

# CHRISTIAN A. CONTRERAS

Graduate Student

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## EDUCATION

In Progress	<b>Ph.D., Chemistry</b> Northwestern University	Evanston, IL
2013	<b>M.S., Chemical Engineering</b> Northwestern University	Evanston, IL
2011	<b>B.S., Chemical Engineering</b> University of California, Riverside	Riverside, CA

## RESEARCH EXPERIENCE

September 2016 – Present **Department of Chemistry Northwestern University**  
**Peter Stair Laboratory, Justin Notestein Laboratory:** Graduate Researcher  
Controlled Templated Pore Generation via Atomic Layer Deposition

June 2014 – April 2016 **R&D Division GreatPoint Energy**  
**Process Development Engineer**  
Production of Synthetic Natural Gas from Coal Gasification, Catalyst Discovery and Recovery

August 2013- May 2014 **Energy Systems Division Argonne National Laboratory**  
**Richard Brotzman Laboratory:** Chemical Engineering Researcher  
Scaled Production of High Aspect Ratio Magnetic Materials via Electrospinning

July 2011 – August 2013 **Department of Chemical and Biological Engineering Northwestern University**  
**Justin Notestein Laboratory:** Graduate Researcher  
Synthesis of Selective Oxidants for Olefin Epoxidation

June 2010 – June 2011 **Materials Science and Engineering Program UC Riverside**  
**David Kisailus Laboratory:** Undergraduate Researcher  
Novel synthesis of platinum nanostructures for Proton Exchange Membrane Fuel Cell

June 2009– June 2011 **Department of Chemical and Environmental Engineering UC Riverside**  
**Yushan Yan Laboratory:** Undergraduate Researcher  
Characterization and implementation of novel electro-catalysts for Proton Exchange Membrane Fuel Cells

## AWARDS AND HONORS

- 2012 George Thodos Teaching Assistant Award, *Chemical and Biological Engineering Northwestern University*
- 2011 1<sup>st</sup> Place Senior Design Competition, *Department of Chemical and Environmental Engineering UC Riverside*
- 2011 Student Choice Award People, Prosperity, Planet Competition, *Environmental Protection Agency*
- 2011 Undergraduate Research Grant *Office of Instructional Development UC Riverside*
- 2011 2<sup>nd</sup> Place International Student Design Contest, *Hydrogen Energy Foundation/Department of Energy*
- 2011 Research Scholarship *American Public Power Association Demonstration of Energy Efficient Developments*
- 2010 2<sup>nd</sup> Place Undergraduate Poster Session *American Institute of Chemical Engineers Annual Meeting*
- 2010 Participant *Massachusetts Institute of Technology A Community in Chemical Engineering Select Symposium\**
- 2010 Fellow *University of California Leadership through Advanced Degrees(UC LEADS)\*\**
- 2010 Fellow *Louis Stokes Alliance/California Alliance for Minority Participation(LSAMP/CAMP)\*\**

2010 Scholar *Xerox Technical Minority Scholarship Program*  
2010 Scholar *The Affiliates of the University of California, Riverside*  
2010 1<sup>st</sup> Place Undergraduate Symposium *California Alliance for Minority Participation Annual Symposium*  
2010 Phase 1 Winner P3(People, Prosperity, Planet) Competition *Environmental Protection Agency*  
2009-2011 Scholar *College Cost Reduction and Access Act (CCRAA) Research Program*  
2007-2011 Scholar *Edison International Scholars Program*  
\* Sponsored by The Dow Chemical Company  
\*\* Sponsored by The National Science Foundation

## **PUBLICATIONS**

Contreras, Christian A., Patricia Anne A. Ignacio-de Leon, and Justin M. Notestein. "Synthesis of a family of peracid-silica materials and their use as alkene epoxidation reagents." *Microporous and Mesoporous Materials* 225 (2016): 289-295.

Ignacio-de Leon, P. A. A., Contreras, C. A., Thornburg, N. E., Thompson, A. B., & Notestein, J. M. *Catalyst structure and substituent effects on epoxidation of styrenics with immobilized Mn (tmtacn) complexes*. *Applied Catalysis A: General*, 511, 78-86.

Alia, S., Jensen, K., Contreras, C., Garzon, F., Pivovar, B., Yan, Y.  
*Platinum Coated Copper Nanowires and Platinum Nanotubes as Acidic Oxygen Reducing ElectroCatalysts*  
*ACS Catalysis* **2013** 3 (3), 358-362

Contreras, C, Chiu, M., Goins, J, Lee, J, Skovgard, J *Design Proposal-Residential Fueling with Hydrogen*  
*Journal of the Hydrogen Education Foundation*, December 2011

Gu, S., Cai, R., Luo, T., Jensen, K., Contreras, C., & Yan, Y. (2010). Quaternary phosphonium-based polymers as hydroxide exchange membranes. *ChemSusChem* 3(5), 555-558. WILEY-VCH Verlag. (Cover Article)

L. Hussein, K. Jensen, S. Alia, C. Contreras, Y. Yan, G. Urban, and M. Krüger, *Novel nanotube buckypaper as electrode material for fuel cell applications*. Proc. PowerMEMS 2009, December 01-04, Washington, USA, pp.112-115, (2009).

## **PRESENTATIONS**

Ignacio-de Leon, P.A., Contreras, C.; "Surface-bound Mn triazacyclononane catalysts for alkene oxidation"  
North American Catalysis Society Meeting June 2013

Contreras, C., Ignacio-de Leon, P.A.; "Peracid-modified Silica as Heterogeneous Oxygen Transfer Agents"  
American Chemical Society Spring Meeting May 2013

Ignacio-de Leon, P.A., Contreras, C.; "Immobilized Manganese triazacyclononane Catalysts for Epoxidation"  
American Chemical Society Spring Meeting May 2013

Contreras, C. "Copper Templated Platinum Nanotubes as PEM Fuel Cell Catalyst" University of California  
Leadership through Advanced Degrees Symposium May 2011

Contreras, C., Chiu, M., Lee, J.B., Skovgard, J. "Residential Hydrogen Refueling Station, based on Hydroxide  
Exchange Membrane Electrolysis" Fuel Cell and Hydrogen Energy Expo, formerly NHA Expo May 2011

Contreras, C., Yan, Y., "Fabrication of Ultra-Low Loading Anodes for PEM Fuel Cells" American Institute of  
Chemical Engineers Annual Meeting November 2010

Contreras, C., Yan, Y., "Cost Reduction Techniques for Proton Exchange Membrane Fuel Cells California Alliance for Minority Participation Annual Symposium February 2010

### **TEACHING EXPERIENCE**

#### **Graduate Teaching Assistant(April 2012-December 2012)**

Instructed undergraduate students in a Unit Operations Laboratory course. I set up instruments for weekly classes, instructed students on how to conduct experiments and write laboratory reports, revised reports, provided additional help beyond classroom. Won TA of the year.

#### **Undergraduate Research Mentoring (April 2010-June 2011):**

Lower classmen undergraduate students (2) and high school students (2) were directly mentored by me in the Yushan Yan Laboratory. Students were trained in the synthesis of ordered metal nanostructures and in the fabrication of fuel cell electrodes. Additional training was given in electron microscopy and electrochemical testing.

### **VOLUNTEERING EXPERIENCE**

#### **Letters to a Pre-Scientist (June 2012 to Present):**

I serve as a Pen-Pal and mentor to Middle School Children in a North Carolina School. The purpose of the program is to engage young students into STEM fields by providing them with mentors throughout middle and high school. As a mentor I have detailed my future goals and my previous experience as a middle school and high school student. I worked with these students to help them discover both the joys of science and the opportunities available to them in order to pursue a career in a STEM field.

#### **American Youth Soccer Organization (AYSO) Assistant Coach (September 2015 to Present)**

Served as assistant coach for U-8 and U-10 team for local youth soccer team. Organized practices, team snacks and fields for weekly soccer games. At times worked with special needs youth to provide them with organized sports experience.

#### **Prieto Career Day Speaker October 2016**

Speaker at Dr. Jorge Prieto Math and Science Academy Career Day. Gave an hour presentation depicting my experience as a minority engineer spanning from high school to present day.

#### **Kitchen Community Volunteer October 2014 to April 2016**

GreatPoint Energy help build and maintain a small garden for Dett Elementary School. As a volunteer I engaged with students in the importance of eating healthy.

The Kitchen Community builds Learning Gardens in schools to connect kids to real food, increase academic achievement, and drive community engagement.

### **PROFESSIONAL MEMBERSHIPS**

American Institute of Chemical Engineers  
Society of Hispanic Professional Engineers  
California Alliance for Minority Participation  
Engineers Without Borders  
Society for the Advancement of Chicanos and Native Americans in Science