

## **MONIKA BUBACZ, PhD**

*Associate Professor*

*Department of Mechanical Engineering, Mercer University, Macon, GA  
504-352-0297, bubacz\_m@mercer.edu*

### **EDUCATION:**

#### **University of New Orleans, New Orleans, LA (2002-2006)**

- PhD in Engineering and Applied Science (Mechanical Engineering)
- GPA of 4.0/4.0, acknowledged by Dean of Graduate Studies and Research in the College of Engineering
- Awarded a travel scholarship by the National Association of Corrosion Engineers (2005)

#### **Poznan University of Technology, Poznan, Poland (1993-1998)**

- BS/MS in Mechanical Engineering and Management
- Specialization: Applied Physics
- GPA of 3.8/4.0
- Graduate Scholarship for excellent results (1994-1998)
- University Award for Academic Excellence (June 1998)

### **EXPERIENCE:**

#### **The Citadel, Charleston, SC (since 2014)**

- Associate Professor, Department of Mechanical Engineering
- Specialization: Materials Science

#### **Applied Aerospace Research Institute, Middle Georgia State College, Aviation Campus, Eastman, GA (part-time, Summer 2013)**

- The James Webb Space Telescope component prototyping
- UAV composite airframe prototyping (PTERA for Area-I, GeoBat for Aerobat Aviation)
- Composite fabrication (carbon, glass/epoxy hand layup; prepregs; Nomex, aluminum, PMI sandwich structures; autoclave curing; mold making)

#### **Mercer University, Macon, GA (2007-2013)**

- Associate Professor, Department of Mechanical Engineering
- Specialization: Materials Science
- Research and technical advisor to undergraduate and graduate students
  - Polymer composite fabrication and testing (multidirectional laminates; prepregs, honeycomb sandwich structures; stress-strain analysis, adhesion strength, thermal warping)
  - Shape memory polymers (novel applications: laminates and sandwich structures; composite shape memory repeatability)
  - Bioplastics (synthesis from industrial organic waste)
  - Material and process selection (based on design, required properties, optimization, cost and material reduction, environmental sustainability, replacement of damaged elements)
  - Corrosion and material degradation (detection, protection, failure, repair)
  - Testing and analysis (basic mechanical testing, fatigue, microstructure, failure detection)
  - Environmental sustainability (life cycle analysis, sustainable material and process selection, recycling)
  - Energy audits (free building audits in the neighborhoods surrounding campus)
  - Planning, funding, and coordinating of engineering projects

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- Materials and Testing Laboratories Manager (equipment maintenance, repair, purchase, supplies, training)
- Consultant to Mercer Engineering Research Center, Robins Air Force Base, The Medical Center of Central Georgia, and local businesses and entrepreneurs (research, failure detection and analysis, material selection for new and replacement of existing designs)

**Pittsburg State University, Pittsburg, KS (2005-2007)**

- Research Associate (Post-doctoral position)
  - Polymer nanocomposite formulation, fabrication, testing, characterization, and modeling (nanoclay reinforced resin used as matrix in laminates, in foams, and to impregnate aramid papers in honeycomb cores; gas permeability of pressurized liquid fuel tanks; destructive and non-destructive evaluation, use of various microscopes; Final Element Analysis with Nastran/Patran)
  - Thermosets, thermoplastics, foams, composites, nanocomposites, adhesives (formulations, manufacturing, testing)
  - Flame and impact resistant materials (navy and aircraft applications; explosion resistance; bird strike resistance)
  - Computer simulations (gas permeability, thermal properties, stresses)
- Assistant Director for Research Associate (CNCMM)
  - Nanocomposite business incubator, entrepreneurship, Lean/Six Sigma
- Research advisor to undergraduate and graduate students
- Composite Laboratory Manager

**University of New Orleans, New Orleans, LA (2002-2006)**

- Graduate Research Assistant (2002-2005)
- Doctoral research, “Permeability And Flammability Study of Composite Sandwich Structures for Cryogenic Applications”
  - Epoxy nanocomposite formulations for decreasing liquid cryogenic fuel permeability; modeling, manufacturing, testing with helium

**Indiana University, Bloomington, IN (2003)**

- Summer co-op, “Temperature dependence of magnetization in magnetic nanocomposites”, Physics Department

**Oak Ridge National Laboratory, Oak Ridge, TN (2002)**

- Summer co-op, “Synthesis of nano/mesoporous TiO<sub>2</sub> oxide films/membranes containing oriented pore channels”, Chemical Technology Division

**Metal Forming Institute, Poznan, Poland (1997-2001)**

- Development Engineer in Metal Powder Forming Department (1998-2001)
  - Mass production and testing of high density precise parts for automotive, machine, and other industries (metal powder formulations, manufacturing, tool design, repeatability, testing)
  - Metal nanocomposites (formulations, manufacturing, testing)
  - Computer aided engineering (drawing, loading simulations)
- Assistant in Marketing Department (1997-2001)

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**COMPUTER SKILLS:** Languages: C, C++, Fortran  
Operating systems: MS-DOS, MS-Windows, Unix, Mac  
Softwares/Applications: AutoCAD, Ansys, CATIA, Nastran, Patran,  
MathCAD, MatLab, Mathematica, TechPlot, OriginLab

**MEMBERSHIPS:** Currently: AIAA, ASEE, Sigma-Xi (chair of mechanical  
engineering division for ASEE Southeast section, 2012-2013)  
Formerly: SAMPE, SPE

**LANGUAGES:** Fluent English, fluent Polish, German, Russian

**SELECTED PUBLICATIONS:**

1. **Bubacz M.**, McCreanor P.T., Jenkins H.E., "Engineering of Beer: Hard Work or Too Much Fun?" ASEE Southeast Section Annual Conference 2013, Cookeville, TN
2. **Bubacz M.**, McCreanor P.T., Lackey L.W., "Power to the People: Energy Audits," ASEE Southeast Section Annual Conference 2012, Starkville, MS
3. Ibeh C., **Bubacz M.**, "Current Trends in Nanocomposite Foams," Journal of Cellular Plastics, 44 (2008) 493-515
4. Ibeh C., **Bubacz M.**, "Development of Nanocomposites for Blast Resistant Hierarchical Structures," ASM-AEROMAT 2008, Austin, TX
5. **Bubacz M.**, Beyle A., Hui D., Ibeh C., "Helium permeability of coated aramid papers," Composites B, 39 (2008) 50-56
6. Ibeh C., **Bubacz M.**, "Trends in Nanocomposite Foams," Polymer Foam 2007 Conference, Newark, NJ
7. Ibeh C., **Bubacz M.**, Beyle A., "Research and Education at the Center for NanoComposites and Multifunctional Materials, PSU," 2007 ASEE Midwest Regional Conference, Wichita, KS
8. Ibeh C., Beyle A., **Bubacz M.**, Bietto S., Scoville S., "Energy Dissipative Polymeric Nanocomposite Sandwich Structures in Blast Mitigation," ONR Solid Mechanics Program Review, 2007, Adelphi, MD
9. Ibeh C., **Bubacz M.**, Bietto S., "Flammability Resistance Properties of Epoxy Nanocomposites," 2006 ASME Congress, Chicago, IL
10. **Bubacz M.**, Bietto S., Ibeh C., Hui D., "Flammability of Polymer Nanocomposite Systems," 6th AIAA ATIO Conference, 2006, Wichita, KS
11. **Bubacz M.**, "Permeability and Flammability Study of Composite Sandwich Structures for Cryogenic Applications" Dissertation, 2006, University of New Orleans, New Orleans, LA
12. **Bubacz M.**, Hui D., Beyle A., Ibeh C., "Gas Permeability Properties of Aramid Papers Coated with Epoxy Resin Systems," ICCE-14, 2006, Boulder, CO
13. **Bubacz M.**, Hui D., Beyle A., Santibhasker P., Ibeh C. "Aramid Papers Coated with Different Resin Systems as Excellent Gas Permeability Barrier" 47th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics & Materials Conference, 2006, Newport, RI
14. **Bubacz M.**, Hui D., Daniel L., Beyle A., Ibeh C., Susnik R., "Different approaches to sandwich structure permeability problem using coated aramid papers," SAMPE 37th International Technical Conference, 2005, Seattle, WA
15. **Bubacz M.**, Hui D., Leo D. "Permeability of helium through aramid fiber papers coated with unsaturated polyester," ICCE-12, 2005, Tenerife, Spain
16. **Bubacz M.**, Martinez-Vilarino S., Hui D., Daniel L. "Problem of corrosion in spacecrafts," ICCE-12, 2005, Tenerife, Spain

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17. Martinez-Vilarino S., **Bubacz M.**, Hui D., Daniel L. "Overview of corrosion issues in ships," ICCE-12, 2005, Tenerife, Spain
18. **Bubacz M.**, Chipara M. "Temperature dependence of magnetization in magnetic nanocomposites," ICCE-10, 2003, New Orleans, LA