals* **2017**, 226, 195-206

PROFESSIONAL EXPERIENCES

Invited Reviewer, Nature Communications	Jan 2025
Invited Reviewer, Journal of Friction	Oct 2024
Invited Reviewer, Journal of Friction	Aug 2024
Invited Reviewer, Journal of Friction	Feb 2024
Invited Reviewer, Journal of Friction	Nov 2023
Invited Reviewer, Journal of Friction	Oct 2023
Invited Reviewer, Tribology Letters	Sep 2023
Invited Reviewer, Tribology Letters	July 2022
Invited Reviewer, Tribology Letters	Nov 2021

SKILLS & CHARACTERIZATIONS

Surface Analysis	XPS, Contact angle & surface tension measurement
Surface Metrology	AFM, 3D optical profilometry
Electron Microscopy	SEM, EDS, Focused Ion Beam (FIB) Milling, Layer probe
Vibrational Spectroscopy	Raman
Mechanical Testing	AFM, A pin-on-disk tribometry
Sample Prep	Chemical Vapor Deposition (CVD), Tubular furnace, Allied TechCut, Spin coating, Surface polishing
Software & Tool	Adobe Illustrator, Mathematica, 3DS Max, ChemSketch