

Graduate student or Postdoctoral position in Theory and Simulation for Soft Matter Lab.

The **Theory and Simulation for Soft Matter Lab** (<https://jnusml.wixsite.com/labintro>) in the School of Polymer Science and Engineering at **Chonnam National University (Gwangju, South Korea)** is currently looking for new members across all levels (internship, undergraduate, graduate students, or post-docs).

Our group is conducting research to predict and describe the physical properties of several **polymer systems**, and to design **new materials** and systems tailored for **cutting-edge technologies**. For that purpose, we employ computational science tools, such as **molecular simulation** and **machine learning** techniques. In detail, our group is interested in developing and applying **mesoscale simulation** models and computational tools to investigate structural, thermodynamic, and dynamic phenomena in various soft matter systems, including but not limited to polymer melts, liquid crystalline polymers, networked polymers, amphiphilic polymers, polymer brushes etc. In addition, efforts are underway to combine **artificial intelligence and data-based technologies**, which have recently grown in interest, to develop novel polymer materials and systems.

Our group is expanding the research subject of interest through **collaborations** with several research groups over **many countries**.

The research topics in progress in our lab are the following:

Developing simulation models and computational tools

- Mesoscale simulation model for solution assembly & emulsified polymer droplets
- Developing a coarse-grained simulation model for polymer bottlebrushes
- Modeling of Extreme Ultraviolet (EUV) photoresist & patterning process

Materials/systems design through data science and machine learning techniques

- Data augmentation for Deep Learning Networks under limited datasets
- Searching low-dielectric constant polymer resins via molecular simulation and machine learning approaches

Investigations on phenomena related to polymer self-assembly

- Boundary Directed Epitaxy
- Multi-component polymer brushes
- 2D melting of nanocrystals
- Kinetics of defect annihilation

If interested in computation-based material science, please contact Prof. Su-Mi Hur (shur@jnu.ac.kr, 82-62-530-1772). Potential applicants are welcome to discuss details on possible research topics and benefits.

Biography of Prof. Su-Mi Hur

1996-2000: **Seoul National University**. Chemical Engineering. B.S.

2000-2002: **Seoul National University**. Chemical Engineering. M.S.

2006-2012: **University of California, Santa Barbara**. Chemical Engineering, Ph.D.

2012-2015: **University of Chicago & Argonne National Lab**. Postdoctoral Researcher.

2015-present: **Chonnam National University**.

Recent (selected) publications & collaborations

ACS Appl. Mater. Interfaces 2021, 13 (34), 41190–41199 (collaboration with Fudan University, China).

ACS Nano 2021, 15 (3), 5513-5522 (collaboration with KAIST, Korea).

Nature Communications 2020, 11, 4151 (selected as editor's highlight, collaborated with UW-Madison, USA).

Science Advances 2019, 5 (6), eaaw3974 (collaboration with UNIST, Korea).

ACS Nano, 2018, 12 (10), 9974-9981 (collaboration with U of Chicago, USA).