

Jaime C. Grunlan

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EDUCATION:

- June 2001 UNIVERSITY OF MINNESOTA Minneapolis, MN
Ph.D. in Materials Science and Engineering w/ Chemistry minor.
- May 1997 NORTH DAKOTA STATE UNIVERSITY Fargo, ND
B.S. in Chemistry w/ Polymers & Coatings Option.

PROFESSIONAL POSITIONS:

- September 2010 to present TEXAS A&M UNIVERSITY, College Station, TX
Associate Professor and Gulf Oil/Thomas Dietz Development Professor I
Studying layer-by-layer assembly of nanocomposite thin films for electronic, biomedical, optical and flame retardant applications. Also studying bulk polymer nanocomposites with unique transport and optical behavior. Teach undergraduate and graduate courses in general materials science and polymers.
- Appointments in Mechanical Engineering and Chemical Engineering and on Executive Committee of Materials (MSEN) Program.
 - Research highlighted in *Nature*, *C&EN*, *ScienceNews*, *New York Times* and in various local newspapers and newscasts.
- July 2004 to August 2010 TEXAS A&M UNIVERSITY, College Station, TX
Assistant Professor
Studying layer-by-layer assembly of nanocomposite thin films for electronic, biomedical, optical and flame retardant applications. Also studying bulk polymer nanocomposites with unique transport and optical behavior.
- Guest edited special issues of *Review of Scientific Instruments*.
 - Invited speaker for ACS, MRS and GRC meetings.
 - Research highlighted in *Nature Materials* and *C&EN* and featured on the cover of *Macromolecular Materials and Engineering*.
 - Won NSF CAREER, 3M Untenured Faculty and Dow Young Faculty awards.
 - Organized symposium for 2008 MRS Fall Meeting entitled *Transport Properties in Polymer Nanocomposites*.
 - Jointly appointed in Chemical Engineering and serve on Executive Committee of Materials Science and Eng. Program.
- June 2001 to July 2004 AVERY RESEARCH CENTER, Pasadena, CA
Senior Research Engineer (Research Engineer until late 2002)
Research and development of polymer-based electronic and biological materials for new business development.
- Created novel antimicrobial coating for wound care.
 - Created novel electrochromic films for display devices.
 - First-authored book chapter on combinatorial materials science.
 - Inventor on two issued patents.

August 2002 to December 2003	AZUSA PACIFIC UNIVERSITY, Azusa, CA <i>Adjunct Professor</i> Taught Physical Science for non-science majors and Introduction to Materials Science for pre-engineering majors.
January 2002 to May 2002	BIOLA UNIVERSITY, La Mirada, CA <i>Adjunct Professor</i> Taught Introduction to Materials Science for pre-engineering students. Created new curriculum that will continue to be taught every other year.

CURRENT GRADUATE STUDENTS:

1. Fangming Xiang (PhD **2016**) – *Thin Films for Gas Separation/Purification*
2. David Hagen (PhD **2015**) – *Thin Films for Gas Separation/Purification*
3. Ping Tzeng (PhD **2015**) – *Thin Films for Gas Separation/Purification*
4. Bart Stevens (PhD **2015**) – *Thermoelectric Polymer Nanocomposites*
5. Amanda Cain (PhD **2014**) – *Antiflammable Behavior of Nanostructured Thin Films Using Layer-by-Layer Assembly*
6. Gregory Moriarty (PhD **2013**) – *Thermoelectric Polymer Nanocomposites*
7. Galina Laufer (PhD **2012**) – *Layer-by-Layer Assembly of Antiflammable Thin Films*
8. You-Hao Yang (PhD **2012**) – *Layer-by-Layer Assembly of Multifunctional Thin Films*

GRADUATED STUDENTS:

PhD (Major Subject Graduation Year)

1. Morgan Priolo (Materials Science and Engineering **2012**) – *Gas Permeability of Nanostructured Thin Films Using Layer-by-Layer Assembly* [Visiting Professor at Geological Sciences Institute, Polish Academy of Sciences (Krakow, Poland)]
2. Yu-Chin Li (Materials Science and Engineering **2011**) – *Environmentally Benign Flame Retardant Nanocoatings for Fabric* [postdoc at NIST]
3. Yong Tae Park (Mechanical Engineering **2011**) – *Transparent and Conductive Carbon Nanotube Multilayer Thin Films Suitable as an Indium Tin Oxide Replacement* [postdoc at University of Minnesota]
4. Krishna Chaitanya Etika (Materials Science and Engineering **2010**) – *Stimuli-Tailored Dispersion State of Aqueous Carbon Nanotube Suspensions and Solid Polymer Nanocomposites* [D1DR Etch Engineer at Intel]
5. Andrea Adamczak (Materials Science and Engineering **2010**) – *High Temperature Materials for Aerospace Applications* [Senior Multi-Disciplined Engineer at Raytheon]

6. Lei Liu (Materials Science and Engineering **2009**) – *Structure Property Relationships in Carbon Nanotube-Polymer Systems: Influence of Non-Covalent Stabilization Techniques* [postdoc at Case Western]
7. Woo-Sik Jang (Mechanical Engineering **2008**) – *Layer-by-Layer Assembly of Clay-Filled Polymer Nanocomposite Thin Films* [postdoc at Yale University]
8. Yeon Seok Kim (Mechanical Engineering **2007**) – *Electrically Conductive Polymer Nanocomposites with Segregated Network Microstructures* [guest researcher at NIST]

M.S. (Major Subject Graduation Year)

1. Zachary Levin (Mechanical Engineering **2011**) – *Polymer Nanocomposite Strain Sensors* [pursuing PhD in Mechanical Engineering at Texas A&M]
2. Charlene Dvoracek (Mechanical Engineering **2009**) – *Antimicrobial Activity of Cationic Antiseptics in Layer-by-Layer Thin Film Assemblies* [pursuing PhD in Materials Science at Johns Hopkins]
3. Thomas Dawidczyk (Mechanical Engineering **2008**) – *Layer-by-Layer Assembly of Poly(3,4-ethylenedioxy-thiophene) Thin Films: Tailoring Growth and UV-Protection* [pursuing PhD in Materials Science at Johns Hopkins]
4. Sethu Madhukar (Mechanical Engineering **2007**) – *Electrical and Mechanical Behavior of Segregated Networks of Carbon Black and Clay* [at Deep Sea Engineering]
5. C. Jason Jan (Mechanical Engineering **2006**) – *Thin Film Carbon Black Composites with Tunable Transparency and Electrical Conductivity* [Business Development Analyst at Air Liquide USA LLP]

AWARDS:

2010 Carl Dahlquist Award (2010)
 Dow 2009 Young Faculty Award (2009)
 NSF CAREER (2007 – 2012)
 3M Untenured Faculty Grant (2007 – 2010)
 Texas Engineering Experiment Station Select Young Faculty (2007)
 Charles & Dorothy Byrd Award for Outstanding Thesis Research (2001)
 Doctoral Dissertation Fellowship (2000 – 01)
 Kodak Fellow (1997 – 2000)
 NDSU Varsity Football – Full Scholarship (1992 – 94)

SOCIETY

MEMBERSHIPS:

American Chemical Society [ACS] (1996 – present)
 Materials Research Society [MRS] (1998 – present)
 American Society for Engineering Education [ASEE] (2005 – present)
 American Society of Mechanical Engineers [ASME] (2006 – present)
 American Institute of Chemical Engineers [AIChE] (2011 – present)
 American Ceramic Society [ACerS] (2011 – present)

EXTERNAL PROFESSIONAL ACTIVITIES:

Materials Research Society (MRS): Lead Organizer for MRS Symposium R – Transport Behavior in Heterogeneous Polymeric Materials and Composites (Spring 2007); Lead Organizer for MRS

Symposium KK – Transport Properties in Polymer Nanocomposites (Fall 2008); Lead Organizer for MRS Symposium DD – Transport Properties in Polymer Nanocomposites II (Fall 2011)

National Science Foundation (NSF): CMMI NanoManufacturing Panels (2006; 2008); Site Visitor for Center for Hierarchical Manufacturing (CHM) at UMass – Amherst (2012)

Polymeric Materials: Science and Engineering (PMSE) Division of the American Chemical Society (ACS): PMSE Fellows Program Administrator (2008 – 2012); Lead Organizer for Frontiers in Polymer Science and Engineering: A Symposium Celebrating the PMSE Fellows Program (March 2012)

JOURNAL EDITORIAL ACTIVITIES:

Associate Editor, *Green Materials* **2011 – present**

Member, Editorial Board, *Journal of Nanotechnology* **2009 – 2011**

Member, Editorial Board, *Research Letters in Nanotechnology* **2007 – 2009**

RESEARCH FUNDING:

1. *Evaluation of Flame Retardant Nanotechnology in Bedding*. Bedding Manufacturer (Confidential), **J. C. Grunlan** (PI). Dates: 3/1/2012 – 2/28/2013. Dollar Value: \$102,039.
2. *High Barrier Polymer Development*. The Dow Chemical Company. **J. C. Grunlan** (PI). Dates: 10/1/2011 – 9/30/2012. Dollar Value: \$164,511.
3. *Flame Retardant and Damage-Resistant Nanocoatings for Fabric, Fibers and Fill from Environmentally Benign Materials*. USDOC – National Institute of Standards & Technology, **J. C. Grunlan** (PI). Dates: 9/1/2011 – 8/31/2014. Dollar Value: \$461,309.
4. *Thermoelectric Polymer Composites*. Company (Confidential), **J. C. Grunlan** (PI). Dates: 9/1/2011 – 8/31/2013. Dollar Value: \$201,935.
5. *Development of Fully Organic Thermoelectric Materials for Converting Waste Heat to Useful Energy*. II-VI Foundation, **J. C. Grunlan** (PI). Dates: 7/1/2011 – 6/30/2013. Dollar Value: \$191,250.
6. *Improvement of Tires*. Tire Maker (Confidential), **J. C. Grunlan** (PI). Dates: 5/1/2011 – 4/30/2013. Dollar Value: \$200,367.
7. *Transparent Nanocoatings for Gas and Moisture Barrier on Polymer Film*. Kuraray America, Inc., **J. C. Grunlan** (PI). Dates: 3/1/2011 – 2/28/2013. Dollar Value: \$203,324.
8. *Performance Evaluation of Flame Resistant Coating for Foam*. Huntsman International LLC. **J. C. Grunlan** (PI). Dates: 12/15/2010 – 12/14/2011. Dollar Value: \$89,754.
9. *Pursuing Moisture Barrier in Self-Assembled Thin Films*. Kuraray America, Inc., **J. C. Grunlan** (PI). Dates: 6/21/2010. Dollar Value: \$15,000. [This is an unrestricted gift from Kuraray.](#)

10. *REU Site: Multifunctional Materials Systems*. National Science Foundation, **J. C. Grunlan** (co-PI). Dates: 06/04/10 – 06/03/12. Dollar Value: \$345,000.
11. *Evaluation of Flame Retardant Nanotechnology in Bedding*. Bedding Manufacturer (Confidential), **J. C. Grunlan** (PI). Dates: 6/1/2010 – 5/31/2011. Dollar Value: \$98,753.
12. *Performance Evaluation of Flame Resistant Coating for Foam*. Huntsman International LLC. **J. C. Grunlan** (PI). Dates: 12/1/2009 – 5/31/2010. Dollar Value: \$37,804.
13. *Energy Harvesting: Thermoelectric Waste Heat Recovery Using Polymer Nanocomposites*. U.S. Air Force Office of Scientific Research, **J. C. Grunlan** (co-PI). Dates: 09/01/2009 – 08/31/2013. Dollar Value: \$662,897.
14. *Nanocomposite Coatings*. Bayer Corporation. **J. C. Grunlan** (PI). Dates: 1/1/2009 – 12/31/2010. Dollar Value: \$176,690.
15. *Protective Coatings*. Baker Hughes. **J. C. Grunlan** (PI). Dates: 1/1/2009 – 12/31/2010. Dollar Value: \$180,772.
16. *Improvement of Sporting Goods*. Sporting Goods Maker (Confidential), **J. C. Grunlan** (PI). Dates: 1/1/2009 – 6/30/2011. Dollar Value: \$235,417.
17. *Improvement of Thin Film Oxygen Barrier from Layer-by-Layer Assembly*. Appleton, **J. C. Grunlan** (PI). Dates: 9/1/2008 – 8/31/2009. Dollar Value: \$115,589. [This is a sub-contract from a multi-million dollar Army Natick project focused on MRE packaging.](#)
18. *Layer-by-Layer Assembly of Flame Retardant Coatings for Foam and Fabric*. USDOC – National Institute of Standards & Technology, **J. C. Grunlan** (PI). Dates: 7/1/2008 – 6/30/2011. Dollar Value: \$253,165.
19. *Layer-by-Layer Assembly of Fast Switching, High Contrast Electrochromics*. The Dow Chemical Company. **J. C. Grunlan** (PI). Dates: 6/1/2008 – 5/31/2010. Dollar Value: \$162,897.
20. *Evaluation of Epoxy Nanocomposites Containing Carbon Nanosphere Chains*. Clean Technologies International Corp. **J. C. Grunlan** (PI). Dates: 9/1/2007 – 2/29/2008. Dollar Value: \$38,572.
21. *New Accelerated Aging Test and Methodology for Ballistic Fibers and Fabrics*. Army Research Office, **J. C. Grunlan** (co-PI). Dates: 7/09/2007 – 08/30/2008. Dollar Value: \$500,000.
22. *Transparent, Electrically Conductive Nanocomposite Thin Films*. 3M Corporation, **J. C. Grunlan** (PI). Dates: 6/13/2007 – 06/12/2010. Dollar Value: \$45,000. [This is award money in conjunction with the 3M Untenured Faculty Grant.](#)
23. *Performance Characterization of Polyimide-Carbon Fiber Composites for Future Hypersonic Vehicles*. U.S. Air Force Office of Scientific Research, **J. C. Grunlan** (co-PI). Dates: 04/01/2007 – 03/31/2010. Dollar Value: \$443,504.
24. *CAREER: Tailoring Nanoparticle Microstructure Using Stimuli-Responsive Polymers*. National Science Foundation, **J. C. Grunlan** (PI). Dates: 03/01/07 – 02/28/12. Dollar Value: \$400,000.

25. *Surface Modification Using Multifunctional Composite Thin Films*. Army Research Laboratory, **J. C. Grunlan** (PI). Dates: 9/1/2006 – 8/31/2007. Dollar Value: \$73,283.
26. *Functionalized Polyolefin Films Using Layer-by-Layer Assembly*. The Dow Chemical Company. **J. C. Grunlan** (PI). Dates: 2/1/2006 – 1/30/2008. Dollar Value: \$149,254.

PUBLICATIONS:

REFEREED JOURNAL PUBLICATIONS

1. Y. H. Yang,^b L. Bolling,^c M. Haile,^c **J. C. Grunlan**,^a “Influence of crosslinking on oxygen and moisture barrier of polyelectrolyte multilayer thin films,” to be submitted.
2. Z. Levin,^b C. Robert,^b J. F. Feller, M. Castro, **J. C. Grunlan**,^a “Flexible latex – polyaniline segregated network composite coating capable of measuring large strain on epoxy,” to be submitted.
3. G. P. Moriarty,^b S. De, P. J. King, M. Via, J. A. King, J. N. Coleman, **J. C. Grunlan**,^a “Thermoelectric behavior of organic thin film nanocomposites,” to be submitted.
4. G. P. Moriarty,^b H. Harrity,^c C. Yu, **J. C. Grunlan**,^a “The promise of fully organic, high performance thermoelectric materials,” *Advanced Materials*, submitted.
5. G. Laufer,^b C. Kirkland,^c A. Morgan, **J. C. Grunlan**,^a “Intumescent multilayer nanocoating, made with renewable polyelectrolytes, for flame retardant cotton,” *Biomacromolecules*, submitted.
6. K. M. Holder,^c M. A. Priolo,^b K. E. Secrist, S. M. Greenlee,^c A. J. Nolte, **J. C. Grunlan**,^a “Humidity-responsive gas barrier of hydrogen-bonded polymer-clay multilayer thin films,” *Journal of Physical Chemistry C*, submitted.
7. G. Laufer,^b M. A. Priolo,^b C. Kirkland,^c A. Cain,^b **J. C. Grunlan**,^a “High oxygen barrier, clay and chitosan-based multilayer thin films: An environmentally-friendly foil replacement,” *Green Materials*, in press.
8. G. Laufer,^b C. Kirkland,^c A. Cain,^b **J. C. Grunlan**,^a “Clay-chitosan nanobrick walls: Completely renewable gas barrier and flame retardant nanocoatings,” *ACS Applied Materials and Interfaces* **2012**, *4*, 1643. [This work was featured as News of the Week in C&EN \(5 SEP 2011\) and in a press conference at the 242nd ACS National Meeting \(30 AUG 2011\).](#)
9. B. Kumar, Y. T. Park,^c M. Castro, **J. C. Grunlan**, J. F. Feller, “Fine control of carbon nanotubes - polyelectrolyte sensors sensitivity by electrostatic layer by layer assembly (eLbL) for the detection of volatile organic compounds (VOC) biomarkers,” *Talanta* **2012**, *88*, 396.
10. G. P. Moriarty,^b J. N. Wheeler,^c C. Yu, **J. C. Grunlan**,^a “Increasing the thermoelectric power factor of polymer composites using a semiconducting stabilizer for carbon nanotubes,” *Carbon* **2012**, *50*, 885.
11. G. P. Moriarty,^b J. H. Whittemore, K. A. Sun,^c J. W. Rawlins, **J. C. Grunlan**,^a “Influence of polymer particle size on the percolation threshold of electrically conductive latex-based composites,” *Journal of Polymer Science Part B: Polymer Physics* **2011**, *49*, 1547.

12. C. Yu, K. Choi, L. Yin, **J. C. Grunlan**, "Light-weight flexible carbon nanotube based organic composites with large thermoelectric power factors," *ACS Nano* **2011**, *5*, 7885. [This paper was featured in the Science and Technology Concentrates of C&EN \(26 SEP 2011\).](#)
13. M. A. Priolo,^b K. M. Holder,^c D. Gamboa,^c **J. C. Grunlan**,^a "Influence of clay concentration on gas barrier of clay-polymer nano brick wall thin film assemblies," *Langmuir* **2011**, *27*, 12106.
14. Y. T. Park,^b A. Ham,^c Y. H. Yang,^b J. C. Grunlan,^a "Fully organic ITO replacement through acid doping of double-walled carbon nanotube thin film assemblies," *RSC Advances* **2011**, *1*, 662.
15. R. J. Smith, P. J. King, M. Lotya, C. Wirtz, U. Khan, S. De, A. O'Neill, G. S. Duesberg, **J. C. Grunlan**, G. Moriarty,^b J. Chen, J. Wang, A. I. Minett, V. Nicolosi, J. N. Coleman, "Large-scale exfoliation of inorganic layered compounds in aqueous surfactant solutions," *Advanced Materials* **2011**, *23*, 3944.
16. Y. C. Li,^b S. Mannen,^c A. B. Morgan, S. C. Chang, Y. H. Yang,^b B. Condon, **J. C. Grunlan**,^a "Intumescent all-polymer multilayer nanocoating capable of extinguishing flame on fabric," *Advanced Materials* **2011**, *23*, 3926 (inside cover article). [This was the focus of a press release issued by the American Chemical Society and a press conference held at the 242nd ACS National Meeting on August 30, 2011 \(<http://www.ustream.tv/recorded/16970683>\).](#) Additionally, this paper was featured in the News of the Week section of *C&EN* (5 SEP 2011), Research Highlights of *Nature* (11 AUG 2011) and *ScienceNews* (24 SEP 2011).
17. Y. S. Kim, R. Davis, A. A. Cain,^b **J. C. Grunlan**, "Development of layer-by-layer assembled carbon nanofiber-filled coatings to reduce polyurethane foam flammability," *Polymer* **2011**, *52*, 2847.
18. J. Lu, J. F. Feller, B. Kumar, M. Castro, Y. S. Kim,^d Y. T. Park,^c **J. C. Grunlan**, "Chemosensitivity of latex-based films containing segregated networks of carbon nanotubes," *Sensors & Actuators: B. Chemical* **2011**, *155*, 28.
19. F. Carosio,^b G. Laufer,^b J. Alongi, G. Camino, **J. C. Grunlan**,^a "Layer-by-layer assembly of silica-based flame retardant thin film on PET fabric," *Polymer Degradation and Stability* **2011**, *96*, 745.
20. Y. H. Yang,^b M. Haile,^c Y. T. Park,^b F. Malek,^c **J. C. Grunlan**,^a "Super oxygen barrier of all-polymer multilayer thin films," *Macromolecules* **2011**, *44*, 1450.
21. Y. C. Li,^b S. Mannen,^c J. Schulz,^c **J. C. Grunlan**,^a "Growth and fire protection behavior of POSS-based multilayer thin films," *Journal of Materials Chemistry* **2011**, *21*, 3060.
22. G. Laufer,^b F. Carosio,^b R. Martinez,^c **J. C. Grunlan**,^a "Flame retardant properties of colloidal silica multilayer thin films on cotton fibers," *Journal of Colloid and Interface Science* **2011**, *356*, 69.
23. A. D. Adamczak,^b A. A. Spriggs,^c D. M. Fitch,^c C. Burke, E. E. Shin, **J. C. Grunlan**,^a "Blistering in carbon fiber-filled fluorinated polyimide," *Polymer Composites* **2011**, *32*, 185.
24. Y. T. Park,^b A. Y. Ham,^c **J. C. Grunlan**,^a "Heating and acid doping thin film carbon nanotube assemblies for high transparency and low sheet resistance," *Journal of Materials Chemistry* **2011**, *21*, 363.

25. J. N. Coleman, M. Lotya, A. O'Neill, S. D. Bergin, P. J. King, U. Khan, K. Young, A. Gaucher, S. De, R. J. Smith, I. V. Shvets, S. K. Arora, G. Stanton, H. Y. Kim, K. Lee, G. T. Kim, G. S. Duesberg, T. Hallam, J. J. Boland, J. J. Wang, J. F. Donegan, **J. C. Grunlan**, G. Moriarty,^b A. Shmeliov, R. J. Nicholls, J. M. Perkins, E. M. Grieveson, K. Theuwissen, D. W. McComb, P. D. Nellist, V. Nicolosi, "Two-dimensional nanosheets produced by liquid exfoliation of layered materials," *Science* **2011**, *331*, 568.
26. M. A. Priolo,^b D. Gamboa,^c K. M. Holder,^c **J. C. Grunlan**,^a "Super gas barrier transparent polymer-clay multilayer ultrathin films," *Nano Letters* **2010**, *10*, 4970. [This and related work was the focus of a press release issued by the American Chemical Society \(\[http://portal.acs.org/portal/acs/corg/content?nfpb=true&pageLabel=PP_ARTICLEMAIN&node_id=222&content_id=CNBP_026937&use_sec=true&sec_url_var=region1&uuid=d3648b5-f0a0-47d2-b381-85e51a68e418\]\(http://portal.acs.org/portal/acs/corg/content?nfpb=true&pageLabel=PP_ARTICLEMAIN&node_id=222&content_id=CNBP_026937&use_sec=true&sec_url_var=region1&uuid=d3648b5-f0a0-47d2-b381-85e51a68e418\)\) and a press conference held at the 241st ACS National Meeting on March 27, 2011 \(<http://www.ustream.tv/recorded/13614054>\).](http://portal.acs.org/portal/acs/corg/content?nfpb=true&pageLabel=PP_ARTICLEMAIN&node_id=222&content_id=CNBP_026937&use_sec=true&sec_url_var=region1&uuid=d3648b5-f0a0-47d2-b381-85e51a68e418)
27. K. C. Etika,^b F. D. Jochum, M. A. Cox,^c P. Schattling, P. Theato, **J. C. Grunlan**,^a "Tailoring properties of nanotube dispersions and nanocomposites using temperature-responsive copolymers of pyrene modified poly(N-cyclopropylacrylamide)," *Macromolecules* **2010**, *43*, 9447.
28. Y. H. Yang,^b F. Malek,^c **J. C. Grunlan**,^a "Influence of deposition time on layer-by-layer growth of clay-based thin films," *Industrial & Engineering Chemistry Research* **2010**, *49*, 8501.
29. A. D. Adamczak,^b A. A. Spriggs,^c D. M. Fitch,^c M. Radovic, **J. C. Grunlan**,^a "Low temperature formation of ultra high temperature transition metal carbides from salt-polymer precursors," *Journal of the American Ceramic Society* **2010**, *93*, 2222.
30. K. C. Etika,^b M. A. Cox,^c F. D. Jochum, P. Theato, **J. C. Grunlan**,^a "Nanotube friendly poly(N-isopropylacrylamide)," *Macromolecular Rapid Communications* **2010**, *31*, 1368.
31. Y. C. Li,^b J. Schulz,^c S. Mannen,^c C. Delhom, B. Condon, S. C. Chang, M. Zammarano, **J. C. Grunlan**,^a "Flame retardant behavior of polyelectrolyte-clay thin film assemblies on cotton fabric," *ACS Nano* **2010**, *4*, 3325. [This paper was featured in the Science and Technology Concentrates of C&EN \(7 JUN 2010\).](#)
32. Y. S. Kim,^d D. Kim, K. J. Martin,^c C. Yu, **J. C. Grunlan**,^a "Influence of stabilizer concentration on transport behavior and thermopower of carbon nanotube filled latex-based composites," *Macromolecular Materials and Engineering* **2010**, *295*, 431.
33. Y. T. Park,^b A. Ham,^c **J. C. Grunlan**,^a "Influence of carbon nanotube type on transparency and electrical conductivity of thin film assemblies," *Journal of Physical Chemistry C* **2010**, *114*, 6325.
34. K. C. Etika,^b M. A. Cox,^c **J. C. Grunlan**,^a "Tailored dispersion of carbon nanotubes in water using pH-responsive polymers," *Polymer* **2010**, *51*, 1761.
35. D. Gamboa,^c M. A. Priolo,^b A. Ham,^c **J. C. Grunlan**,^a "Influence of rinsing and drying routines on growth of multilayer thin films using automated deposition system," *Review of Scientific Instruments* **2010**, *81*, 036103.
36. Y. T. Park,^b **J. C. Grunlan**,^a "Fast switching electrochromism from colloidal ITO in tungstate-based thin film assemblies," *Electrochimica Acta* **2010**, *55*, 3257.

37. Y. S. Kim,^d D. Kim, K. Choi, **J. C. Grunlan**,^a C. Yu, “Improved thermoelectric behavior of nanotube-filled polymer composites with poly(3,4-ethylenedioxythiophene) poly(styrene sulfonate),” *ACS Nano* **2010**, *4*, 513.
38. M. A. Priolo,^b D. Gamboa,^c **J. C. Grunlan**,^a “Transparent clay-polymer nano brick wall assemblies with tailorable oxygen barrier,” *ACS Applied Materials and Interfaces* **2010**, *2*, 312. [This paper was featured in the Science and Technology Concentrates of C&EN \(11 JAN 2010\).](#)
39. A. D. Adamczak,^b A. A. Spriggs,^c D. M. Fitch,^c W. Awad, C. A. Wilkie, **J. C. Grunlan**,^a “Thermal degradation of high temperature fluorinated polyimide and its carbon fiber composite,” *Journal of Applied Polymer Science* **2010**, *115*, 2254.
40. Y. C. Li,^b J. Schulz,^c **J. C. Grunlan**,^a “Polyelectrolyte-nanosilicate thin film assemblies: Influence of pH on growth, mechanical behavior and flammability,” *ACS Applied Materials and Interfaces* **2009**, *1*, 2338.
41. K. C. Etika,^b F. D. Jochum, P. Theato, **J. C. Grunlan**,^a “Temperature controlled dispersion of carbon nanotubes in water with pyrene-functionalized poly(N-cyclopropylacrylamide),” *Journal of the American Chemical Society* **2009**, *131*, 13598.
42. M. D. Gawryla, L. Liu,^b **J. C. Grunlan**,^a D. A. Schiraldi, “pH tailoring electrical and mechanical behavior of polymer-clay-nanotube aerogels,” *Macromolecular Rapid Communications* **2009**, *30*, 1669.
43. C. M. Dvoracek,^b G. Sukhonosova,^c M. J. Benedik, **J. C. Grunlan**,^a “Antimicrobial behavior of polyelectrolyte-surfactant thin film assemblies,” *Langmuir* **2009**, *25*, 10322.
44. K. C. Etika,^b L. Liu,^b L. A. Hess,^c **J. C. Grunlan**,^a “The influence of synergistic stabilization of carbon black and clay on the electrical and mechanical properties of epoxy composites,” *Carbon* **2009**, *47*, 3128.
45. L. Liu,^b K. C. Etika,^b K. S. Liao, L. A. Hess,^c D. E. Bergbreiter, **J. C. Grunlan**,^a “Comparison of covalently and noncovalently functionalized carbon nanotubes in epoxy,” *Macromolecular Rapid Communications* **2009**, *30*, 627.
46. C. Yu, Y. S. Kim,^d D. Kim, **J. C. Grunlan**,^a “Thermoelectric behavior of segregated-network polymer nanocomposites,” *Nano Letters* **2008**, *8*, 4428.
47. S. M. Miriyala,^b Y. S. Kim,^b L. Liu,^b **J. C. Grunlan**,^a “Segregated networks of carbon black in poly(vinyl acetate) latex: Influence of clay on electrical and mechanical behavior,” *Macromolecular Chemistry and Physics* **2008**, *209*, 2399.
48. T. J. Dawidczyk,^b M. D. Walton,^c W. S. Jang,^b **J. C. Grunlan**,^a “Layer-by-layer assembly of UV-resistant poly(3,4-ethylenedioxythiophene) thin films,” *Langmuir* **2008**, *24*, 8314.
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BOOK CHAPTERS

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*SYMPOSIUM PUBLICATIONS**

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^a Corresponding author. ^b Graduate student advised. ^c Undergraduate student mentored.
* Beginning in 2007 this list became selective rather than exhaustive.

PATENTS:

J. C. Grunlan “Multilayer coating for flame retardant foam or fabric,” U.S. Patent 20100227070 A1 (filed September 9, 2010).

J. C. Grunlan, C. Yu, “Thermoelectric polymer composites,” U.S. Provisional Filing [TAMUS-2814] (filed October 21, 2008).

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J. P. Coleman, I. J. Forster, S. W. Ferguson, **J. C. Grunlan**, A. W. Holman, P. Liu, “Transistor device and method of making,” U. S. Patent 20040200061 A1 (filed April 11, 2003).

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J. C. Grunlan, Y.-H. Chiao, K. Li, M. Licon, R. Heydarpour, “Low permeability materials and coatings,” U.S. Patent 6,764,885.

SIGNIFICANT PRESENTATIONS:

2012

“Nanobrick walls for gas barrier and flame suppression and polymer nanocomposites for thermoelectric energy conversion,” by **J. C. Grunlan**, presented to the Smart Plastics Group, University of South Brittany, in Lorient, France on July 10, 2012 (*Invited Presentation*).

“Thermoelectric polymer nanocomposites,” by **J. C. Grunlan**, presented at the IUPAC World Polymer Congress 2012 in Blacksburg, VA on June 26, 2012 (*Invited Presentation*).

“Water-based, flame retardant nanocoatings for foam and fabric,” by **J. C. Grunlan**, presented at the Fire Retardants in Plastics 2012 in Denver, CO on June 14, 2012 (*Invited Presentation*).

“Layer-by-layer assembly of antflammable nanocoatings for foam and fabric using renewable and/or environmentally-benign materials,” by **J. C. Grunlan**, presented at the 23rd Annual Conference on Recent Advances in Flame Retardancy of Polymeric Materials in Stamford, CT on May 21, 2012 (*Invited Presentation*).

“Nanobrick walls that stop fire and nanocomposites that could use your body heat to power your mobile phone,” by **J. C. Grunlan**, presented to the College of Engineering, Mathematics and Physical Sciences, University of Exeter, England on May 16, 2012 (*Invited Presentation – part of Exeter’s “Inspiring Science” series of presentations designed to get the general public excited about science and engineering*).

“Nanobrick walls for protecting clothing from fire and polymer nanocomposites that can use body heat to power a cell phone,” by **J. C. Grunlan**, presented to the School of Engineering and Materials Science, Queen Mary University of London, England on May 14, 2012 (*Invited Presentation*).

“Thick and thin film polymer-CNT nanocomposites for thermoelectric energy conversion and transparent electrodes,” by **J. C. Grunlan**, presented to the Department of Mechanical Engineering, Texas Tech University, Lubbock, TX on May 7, 2012 (*Invited Presentation*).

“Nanobrick walls that stop fire and nanocomposites that could power cell phones using body heat,” by **J. C. Grunlan**, presented to the Department of Mechanical Engineering, National University of Singapore on April 20, 2012 (*Invited Presentation*).

“Tailoring Gas Permeability and Imparting Flame Retardant Behavior Using Nano Brick Wall Thin Film Assemblies,” by **J. C. Grunlan**, presented at the Materials Research Society Spring Meeting 2012 in San Francisco, CA on April 11, 2012 (*Invited Presentation*).

“Layer-by-layer assembly of water-based, environmentally-friendly flame retardant nanocoatings for fabric and foam,” by **J. C. Grunlan**, presented at the 243rd American Chemical Society National Meeting in San Diego, CA on March 26, 2012 (*Invited Presentation*).

“Layer-by-layer assembly of transparent thin films on polymeric substrates for gas barrier, fire resistance and transparent electrodes,” by **J. C. Grunlan**, presented at BASF in Wyandotte, MI on March 20, 2012 (*Invited Presentation*). This seminar was sponsored by BASF’s Committee for Scientific Innovation and Interaction (CSI²).

“Thick and thin film polymer – carbon nanotube composites for thermoelectric energy conversion and transparent electrodes,” by **J. C. Grunlan**, presented at the TMS 2012 141st Annual Meeting & Exhibition in Orlando, FL on March 14, 2012 (*Invited Presentation*).

“Layer-by-layer assembly of transparent thin films on polymeric substrates for gas barrier, fire resistance and transparent electrodes,” by **J. C. Grunlan**, presented at LeTourneau University in Longview, TX on February 9, 2012 (*Invited Presentation*).

“Layer-by-layer assembly of transparent thin films on polymeric substrates for gas barrier, fire resistance and transparent electrodes,” by **J. C. Grunlan**, presented at the Southwest Research Institute in San Antonio, TX on January 24, 2012 (*Invited Presentation*).

2011

“Layer-by-layer assembly of transparent thin films on polymeric substrates for gas barrier, fire resistance and transparent electrodes,” by **J. C. Grunlan**, presented to the Department of Chemical and Biomolecular Engineering, University of Notre Dame, South Bend, IN on December 6, 2011 (*Invited Presentation*).

“Thermoelectric behavior of electrically conductive polymer composites,” by **J. C. Grunlan**, presented at the 67th Southwest Regional Meeting of the American Chemical Society in Austin, TX on November 10, 2011 (*Invited Presentation*).

“Layer-by-layer assembly of polymer and nanoplatelets to create gas barrier and flame retardant thin films,” by **J. C. Grunlan**, presented at the 67th Southwest Regional Meeting of the American Chemical Society in Austin, TX on November 9, 2011 (*Invited Presentation*).

“Polymer-clay nano brick walls for gas barrier and flame suppression,” by **J. C. Grunlan**, presented at Composites at Lake Louise 2011 in Alberta, Canada on November 1, 2011 (*Invited Presentation*).

“Thick and thin film water-based coatings containing carbon nanotubes: Thermoelectric energy conversion and transparent electrodes from fully organic materials,” by **J. C. Grunlan**, presented at the 242nd American Chemical Society National Meeting in Denver, CO on August 28, 2011 (*Invited Presentation*).

“Layer-by-layer assembly of multifunctional nanocoatings,” by **J. C. Grunlan**, presented to the Department of Chemical Engineering, University of South Carolina, Columbia, SC on July 29, 2011 (*Invited Presentation*).

“Thermoelectric behavior of electrically conductive polymer nanocomposites,” by **J. C. Grunlan**, presented at International Conference on Materials for Advanced Technologies (ICMAT) 2011, in Singapore on June 27, 2011 (*Invited Presentation*).

“High electrical conductivity and thermoelectric performance in segregated network polymer nanocomposites,” by **J. C. Grunlan**, presented at Summer Forum on Materials and Nanotechnology, North Dakota State University, in Fargo, ND on June 9, 2011 (*Invited Plenary Lecture*).

“Polymer-clay nano brick walls for transparent gas barrier on plastic film,” by J. C. Grunlan, presented at the Pressure Sensitive Tape Council (PSTC) Week of Learning, Orlando, FL on May 12, 2011 (*Invited Presentation*). This is where I received the plaque associated with winning the 2010 Carl A. Dahlquist Award, for best presentation, the previous year.

“Layer-by-layer assembly of polymer and clay: Gas barrier and flame retardant thin films,” by **J. C. Grunlan**, presented at the 241st American Chemical Society National Meeting in Anaheim, CA on March 30, 2011 (*Invited Presentation*).

“Novel anti-flammable nanocoatings for textiles,” by **J. C. Grunlan**, presented at the American Association of Textile Colorists and Chemists (AATCC) International Conference 2011 in Charleston, SC on March 23, 2011 (*Invited Presentation*).

“Gas barrier and anti-flammability of polymer-clay nano brick walls,” by **J. C. Grunlan**, presented at the International LbL Symposium 2011 in Strasbourg, France on March 12, 2011 (*Invited Presentation*).

“High electrical conductivity and thermoelectric performance in segregated network polymer nanocomposites,” by **J. C. Grunlan**, presented at SPE Polymer Nanocomposites 2011, Lehigh University, in Bethlehem, PA on March 9, 2011 (*Invited Keynote Lecture*).

“Layer-by-layer assembly of transparent thin films on polymeric substrates for gas barrier, fire resistance and electrical conductivity,” by **J. C. Grunlan**, presented at the 3M Corporation’s Tech Forum in St. Paul, MN on March 3, 2011 (*Invited Presentation*).

“Thick and thin film polymer-CNT nanocomposites for thermoelectric energy conversion and transparent electrodes,” by **J. C. Grunlan**, presented to the Department of Mechanical Engineering, University of Houston, Houston, TX on January 27, 2011 (*Invited Presentation*).

2010

“Tailoring nanocomposite properties using stimuli-responsive polymers,” by **J. C. Grunlan** and K. C. Etika, presented at the Materials Research Society Fall Meeting 2010 in Boston, MA on November 29, 2010 (*Invited Presentation*).

“Transparent nanocomposite oxygen barrier coating for polymer films,” by **J. C. Grunlan**, presented at the European Coatings Conference on Packaging Coatings, in Berlin, Germany on October 13, 2010 (*Invited Presentation*).

“Layer-by-layer assembly of multifunctional thin films for gas barrier, fire resistance and other types of environmental protection,” by **J. C. Grunlan**, presented to the Department of Chemistry, University of Texas – Pan American, Edinburg, TX on October 7, 2010 (*Invited Presentation*).

“Thick and thin film polymer-CNT nanocomposites for thermoelectric energy conversion and transparent electrodes,” by **J. C. Grunlan**, presented to the Department of Mechanical Engineering and Nanotechnology Graduate Program, Stevens Institute of Technology, Hoboken, NJ on September 29, 2010 (*Invited Presentation*).

“Anti-flammable thin film assemblies on cotton fabric,” by **J. C. Grunlan**, presented at the Southern Textile Research Conference 2010 in Myrtle Beach, SC on September 20, 2010 (*Invited Presentation*).

“Thermoelectric polymer nanocomposites,” by **J. C. Grunlan**, presented at the 240th American Chemical Society National Meeting in Boston, MA on August 22, 2010 (*Invited Presentation*).

“Layer-by-layer assembly of multifunctional nanocomposites,” by **J. C. Grunlan**, presented to Politecnico di Torino, Alessandria, Italy on July 6, 2010 (*Invited Presentation*).

“Layer-by-Layer Assembly of Nanocomposite Thin Films,” by **J. C. Grunlan**, presented to the Max Planck Institute for Polymer Research, Mainz, Germany on June 7, 2010 (*Invited Presentation*).

“Clay-polymer thin films for imparting flame retardant behavior to foam and textiles,” by **J. C. Grunlan**, presented at the European Coatings Conference on Fire Retardant Coatings IV, in Berlin, Germany on June 3, 2010 (*Invited Presentation*).

“Nanocomposite gas barrier thin films on PET,” by **J. C. Grunlan**, presented at the Pressure Sensitive Tape Council Week of Learning, in Las Vegas, NV on May 13, 2010 (*Invited Presentation*).

“Layer-by-layer assembly of multifunctional thin films for flame suppression, gas barrier, and other types of environmental protection,” by **J. C. Grunlan**, presented to the Department of Fiber Science & Apparel Design, Cornell University, Ithaca, NY on March 12, 2010 (*Invited Presentation*).

“Stimuli-responsive dispersion of carbon nanotubes in water and highly conductive segregated network composites for energy harvesting,” by **J. C. Grunlan**, presented at the Gordon Research Conference on Composites in Ventura, CA on January 19, 2010 (*Invited Presentation*).

2009

“Layer-by-layer assembly of multifunctional thin films,” by **J. C. Grunlan**, presented at Kimberly-Clark Corporation in Roswell, GA on November 6, 2009 (*Invited Presentation*).

“Layer-by-layer assembly of multifunctional thin films,” by **J. C. Grunlan**, presented to the Department of Chemistry and Biochemistry, Texas State University, San Marcos, TX on November 2, 2009 (*Invited Presentation*).

“Flame resistance via 3-D composite coatings,” by **J. C. Grunlan**, presented at International Nonwovens Technical Conference 2009, Denver, CO on September 23, 2009 (*Invited Presentation*).

“Multifunctional polymer nanocomposites for energy conversion, gas barrier and anti-flammability,” by **J. C. Grunlan**, presented at The Dow Chemical Company (formerly Rohm and Haas) in Spring House, PA on July 23, 2009 (*Acceptance of Dow 2009 Young Faculty Award*).

“Anti-flammable and foil replacement technologies based upon clay-containing thin films: Efforts to obtain sponsorship and/or partnerships for commercial development,” presented at the 46th Annual Meeting of The Clay Minerals Society, in Billings, MT on June 8, 2009 (*Invited Presentation*).

“Layer-by-layer assembly of multifunctional thin films,” by **J. C. Grunlan**, presented at NSTI Nanotech 2009 in Houston, TX on May 6, 2009 (*Keynote Presentation*).

“Tailoring carbon nanotube microstructure through noncovalent interactions,” by **J. C. Grunlan**, presented at the 237th American Chemical Society National Meeting in Salt Lake City, UT on March 23, 2009 (*Invited Presentation*).

“Layer-by-layer assembly of flame retardant coating for foam and fabric,” by **J. C. Grunlan**, presented at the NIST Barrier Fabric Workshop in Gaithersburg, MD on March 19, 2009 (*Invited Presentation*).

2008

“Layer-by-layer assembly of multifunctional thin films,” by **J. C. Grunlan**, presented to the Department of Chemistry, Marquette University, in Milwaukee, WI on September 26, 2008 (*Invited Presentation*).

“Layer-by-layer assembly of multifunctional thin films,” by **J. C. Grunlan**, presented to the Department of Chemistry, University of Texas at Dallas, in Richardson, TX on September 19, 2008 (*Invited Presentation*).

“Multifunctionality of clay-based thin films prepared via layer-by-layer assembly,” by **J. C. Grunlan**, presented at the 235th American Chemical Society National Meeting in New Orleans, LA on April 8, 2008 (*Invited Presentation*).

“Layer-by-layer assembly of nano brick walls: Tailoring film growth and oxygen barrier,” by **J. C. Grunlan**, presented at SPE Polymer Nanocomposites 2008, Lehigh University, in Bethlehem, PA on March 4, 2008 (*Invited Keynote Lecture*).

“Layer-by-layer assembly of multifunctional nanocomposite coatings,” by **J. C. Grunlan**, presented at Smart Coatings 2008, in Orlando, FL on February 27, 2008 (*Invited Seminar*).

2007

“Multifunctional polymer nanocomposites,” by **J. C. Grunlan**, presented to the Department of Polymer Science and Engineering, Univ. Mass. Amherst, in Amherst, MA on September 14, 2007 (*Invited Presentation*).

“Layer-by-layer assembly of thin multifunctional coatings,” by **J. C. Grunlan**, presented at the 234th American Chemical Society National Meeting in Boston, MA on August 20, 2007 (*Invited Presentation*). This was the Tess Award Symposium in honor of L. E. “Skip” Scriven.

Grunlan, J. C., “Carbon-filled polymer nanocomposites,” Centro de Investigacion en Quimica Aplicada (CIQA), in Saltillo, Mexico on August 10, 2007 (*Invited Presentation*).

“Electrical and mechanical behavior of epoxy containing carbon nanotubes and clay,” by **J. C. Grunlan**, presented at the ASME Applied Mechanics and Materials Conference in Austin, TX on June 7, 2007.

“Layer-by-layer assembly of thin nanocomposite oxygen barrier,” by **J. C. Grunlan** and W. S. Jang, presented at the Materials Research Society Spring Meeting 2007 in San Francisco, CA on April 11, 2007.

“Layer-by-layer assembly of multifunctional thin films,” by **J. C. Grunlan**, presented at SPE Polymer Nanocomposites 2007, Lehigh University, in Bethlehem, PA on March 7, 2007 (*Invited Presentation*).

2006

“Deposition and patterning of conductive carbon black thin films,” by **J. C. Grunlan**, M. Walton, Y. Kim, W. N. Everett, C. J. Jan, and W. S. Jang, presented at the Materials Research Society Spring Meeting 2006 in San Francisco, CA on April 10, 2007.

“Tailoring dispersion and microstructure of carbon nanotubes using weak polyelectrolytes,” by **J. C. Grunlan**, presented at the Materials Research Society Fall Meeting 2006 in Boston, MA on November 27, 2006.

“Tailoring the behavior of conductive polymer nanocomposites using non-covalent interactions,” by **J. C. Grunlan**, presented as the Grain Processing Corporation Distinguished Lecturer for the Department of Chemical Engineering, Michigan Tech. Univ., in Houghton, MI on October 27, 2006 (*Invited Presentation*).

“Layer-by-layer assembly of nanocomposite oxygen barrier,” by **J. C. Grunlan**, presented at the 232nd American Chemical Society National Meeting in San Francisco, CA on September 13, 2006.

“Thin film assemblies of carbon black with tunable transparency and electrical conductivity,” by **J. C. Grunlan**, J. Jan, M. Walton, E. McConnell, and W. S. Jang, presented at the Materials Research Society Spring Meeting 2006 in San Francisco, CA on April 20, 2006.

“Reversible control of carbon nanotube microstructure using poly(acrylic acid),” by **J. C. Grunlan**, L. Liu, and Y. S. Kim, presented at the Materials Research Society Spring Meeting 2006 in San Francisco, CA on April 19, 2006.

“Multifunctional nanocomposite thin films,” by **J. C. Grunlan**, presented to the School of Polymers & High Performance Materials, University of Southern Mississippi, in Hattiesburg, MS on February 8, 2006 (*Invited Presentation*).

2005

“High-throughput preparation and screening of polymeric coatings,” by **J. C. Grunlan**, presented at the 2005 Materials Research Society Fall Meeting in Boston, MA on November 29, 2005 (*Invited Presentation*).

“Functional multilayer thin films prepared using layer-by-layer assembly,” by **J. C. Grunlan**, presented at the 229th American Chemical Society National Meeting, in San Diego, CA on March 17, 2005 (*Invited Presentation*).