

AMANDA ASHLEY CAIN

PROFILE

- Graduate Research Assistant in Polymer NanoComposites (PNC) Lab – J.C. Grunlan, Ph.D.
- Thin Film Material Characterization: *growth* (Ellipsometer, Reflectometer, Profilometer, UV-vis, QCM); *micro imaging* (TEM, SEM, LM); *thermal stability* (TGA, vertical/horizontal flame testing)

EDUCATION

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| May 2010 - Present | TEXAS A&M UNIVERSITY — College Station, TX PhD Student in Material Science and Engineering | Projected December 2014 <u>Cumulative GPA: 3.568 / 4.00</u> |
| May 2010 | MILLSAPS COLLEGE — Jackson, MS Bachelor of Science, Major in Physics • Mathematics and Business Minors; Pre-Engineering Concentration | <u>Cumulative GPA: 3.265 / 4.00</u> |

EXPERIENCE

TEXAS A&M UNIVERSITY – College Station, TX May 2010 ~ present
Graduate Research Assistant. Polymer NanoComposites Lab
Advisor: Dr. Jaime C. Grunlan

RESEARCH TOPICS

- Exploring suitable materials to build nanostructured thin films via layer-by-layer assembly that impart anti-flammable behavior.
- Investigating optoelectronic properties of sp² hybridized carbon allotrope transparent, conductive thin films fabricated with layer-by-layer assembly.

COMPANY PROJECTS

- Performance evaluation of flame resistant coatings for foam (Funded by Huntsman) Dec. 2010 ~ Dec. 2011
- Evaluation of Flame Retardant Nanotechnology in Bedding (Funded by *Confidential* Bedding Manufacturer) Mar. 2011 ~ May 2012
- Improvement of Sporting Goods. (Funded by *Confidential* Sporting Goods Maker) Aug. 2012 ~ Jan. 2013
- Evaluation of Flame Retardant Nanotechnology (Funded by *Confidential* Airplane Manufacturer) Mar. 2013 ~ present

RIVER OAKS HOSPITAL - Jackson, MS Spring 2010
Internship with cardiovascular surgeon conducting vascular pressure & occlusion hemodynamic research.

CENTERPOINT ENERGY – Shreveport, LA Summers 2008, 2009
Internship with the Pipeline Integrity Division consisted of compiling data and assisting with engineering projects.

JOURNAL PAPERS

- Y. S. Kim, R. Davis, **A. A. Cain**, J. C. Grunlan. "Development of layer-by-layer assembled carbon nanofiber-filled coatings to reduce polyurethane foam flammability." *Polymer* **2011**, 52, 2847.
- G. Laufer, C. Kirkland, **A. A. Cain**, J. C. Grunlan. "Clay-chitosan nanobrick wall: Completely renewable gas barrier and flame retardant nanocoatings," *ACS Applied Materials and Interfaces* **2012**, 4, 1643. [This work was already featured as News of the Week in C&EN \(5 SEP 2011\), based upon a press conference at the 242nd ACS National Meeting in Denver, CO \(30 AUG 2011\).](#)
- G. Laufer, C. Kirkland, **A. A. Cain**, J. C. Grunlan. "Oxygen barrier of multilayer thin films comprised of polysaccharides and clay," *Carbohydrate Polymers* **2013**, 95, 299.
- **A. A. Cain**, C. R. Nolen, Y.-C. Li, R. Davis, J. C. Grunlan. "Phosphorous-filled nanobrick wall multilayer thin film eliminates polyurethane melt dripping and reduces heat release associated with fire," *Polymer Degradation and Stability* **2013**, 98, 2645.
- **A. A. Cain**, S. Murray, K. Holder, C. R. Nolen, J. C. Grunlan, "Aqueous OnePot Polyelectrolyte Complex Extinguishes Flame on Fabric via Intumescence," **2014**, *in press*.
- A. Mateous,[†] **A. A. Cain**,[‡] J. C. Grunlan, "Uniform thin films deposited on fabric by continuous dipping system," **2014**, *in review*.

- **A. A. Cain**, M. Plummer, T. Smith, O. Regev, J. C. Grunlan, "Single Polymer/Clay Layer Creates Effective Flame-Retardant Nanocoatings for Polyurethane Foam," **2014**, *in preparation*.

ORAL PRESENTATIONS

- "Intumescent multilayer nanocoating, made with renewable polyelectrolytes, for flame-retardant cotton" by G. Laufer, C. Kirkland, **A. A. Cain**, A. B. Morgan, and J. C. Grunlan, presented at the 245th American Chemical Society National Meeting & Exposition; New Orleans, LA (4/10/2013).

AWARDS

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| INTERNATIONAL LAYER-BY-LAYER SYMPOSIUM 2011 – STRASBOURG, FRANCE | March 2011 |
| <ul style="list-style-type: none"> • Wiley-VCH Award for best poster in the area of Materials Science | |
| HENRY KAHN MEMORIAL SCHOLARSHIP – SPE SCHOLARSHIP | MAY 2012 |

ADVISING

Undergraduate Research Assistants: Polymer NanoComposite Lab

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| • Arturo Mateos | Jan. 2011 ~ Aug. 2013 |
| • Matthew Gill | REU 2011 Summer Program |
| • Michael Wampler | Aug. 2011 ~ Mar. 2012 |
| • Craig Nolan | Aug. 2011 ~ Dec. 2012 |
| • Shannon Murray | Oct. 2012 ~ Present |
| • Morgan Plummer | May 2013 ~ Present |

PROFESSIONAL AFFILIATIONS

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| • Microscopy Society of America | Jan. 2011 ~ Jan. 2012 |
| • Materials Research Society | Dec. 2011 ~ Dec. 2012 |
| • Society of Plastics Engineers (SPE) | Oct. 2011 ~ Present |
| <ul style="list-style-type: none"> • MSEN Representative | May 2012 ~ May 2013 |
| • American Chemical Society | Aug. 2012 ~ Present |

SCHOLARSHIPS AND ACHIEVEMENTS

Texas A&M University:

- *Passed* Material Science and Engineering PhD Qualifiers (Fall 2011)
- *Passed* Material Science and Engineering PhD Preliminary Examinations (Fall 2013)

Millsaps College:

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| • Millsaps Presidential Scholarship | • Senator of the Year, 2009 |
| • Millsaps Tops Scholarship | • SCAC All-Sportsmanship Team, 2009 |
| • United Methodist Triple Your Dollars for Scholars | • Most Outstanding SBA Senate Committee, 2008 |
| • Millsaps Methodist Youth Scholarship | • All SCAC Academic Honor Roll 2006 – 2009 |
| • Elks Lodge Student of the Year Scholarship | • Dean's List 2006 – 2009 |
| • Louisiana Fraternal Order of Police Scholarship | • Asked to speak at Loyola Open House – 2008, 2010 |
| • Hall of Fame Recipient, 2010 | • Speaker for 2007 Graduates |
| • Who's Who Among College Students, 2010 | • Archie Lamb Sportsmanship Award, 2010 |
| • Most Distinguished Woman, 2010 | |

CAMPUS INVOLVEMENT

SOCIETY OF PLASTICS ENGINEERS (SPE)

- BASF Plant Tour & dinner with SPE South TX, 2011
- Chemistry Open House, 2011

MILLSAPS STUDENT BODY ASSOCIATION

- Executive Director of Programming, 2009
- Executive Board Member, 2009
- Chair for Campus Services, 2007-2008
- Co-chair for Programming Committee, 2006
- Senator, 2006-2008

MILLSAPS HALL OF FAME

- Committee Member, 2007
- Who's Who Selection Committee, 2009
- Chair of Hall of Fame Committee, 2009

MILLSAPS VOLLEYBALL TEAM

- Senior and Junior Team Captain, 2008-2009
- SCAC All-Sportsmanship Team, 2009
- Defensive Specialist, 2006-2009
- SCAC Academic Honor Roll, 2006-2009

- 2nd Degree Black Belt in Tae Kwon Do

REFERENCE

Dr. Jaime C. Grunlan, Associate Professor, Department of Mechanical Engineering, Texas A&M University.
 Email: jgrunlan@tamu.edu Phone: 979-845-3027