Annual Report for TECS Department
For the period, July 1, 2014 - June 30, 2015

Notes: Please keep within a five-page limit. Feel free to add concise appendices as needed. Please avoid duplicating information in the main body of the report. If a section is not applicable to your unit, insert “N/A.”

Executive Summary
The TECS Department continues to contribute to the College of Textiles vision of being the global leader in textile education, discovery, and innovation. Faculty and student honors illustrate the high level of recognition for TECS programs while significant research output demonstrates the contribution TECS faculty make to global textile knowledge. The attached appendix provides detailed information on faculty publications, presentations and research projects.

Major concerns include loss of faculty textile science knowledge and need for additional research funding.

Enhance the success of our students through educational innovation
- Senior design course for TE/TT students incorporates academic and recurring industrial inputs
- New courses in protective textiles (TE550, TE551)
- New inquire-guided classroom has led to new teaching methods
- Ericka Ford enrolled in TH!NK program

Enhance scholarship and research by investing in faculty and infrastructure
- Inquire-guided classroom (2115) designed and installed
- Two new faculty (Ford and Gao) hired
- New TECS position approved for Spring 2016
- AFM acquired from Natick
- Raman microscope purchased with Provost funds
- Senior design classroom upgraded with Provost funds

Enhance interdisciplinary scholarship to address grand challenges of society
The University defines the Grand Challenges of Society to be health and well-being, educational innovation, energy and environment, safety and security.
- Health and well-being: TE and ECE students developed a “smart shirt” to monitor EKG results and won the Engineering Senior Design Day competition
- Health and well-being: TE and CNR faculty are collaborating on innovative mosquito nettings to combat Third World mosquito borne diseases
- Health and well-being: TECS and TATM faculty are working with Hunar, an underprivileged women’s group in India
- Energy and environment: TE and CHE faculty are collaborating on Li battery research for energy storage

Enhance organizational excellence by creating a culture of constant improvement
- N/A
Enhance local and global engagement through focused strategic partnerships
- 3+X program for international students (Donghua, Jiangnan, Zhejiang Sci-Tec Universities)
- Hanesbrands – NCSU Partnership: $1 million over 4 years to support graduate and undergraduate students, class projects, senior design, student events as well as cover testing.

Changes in service environment
- Challenges: recent high turnover of TECS administrative staff

Major initiatives and/or changes to programs or activities
- Increase emphasis on ABM program
- Grow domestic MS graduate student enrollment
- Inter-program cooperation for Polymer Camp (TE/TT/ PCC)

Diversity initiatives and progress
- Newest faculty hires have increased department diversity (female African-American, female Asian)
- Suggestion: Encourage growth of minority graduate students and faculty by recruiting visits to historically black colleges and universities (HBCUs).

Instructional program advances
- 171 on-campus courses taught for 3501 students
- 60 distance courses (TOP) taught for 433 students
- 239 Special Topics courses (Graduate Research)

Research volume and achievements of significance
Some research dollars show a significant decrease, I'm not sure if Jon included T-PACC numbers last year.
- 39 non-government sponsored research projects
- 22 government sponsored research projects
- $2,098,348 new research dollars down from $9,155,215 in 2013-2014
- $2,804,824 research expenditures slightly down from $2,945,980 in 2013-2014
- $19,625,245 dollars in submitted proposals down from $41,410,417 in 2013-2014
- 78 research proposals submitted down from 85 in 2013-2014
- 29 research proposals awarded down from 52 in 2013-2014
- $117,200 in new TSA awards from 19 TECS faculty
- 99 refereed publications up from 96 in 2013-2014, 17 with two or more TECS faculty authors
- 5 non-refereed publications down from 14 in 2013-2014, 1 with two or more TECS faculty authors
- 57 papers submitted for publication up from 40 in 2013-2014
- 14 book chapters written up from 3 in 2013-2014
- 2 books edited
- 1 book written down from 4 in 2013-2014
- 1 patent issued down from 8 in 2013-2014
- 7 patents disclosed same as 7 in 2013-2014
- 122 presentations up from 102 in 2013-2014 (38 international, 50 regional/national, 36 local)
- 454 manuscripts reviewed by 18 TECS faculty
- 67 research meetings attended by 16 TECS faculty
- 54 Theses and dissertations completed
- 32 PhD prelims completed
Extension initiatives and public service activities
[Optional 1-2 paragraph introduction]

- Faculty have 61 University, 67 College, and 24 Department committee memberships
- Faculty have 103 professional committee and organization memberships
- Faculty have 24 consulting agreements
- Faculty made 23 plant visits

Faculty honors, awards and recognition
An outstanding year for TECS faculty!
- O. Max Gardner Award: Pourdeyhimi
- Alexander Quarles Hollady Medal of Excellence: Barker
- 9 Thank a Teacher awards: Gorga(2), Hauser, Jasper(2), Joines(2), Michielsen(2), Zhang
- Alumni Distinguished Graduate Professor: Michielsen
- Advance Distinguished Lecturer – Kansas State University Women in Science and Engineering Program: Michielsen
- College of Textiles Advising Award: Pasquinelli
- College of Textiles Nominee for Board of Governor’s Teaching Award: Joines
- 2014 INFORMS Distinguished Service Award: Joines
- College of Textiles Nominee for Alumni Distinguished Undergraduate Professor: Gorga
- Sigma Xi 2015 Outstanding Service Award: Zhang
- University Faculty Scholar: Shamey

Student honors, awards and recognition
Great year for our students.
- Michaela Zuraff – Outstanding poster at Spring 2015 NCSU Undergraduate Research Symposium: Ford
- Timothy Chen – Finalist for NC International Science Challenge: Pasquinelli
- Stacy Rudolf – NSF Scholarship to Green Chemistry and Engineering Conference; NWI IAB Best Presentation Award November 2014: El-Shafei
- Mira Abed – AATCC Foundation Research Scholarship: El-Shafei
- Yavuz Caydamli - UGSA Graduate Teaching Assistant Award: Tonelli
- Kevin Harrow – Undergraduate Research Award: Bradford
- Tova Williams – NSF Graduate Research Fellowship: Freeman
- Christian Evaro: NCSU Undergraduate Research Award: King
- Chirag Gajjar: American Society for Quality Student Scholarship: King
- Joseph Moo-Young: College of Engineering Faculty Senior Scholarship: Jasper
- James Schaefer: Undergraduate Research Grant: Jasper

Private fundraising successes
We didn’t specifically ask for this from TECS faculty this year, we will next year.
- 16 Senior Design projects were funded by 12 companies (~$50,000)
Administration achievements and staff changes
Lots of changes!
- Dr. Jon Rust left the TECS Department Head position December 1, 2014 to become Interim Head of the Zeiss Textile Extension.
- Dr. Peter Hauser became the Interim Head of TECS December 1, 2014. A search for a permanent TECS Department Head will begin late summer.
- Dr. Ericka Ford joined the TECS Department on July 1, 2014 as an Assistant Professor with a joint appointment in the Nonwovens Institute.
- Dr. Wei Gao joined the TECS Department on January 1, 2015 as an Assistant Professor in Analytical Chemistry.
- Dr. Xiangwu Zhang was named Director of Graduate Programs and promoted to full Professor.
- A new faculty position in TECS has been approved for an Assistant/Associate Professor in nonwovens research and a search committee established.
- Ms. Amanda Padbury left as the TECS Executive Assistant on April 27, 2015 to become Executive Assistant to the Dean in the College of Textiles. Ms. Lakisha Patterson has been hired as TECS Executive Assistant with an anticipated start date in mid-July.
- Ms. Vicki Stocksdale retired on June 30, 2015 as TECS Purchase & Travel Coordinator.

Recommendations and concerns for the future
- Concern that traditional textile science knowledge will be lost due to faculty retirements in near future
- Concern with high teaching loads (more TAs needed)
- Concern with poor inter-Departmental communications and interactions
- Concern with need for more research funding

Your Unit’s Goals for the 2015/2016 academic year
- Increase number and quality of undergraduate and graduate students
- Decrease dependency on state appropriated funds by Increasing research funding from non-state sources

Recommendations on how the Dean can personally assist you and/or your unit more effectively
- Encourage and enhance College inter-department collaborations
- Increase transparency in College policy decisions
**TECS Publications and Presentations 2014-2015**

Refereed Publications: 99 (17 with two or more faculty members)


Kun Fu, Yao Lu, Mahmut Dirican, Chen Chen, Meltem Yanilmaz, Quan Shi, Philip D. Bradford, Xiangwu Zhang, “Chamber-Confined Silicon-Carbon Nanofiber Composites for Prolonged Cycling Life of Li-Ion Batteries”, Nanoscale, 6, 7489-7495(2014).


N.M. Thoppey, R.E. Gorga, L.I. Clarke, and J.R. Bochinski, “Control of the electric fieldepolymer solution interaction by utilizing ultra-conductive fluids” Polymer, 55, 6390 - 6398, 2014.


Edwards, B., P.J. Hauser, and A. El-Shafei, "Nonflammable cellulosic substrates by application of novel radiation-curable flame retardant monomers derived from cyclotriphosphazene", Cellulose, 2014,


Ying Li, Yujie Sun, Guanjie Xu, Yao Lu, Shu Zhang, Leigang Xue, Jesse S. Jur, Xiangwu Zhang, “Tuning Electrochemical Performance of Si-Based Anodes for Lithium-ion Batteries by Employing Atomic Layer Deposition Alumina Coating”, Journal of Materials Chemistry A, 2, 11417-11425 (2014).


Hegarty-Craver M., Grant E, Kravitz S., Reid L., Kwon C., Oxenham W., “Research into fabrics used in compression therapy and assessment of their impact on treatment regimens” Hegarty-Craver M., Grant E, Kravitz S., Reid L., Kwon C., Oxenham W., “Research into fabrics used in compression therapy and assessment of their impact on treatment regimens” Journal of Wound Care, Vol. 23, No. Sup9, pp S14–S22, 2014


J Chen, BJ Hanson, and MA Pasquinelli, "Molecular Dynamics Simulations for Predicting Surface Wetting," AIMS Materials Science 1 (2) 121-131 (2014). DOI: 10.3934/matersci.2014.2.121


Eunjou Yi, Renzo Shamey*, Cross-Cultural Comparison of Color Terms and Preference of Persimmon-Dyed Fabric, Galchon, Color Research and Application, May 2014


Renzo Shamey*, Renbo Cao, Weethima Sawatwarakul, Juan Lin, Performance of various color difference models in challenging regions of CIELAB color space, Color Imaging Conference Proceedings, 11/2014

Shamey R*, Sawatwarakul W, F. Sha, Does Hue affect the perception of grayness?, Color Research and Application, 05/2014; DOI:10.1002/col.21894

PLLA in Solution: A Flexible Random-Coil or an Extended, Rather Rigid Helical Polymer Tonelli, A. E. MACROMOLECULES Volume: 47,141-6143 Published: SEP 9 2014

Non-Stoichiometric Polymer-Cyclodextrin Inclusion Compounds: Constraints Placed on Un-Included Chair Portions Tethered at Both Ends and Their Relation to Polymer Brushes, Tonelli A.E. POLYMERS Volume:6,2166-2185 Published: AUG 2014


Poly(epsilon-caprolactone) Nanowebs Functionalized with alpha- and gamma-Cyclodextrins, Narayanan, G., Gupta, B. S., Tonelli, A. E., BIOMACROMOLECULES Volume: 15, 4122-4133 Published: NOV 2014


Meltem Yanilmaz, Xiangwu Zhang, “Polymethylmethacrylate/Polyacrylonitrile Membranes via Centrifugal Spinning as Separator in Li-Ion Batteries”, Polymers Separator in Li-Ion Batteries”, Polymers, 7, 629-643 (2015).


Yeqian Ge, Han Jiang, Kun Fu, Changhuan Zhang, Jiadeng Zhu, Chen Chen, Yao Lu, Yiping Qiu, and Xiangwu Zhang, “Copper-Doped Li4Ti5O12/Carbon Nanofiber Composites as Anode for High-Performance Sodium-Ion Batteries”, Journal of Power Sources, 272, 860-865 (2014).


Non Refereed Publications: 5 (1 with two or more faculty members)


In-Press or Accepted Publications: 12 (3 with two or more faculty members)

Ahmed El-Shafei, Harold S. Freeman, Paul D. Boyle, and David Hinks, Characterization of non-genotoxic diarylides using experimental and molecular orbital methods, Dyes and Pigments, 2015, DOI: 10.1016/j.dyepig.2015.04.036


Li, Shiqi; Freeman, Harold; Boyter, Jr., Henry; Qian, Lei; One Step Pad Dyeing and DP Finishing of Cotton: Part 1. Reactive Dyes with DMDHEU, AATCC Review, 2015, Accepted.

Li, Shiqi; Freeman, Harold; Boyter, Jr., Henry; Qian, Lei; One Step Pad Dyeing and DP Finishing of Cotton: Part 2. Mechanism of Dye Fixation Using DMDHEU, AATCC Review, 2015, Accepted.


Ramiz Boy, Chandler Maness, Richard Kotek, Properties of Chitosan/Soy Protein Blended Films with Added Plasticizing Agent as a Function of Solvent Type at Acidic pH”, accepted for publication in International Journal of Polymeric Materials and Polymeric Biomaterials, 2015
Richard Kotek, Mesbah Najafi, High Performance Filaments by Melt Spinning Low Viscosity Nylon 6 Using Horizontal Isothermal Bath Process”, accepted for publication in Polymer Engineering and Science, 2015


MA Pasquinelli, Q Jiang, and J Moo-Young, “Interfacial Characteristics of Polymer Nanocomposites via Molecular Dynamics Simulations,” Texcomp-12 Conference, 26-29 May 2015, Raleigh, NC.


Submitted for Publication: 57 (17 with two or more faculty members)


Thompson, D., Barker, R. and DenHartog, E., “ Integrating Standards into Courses on Human Protection

S. Topal, L. Baiocci, A. Crocombe, S.L. Ogin, P. Potluri, P. Withers, M. Quaresimin, P. Smith, M. Poole, and A. Bogdanovich, "Late-Stage Fatigue Damage in a 3D Orthogonal Non-Crimp Woven Composite: an Experimental and Numerical Study", submitted to Composites: Part A


A. Li, A. Bogdanovich, P.D. Bradford, "Aligned Carbon Nanotube Sheet Piezoresistive Strain Sensors", submitted to Smart Materials and Structures


Li, A. Bogdanovich, A. and Bradford, P. Aligned Carbon Nanotube Sheet Piezoresistive Strain Sensors. Submitted to Smart Materials and Structures

Bradford, P. Nanotechnology: A Driving Force For Textile Innovation, Submitted to Textile World


Meredith McQuerry, Dr. Emiel DenHartog, Dr. Roger Barker, Kevin Ross: Garment Ventilation for Protective Clothing: Strategies & Measurements for Heat Loss. Submitted to textile Research Journal;


Nahid Mehraban and Harold S. Freeman, Recent Developments in Sensitizer Design for Photodynamic Therapy, Materials, 2015.


Jasper, Warren, Modeling of submicron particle filtration in the electret monolith filter with rectangular cross-section microchannels, Physics of Fluids, Submitted 5/12/2015


Uluskan, Meryem; Godfrey, A. Blanton; and Jeffrey Joines, April 5, 2015, "Comprehensive Insight into Supplier Quality and the Impact of Quality Strategies of Suppliers on Outsourcing Decisions," submitted to Supply Chain Management: An International Journal by Emerald


Murat A. Yokus, Philip Asare, John Lach, and Jesse S. Jur* “Printed Dry Electrodes for Body Surface Biopotential Recording” In review, Spring 2015

Jonathan C. Halbur, Richard P. Padbury, and Jesse S. Jur* “Photodeposition of Ag onto polymer supported semiconductor thin films deposited by atomic layer deposition” Submitted, Spring 2015.

Stano, K., Faraji, S., Hodges, R., Yildiz, O., Wells, B., Akyildiz, H., Zhao, J., Jur, J. and Bradford, P., Ultralight Interconnected Metal Oxide Nanotube Networks, Submitted to Advanced Materials


Douglass E. F., Avci H., & Kotek R. Cellulose and cellulose blend membranes – A review, submitted to Polymer Reviews, 2015.


Renzo Shamey, Lina M. Cárdenas, David Hinks and Rolf G. Kuehni, Comparing a perceptually linear and a conventional geometric gray scale in supra-threshold small color difference evaluation, JOSA A

Renzo Shamey, Renbo Cao, Weethima Sawatwarakul, Juan Lin, Performance of various color difference models in the challenging regions of CIELAB color space, Jounal of Imaging Science and Technology (2014), December

Weethima Sawatwarakul, Renzo Shamey, A Coloration Expert System for the Dyeing of Protein Fibers, Coloration Technology, April 2015

Weethima Sawatwarakul, Renzo Shamey, and Jeff Joines, A Coloration Expert System for the Dyeing of Protein Fibers, Coloration Technology, April 2015

Enhanced Mechanical properties of Poly (ε-caprolactone) Nanofibers produced by the Addition of Non-stoichiometric Inclusion Complexes of Poly (ε-caprolactone) and α-Cyclodextrin, Narayanan, G., Gupta, B. S., Tonelli, A. E., POLYMER.


Yeqian Ge, Jiadeng Zhu, Yao Lu, Chen Chen, Yiping Qiu, and Xiangwu Zhang, "The study on structure and electrochemical sodiation of one-dimensional nanocrystalline TiO2@C nanofiber composites", submitted to Journal of Power Sources, April 2015.

Jiadeng Zhu, Chen Chen, Yao Lu, Yeqian Ge, Han Jiang, Kun Fu, and Xiangwu Zhang, “Nitrogen-Doped Carbon Nanofibers Derived from Polyacrylonitrile for Use as Anode Material in Sodium-Ion Batteries”, submitted to Carbon, April 2015.


**Book Chapters Written: 14**


Jasper, Warren, Modelling, Simulation and Control of the Dyeing Process, Woodhead Publishing, Chapter 8


Books Edited: 2


Books Written: 1


Patents Issued: 1

Patents Filed: 5 (2 with two or more faculty members)


Smart Textile Sensing Systems and related Methods, Alper Bozkurt, Tushar K. Ghosh, Provisional patent filed on 11/12/2014, US 62/075,11


“Flexible Thermoelectric Devices, Methods or Preparation Thereof, and Methods of Recovering Waste Heat Therewith” J. S. Jur and M. D. Losego Application No. 61/984,373; (April 25, 2014)

Patents Disclosed: 7 (1 with two or more faculty members)

Ahmed El-Shafei and Mira Abed, Highly stable aromatic systems for increased photostability of perovskites, Invention Disclosure No. 15202, North Carolina State University, April 2014.

Ahmed El-Shafei and Mira Abed, Highly stable aromatic dopant-free hole-transporting materials, Invention Disclosure No. 15203, North Carolina State University, April 2014.


Smart Textile Sensing Systems and related Methods, Alper Bozkurt, Tushar K. Ghosh, NCSU Invention Disclosure Number 15087, October 2014

Yildiz, O., Jur, J. and Bradford P. NCSU Invention Disclosure No. 15094 “Carbon Nanotube – Nanofiber Hybrid Fabrics” (2014)

Hudson, Sam, COMPOSITION, PREPARATION, AND USE OF CHITOSAN POWDER FOR BIOMEDICAL APPLICATIONS. Case 15166 Submitted Jan 6, 2015. Wolff Kirsch and Andrew Crofton (Loma Linda Univ) are co inventors.

Hudson, Sam, SYSTEMS AND METHODS FOR THE TREATMENT OF BLADDER CANCER. Case 15164 Submitted Jan 6, 2015. Wolff Kirsch and Andrew Crofton (Loma Linda Univ) are co inventors.
International Presentations and/or Conferences:  38 (8 with two or more faculty members)


Hauser, P.J., "Frontier and Future of Eco-textiles", International Conference on Engineering, Science & Technology, Beijing, China, June 3, 2014 (Invited presentation)

Jasper, W., Communicating Color in Fashion (Keynote Speaker), FashionTech Conference, 6/9/2014 Shenkar College Ramat Gan Israel

Jasper, W. Blending Art and Science in Color Measurement, Shenkar College, 6/12/2014


"The Effects of Triclosan Antimicrobials on the Physical Thermophysiological and Mechanical Properties of Pressure Garments in Burn Scar Treatment", 15th International Materials Symposium, Denizli, Turkey, October 15-17, 2014, N.Y. Varan, M.W. King, and P.J. Hauser


Renbo Cao, Weethima Sawatwarakul, Juan Lin, Renzo Shamey, Performance of various color difference models in the challenging regions of CIELAB color space, Color Imaging Conference, Boston (2014)

Renzo Shamey, Color Quality Control and Troubleshooting Issues in the Coloration of Textile Substrates, Tianjin Polytechnic University, Tianjin, China, Nov 1, 2014 (Invited)

Renzo Shamey, Review of anti-counterfeiting techniques for textile substrates, ISFFM2014, Jiangnan University, Wuxi, China, December, 2014 (Invited)


Xiangwu Zhang, “Centrifugally Spinning: An Alternative Approach to Produce Nanofibers at High Speed and Low Cost”, Zhejiang Sci-Tec University, Hangzhou, China, June 2014. (Invited Talk)

Regional/National Presentations and/or Conferences: 50 (14 with two or more faculty members)


Barker, R.L., “Revolutionizing Modern Structural Firefighter Turnout Suit” FIERO Conference, Raleigh

Barker, R.L., “ TPACC Firefighter PPE Research and Testing Capabilities”, FIERO Conference, Raleigh, NC


Denhartog, E., AATCC International conference (2015 Accepted): Evaluation of Active Moisture Management Effects with Standard and Adapted Test Methods


YT Su, RE Gorga, and MA Pasquinelli, "A Systematic Investigation of the Factors that Trigger Thermal Decomposition During the Processing of Industrially-Relevant Polymers ", NCRC Industrial Advisory Board Meeting, (12 November 2014)

YT Su, RE Gorga, and MA Pasquinelli, "A Systematic Investigation of the Factors that Trigger Thermal Decomposition During the Processing of Industrially-Relevant Polymers ", NCRC Industrial Advisory Board Meeting, (21 May 2014)

Ya-Ting Su, Russell E. Gorga, Melissa A. Pasquinelli, Investigations of the Factors that Trigger Thermal Degradation During the Processing of Polymers, 248th ACS National Meeting, San Francisco, CA, August 2014


Richard Kotek, Mesbah Najafi, Properties of highly oriented nylon 6 fibers, Sermacs 2014, Nashville, TN., 10/19/2014


"Where has all the water gone: One drop at a time", Stephen Michielsen, Moisture Management Symposium Enhancing Product Performance from Absorbency to Repellency, AATCC, NCSU - COT, October 8, 2014


JF Matthews and MA Pasquinelli, "Confidential," Confidential industry sponsor (26 January 2015).

BJ Hanson, J Hofmann, and MA Pasquinelli, “Confidential,” Confidential industry sponsor (26 January 2015).

E Yildirim, A El-Shafei, and MA Pasquinelli, "Confidential" Confidential industry sponsor (26 January 2015).

M Tuhin, RJ Spontak, and MA Pasquinelli, " 13-154 – Cold-Draw Shape-memory Bi/Tricomponent Fibers: Investigating the Polymer/Polymer Interface and Adding Sensory Functionality," NWI Industrial Advisory Board Meeting, (11 November 2014).

YT Su, RE Gorga, and MA Pasquinelli, "A Systematic Investigation of the Factors that Trigger Thermal Decomposition During the Processing of Industrially-Relevant Polymers ", NCRC Industrial Advisory Board Meeting, (12 November 2014)


Mataz Alcoutlabi, Baicheng Weng, Fenghua Xu, Hun Lee, and Xiangwu Zhang, “Nanofiber-Based Membrane Separators for Lithium-Ion Batteries”, 2014 Fall MRS Meeting & Exhibit, Boston, Massachusetts, December 2014.


Local (Triangle) Presentations: 34 (6 with two or more faculty members)

Y Su, RE Gorga, MA Pasquinelli, "A Systematic Investigation of the Factors that Trigger Thermal Degradation During the Processing of Industrially-Relevant Polymers", NCSU Graduate Student Research Symposium; Raleigh NC (25 March, 2015)

R. E. Gorga "What question is it that you want to answer" COT Graduate seminar series, October 1, 2014


Joines, J ,Teaching with Active Learning, New Faculty Orientation, 8/14/14

Joines, J., Supply Chain Optimization, Carters Inc Visit, 8/12/2014

Joines, J. Overview TECS, COT Career Fair, 9/11/2014

Joines, J., Improvements to Evaluation of teaching, PPC of the Senate, 3/17/2015

Joines, J., Improvements to Evaluation of teaching, APC of the Senate, 12/04/2014

Joines, J., Supply Chain Optimization, Walmart Visit, 11/12/2014

J. S. Jur “Introduction to One Health”, Wake NC State Early STEM High School, Raleigh NC, Nov. 7th 2014.


Y Su, RE Gorga, MA Pasquinelli, "A Systematic Investigation of the Factors that Trigger Thermal Degradation During the Processing of Industrially-Relevant Polymers", NCSU Graduate Student Research Symposium; Raleigh NC (25 March 2015)

CR Gajjar, MA Pasquinelli, MW King, "Combined Experimental and Computational Study of Degradation Behavior for Biodegradable Polymers", 10th Annual NC State University Graduate Student Research Symposium, Raleigh NC (25 March 2015)

M Tuhin, R Spontak, and M Pasquinelli, "Cold-Draw Shape-Memory Bi/Tri-component Fibers: Investigating Polymer/Polymer Interface and Adding Sensory Functionality", Schoenborn Graduate Research Symposium at NC State (26 January 2015).

TS Chen and MA Pasquinelli, “Predicting the Mechanism of Endocrine Disruption for Firemaster 550 with Virtual Screening (Two-Year Study)” 128th NC-ACS Local Section Meeting, Duke University (7 November 2014)


YT Su, RE Gorga, and MA Pasquinelli, "A Systematic Investigation of the Factors that Trigger Thermal Decomposition During the Processing of Industrially-Relevant Polymers ", NCRC Industrial Advisory Board Meeting, (21 May 2014)

M Tuhin, RJ Spontak, and MA Pasquinelli, "13-154 – Cold-Draw Shape-memory Bi/Tricomponent Fibers: Investigating the Polymer/Polymer Interface and Adding Sensory Functionality," NWI Industrial Advisory Board Meeting, (20 May 2014).


Renzo Shamey, Renbo Cao, Introduction to Color Science and Digital Camera Based Colorimetry, Graduate Seminar, COT, NCSU, Feb 2015 (Invited)


TECS Research Projects 2014-2015

Thermal Strain Companion Tool (previous title: Thermal Strain Companion)
Roger L. Barker
TNO Innovation for Life
$56,618.00
2012-09-28 to 2015-04-28

Thermal Strain Companion Tool (previous title: Thermal Strain Companion)
Roger L. Barker
TNO Innovation for Life
$31,296.00
2012-09-28 to 2015-04-28

Revolutionizing the Modern Turnout Suit: Technical Basis for Redesigning Structural Firefighter Protective Ensembles for Reduced Heat Stress
Roger L. Barker
US Dept. of Homeland Security (DHS)
$999,988.00
2013-07-11 to 2016-07-10

Development and Validation of Bench-Level and Manikin Test Methods To Predict Heat and Moisture Related Comfort Properties of Mattresses
Roger L. Barker, Emiel A Den Hartog
Tempur-Pedic Management, LLC
$299,358.00
2014-01-01 to 2015-12-31

"Understanding Macro-Structural Differences of a Nike Provided Set of Sport Knit T-shirt Fabrics"
Roger L. Barker, Richard Kotek
Nike, Inc.
$273,818.00
2014-05-01 to 2015-04-30

Partnership Agreement with Ghent University/Dr. Izabela Luiza Ciesielska-Wrobel-Magnum Bonum-Modelling of Human Body and Protective Textiles for Estimation of Skin Sensorial Comfort and Life Risk of Fire Fighters Working in Extreme External Conditions
Roger L. Barker
Ghent University
$28,790.00
2014-05-01 to 2016-04-30

Incorporating Standards Education into Courses on Textile Protection and Comfort
Roger L. Barker, Alexander Charles Hummel, Robert Ormond, Donald B. Thompson
National Institute of Standards & Technology
$66,457.00
2014-07-01 to 2015-12-31
Advanced Fire Blocking Materials for Enhanced Performance in Wildland Fire Shelters
Roger L. Barker, Alexander Charles Hummel, Jesse Jur, Joseph P. Roise
Federal Emergency Management Agency (FEMA)
$1,422,024.00
2014-08-01 to 2015-07-31

Advanced Multi-purpose Base Ensemble for Emergency Responders (AMBER)
Roger L. Barker, Emiel A Den Hartog
US Dept. of Homeland Security (DHS)
$718,404.00
2014-09-30 to 2016-03-29

Nanofiber Functionalized 3D S-glass Reinforced Transparent Ballistic Composite
Dr. Alexander Bogdanovich
DOTS (prime); Luna Innovations, Inc. (direct)
$0.00
to be determined

Microvascular Composites for Novel Thermal Management Devices
Dr. Alexander Bogdanovich
US Air Force - Office of Scientific Research (prime); CU Aerospace, Inc. (direct)
$0.00
to be determined

High Sensitivity Fiber Bragg Grating Sensors through Carbon Nanotube Coatings and Adhesives
Philip David Bradford, Kara Jo Peters
US Navy-Office Of Naval Research
$200,000.00
2014-05-15 to 2017-05-14

Bonding Unidirectional Carbon Nanotube with Carbon for High Performance, Low Density Composites
Philip David Bradford, Yuntian Zhu
US Air Force - Office of Scientific Research (AFOSR)
$557,852.00
2012-03-15 to 2015-03-14

Synthesis of Carbon Nanotube/Copper Matrix Composites
Philip David Bradford, Yuntian Zhu
Eaton Corporation
$91,571.00
2014-10-01 to 2015-09-30

Development of Carbon Nanotube Enhanced High Performance Fabrics
Philip David Bradford, Abdelfattah M. Seyam
SCEYE S.A.
$145,899.00
2015-01-01 to 2015-12-31
Multifunctional Shear Pressed CNT Sheets For Strain Sensing and Composite Joint Toughening
Alexander E. Bogdanovich, Philip David Bradford
US Air Force - Office of Scientific Research (AFOSR)
$377,017.00
2012-04-01 to 2015-03-31

Confidential
Philip David Bradford
Confidential industry sponsor
$173,462.00
2012-11-01 to 2014-12-31

Carbon Nanotube Sheet Electrodes with Inorganic Coatings
Philip David Bradford, Jesse Jur
National Aeronautics & Space Administration (NASA)
$38,357.00
2014-04-07 to 2014-12-31

Development and Validation of Bench-Level and Manikin Test Methods To Predict Heat and Moisture Related Comfort Properties of Mattresses
Roger L. Barker, Emiel A Den Hartog
Tempur-Pedic Management, LLC
$299,358.00
2014-01-01 to 2015-12-31

Advanced Multi-purpose Base Ensemble for Emergency Responders (AMBER)
Roger L. Barker, Emiel A Den Hartog
US Dept. of Homeland Security (DHS)
$718,404.00
2014-09-30 to 2016-03-29

Understanding the Cooling Effect of a Polymer Technology
Emiel A Den Hartog
Kraton Polymers
$50,000.00
2014-10-18 to 2015-04-30

Next Generation NFPA 1994 Ruggedized Class 2 Ensemble
Emiel A Den Hartog, Robert Ormond
Combating Terrorism Technology Support Office (CTTSO)
$250,000.00
2015-03-30 to 2017-03-29

Confidential
Ahmed M El-Shafei, Harold S. Freeman, Melissa Pasquinelli, Renzo Shamey
Confidential industry sponsor
$778,535.00
2012-11-01 to 2015-12-31
Wrinkle Free Cotton Without the Use of Formaldehyde-Containing Chemicals or Generation/Release of Formaldehyde
Ahmed El-Shafei
Cotton Inc.

Strengthening Carbon Nanocomposite Fibers Using Reactive Interphases
Ericka Nicole Ford, Jon P. Rust
NCSU Faculty Research & Professional Development Fund
$8,000.00
2014-07-01 to 2015-06-30

Integration of Digital Printing with Cut and Sew Technology
Lisa P Chapman, Harold S. Freeman, Trevor J. Little, Nancy B. Powell, Andre J West
Wal-Mart Stores, Inc.
$639,111.00
2014-08-15 to 2016-08-15

Characterization Of Lubrizol's Pre-Treatment Interactions
Lisa P Chapman, Harold S. Freeman, Renzo Shamey
Lubrizol Corporation
$49,991.00
2014-09-08 to 2015-09-08

CHPTAC Alternative for Cationized Cotton - Phase 2; Task Order 2015-2202
Harold S. Freeman, Malgorzata Szymczyk
Hanesbrands, Inc.
$25,079.00
2015-03-15 to 2015-06-15

Development of Portable Pneumatic Splicing System for Heavy Denier Continuous Filament Yarns
Abdelfatah Seyam, Tushar Ghosh, Jon Rust
All-American hose LLC
$49,565.00
2014-06-01 to 2014-12-23

Fiber-Based Thermoelectric Device for Unobtrusive Integration in Textiles
Brendan O’Connor, Tushar Ghosh
NCSU Research and Innovation Seed Funding Program
$24,925 (+$6325 in cost-share)
2015-01-01 to 2015-12-31
Sustainable Support for Underprivileged Women's Collective: Collaborative Service Learning and Study Abroad in India
Tushar Ghosh, Cindy Istook, Andre West
Office of International Affairs, NC State University
$5,000.00
2015-07-01 to 2016-06-30

Lignin as a Material Platform for High Value-Added Macromolecules
Russell E. Gorga, Orlando Jose Rojas, Julie Crowe Willoughby
University of Tennessee
$133,000.00
2013-06-01 to 2015-08-31

Research Design Project: Bite Sleeve Commercialization, Elephant Monitoring, and Saddle Redesign
Russell E. Gorga, Jesse Jur
UNC - General Administration
$15,000.00
2013-09-27 to 2015-08-31

Research Design Project: Bite Sleeve Commercialization, Elephant Monitoring, and Saddle Redesign
Russell E. Gorga, Jesse Jur
UNC - General Administration
$30,000.00
2014-09-01 to 2015-08-31

Triggering Chemical Degradation of Plastics at End-of-Life Using Light and Environmentally-Neutral Nanoparticles
Jason Russell Bochinski, Laura I. Clarke, Russell E. Gorga
National Science Foundation (NSF)
$299,119.00
2015-05-01 to 2018-04-30

A Systematic Investigation of the Factors that Trigger Thermal Decomposition During the Processing of Industrially-Relevant Polymers
M.A. Pasquinelli and R. E. Gorga
Nonwovens cooperative research center
$168,885.00
2012-08-15 to 2015-07-31

Utilizing the Photothermal Effect of Metal Nanoparticles for Processing of Polymers
Jason Russell Bochinski, Laura I. Clarke, Russell E. Gorga
National Science Foundation (NSF)
$481,596.00
2012-05-01 to 2016-04-30

Hanes Task Order: Cationic Cotton
Peter J. Hauser, David Hinks
Hanesbrands, Inc.
$21,654.00
2013-03-01 to 2015-05-31
Task Order - Bleach Activator (High Efficiency Ultra Deep Dyeings Via Cationized Cotton)
Peter J. Hauser, David Hinks
Hanesbrands, Inc.
$22,211.00
2013-03-01 to 2015-05-15

Confidential
Peter J. Hauser
Confidential industry sponsor
$265,822.00
2013-05-01 to 2016-03-15

Confidential
Peter J. Hauser, David Hinks, Saad A. Khan, Marian G. McCord, Jon P. Rust, Julie Crowe Willoughby
Confidential industry sponsor
$1,201,327.00
2013-08-01 to 2016-07-01

Confidential
Peter J. Hauser, David Hinks, Saad A. Khan, Marian G. McCord, Jon P. Rust, Julie Crowe Willoughby
Confidential industry sponsor
$10,000.00
2013-08-01 to 2016-07-01

Confidential
Ahmed M El-Shafei, Peter J. Hauser
Confidential industry sponsor
$187,136.00
2014-01-01 to 2015-12-31

Efficient, Low Temperature and Neutral Bleaching of Cotton: Scale Up
Peter J. Hauser, David Hinks
Cotton, Inc.
$22,906.00
2015-01-01 to 2015-12-31

Capping and Modeling Cationized Cotton
Peter J. Hauser, Renzo Shamey
Cotton, Inc.
$52,883.00
2015-01-01 to 2015-12-31

Dyeing Properties of Ionized Cotton
Peter J. Hauser
Cotton Inc.
2015-01-01 to 2015-12-31

Hanes Task Order: Cationic Cotton
Peter J. Hauser, David Hinks
Hanesbrands, Inc.
$21,654.00
2013-03-01 to 2015-05-31
Task Order - Bleach Activator (High Efficiency Ultra Deep Dyeings Via Cationized Cotton)
Peter J. Hauser, David Hinks
Hanesbrands, Inc.
$22,211.00
2013-03-01 to 2015-05-15

Confidential
Peter J. Hauser, David Hinks, Saad A. Khan, Marian G. McCord, Jon P. Rust, Julie Crowe
Willoughby
Confidential industry sponsor
$1,201,327.00
2013-08-01 to 2016-07-01

Confidential
Peter J. Hauser, David Hinks, Saad A. Khan, Marian G. McCord, Jon P. Rust, Julie Crowe
Willoughby
Confidential industry sponsor
$10,000.00
2013-08-01 to 2016-07-01

Efficient, Low Temperature and Neutral Bleaching of Cotton: Scale Up
Peter J. Hauser, David Hinks
Cotton, Inc.
$22,906.00
2015-01-01 to 2015-12-31

A Comparative Study of the Environmental Impacts of Optimized Dyeing Systems Using Natural and Synthetic Dyes and on Cotton
David Hinks
Cotton, Inc.
$14,760.00
2015-01-01 to 2015-12-31

Intravesical Chitosan IL-12 Therapy in an Orthotopic Mouse Bladder Cancer Model
Samuel M. Hudson
Scion Cardio-Vascular, Inc.
$24,991.00
2014-09-15 to 2015-07-31

Confidential
Warren J. Jasper
Confidential industry sponsor
$3,500.00
2014-02-28 to 2015-06-15

Confidential
Sharon M. Joines, Jeffrey A. Joines
Confidential industry sponsor
$34,684.00
2015-01-15 to 2015-05-15
Apparel Disposal Behavior and Analysis
Thoney, K.A., Joines, J.A.
Self Funded

Analysis of the Potential of Africa in Comparison to Other Apparel Sourcing Regions
Joines, J.A., Thoney, K.A.
Self Funded

Hanesbrands/NCSU Partnership
Jeff Joines
Hanesbrands
$750,000.00
2012-08-01 to 2016-04-04

Research Design Project: Bite Sleeve Commercialization, Elephant Monitoring, and Saddle Redesign
Russell E. Gorga, Jesse Jur
UNC - General Administration
$15,000.00
2013-09-27 to 2015-08-31

I/UCRC Multi-University I/UCRC for Dielectrics and Piezoelectrics
Elizabeth C. Dickey, Jesse Jur, Jon-Paul Maria, Xiangwu Zhang
National Science Foundation (NSF)
$112,710.00
2014-03-01 to 2019-02-28

Wearable Nanodevices, Linking Health and Environment: RET in Engineering and Computer Science Site
Melissa G. Jones, Jesse Jur, Veena Misra
National Science Foundation (NSF)
$499,746.00
2014-05-01 to 2017-04-30

Thermoelectric Textiles for Waste Heat Recovery
Jesse Jur, Mark Losego
Chancellor's Innovation Fund (CIF)
$75,000.00
2014-07-01 to 2015-06-30

Advanced Fire Blocking Materials for Enhanced Performance in Wildland Fire Shelters
Roger L. Barker, Alexander Charles Hummel, Jesse Jur, Joseph P. Roise
Federal Emergency Management Agency (FEMA)
$1,422,024.00
2014-08-01 to 2015-07-31
Flexible Materials for Integration and Packaging
Jesse Jur
NCSU Advanced Self Powered Systems of Sensors and Technologies (ASSIST) Center
$150,000.00
2014-09-01 to 2015-08-31

Research Design Project: Bite Sleeve Commercialization, Elephant Monitoring, and Saddle Redesign
Russell E. Gorga, Jesse Jur
UNC - General Administration
$30,000.00
2014-09-01 to 2015-08-31

Confidential
Roger L. Barker, Richard Kotek
Confidential industry sponsor
$273,818.00
2014-05-01 to 2015-04-30

"Blends of Soy Proteins with Natural and Synthetic Polymers"
Richard Kotek
Turkish Educational Fund and NCSU
$100,000.00

hIB-ECOB Process for Low Tg Polymers (N6, PE, PLA and PTT)
Richard Kotek
NCSU

Reversible Superhydrophilic-Superoleophobic Membranes for Oil-Water Separation
Wendy E. Krause, Lucian Lucia
NCSU Faculty Research & Professional Development Fund
$4,000.00
2014-07-01 to 2015-06-30

Reversible Superhydrophilic-Superoleophobic Membranes for Oil-Water Separation
Wendy E. Krause, Lucian Lucia
Nonwovens Institute
2015-08-01 to 2018-07-31

The North Carolina Louis Stokes Alliance For Minority Participation Phase V
Jerome P. Lavelle
UNC - NC A & T State University
$90,545.00
2012-09-15 to 2015-08-31

Non-toxic Insect-resistant Textiles for Military Clothing and Equipment (previous title: Non-toxic Insecticidal and Insect-resistant Textiles for Military Clothing and Equipment)
Charles S. Apperson, Marian G. McCord, Richard M. Roe
US Army - Soldier Systems Center (Natick)
$29,860.00
2012-04-19 to 2015-04-18
Non-toxic Insect-resistant Textiles for Military Clothing and Equipment (previous title: Non-toxic Insecticidal and Insect-resistant Textiles for Military Clothing and Equipment)
Charles S. Apperson, Marian G. McCord, Richard M. Roe
US Army - Soldier Systems Center (Natick)
$30,160.00
2012-04-19 to 2015-04-18

Non-toxic Insect-resistant Textiles for Military Clothing and Equipment (previous title: Non-toxic Insecticidal and Insect-resistant Textiles for Military Clothing and Equipment)
Charles S. Apperson, Marian G. McCord, Richard M. Roe
US Army - Soldier Systems Center (Natick)
$124,739.00
2012-04-19 to 2015-04-18

Confidential
Peter J. Hauser, David Hinks, Saad A. Khan, Marian G. McCord, Jon P. Rust, Julie Crowe
Willoughby
Confidential industry sponsor
$1,201,327.00
2013-08-01 to 2016-07-01

Confidential
Peter J. Hauser, David Hinks, Saad A. Khan, Marian G. McCord, Jon P. Rust, Julie Crowe
Willoughby
Confidential industry sponsor
$10,000.00
2013-08-01 to 2016-07-01

Modeling of Superhydrophobic Superoleophobic Textile Aerosol Barriers
Hoon Joo Lee, Stephen Michielsen
US Army - Soldier Systems Center (Natick)
$131,064.00
2012-08-08 to 2016-05-31

Transfer of Bloodstains from Textile Surfaces: A Fundamental Analysis
Stephen Michielsen
National Institute of Justice
$305,692.00
2015-01-01 to 2016-12-31

Finding the Region of Origin of Bloodspatters in Complex Situations: Novel Physics-Based Methods and Tools; award as "Finding the Origin of Bloodspatters in Complex Situations: Novel Physics-Based Methods and Tools"
Stephen Michielsen
Iowa State University
$90,700.00
2015-01-01 to 2017-12-31

Confidential
Ahmed M El-Shafei, Harold S. Freeman, Melissa Pasquinelli, Renzo Shamey
Confidential industry sponsor
$520,772.00
2012-11-01 to 2015-12-31
Cold-Draw Shape-Memory Bi/Tricomponent Fibers: Elucidating the Polymer/Polymer Interface and Adding Sensory Functionality
Melissa Pasquinelli, Rich Spontak, and Behnam Pourdeyhimi
The Nonwovens Institute
~$170,000
2014-01-01 to 2016-12-31

Confidential
Melissa Pasquinelli
Confidential industry sponsor
$166,152.06
2013-09-01 to 2015-08-31

Spinning and Drawing Resorbable Yarns from Resorbable Polymers (Spinning and Drawing Resorbable Yarns from Bacterial Polyesters)
Martin W. King, Melissa Pasquinelli
Atex Technologies, Inc.
$108,129.00
2013-09-03 to 2015-09-02

Confidential
Melissa Pasquinelli
Confidential industry sponsor
$30,218.83
2014-11-17 to 2015-11-16

A Systematic Investigation of the Factors that Trigger Thermal Decomposition during the Processing of Industrially-Relevant Polymers
Melissa Pasquinelli and Russell Gorga
The Nonwovens Institute
~ $180,000
2012-08-16 to 2015-07-31

Sponsorship For PHD Thesis For Mr. Dennis Luzius
Behnam Pourdeyhimi
Forschungsgesellschaft fuer Textiltechnik Albstadt mbH (FTA)
$132,000.00
2012-08-15 to 2015-08-14

Confidential
Behnam Pourdeyhimi, Eunkyoung Shim
Confidential industry sponsor
$193,578.00
2012-11-01 to 2015-12-31

Nonwovens Institute Membership, Full (II) Member
Behnam Pourdeyhimi
ExxonMobil Chemical Co.
$125,000.00
2013-01-01 to 2017-12-31
Nonwovens Cooperative Research Center, Full (2) Member
Behnam Pourdeyhimi
Braskem America, Inc
$118,750.00
2013-04-01 to 2017-12-31

Task Order A1
Benoit Maze, Behnam Pourdeyhimi, Eunkyong Shim
Groz-Beckert KG
$197,901.00
2013-07-01 to 2016-06-30

Task Order A12
Benoit Maze, Behnam Pourdeyhimi
Groz-Beckert KG
$1,193,570.00
2013-07-01 to 2016-06-30

Task Order A14
Genevieve Garland, Behnam Pourdeyhimi
Groz-Beckert KG
$478,570.00
2013-07-01 to 2016-06-30

Task Order B4
Kirill Efimenko, Jan Genzer, Behnam Pourdeyhimi, Orlando Jose Rojas, Jirl Srogl
Groz-Beckert KG
$286,998.00
2013-07-01 to 2016-06-30

Task Order W4
Jan Genzer, Behnam Pourdeyhimi, Orlando Jose Rojas, Jirl Srogl
Groz-Beckert KG
$332,471.00
2013-07-01 to 2016-06-30

Task Order - W6
Kirill Efimenko, Jan Genzer, Behnam Pourdeyhimi, Orlando Jose Rojas, Jirl Srogl
Groz-Beckert KG
$769,170.00
2013-07-01 to 2016-06-30

Task Order - A10
Saad A. Khan, Behnam Pourdeyhimi, Orlando Jose Rojas, Eunkyong Shim
Groz-Beckert KG
$280,241.00
2013-07-01 to 2016-06-30

Task Order - Administration
Behnam Pourdeyhimi
Groz-Beckert KG
$849,977.00
2013-07-01 to 2016-06-30
Task Order - W1
Benoit Maze, Behnam Pourdeyhimi
Groz-Beckert KG
$247,646.00
2013-07-01 to 2016-06-30

Testing GB
Behnam Pourdeyhimi
Groz-Beckert KG
$580,000.00
2013-07-01 to 2015-06-29

Testing GB
Behnam Pourdeyhimi
Groz-Beckert KG
$300,000.00
2013-07-01 to 2015-12-31

Evaluating Nonwovens as Filtration Media
Behnam Pourdeyhimi
Veolia Water Solutions
$80,447.00
2013-08-01 to 2015-08-31

Confidential
Genevieve Garland, Behnam Pourdeyhimi
Confidential industry sponsor
$154,597.00
2013-09-01 to 2015-09-01

Nonwovens Institute Membership, Full (2) Member
Behnam Pourdeyhimi
Truetzschler Group
$125,000.00
2014-01-01 to 2018-12-31

Task Order A7
Michael Carl Flickinger, Benoit Maze, Behnam Pourdeyhimi
Groz-Beckert KG
$359,461.00
2014-01-01 to 2016-12-31

Membership in NWI, Full (2) Member
Behnam Pourdeyhimi
Voith Paper Holding GmbH & Co. KG
$125,000.00
2014-01-01 to 2018-12-31

Membership in NWI, Full (2) Member
Behnam Pourdeyhimi
Cummins Filtration Inc.
$125,000.00
2014-01-01 to 2018-12-31
NWI Membership, Full Member 2
Behnam Pourdeyhimi
Kraton Polymers
$125,000.00
2014-01-01 to 2018-12-31

Nonwovens Institute Membership, Full (2) Member
Behnam Pourdeyhimi
Welspun India Ltd.
$125,000.00
2014-01-01 to 2018-12-31

The Nonwovens Institute, Full (2) Member
Behnam Pourdeyhimi
First Quality Enterprises, Inc
$125,000.00
2014-01-01 to 2018-12-31

NWI Membership, Full (II) Member
Behnam Pourdeyhimi
Nike, Inc.
$250,000.00
2014-01-01 to 2018-12-31

The Nonwovens Institute Membership, Affiliate Member
Behnam Pourdeyhimi
CHA Technologies, Inc.
$50,000.00
2014-01-01 to 2018-12-31

Confidential
Benoit Maze, Behnam Pourdeyhimi, Eunkyoung Shim
Confidential industry sponsor$458,205.00
2014-03-01 to 2016-02-29

Nonwovens Institute Membership, Full (2) Member
Behnam Pourdeyhimi
Donaldson Company, Inc.
$118,750.00
2014-04-01 to 2018-12-31

NWI Membership, Full (2) Member
Behnam Pourdeyhimi
Clarcor, Inc
$125,000.00
2014-04-01 to 2018-12-31

The Nonwovens Institute Membership, Full (2) Member
Behnam Pourdeyhimi
Herty Advanced Materials Development Center, LLC
$116,667.00
2014-05-01 to 2018-12-31
Confidential
Peter J. Hauser, David Hinks, Saad A. Khan, Marian G. McCord, Jon P. Rust, Julie Crowe Willoughby
Confidential industry sponsor
$1,201,327.00
2013-08-01 to 2016-07-01

Confidential
Peter Hauser, Jon Rust
Confidential industry sponsor
$50,000.00
2014-12-01 to 2015-05-31

Confidential
Ahmed M El-Shafei, Harold S. Freeman, Melissa Pasquinelli, Renzo Shamey
Confidential industry sponsor
$778,535.00
2012-11-01 to 2015-12-31

Characterization Of Lubrizol's Pre-Treatment Interactions
Lisa P Chapman, Harold S. Freeman, Renzo Shamey
Lubrizol Corporation
$49,991.00
2014-09-08 to 2015-09-08

A Digital Camera Based Method for Color Quality Control of the OCP Camouflage Fabrics
Renzo Shamey, Henry J. Trussell
US Army
$407,405.00
2014-09-23 to 2015-09-22

Capping and Modeling Cationized Cotton
Peter J. Hauser, Renzo Shamey
Cotton, Inc.
$52,883.00
2015-01-01 to 2015-12-31

Confidential
Alan E. Tonelli
Confidential industry sponsor
$42,009.00
2014-12-01 to 2015-11-30

Next Generation of High Performance Flame Retardants with Low Environmental/Toxicological Impact (NCSU Research and Innovation Seed Funding Program)
Roger L. Barker, David Hinks, Melissa Pasquinelli, Heather B Patisaul, Alan E. Tonelli
2013-07-01 to 6/30/14 and beyond
<table>
<thead>
<tr>
<th>Title</th>
<th>PI</th>
<th>Institution</th>
<th>Amount</th>
<th>Dates</th>
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<tbody>
<tr>
<td>Fast and Scalable Fabrication of Nanofibers of Polymers, Carbons,</td>
<td>Xiangwu Zhang</td>
<td>National Science Foundation (NSF)</td>
<td>$423,016.00</td>
<td>2012-08-15 to 2016-07-31</td>
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<td>Ceramics, and Composites By Centrifugal Spinning</td>
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<td>I/UCRC Multi-University I/UCRC for Dielectrics and Piezoelectrics</td>
<td>Elizabeth C. Dickey, Jesse Jur, Jon-Paul Maria, Xiangwu Zhang</td>
<td>National Science Foundation (NSF)</td>
<td>$112,710.00</td>
<td>2014-03-01 to 2019-02-28</td>
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<td>High-Energy Lithium-Sulfur Batteries for Use in Stratospheric</td>
<td>Xiangwu Zhang</td>
<td>SCEYE S.A.</td>
<td>$299,637.00</td>
<td>2014-11-01 to 2016-10-31</td>
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<td>Environment</td>
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<td>Stationary Energy Storage Based Solution</td>
<td>Xiangwu Zhang</td>
<td>NCSU Future Renewable Electric Energy Delivery and Management Systems Center (FREEDM)</td>
<td>$50,362.00</td>
<td>2013-09-01 to 2014-08-31</td>
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<td>Electrospun Polymeric Fibers for Use as Reinforcements in Rubber</td>
<td>Xiangwu Zhang</td>
<td>Michelin Americas Research Company</td>
<td>$99,678.00</td>
<td>2013-08-01 to 2014-07-31</td>
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<td>Composites</td>
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<td>Nanofiber and Battery Research</td>
<td>Xiangwu Zhang</td>
<td>Qingdao Huashijie Environmental Proection</td>
<td>$38,000.00</td>
<td>2014-04-01 to 2015-03-31</td>
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<td>Plasma Treatment and Characterization of Carbon Fibers</td>
<td>Quan Shi, Xiangwu Zhang, Marian McCord, Mohamed Bourham</td>
<td>Cytec Engineered Materials Inc</td>
<td>$10,000.00</td>
<td>2014-01-01 to 2014-12-31</td>
</tr>
<tr>
<td>Undergraduate Research: Sodium-Ion Battery</td>
<td>Xiangwu Zhang</td>
<td>NCSU FREEDM System Center</td>
<td>$4,500.00</td>
<td>2014-05-25 to 2014-08-01</td>
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