

# Chungyeon Cho

Department of Mechanical Engineering  
Texas A&M University  
3123 TAMU, College Station, TX, 77843  
Phone: (979) 446 - 2620, Email: chocy78@gmail.com

## Education:

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**2009 – 2013** : Texas A&M University, College Station, Texas

Ph.D. Materials Science & Engineering

Advisor : Nicole S. Zacharia

Thesis : A Study of Porous Transitions of Layer-by-Layer Thin Films and Patterning Multilayers

**2006 – 2008** : Seoul National University, Seoul, Korea

M.S. Materials Science & Engineering

Advisor : Yongsok Seo

Thesis : Optical properties of cyanostilbene derivatives and characterization in Langmuir-Blodgett (LB) films

**1999 – 2006** : Konkuk University, Seoul, Korea

B.S. Materials Chemistry & Engineering

## Research Interest:

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- Looking at assembly of polyelectrolyte multilayers thin films; deposition, properties, surface chemistry
- Investigation of morphological transformation, physical and mechanical properties within polymer thin films by external stimuli such as pH, ionic strength solution, and electric field
- Microstructure of polymer thin films, their structure, and interactions
- Proton exchange membrane fuel cells; assembly of polyelectrolyte multilayers as a nanoreactor for the synthesis of platinum nanoparticles
- Characterization of polymer structure-property relationships
- Electrophoretic-deposition of polymer/inorganic nanomaterials for gas barrier films
- Transparent conducting films consisting of polymers and graphenes assembled by Layer-by-Layer method
- Thermoelectric organic thin film nanocomposites

## Empolyment:

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**2013 – Present :** Texas A&M University, College Station, Mechanical Engineering.

Advisor : Prof. Jaime C. Grunlan

**June – August 2012 :** Argonne National Laboratory, Chemical Science Engineering (CSE) division, Argonne, IL. Research Aide, advised by Dr. Deborah Myers and Prof. Nicole S. Zacharia

**March – May 2008 :** Intelligent Textile System Research Center, ITRC, Seoul National University, Seoul, Korea. Research Aide

## Research Experience:

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**2013 – Present :** Mechanical Engineering, Texas A&M University, College Station, Texas

Postdoctoral Researcher for Prof. Jaime Grunlan

- Electrophoretic-driven polymer/clay nanobrick films
- Highly transparent conducting polymer/graphene gas barrier films
- Stretchable gas barrier of polyelectrolyte multilayer thin films

**2009 – 2013 :** Materials Science & Engineering, Texas A&M University, College Station, Texas

Graduate Research Assistant for Prof. Nicole S. Zacharia

- Patterning of polyelectrolyte multilayers thin films, especially their bulk and surface properties, by using reactive wet stamping (r-WETS) technique
- Mechanism of the morphology transition from a continuous morphology to a porous morphology within weak polyelectrolyte multilayers for post-assembly treatment
- Morphological transitions in weak polyelectrolyte multilayers by applying an electric field
- Salt-induced physical / mechanical / morphological changes in multilayers and the creation of lateral gradient thickness or porosity structures using r-WETS technique
- Synthesis of platinum nanoparticles and uniform distribution of them in the polyelectrolyte multilayers thin films for the application of proton exchange membrane fuel cells

**June – August 2012 :** Chemical Science & Engineering Division, Argonne National Laboratory, Argonne, IL. Research Aide for Dr. Deborah Myers and Prof. Nicole S. Zacharia

- Polyelectrolyte multilayer stabilized platinum nanoparticles for proton exchange membrane fuel cells

**March – May 2008 :** Intelligent Textile System Research Center, ITRC, Seoul National University, Seoul, Korea. Research Aide for Prof. Yongsok Seo

- Fabrication of Langmuir-Blodgett (LB) films consisting of regioregular poly(3-hexylthiophene) and CN-TFMBE for application to organic thin film transistor

**2006 - 2008 :** Department of Materials Science & Engineering, Seoul National University, Korea  
Graduate Research Assistant for Prof. Yongsok Seo

- Self-assembly of a polystyrene-poly(methyl methacrylate) diblock copolymer at the air-water interface
- Optical properties of cyanostilbene derivatives and characterization in Langmuir-Blodgett (LB) films

**2004 - 2005 :** Department of Materials Chemistry and Engineering, Konkuk University, Korea  
Undergraduate Research Assistant under Prof. Jeonglim Heo

- A study on the properties of solventless and high epoxy resins

## **Teaching Experience:**

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**September – December :** Department of Mechanical Engineering, Texas A&M University, TX  
Teaching Assistant (Fall 2011), Class : Mechanical Engineering (MEEN 471), Materials in Design

- Graded homework and quizzes for 64 students and held weekly office hours

**January – May :** Materials Science & Engineering, Texas A&M University, TX

Teaching Assistant (spring 2013), Class : Materials Science & Engineering (MSEN 604), Fundamental Soft and Biomaterials

- Graded homework and quizzes for graduate students and held weekly office hours

## **Honors and Awards:**

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- Summa Cum Laude in Materials Chemistry and Engineering Major, Konkuk University, Korea
- Scholarship from Dongbu Cultural Foundation Scholarship: Materials Science and Engineering, Seoul National University, March 2006 - February 2008

## Publications:

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- Y, Seo.; C, Cho.; M, Hwangbo.; S, Hong. “Effect of Temperature on the Interfacial Behavior of a Polystyrene-b-poly(methyl methacrylate) Diblock Copolymer at the Air/Water Interface”, *Langmuir* 2008, 24, 2381-2386.
- C, Cho.; L, Valverde.; G, Ozin.; N, S. Zacharia. “Reactive Wet Stamping for Patterning of Polyelectrolyte Multilayers”, *Langmuir* 2010, 26, 13637-1364.
- C, Cho.; N, S. Zacharia. “Film Stability during Postassembly Morphological Changes in Polyelectrolyte Multilayers Due to Acid and Base Exposure”, *Langmuir* 2012, 28, 841-848.
- C, Cho.; J, Jeon.; J, L. Lutkenkaus.; N, S. Zacharia. “Electric Potential-Induced Morphological Transitions in Polyelectrolyte Multilayers”, *ACS Appl. Mater. Interfaces* 2013, 5, 4930-4936.
- C, Cho.; N, Kariuki.; D, Myers.; N, S. Zacharia. “Polyelectrolyte Multilayer Stabilized Platinum Nanoparticles for Proton Exchange Membrane Fuel Cells”, *manuscript in preparation*.

## Conferences:

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- C, Cho.; N, Kariuki.; D, Myers.; N, S. Zacharia. “Polyelectrolyte Multilayer Stabilized Platinum Nanoparticles for Proton Exchange Membrane Fuel Cells” American Chemical Society (ACS) Spring 2013 Meeting, New Orleans (oral presentation)
- C, Cho.; N, S. Zacharia. “Structural and Assembly with Polyelectrolytes” American Chemical Society (ACS) Fall 2011 Meeting, Denver (oral presentation)
- C, Cho.; N, S. Zacharia. “Film Stability during Post-Assembly Morphological Changes in Polyelectrolyte Multilayers” American Physical Society (APS) Spring 2011 meeting, Dallas (post presentation)
- C, Cho.; L, M. Valverde.; J, Kaiser.; N, S. Zacharia. “Patterning and etching of polyelectrolyte multilayers by using reactive wet stamping (r-WETS)” Materials Science & Technology (MS&T) 2010 Conference, 2010, Houston (post presentation)
- C, Cho.; G, A. Ozin.; N.S. Zacharia. “Reactive Wet stamping for Patterning Polyelectrolyte Multilayers” LB13- International Conference on Organized Molecular Film, July 19th, 2010, Quebec City, Canada (post presentation)

## References:

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### **Dr. Nicole S. Zacharia**

Assistant Professor

Dept. of Polymer Engineering

University of Akron, Akron, OH 44325

College Station, TX 77843-3123.

Phone: (330) 972-8248

Email: nzacharia@uakron.edu

### **Dr. Jaime Grunlan**

Associate Professor

Dept. of Mechanical Engineering & Materials Science and Engineering Program

Texas A&M University, 3123 TAMU

College Station, TX 77843-3123.

Phone: (979) 845-3027

Email: jgrunlan@tamu.edu

### **Dr. Jodie L. Lutkenhaus**

Assistant Professor

Dept. of Chemical Engineering & Materials Science and Engineering Program

Texas A&M University, 3122 TAMU

College Station, TX 77843-3123.

Phone: (979) 845-2682

Email: jodie.lutkenhaus@che.tamu.edu