

# ZHIYU JIANG (JOSEPH)

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## Education

<b>Fudan University</b> Optical Science and Engineering	Bachelor of Science	China, 6/2016
<b>Waseda University</b>	Exchange Student	Japan, 7 – 8/2014
<b>Ulsan National Institute of Science and Tech</b> Center for soft and living matters	Visiting Scientist	South Korea, 7/2016
<b>Lehigh University</b>	Master of Physics	USA, 1/2018
<b>Lehigh University</b>	PhD of Physics (GPA: 3.87) Thesis: Mechanical Properties of Soft Matters	Expected in 5/2021

## Experience & Projects

### **PhD Candidate, Soft Matter Physics, Lehigh University** **5/2019 – Now**

- Identify micropatterns of adhesive materials by using MATLAB image processing.
- Statistically analyze the evolution of local stress in a developing plastic film.
- Experimentally study fluid convection as density of solvent and dispersed particles mismatches.
- Develop Python codes to fit 2D/3D curves by using Scikit-learn regression.
- Design optical path to measure light transmission of a 2D cement sample.

### **Teaching Assistant, Physics, Lehigh University** **9/2016 – Now**

- Introduce mechanical physics to undergraduate students in labs and recitations.
- Simulate DNA transcriptions by using a stochastic process.
- Numerically solve partial differential functions to understand the process of thermal diffusion, wave propagation, and stress evolution.
- Generate movies to show the deformation of plastic materials.

### **Product Development Intern, Henkel Co** **7/2020 – 8/2020**

- Established a procedure to evaluate water-based emulsion and adhesives for flexible food packaging.
- Developed general understandings on what is required to achieve a good bond performance.
- Evaluated different means to address the film blocking and identified potential issues on food resistance.

### **Research Assistant, Emulsion Polymers Institute, Lehigh University** **3/2017 – Now**

- Design algorithms to identify colloidal particles in microscopic images
- Trace particles from image stacks to obtain trajectory, displacement, and moving velocity.
- Simulate particle-particle interactions to mimic the process of particle packing in drying.
- Analyze crack formation in the plastic films by using image segmentation.
- Study fundamental physics of the colloidal coagulation based on the system of dark-field optical tweezer.
- Analyze the relationship between the size of nanoparticles measured by SEM and the amount of surfactant.
- Generate understanding on the relationship between plastic film formation and glass transition temperature ( $T_g$ ).
- Study how the volume fraction of water affects the rheology of packed colloids.
- Assisted Royce Global® to test monomer conversion by using provided organic initiators.
- Assisted LiquidPower Inc.® to understand the fundamental process of mini-emulsion.

**Research Assistant, Imaging Development for Opaque Materials, Lehigh Univ.****9/2017 – 8/2019**

- Imaged spatiotemporal evolution of colloidal film formation by optical coherence tomography (OCT).
- Studied the process of micro channel formation, shear banding formation, and crack formation in drying latex by fluorescence confocal microscopy.
- Developed micron probes to detect stress relaxation near failure structures of plastic films.

**Research Scholar, Optical Response Features of Nano Silicon Particle Arrays, Fudan Univ.****9/2014 – 6/2016**

- Simulated reflection and transmission features of Si nanoparticle crystals.
- Mapped electromagnetic field distribution of 2D photonic crystals.
- Designed optical films to adjust reflection and transmission of visible light.
- Designed many-lens system to remove image aberration, color aberration, and image distortion.

## **Technical Skills**

Languages	C, C++, Java, MATLAB, Python
Software	Microsoft Office, Photoshop, ImageJ, Solidworks, Mathematica.
Machine Learning	Scikit-learn
Courses	Analog Electronics, C programming, C++ programming, Calculus, Complex Mathematics Computer Interface Techniques, Digital Logic Circuit, Linear Algebra, MATLAB Programming Mechanics, Mechanics of Soft Matters, Nonlinear Optics, Numerical Analysis & Computation Solid State Physics, Optical Fiber Communication, Physics Simulation, Quantum Mechanics Statistics, Stochastic Process, Polarized Optics

## **Elected Positions**

<b>Secretary of Publication</b>	School of Information Science and Technology	9/2012-7/2013
<b>Secretary of Study &amp; Research</b>	Department of Optical Science and Engineering	8/2013-6/2016
<b>Vice President</b>	Physics Graduate Students Association, Lehigh University	5/2018-5/2019
<b>Secretary of Treasurer</b>	Physics Graduate Students Association, Lehigh University	5/2020 - Now

## **Honors**

<b>Chinese National Scholarship</b>	2013 & 2015
<b>Excellent Student of Fudan University</b>	2014
<b>Scholar of Wangdao</b>	2016
<b>Instructor's Choice Award</b>	2016
<b>Teaching Assistant Award Honorable Mention, Lehigh University</b>	2019

## **Publications**

- Jiang, Z. Y.; Wang, S. Y; et. al. **Theoretical study on the optical response features of silver nanoparticles and arrays.** *Acta Physica Sinica*, (2016).
- Jiang, Z.; Ou-Yang, H.D.; et. al. **Frequency Response of Induced-Charge Electrophoretic Metallic Janus Particles.** *Micromachines* (2020).
- Jiang, Z.; Zhou, C.; et. al. **Nondestructive Characterization of Drying Processes of Colloidal Droplets and Latex Coats Using Optical Coherence Tomography.** In *Optical Coherence Tomography and Its Non-medical Applications.* *IntechOpen* (2020).
- Jiang, Z.; Ou-Yang, H. D.; et. al. **Extract active fluctuations from total fluctuations of a confined active Brownian particle.** *SPIE* (2020).

## **Personal Link**

<b>Personal web</b>	<a href="https://jiangzhiyu93.wixsite.com/joseph">https://jiangzhiyu93.wixsite.com/joseph</a>
<b>Linked in</b>	<a href="https://www.linkedin.com/in/joseph-jiang-1433ab116/">https://www.linkedin.com/in/joseph-jiang-1433ab116/</a>