

# ALEXANDER THOMAS BRIDGE

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## EDUCATION

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B.S.E. Chemical Engineering, Mathematics Minor – May 2017 *Summa Cum Laude*  
**Arizona State University – Ira A. Fulton Schools of Engineering**  
Graduate of Barrett, the Honors College  
GPA: 3.88

Ph.D. Chemical Engineering – *In Progress, Expected Summer 2022*  
**The University of Texas at Austin – Cockrell School of Engineering**  
GPA: 3.88

## PROFESSIONAL EXPERIENCE

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**The University of Texas at Austin:** Freeman/Brennecke Research Groups      Fall 2017-Present  
*Graduate Research Assistant, Safety Officer*      *Austin, TX*

- Conducting fundamental studies on membranes based on polymer blends for target applications in pre-combustion carbon capture and post-cracking dehydrogenation
- Developing techniques for eliminating support layer macrovoids and skin layer defects in asymmetric gas separation membranes prepared via phase inversion
- Designed and purchased pilot-scale manufacturing equipment for fabrication of flat sheet and hollow fiber asymmetric membranes for gas and water separations
- Developing safety protocol and training personnel as the Freeman lab group safety officer

**Arizona State University:** Green Research Group      Fall 2014-Spring 2017  
*Undergraduate Research Assistant*      *Tempe, AZ*

- Conducted projects on polymer/polyelectrolyte rheology funded by the Fulton Schools
- Used rheological analysis to optimize polymer solutions for membrane applications
- Constructed a functional bench-scale spinline for hollow fiber membrane fabrication

**Hewlett-Packard (HP Inc.)**      Summer 2016-Fall 2016  
*Chemical Engineering Intern*      *San Diego, CA*

- Developed a model to isolate cause of batch-to-batch viscosity fluctuations in coating formulations for publishing applications
- Performed gage R&R and statistical DoE studies on lab equipment and technicians to update standard operating procedures

**PolyOne Corporation**

Summer 2015-Fall 2015

*Engineered Materials Intern**Avon Lake, OH*

- Tested mechanical properties of long fiber reinforced thermoplastic (LFT) parts
- Designed and implemented experiments to track long-term water uptake of Nylon LFTs
- Assisted in pilot-scale manufacturing and injection molding of LFT resins
- Created experimental additive thermoplastic filaments for 3D printing studies

**ORGANIZATIONS****Center for Innovative and Strategic Transformation of**

Fall 2017-Present

**Light Alkane Resources (CISTAR)***Graduate Research Assistant, Young Scholar Mentor**Austin, TX**Student Leadership Council (SLC) Chair*

- Developing membrane separations technologies for purification of C<sub>2</sub><sup>+</sup> dehydrogenation products in the CISTAR process
- Mentored high school students for 6 weeks through the CISTAR Young Scholars Program
- Serving as chair of the SLC – responsibilities include planning and running SLC meetings, overseeing a yearly student assessment of CISTAR and presenting results to National Science Foundation (NSF) representatives, developing programs and seminars for CISTAR students, and representing the CISTAR student body at NSF biennial meetings in Washington, D.C.

**Fulton Ambassadors**

Fall 2014-Spring 2017

*Special Events Director**Tempe, AZ*

- Represented the Fulton Schools of Engineering in recruiting prospective students
- Led campus tours for groups of 2-30
- Led engineering presentations at high schools to groups of 30+
- Served as the special events director from Fall 2015-Spring 2017

**Fulton Undergraduate Research Initiative (FURI)**

Fall 2015-Fall 2016

*Undergraduate Research Assistant, FURI Fellow**Tempe, AZ*

- Conducted solution rheology and membrane research
- Presented posters at three FURI research symposiums
- Received funded travel to present a poster at the 2016 American Institute of Chemical Engineers (AIChE) annual meeting in San Francisco, CA
- Encouraged undergraduate research in speeches to engineering classes as a FURI fellow

**Boy Scouts of America – Troop 644**

Summer 2006-Summer 2012

*Eagle Scout, Senior Patrol Leader**Scottsdale, AZ*

- Obtained the rank of eagle scout, scouting's highest honor, in 2012
- Led troop 644 as the senior patrol leader (SPL) in 2011 – trained 40+ boy scouts as SPL
- Served as master of ceremonies for troop 644

## HONORS AND AWARDS

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**Cockrell School of Engineering Doctoral Fellowship** Fall 2017-Fall 2021

- Awarded an additional \$9,000 per year for first 4 years of doctoral studies

**Fulton Undergraduate Research Initiative Grant** Fall 2015-Spring 2016

- Awarded twice for rheology and membrane studies, each granting \$800 for research materials and \$1,500 in personal stipends

**W.L. Gore and Associates Research Grant** Spring 2016

- Awarded \$500 for the construction of a bench-scale hollow fiber spinning apparatus

**Fulton Undergraduate Research Initiative Travel Grant** Fall 2016

- \$1,000 travel stipend to present at the 2016 AIChE annual meeting

**Most Outstanding Senior Design: Low-C SMR Hydrogen Production** Spring 2017

- Selected by industry committee to receive \$500 prize for best senior design

## PUBLICATIONS

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1. Moon, J. D.; **Bridge, A. T.**; D'Ambra, C.; Freeman, B. D.; Paul, D. R. Gas Separation Properties of Polybenzimidazole/Thermally-Rearranged Polymer Blends. *Journal of Membrane Science* 2019, 582, 182–193
2. Schreiner C.; **Bridge, A.T.**; Hunley, M.T.; Long, T.E.; Green, M.D.; Segmented imidazolium ionenes: Solution rheology, thermomechanical properties, and electrospinning; *Polymer*, 2017, 114, 257-265.

## ORAL PRESENTATIONS

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1. Davila Labastida, J.C.; **Bridge, A.T.**; Brennecke, J.F.; Freeman, B.D.; Advanced Polymer Membranes for Gas Separations Relevant to Shale Gas Processing; Spoke at: 12<sup>th</sup> Natural Gas Conversion Symposium 2019, April 5<sup>th</sup>; San Antonio, TX.
2. **Bridge, A.T.**; Moon, J.D.; D'Ambra, C.; Freeman, B.D.; Paul, D.R.; Gas Transport Properties of Blends Containing Polybenzimidazoles; Spoke at: PSTC Fall Meeting; 2018 October 16th-17th; Austin, TX.
3. **Bridge, A.T.**; Freeman, B.D.; Brennecke, J.F.; Membrane Pilot Scale Manufacturing Facility; Spoke at: PSTC Fall Meeting; 2018 October 16th-17th; Austin, TX.

## POSTER PRESENTATIONS

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1. **Bridge, A.T.**; Freeman, B.D.; Brennecke, J.F.; Asymmetric Polymeric Membranes for Gas Separations: Fabrication and Scale-Up, Poster presented at: Spring 2019 NSF Engineering Research Center (CISTAR) Meeting; 2019 May 22nd; West Lafayette, IN.

2. **Bridge, A.T.**; Freeman, B.D.; Brennecke, J.F.; Preparation of Asymmetric Membranes for High-Performance Gas Separations, Poster presented at: Fall 2018 NSF Engineering Research Center (CISTAR) Meeting; 2018 October 5th; Albuquerque, NM.
3. **Bridge, A.T.**; Davila Labastida, J.C.; Brennecke, J.F.; Freeman, B.D.; Membrane Materials Synthesis, Screening, and Scale-up: from Lab to Pilot Scale, Poster presented at: Fall 2018 NSF Engineering Research Center (CISTAR) Meeting; 2018 October 5th; 2018 October 5th; Albuquerque, NM.
4. **Bridge, A.T.**; Freeman, B.D.; Brennecke, J.F.; Pilot-Scale Manufacturing for Industrially Relevant Membrane Gas Separations Research, Poster presented at: Spring 2018 NSF Engineering Research Center (CISTAR) Meeting; 2018 May 24th; West Lafayette, IN.
5. **Bridge, A.T.**; Green, M.D.; Solution Rheology: Scaling Theory and Membrane Applications, Poster presented at: Fall 2016 American Institute of Chemical Engineers Annual Meeting; 2016 November 14th; San Francisco, CA.
6. **Bridge, A.T.**; Green, M.D.; Rheology of Novel Polyelectrolytes: Proof of Concept and Application to Membrane Formation, Poster presented at: Spring 2016 FURI Symposium; 2016 April 22nd; Tempe, AZ.
7. **Bridge, A.T.**; Green, M.D.; Exploring Polymer Solution Behavior Through Rheological Analysis, Poster presented at: Fall 2015 Fulton Undergraduate Research Initiative (FURI) Symposium; 2015 November 20th; Tempe, AZ.