

## ***Dr. William Andrew Hollerman***

204 Renwood Circle  
Lafayette, Louisiana 70503  
Home Phone: (337) 406-0464  
Office Phone: (337) 482-5063  
E-Mail Address: [hollerman@louisiana.edu](mailto:hollerman@louisiana.edu)  
Internet Address: <http://www.ucslouisiana.edu/~wah0320>

**Objective:** Maintain a position in physics, applied physics, or engineering that uses my accumulated experience in academia, government, and industry.

### **Professional Experience:**

- ***Associate Professor of Physics:***

- Appointed to a tenure-track position in the Department of Physics at the University of Louisiana at Lafayette in August 1999. As a member of the physics faculty, was responsible for teaching a wide variety of physics courses, mentoring upper level students, and conducting a rigorous research program in applied and engineering science.
- Member of the graduate faculty at the University of Louisiana at Lafayette, originally appointed in 1999 and reappointed in 2004.
- Awarded tenure and promoted to Associate Professor of Physics at the University of Louisiana at Lafayette in August 2005.

- ***Applied Physics and Materials Science:***

- Managed a \$400,000 x-ray survivability experiment for beryllium and silicon carbide composite mirror and baffle samples using an electron beam and soft x-ray source in San Diego, California. This experiment used innovative sample holders that position the test article at both ambient and cryogenic temperatures. This work was performed for the United States Army Space and Missile Defense Command.
- Responsible for the completion of a series of engineering tasks in support of several radiation test programs for the United States Army Space and Missile Defense Command from 1986 to 1990. These tasks involved the development of radiation resistant experimental hardware that was used to simulate the effects of nuclear weapons on infrared sensor systems. Completed a variety of analytical and experimental functions to select appropriate experimental hardware and software for these measurements. Provided direct support to the Government for space and weapons-based sensor radiation effects tests at radiation facilities.
- Completed a series of Scanning Electron Microscope (SEM), Atomic Force Microscope (AFM), and thermogravimetric measurements to determine the material properties for rare earth fluor paint samples.
- Participated in the set-up and preliminary operation for two 2,500 °C high temperature research furnaces used to heat-treat a variety of glassy carbon samples at Alabama A&M University. Managed several small tasks designed to manufacture glassy carbon materials for several small research programs.
- Completed a series of measurements concerning the growth of cryogenic films on cold infrared sensor optics for the Army Space and Missile Defense Command.
- Accumulated more than twenty years experience in writing technical proposals for a variety of funding agencies.

- Completed more than twenty years experience using a variety of ionizing radiation sources and detectors.
- Completed a series of hypervelocity triboluminescence experiments using the two-stage light gas gun located at the NASA Marshall Space Flight Center in Huntsville, Alabama.

- ***Radiation Sources:***

- Participated in a high-energy physics experiment at the Proton East Facility at the Fermi National Accelerator Laboratory. Involved in all aspects of the operation, detector use and calibration, computer data acquisition software, and general maintenance activities for an experiment to measure the chi and chi-prime particle cross sections at 500 GeV.
- Designed and constructed a differentially pumped gas cell and beam line system for the 6 MV model EN tandem Van de Graaff accelerator at Western Michigan University. This equipment was used to measure the argon and sulfur  $K_{\alpha}$  and  $K_{\beta}$  x-ray cross-sections for ion beam energies of 30 to 60 MeV. Duties completed during this tenure included experimental data acquisition, hardware design and testing, solid-state detector maintenance and use, accelerator operation, and the design/construction of high vacuum equipment.
- Participated in an experiment to measure nuclear giant resonance phenomena for  $^{90}\text{Zr}$  at the National Superconducting Cyclotron Laboratory using 35 MeV/nucleon  $^{14}\text{N}$  ions. Involved in the operation, detector calibration, software upgrades, and general maintenance activities for this experiment.
- Trained operator for a FN tandem Van de Graaff accelerator at the University of Notre Dame Nuclear Structure Laboratory. I was responsible for the operation of both accelerators during experiments, maintenance and operation of radiation detectors, and construction of high vacuum equipment.
- Program lead for the \$285,000 Fluorescent Materials and Bonding: Extended Energy (FMAB:EE) research program for the U.S. Army Space and Missile Defense Command. The objective of this program was to determine the relationship between the half brightness dose and energy due to 3 and 45 MeV proton irradiation for such fluors as  $\text{Y}_2\text{O}_2\text{S:Eu}$ ,  $\text{Gd}_2\text{O}_2\text{S:Eu}$ ,  $\text{Gd}_2\text{O}_2\text{S:Pr}$ ,  $\text{Gd}_2\text{O}_2\text{S:Tb}$ ,  $\text{YAG:Ce}$ , and  $\text{YOS:Ce}$ . The 3 MeV measurements were completed using the 1.7 MV 5SDH-2 Pelletron accelerator at Alabama A&M University. The 45 MeV measurements were completed at the Indiana University Cyclotron Facility at both ambient temperature and 150 °C.
- Technical lead for the \$100,000 Fluorescent Materials and Bonding research program for the United States Army Space and Missile Defense Command. This effort determined the relationship between the degradation of fluorescence light and total dose using a 3 MeV proton beam at the University of Massachusetts at Lowell Van de Graaff accelerator. I was responsible for all aspects of the testing for all experimental hardware as well as the completion of data analysis for the candidate yttrium and gadolinium fluors.
- Participated in an atomic physics experiment to measure the electron infrared divergence for carbon at the National Synchrotron Light Source (NSLS) at Brookhaven National Laboratory in 1999.
- Completed a series of ion implantation, proton induced x-ray emission (PIXE), proton induced gamma emission (PIGE), scanning transmission ion microscopy (STIM), Rutherford backscattering spectroscopy (RBS), and secondary electron imaging (SEI) analyses using 1.7 MV Pelletron accelerators at the Center for the Irradiation of Materials at Alabama A&M University and at the Louisiana Accelerator Center in Lafayette, Louisiana.

- ***Biophysics and Environmental Science:***

- Experience in providing technician-level hazardous materials training for industrial workers. Typically, these workers have all levels of existing training and education. Responsible for course design, implementation of lesson plans, and management of individual programs.

- Provide site-specific scientific assistance on the best methods to remove small quantities of mercury from the Upper East Fork Poplar Creek at the Oak Ridge Y-12 Plant in Tennessee. Provided Y-12 with detailed recommendations concerning methods to reduce the mercury concentration in the creek to meet NPDES permit requirements.

- ***Education:***

- Accumulated a total of six years experience at teaching physics laboratory and recitation courses at Western Michigan University, the University of Notre Dame, and Purdue University.
- Physics instructor for the Louisiana Systematic Initiatives Program (LaSIP) K-12 teacher-training course at the University of Louisiana at Lafayette during the summer of 1999 and 2000.
- Judge for the Louisiana regional Science and Engineering Fair and the Science Olympiad from 1999 to present.
- Reviewer for several new physics and environmental science textbooks from 2000 to the present.
- Physics instructor for the Eisenhower Southwest Consortium for the Improvement of Mathematics and Science Teaching (SCIMAST) K-12 teacher-training course at the University of Louisiana at Lafayette during summer 2001.
- Directed all activities for five sections of the PHYS 215 laboratory (first semester general laboratory) at the University of Louisiana at Lafayette from 2003 to the present.
- Developed several hundred basic solar system astronomy questions for the Classroom Performance System (CPS) in 2004 and 2005.
- Directed the Louisiana Regional Science Olympiad Physics Laboratory and Mission Possible competitions at the University of Louisiana at Lafayette from 2004 to the present.
- Utilized the CPS Hand-held Interactive Response System (“clicker”) for quizzes and attendance during PHYS160 (Astronomy of the Solar System) in spring 2005.

- ***Internet:***

- Developed and maintained several Internet pages using Hypertext Mark-up Language (HTML). Acts as the liaison for several web pages at the University of Louisiana at Lafayette including the physics department site, <http://physics.louisiana.edu>.
- Developed a presentation designed to provide a professional with useful information on how to locate and utilize information on the Internet. More than 450 persons have attended this quality presentation.

- ***Management:***

- Principal investigator and co-principal investigator for several research grants from state and federal agencies.
- Managed a series of research tasks, ranging in value from \$1,000 to \$400,000, for a variety of applied physics programs. I was responsible for all aspects of personnel and materials management to meet assigned task objectives. Management of these tasks included developing and writing of funding proposals/task statements as well as interfacing with individual agency contacts.
- Managed the environmental safety and health training program at the Center for Environmental Technology in Muscle Shoals, Alabama from 1994 to 1997.
- Developed a full-color brochure describing activities at the Center of Irradiation of Materials at Alabama A&M University as well as the Louisiana Accelerator Center and the Department of Physics at the University of Louisiana at Lafayette.

- Operated and managed the 1.7 MV 5SDH-2 Pelletron accelerator at the Louisiana Accelerator Center located on the campus of the University of Louisiana at Lafayette.
  - Directed a column repair of the 1.7 MV 5SDH-2 Pelletron accelerator at the Louisiana Accelerator Center in 1999.
  - Directed initial efforts to reassemble and troubleshoot a used 200 kV Eaton Ion Implanter at the Center for Irradiation of Materials at Alabama A&M University during the late spring of 1998.
  - Directed the formation for the Louisiana Section of the Materials Research Society in 1999 and 2000.
  - Directed operations of the 1  $\mu\text{m}^2$  Oxford Microprobes, Limited nuclear microprobe that is located at the Louisiana Accelerator Center from 1999 to 2001.
  - Developed and managed the technical program for the 2002 Symposium of Northeastern Accelerator Personnel (SNEAP), held from October 7-10, 2002 in Lafayette, Louisiana.
- **Computer Analysis:**
    - Completed a computer analysis to calculate di-baryon resonance parameters at Argonne National Laboratory.
    - Completed an extensive series of calculations that measured the production of infrared radiance from space-based nuclear detonations. This information was used to determine the operability of a variety of United States Army infrared sensor components in a nuclear environment. These analyses used the NORSE computer code.
    - Completed a variety of x-ray, gamma, and neutron fluence, total dose, electromagnetic pulse, blast overpressure, wind gust, thermal flux and fluence, and electron density calculations for scenarios associated with nuclear detonations using a variety of analytical and computer techniques for the United States Army.
    - Task lead for an effort to calculate the melt dose and on-set of plastic deformation fluence limits for five proposed infrared sensor mirror designs using the FORTRAN PUFF-TFT computer code. These results can be used as inputs to a statistical analysis to determine which material properties are most important to maximize mirror survivability.
    - Technical lead for the design of several nuclear effects multimedia software modules for the U.S. Army Space and Missile Defense Command. This effort includes design and implementation of a fast running FORTRAN routine that modeled attenuation of gamma photons and beta particles, including first order bremsstrahlung production, through a multi-layered shield.

## Education:

- Ph.D. Applied Physics, Alabama A&M University, Normal, Alabama, May 12, 1996, GPA: 3.92/4.00.
  - Dissertation: *Investigation of Proton Induced Fluorescence From Yttrium and Gadolinium Compounds*
  - Advisor: Dr. Lawrence R. Holland
- M.S. Physics (Emphasis in Radiation Physics), Purdue University, West Lafayette, Indiana, May 1986, GPA: 5.67/6.00.
- M.A. Physics (Emphasis in Experimental Atomic Physics), Western Michigan University, Kalamazoo, Michigan, May 1985, GPA: 3.81/4.00.
  - Thesis: *Construction and Testing of a New Atomic Physics Beam Line at the Western Michigan University Accelerator Laboratory*
  - Advisor: Dr. John A. Tanis
- B.S. Mathematics-Physics, St. Joseph's College, Rensselaer, Indiana, May 1981, GPA: 3.44/4.00, Cum Laude.

## Specialized Training:

- Completed various short courses and symposia in radiation physics and infrared sensors, 1986 to 1999.
- Hazardous Waste Operations and Emergency Response (HAZWOPER) 40 hour training, 1993 to 2000.
- OSHA Regulations undergraduate course, 5 quarter hours, Central Alabama Community College, August 1993.
- DOT/UN HM-181 regulation training, 1993 to 1995.
- Environmental Impact Assessment, University of Alabama in Huntsville, February 1994.
- Industrial Wastewater Treatment, University of Toledo, April 1996.
- ISO 14000 Executive Overview, Air and Waste Management Association Conference, Nashville, Tennessee, June 1996.
- ISO 14000 Awareness Level Trainer-the-Trainer Course, American National Standards Institute (ANSI), Global Environmental Technology Foundation (GETF), and Partnership for Environmental Technology Education (PETE), Tampa, Florida, September 25 to 29, 1996.
- 80 Hour HAZWOPER (Waste Site and Emergency Response) Train-the-Trainer Course, Hazardous Materials Training and Research Institute (HMTRI), Cedar Rapids, Iowa, August 5 to 16, 1996.
- 24 Hour HAZWOPER (Waste Site and Emergency Response) Train-the-Trainer Course Refresher, Hazardous Materials Training and Research Institute (HMTRI), Cedar Rapids, Iowa, 1997 and 2000.
- LabVIEW Basic I/II Courses, Radical Systems, Incorporated, Huntsville, Alabama, January 2002.
- Completed graduate courses in astrophysics, nuclear engineering, laser physics, plasma physics, solidification of solids, atomic and nuclear physics, materials science, advanced laboratory, quantum mechanics, electricity and magnetism, statistical mechanics, classical mechanics, semiconductor physics, polymer physics, surface characterization of materials, mechanical behavior of solids, and environmental chemistry.

## Computer Experience:

- Languages: BASIC, FORTRAN, HTML, and LabVIEW.
- Hardware: IBM, VAX, CDC, CYBER, CRAY, Macintosh, and IBM compatible PC.
- Software: Macintosh OS X, Windows/MS-DOS, MS Office, other graphical user interface word-processing software, Internet authoring software, spreadsheet, drawing, graphics, and data acquisition packages.

## Courses Taught:

- University of Louisiana at Lafayette, Lafayette, Louisiana:
  - PHYS 160, Astronomy of the Solar System, 3 credits, 2000 to Present.
  - PHYS 201, Physics I (Calculus), 4 credits, 1999 to Present.
  - PHYS 207, Introduction to Physics I (Algebra), 3 credits, 2004 to Present.
  - PHYS 208, Introduction to Physics II (Algebra), 3 credits, 2005 to Present.
  - PHYS 215, Physics Laboratory I (Basic Physics), 1 credit, 1998 to Present.
  - PHYS 223, Physics Laboratory for Elementary School Teachers, 1 credit, 1999 to Present.
  - PHYS 301, Physics III (Modern Physics), 3 credits, 2003.
  - PHYS 311/312, Physics Laboratory III/IV (Modern Physics), 1 credit each, 2000 to 2004.
  - PHYS 450, Solid State Physics, 3 credits, 2004.

- PHYS 571, Physics for Secondary Teachers, 3 credits, 1999 to Present.
- Numerous physics advanced special topics and graduate research courses.
- Northwest-Shoals Community College, Muscle Shoals, Alabama:
  - EVT 101, Introduction to Environmental Science, 3 credits, Fall 1996.
  - EVT 120, Introduction to HAZMAT and OSHA Regulations, 3 credits, Winter 1997.
  - EVT 250, HAZMAT Incident Management, 3 credits, Spring 1997.
  - EVT 280, Treatment, Storage, and Disposal of Hazardous Wastes, 3 credits, Summer 1997.
- Central Alabama Community College, Huntsville, Alabama, Incident Management, 5 credits, Summer 1994.
- Numerous college-level physics laboratory and recitation courses at Western Michigan University, University of Notre Dame, and Purdue University.
- More than twenty years experience as a private tutor for high school and college level science courses.

### **Student Direction:**

- Managed the efforts for many undergraduate and graduate students working at the University of Louisiana at Lafayette from 1998 to the present.
- Managed initial efforts for five undergraduate students to reassemble and troubleshoot a used 200 kV Eaton ion implanter at the Center for Irradiation of Materials at Alabama A&M University during the spring of 1998.
- Led a group of physics students in a program to learn about space careers and develop a scientific payload for a high altitude balloon flight during the fall of 2004 and spring of 2005.

### **Thesis Committee Participation (University of Louisiana at Lafayette):**

- Member, Master of Science Committee, Applied Physics, Nancy Ruzycki, *Gold Implantation Studies of Titanium Oxide Thin Films on Titanium Substrates*, May 2000.
- Member, Master of Science Committee, Chemical Engineering, Murli Bashyam, *Surface Changes Caused by Implantation of 1 MeV Aluminum into 1018 Steel*, December 2000.
- Member, Master of Science Committee, Applied Physics, Shelly Hynes, *Operational Characteristics of the Nuclear Microprobe at the Louisiana Accelerator Center*, August 2001.
- Chair, Master of Science Committee, Applied Physics, Natalia V. Zhelezina, *Superconductivity*, May 2003.
- Chair, Master of Science Committee, Applied Physics, Tesia L. Albarado, *Characterization of Electron Damage to Solar Sail Materials*, August 2003.
- Member, Master of Science Committee, Applied Physics, Peng Liang, *Computerized Automated Microprobe Controller*, December 2003.
- Chair, Master of Science Committee, Applied Physics, Frank Womack, *A Study of the Triboluminescent Properties of ZnS:Mn Using a Custom Built Drop Tower*, December 2004.
- Chair, Master of Science Committee, Applied Physics, Mikhail Yevdokimov, *Training Physics Students for Space Careers: Introduction to the LaACES CajunSat Program*, May 2005.
- Chair, Master of Science Committee, Applied Physics, Noah P. Bergeron, *A Study of the Triboluminescence Properties of ZnS:Mn*, Completed in August 2006.

## **Employment History:**

- Associate Professor, Department of Physics, University of Louisiana at Lafayette, September 2005 to Present.
- Assistant Professor, Department of Physics, University of Louisiana at Lafayette, August 1999 to August 2005
- Assistant Research Professor, University of Louisiana at Lafayette, June 1998 to August 1999.
- Postdoctoral Research Associate, Center for Irradiation of Materials, Alabama A&M University, Normal, Alabama, December 1997 to June 1998.
- Training Director and Environmental Technology Specialist, Center for Environmental Technology, Muscle Shoals, Alabama, December 1994 to December 1997.
- Graduate Research Assistant, Department of Physics, Alabama A&M University, Normal, Alabama, January 1994 to June 1995.
- Member of the Technical Staff, Nichols Research Corporation, Huntsville, Alabama, May 1986 to February 1994.
- Graduate Student Teaching Assistantships, Western Michigan University, Purdue University, and the University of Notre Dame, August 1981 to May 1986.
- Graduate Student Research Assistantships, Western Michigan University and the University of Notre Dame, August 1981 to May 1983.

## **Summer Employment History:**

- Summer Faculty Fellowship Program, Space Environmental Effects Group (ED31), NASA Marshall Space Flight Center, Huntsville, Alabama, Mentor: Dr. David Edwards, Completed tasks in space radiation research, 2000 and 2002.
- Faculty Research Participant, Oak Ridge National Laboratory, Oak Ridge, Tennessee, Mentor: Dr. Stephen W. Allison, Measured material properties for a variety of rare earth phosphors, 2001 to 2005.

## **Professional Memberships:**

- International Society for Optical Engineering (SPIE)
- IEEE Nuclear and Plasma Society
- American Physical Society
- Sigma Pi Sigma, Physics Honor Society
- Indiana Academy of Science

## **Professional Certifications:**

- Master Certified Hazardous Materials Manager (CHMM), Institute of Hazardous Materials Management, Number 3730, September 1992, Renewed September 1997 and March 2002.

## **Professional Activities:**

- Chair, Student Section, ISA International Instrumentation Symposium, 2004 and 2005.
- Founding President, Louisiana Section, Materials Research Society, 2000 and 2001.
- Member, Board of Directors, Academy of Certified Hazardous Materials Managers, 1996.
- Vice President, Alabama Society of Hazardous Materials Managers, 1996.
- Member, Board of Directors, Alabama Society of Hazardous Materials Managers, 1995 to 1996.
- Coordinator, North Alabama Section, Alabama Society of Hazardous Materials Managers, 1993 to 1994.

## Funded Proposals:

- *Investigation of Fluorescence Properties of Micrometer-Sized Fluor Grains*, Louisiana Board of Regents Support Fund (BORSF), \$117,027, 2000-2004, Principal Investigator.
- *Travel Grants for Emerging Faculty (TGEF)*, Louisiana Board of Regents, \$1,000, 2000-2004 (several awards), Principal Investigator.
- *Microscopic Quantitative Mapping Ion Flux in Rat Brain*, National Institute of Neurological Disorders and Stroke (NIH), \$199,000, 2002-2004, Co-Principal Investigator.
- *Nanoscale Microscopy System Using High Energy Ions*, Louisiana Board of Regents Support Fund (BORSF), \$124,797, 2002-2003, Co-Principal Investigator.
- *Measurement of Proton Effects on Candidate Solar Sail Materials*, Louisiana Space Grant (LaSPACE) Consortium, \$24,946 2003-2005, Principal Investigator.
- *Mercury Detection Studies of Tree Ring Samples Using Particle Induced X-Ray Emission (PIXE)*. Environmental Protection Agency, \$29,971, 2003-2005, Principal Investigator.
- *Louisiana Expertise Exchange Program (LEEP)*, Louisiana Board of Regents, \$1,200, 2003, Principal Investigator.
- *Space Radiation Effects on Solar Sails and Hypervelocity Triboluminescence Research*, Visiting Researcher Exchange and Outreach (VREO) Program, Partnership between the NASA Marshall Space Flight Center Education Programs Department and Universities Space Research Association (USRA), 2003-2004, \$4,200 (travel and conference expenses), Principal Investigator.
- *Participation in LaACES: Development of the "CajunSat" High Altitude Balloon Payload*, Louisiana Space Grant (LaSPACE) Consortium, \$16,294, 2004-2005, Principal Investigator.
- *Feasibility of Constant Mass Triboluminescent Tracers*, Louisiana National Science Foundation EPSCoR Links with Industry, Research Centers, and National Laboratories (LINK), \$11,000, Summer 2005, Principal Investigator.
- *Special Travel for Aerospace Researchers (STAR)*, Louisiana NASA Experimental Program to Stimulate Competitive Research (EPSCOR), Principal Investigator:
  - NASA Marshall Space Flight Center, \$1,600, January 2003.
  - NASA Marshall Space Flight Center, \$1,800, August 2004.
  - NASA Marshall Space Flight Center and NASA White Sands Test Facility, \$2,476, January 2005.
  - NASA Jet Propulsion Laboratory and SPIE Conference (San Diego, CA), \$1,865, August 2005.
  - NASA Marshall Space Flight Center, \$2,536, January 2006.
  - SPIE Sensors for Propulsion Measurement Conference, \$1,495, April 2006.
- *HASP Student Cosmic Ray Detector Experiment*, Louisiana Space Grant (LaSPACE) Consortium, \$16,204, 2006, Principal Investigator.

## Patents:

- W.A. Hollerman, N.P. Bergeron, and S.M. Goedeke, *Constant Mass Luminescent Tracers for Munition Rounds*, U.S. Patent and Trademark Office Serial Number 60/706,089, Provisional patent application filed on August 5, 2005.

## Published Book Chapters or Sections:

- W.A. Hollerman, *Review of Radiation Principles*, Handbook of Hazardous Materials Management, 5th Edition, Edited by Doye B. Cox, Institute of Hazardous Materials Management (1995).

- W.A. Hollerman, *Ionizing Radiation*, Standard Handbook of Environmental Science, Edited by Jay Lehr, McGraw-Hill Publishing, 15.58-15.72 (2000).
- S.W. Allison, M.R. Cates, S.M. Goedeke, W.A. Hollerman, F.N. Womack, and G.T. Gillies, Remote Thermometry With Thermographic Phosphors: Instrumentation and Applications (Chapter 4), Handbook of Luminescence, Display Materials, and Devices, Volume 2: Inorganic Display Materials, Edited by H.S. Nalwa and L.S. Rohwer, American Scientific Publishers, 187-250 (2003).
- S.W. Allison, W.A. Hollerman, S.M. Goedeke, M.R. Cates, and T.J. Bencic, *Fluorescent Coatings for High Temperature Phosphor Thermometry*, Encyclopedia of Chemical Processing, Edited by Sunggyu Lee, Marcel Dekker, Incorporated, 1021-1030 (2005).
- W.A. Hollerman, S.W. Allison, S.M. Goedeke, and M.R. Cates, *Measuring Experimental Quantities Using Simple Fluorescence*, Encyclopedia of Chemical Processing, Edited by Sunggyu Lee, Marcel Dekker, Incorporated, 1561-1574 (2005).

## Other Publications:

- ***Space Physics:***

### Refereed Articles:

- D.L. Edwards, W.S. Hubbs, G.E. Wertz, D.T. Hoppe, M.K. Nehls, W.A. Hollerman, P.A. Gray, and C.L. Semmel, *Electron Radiation Effects on Candidate Solar Sail Material*, High Performance Polymers, 16, 277-288 (2004).
- T. Albarado, W. Hollerman, D. Edwards, W. Hubbs, and C. Semmel, *Electron Exposure Measurements of Candidate Solar Sail Materials*, ASME Journal of Solar Energy Engineering, 127 (1), 125-130 (2005).

### Proceedings Articles:

- D. Edwards, W. Hubbs, T. Stanaland, A. Hollerman, and R. Altstadt, *Characterization of Space Environmental Effects on Candidate Solar Sail Material*, Photonics for Space Environments VIII, Society of Photo-Optical Instrumentation Engineers, Volume 4823, 67-74 (2002).
- D. Edwards, W. Hubbs, T. Stanaland, A. Hollerman, and R. Altstadt, *Characterization of Space Environmental Effects of Candidate Solar Sail Material*, 14th Annual Symposium on Propulsion, Propulsion Research Center, State College, PA (2002).
- W.A. Hollerman, T.L. Stanaland, D. Edwards, P. Boudreaux, L. Elberson, J. Fontenot, E. Gates, R. Greco, M. McBride, and A. Woodward, *Accelerator-Based PIXE and STIM Analysis of Candidate Solar Sail Materials*, 17th International Conference on the Application of Accelerators in Research and Industry, Edited by J.L. Duggan and I.L. Morgan, American Institute of Physics, 452-455 (2003).
- T. Albarado, W. Hollerman, D. Edwards, W. Hubbs, and C. Semmel, *Electron Exposure Measurements of Candidate Solar Sail Materials*, International Solar Energy Conference, Kona, HI (2003).
- W. Hollerman, T. Albarado, and M. Lentz, *Ionizing Radiation Exposure Measurements for Candidate Solar Sails*, 39th AIAA/ASME/SAE/ASEE Joint Propulsion Conference, AIAA-2003-4660 (2003).
- D.L. Edwards, W.S. Hubbs, P.A. Gray, G.E. Wertz, D.T. Hoppe, M.K. Nehls, C.L. Semmel, T.L. Albarado, and W. A. Hollerman, *Characterization of Candidate Solar Sail Materials Subjected to Electron Radiation*, 9th International Symposium on Materials in a Space Environment, Noordwijk, Holland (2003).

- D. Edwards, M. Hovater, W. Hubbs, G. Wentz, W. Hollerman, and P. Gray, *Characterization of Candidate Solar Sail Material Exposed to Space Environmental Effects*, 42nd AIAA Aerospace Sciences Meeting, AIAA-2004-1085 (2004).
- M. Lentz, W.A. Hollerman, D.L. Edwards, W. Hubbs, and C. Semmel, *Space Environmental Effects Testing and Characterization for Candidate Solar Sail Materials*, Proceedings of the 50<sup>th</sup> International Instrumentation Symposium of the ISA, San Antonio, TX (2004).
- W. Hollerman, M. Yevdokimov, N. Bergeron, R. Moore, R. Fontenot, J. Bulliard, and D. Crouch, *Training Physics Students for Space Careers: Introduction to the LaACES CajunSat Program*, 41st AIAA/ASME/SAE/ASEE Joint Propulsion Conference, AIAA-2005-3521 (2005).
- W.A. Hollerman, N.P. Bergeron, and R.J. Moore, *Proton Survivability Measurements for Candidate Solar Sail Materials*, IEEE Nuclear Science Symposium Conference Record, Fajardo, Puerto Rico (2005).

- ***Applied Physics and Materials Science:***

**Refereed Articles:**

- T.M. Schuler, D.L. Ederer, N. Ruzycki, G. Glass, W.A. Hollerman, A. Moewes, M. Kuhn, and T.A. Callcott, *Diffusion of TiN into Aluminum Films Measured by Soft X-Ray Spectroscopy and Rutherford Backscattering Spectroscopy*, Journal of Vacuum Science and Technology, A19 (5), 2259-2266 (2001).

**Proceedings Articles:**

- W.A. Hollerman, D.R. Evans, G.A. Shelby, M. Ward, A. Wilkosz, C. Martin, and R. Seals, *Soft X-Ray Testing of Silicon Carbide and Beryllium Optics*, Second RADC Large Optics Conference, Griffiss AFB, NY (1990).
- D. Evans, A. Wilkosz, M. Triplett, and W. Hollerman, *Measurements of Micro-Debris Deposits Using a QCM*, Indiana Academy of Science, 101, 49-58 (1992).
- W.A. Hollerman, G.M. Jenkins, S.A. Huber and G.S. Benko, *Potential of Radioactive Waste Fixation Using Polymers*, Academy of Certified Hazardous Materials Managers, 145-153 (1994).
- W.A. Hollerman, N.A. Guardala, D.J. Land, G.A. Glass and J.L. Price, *Measurement of Compton Scattered Electrons Using Monochromatic X-Rays*, 16th International Conference on the Application of Accelerators in Research and Industry, Edited by J.L. Duggan and I.L. Morgan, American Institute of Physics, 193-196 (2001).
- T.M. Schuler, D.L. Ederer, N. Ruzycki, G. Glass, W.A. Hollerman, A. Moewes, M. Kuhn, and T.A. Callcott, *Diffusion of TiN into Aluminum Films Measured by Soft X-Ray Spectroscopy*, 16th International Conference on the Application of Accelerators in Research and Industry, Edited by J.L. Duggan and I.L. Morgan, American Institute of Physics, 548-551 (2001).
- N. Ruzycki, G. Glass, U. Diebold, D. Ederer, W. Hollerman, and P. Fleming, *Radiation Damage Effects in TiO<sub>2</sub> Thin Film on Titanium Due to Ion Implantation of Gold at Varying Energies and Doses*, Materials Research Society Symposium (2000).

- ***Fluorescence:***

**Refereed Articles:**

- L.R. Holland, G.M. Jenkins, J.H. Fisher, W.A. Hollerman, and G.A. Shelby, *Efficiency and Radiation Hardness of Phosphors in a Proton Beam*, Nuclear Instruments and Methods in Physics Research, B56/57, 1239-1241 (1991).

- W.A. Hollerman, J.H. Fisher, G.A. Shelby, L.R. Holland, and G.M. Jenkins, *Proton Damage Measurements of Rare Earth Oxide Scintillators*, IEEE Transactions on Nuclear Science, 38 (2), 184-187 (1991).
- W.A. Hollerman, L.R. Holland, J.H. Fisher, G.A. Shelby, and G.M. Jenkins, *Spectroscopic Analysis of Proton Induced Fluorescence From Yttrium and Gadolinium Oxysulfide Phosphors*, IEEE Transactions on Nuclear Science, 39 (6), 2295-2297 (1992).
- W.A. Hollerman, J.H. Fisher, L.R. Holland, and J.B. Czirr, *Spectroscopic Analysis of Proton Induced Fluorescence From Yttrium Orthosilicate*, IEEE Transactions on Nuclear Science, 40 (5), 1355-1358 (1993).
- J.H. Fisher, W.A. Hollerman, G.A. Shelby, L.R. Holland, G.M. Jenkins, and D.B. Nisen, *Spectroscopic Analysis of Proton Induced Fluorescence From Cerium Doped Yttrium Aluminum Garnet*, Nuclear Instruments and Methods in Physics Research, B80/81, 1207-1209 (1993).
- W.A. Hollerman, G.M. Jenkins, J.H. Fisher, L.R. Holland, D.B. Nisen, E.K. Williams, and C.C. Foster, *Measurement of Fluorescence Phenomena From Yttrium and Gadolinium Fluors Using a 45 MeV Proton Beam*, Nuclear Instruments and Methods in Physics Research, A353, 20-23 (1994).
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## Poster Presentations (Participating Author):

- ***Space Physics:***

- *Thermo-Optical and Mechanical Property Testing of Candidate Solar Sail Materials*, 5th Conference on Aerospace Materials, Processes, and Environmental Technology (AMPET), Huntsville, AL, September 18, 2002.
- *Proton Survivability Measurements for Candidate Solar Sail Materials*, IEEE Nuclear Science Symposium, Fajardo, Puerto Rico, October 27, 2005.

- ***Applied Physics and Materials Science:***

- *Radiation Damage Effects in TiO<sub>2</sub> Thin Film on Titanium Due to Ion Implantation of Gold at Varying Energies and Doses*, Materials Research Society Fall Meeting, Boston, MA, November 27, 2000.

- ***Fluorescence:***

- *Proton Damage Measurements of Rare Earth Oxide Scintillators*, IEEE Nuclear Science Symposium and Medical Imaging Conference, Washington DC, October 22 to 27, 1990.
- *Efficiency and Radiation Hardness of Phosphors in a Proton Beam*, 11th International Conference on the Application of Accelerators in Research and Industry, Denton, TX, September 1990.
- *Spectroscopic Analysis of Proton Induced Fluorescence From Yttrium Aluminum Garnet*, Eighth International Conference on Ion Beam Modification of Materials, Heidelberg, Germany, September 9, 1992.
- *Spectroscopic Analysis of Proton Induced Fluorescence From Yttrium and Gadolinium Oxysulfide Phosphors*, IEEE Nuclear Science Symposium and Medical Imaging Conference, Orlando, FL, October 29, 1992.
- *Measurement of Fluorescence Phenomena From Yttrium and Gadolinium Fluors Using a 45 MeV Proton Beam*, Eighth Symposium on Radiation Measurements and Applications (SORMA), Ann Arbor, MI, May 17, 1994.
- *Survey of Recent Research Results for New Fluor Materials*, Materials Research Society Spring Meeting, San Francisco, CA, April 6, 1999.
- *Results from a Nuclear Microprobe Analysis of Selected Rare Earth Fluor Materials*, IEEE Nuclear Science Symposium and Medical Imaging Conference, San Diego, CA, November 7, 2001.
- *High Temperature Thermographic Phosphor Coatings Development*, 5th Conference on Aerospace Materials, Processes, and Environmental Technology (AMPET), Huntsville, AL, September 18, 2002.
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- *Changes in Half Brightness Dose Due to Preparation Pressure for YAG:Ce*, IEEE Nuclear Science Symposium and Medical Imaging Conference, Portland, OR, October 22, 2003.
- *Measurement of Triboluminescence and Proton Half Brightness Dose for ZnS:Mn*, IEEE Nuclear Science Symposium and Medical Imaging Conference, Portland, OR, October 22, 2003.
- *Study of Resbond<sup>®</sup> Ceramic Binders Used for High Temperature Non-Contact Thermometry*, 106<sup>th</sup> Annual Meeting of the American Ceramic Society, Indianapolis, IN, April 19, 2004.

- *Selected Triboluminescence Research Results for a Variety of Inorganic Materials*, 106<sup>th</sup> Annual Meeting of the American Ceramic Society, Indianapolis, IN, April 19, 2004.
- *Effect of 3 MeV Proton Radiation on ZnS:Mn*, 18th International Conference on the Application of Accelerators in Research and Industry (CAARI), Ft. Worth, TX, October 13, 2004.
- *Annealing Effects of Triboluminescence Production on Irradiated ZnS:Mn*, 14th International Conference on Surface Modification of Materials by Ion Beams, Kusadasi, Turkey, September 4-9, 2005.
- *Measurement of the Half Brightness Fluence for ZnS:Mn Due to 20 keV Electron Irradiation*, IEEE Nuclear Science Symposium, Fajardo, Puerto Rico, October 27, 2005.
- *Cathodoluminescence Emission Studies for Selected Phosphor-Based Sensor Materials*, IEEE Nuclear Science Symposium, Fajardo, Puerto Rico, October 27, 2005.
- *Potential for Developing Smart Materials Using Triboluminescence*, Louisiana Materials and Emerging Technologies Conference, Louisiana Tech University, December 12, 2005.

• **Radiation Sources:**

- *Construction and Testing of the New Fluorescent Materials Test Chamber at the Alabama A&M University Accelerator Laboratory*, North Alabama Student Materials Research Conference, Normal, AL, April 13, 1991.
- *Development of the Fluorescent Materials Test Chamber*, Second European Conference on Accelerators in Applied Research and Technology, Frankfurt, Germany, September 6, 1991.
- *Development of a Fast Beam Pulsing System for the Fluorescent Materials Test Chamber*, 5th Alabama Materials Research Conference, Birmingham, AL, September 25 and 26, 1991.
- *Development and Testing of an Adjustable Cathode Positioning System for a SNICS II Source*, 16th International Conference on the Application of Accelerators in Research and Industry, Denton, TX, November 3, 2000.
- *Comparison of Measured and Calculated Beam Spot Sizes for the Louisiana Accelerator Center Nuclear Microprobe*, 16th International Conference on the Application of Accelerators in Research and Industry, Denton, TX, November 3, 2000.
- *Crisis, Challenges, and Development of Nuclear Techniques - Some Applications of Accelerators in China*, 16th International Conference on the Application of Accelerators in Research and Industry, Denton, TX, November 3, 2000.
- *Microscale Analysis and Modification Using a Nuclear Microprobe*, NanoSpace 2001, National Aeronautics and Space Administration, Galveston Island, TX, March 13, 2001.
- *Louisiana Accelerator Center*, Roadmap to Opportunities, Louisiana Board of Regents, Baton Rouge, LA, April 25, 2001.
- *Microscale Analysis and Modification Using a Nuclear Microprobe*, Bio-Micro-Sensors for Biology and Medicine, Institute for Micromanufacturing, Ruston, LA, May 9, 2001.
- *Introduction to Proton Microscopy*, 5th Conference on Aerospace Materials, Processes, and Environmental Technology (AMPET), Huntsville, AL, September 18, 2002.

- ***Biophysics and Environmental Science***

- *Determination of Heavy Element Concentrations in Tree Ring Samples Using Ion Beam Methods*, 15th International Conference on the Application of Accelerators in Research and Industry, Denton, TX, November 6, 1998.
- *Study of the Elemental Composition of Yellow Pine Using Particle Induced X-Ray Emission (PIXE)*, 16th International Conference on the Application of Accelerators in Research and Industry, Denton, TX, November 3, 2000.
- *Nuclear Microprobe Analysis of Artificial Coal*, Ninth International Conference on Particle Induced X-Ray Emission and its Analytical Applications, University of Guelph, Guelph, Canada, June 11, 2001.
- *Analysis of a Clay-Like Strata Thought to be Old Mortar*, Ninth International Conference on Particle Induced X-Ray Emission and its Analytical Applications, University of Guelph, Guelph, Canada, June 11, 2001.
- *Review of PIXE Mercury Detection Research at the Louisiana Accelerator Center*, 2003 American Geophysical Union (AGU) Fall Meeting, San Francisco, California, December 8, 2003.

## **Oral Presentations:**

- ***Space Physics***

- *Overview and Potential New Uses for the Electrostatic Particle Accelerators at NASA/MSFC/ED31*, Space Environmental Effects Group, NASA Marshall Space Flight Center, Huntsville, AL, July 26, 2000.
- *The Physics of Solar Sails*, Space Environmental Effects Group, NASA Marshall Space Flight Center, Huntsville, AL, August 9, 2002.
- *Glowing Paint and Solar Sailing, A Summer of Physics*, Department of Chemistry and Physics, University of Southeastern Louisiana, Hammond, LA, October 25, 2002.
- *Would You Like to Ride in My Research Balloon: LaACES Student Balloon Project*. University of Louisiana at Lafayette, Department of Physics Seminar, September 1, 2004.

- ***Applied Physics and Materials Science:***

- *Soft X-Ray Testing of Silicon Carbide and Beryllium Optics*, Second Annual RADC Large Optics Conference, Griffiss AFB, NY, June 1990.
- *Use of Low Temperature Thermoset Polymers to Encapsulate High-Level Radioactive Waste Spills*, 6th Annual Alabama Materials Research Conference, Auburn, AL, October 6 and 7, 1992.
- *Potential of Radioactive Waste Fixation Using Polymers*, Annual Conference of the Academy of Certified Hazardous Materials Managers, Chattanooga, TN, October 26, 1994.
- *Formation and Organization of the New Louisiana Section of the Materials Research Society*, 5th Center for Advanced Microstructures and Devices (CAMD) Science and Technology Symposium and User's Meeting, Baton Rouge, LA, May 7, 1999.
- *Formation of the New Louisiana Section of the Materials Research Society*, 5th Center for Advanced Microstructures and Devices (CAMD) Science and Technology Symposium and User's Meeting, Baton Rouge, LA, April 7, 2000.
- *Measurement of Compton Scattered Electrons Using Monochromatic X-Rays*, 16th International Conference on the Application of Accelerators in Research and Industry, Denton, TX, November 4, 2000.

- **Fluorescence:**

- *Spectroscopic Analysis of Proton Induced Fluorescence and Deterioration of Rare Earth Doped Yttrium and Gadolinium Oxysulfides*, 5th Alabama Materials Research Conference, Birmingham, Alabama, September 25, 1991.
- *Spectroscopic Analysis of Proton Induced Fluorescence From Yttrium Aluminum Garnet*, 6th Annual Alabama Materials Research Conference, Auburn, AL, October 6, 1992.
- *Investigation of Proton Induced Fluorescence From Paints Containing Yttrium and Gadolinium Compounds:*
  - ◇ Materials Research Conference, University of Alabama in Huntsville, Huntsville, AL, September 26, 1997.
  - ◇ Alternating Gradient Synchrotron, Brookhaven National Laboratory, Upton, NY, October 14, 1997.
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- *Survey of Recent Research Results for New Fluor Materials*, Physics Department, University of Louisiana at Lafayette, Lafayette, LA, April 21, 1999.
- *Results from the Nuclear Microprobe PIXE Analysis of Selected Rare Earth Fluor Compounds*, 9th International Conference on Particle Induced X-Ray Emission and its Analytical Applications, University of Guelph, Guelph, Canada, June 11, 2001.
- *Results from the  $\mu$ PIXE Analysis of Selected Rare Earth Fluor Compounds*, 2nd Louisiana Conference on Microfabrication and Materials Science, Louisiana State University, Baton Rouge, LA, August 21, 2001.
- *Materials Analysis and Modification Using the LAC Nuclear Microprobe*, Idaho Accelerator Center, Idaho State University, Pocatello, ID, November 16, 2001.
- *Development of Inorganic Fluorescent Coatings for High Temperature Aerospace Applications*, 49th ISA International Instrumentation Symposium, Orlando, FL, May 6, 2003.
- *Use Of Phosphor Coatings For High Temperature Aerospace Applications*, 39th AIAA/ASME/SAE/ASEE Joint Propulsion Conference, Huntsville, AL, July 21, 2003.
- *Radiation Hardness of Candidate Phosphor Sensor Materials*, 50th ISA International Instrumentation Symposium, San Antonio, TX, May 11, 2004.
- *Review of Phosphor Research:*
  - ◇ DOE Special Technologies Laboratory, Santa Barbara, CA, August 2, 2004.
  - ◇ Miltech Corporation, Huntsville, AL, October 7, 2005.
- *Developing a Phosphor-Based Health Monitoring Sensor Suite*, Shock Technology and Applied Research (STAR) Facility, Sandia National Laboratories, Albuquerque, NM, February 14, 2005.
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- *Potential for Developing Smart Materials Using Triboluminescence:*
  - ◇ Department of Physics, Auburn University, Auburn, AL, January 20, 2006.
  - ◇ Department of Industrial Engineering, Florida State University, Tallahassee, FL, January 27, 2006.
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- *What Do Triboluminescence, Meteoroids, Lunar Regolith, and Hypervelocity Impacts Have in Common?*, Department of Physics, University of Louisiana at Lafayette, March 22, 2006.

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- ***Radiation Sources:***

- *Construction and Testing of a New Atomic Physics Beam Line at the Western Michigan University Accelerator Laboratory*, 101st Annual Fall Meeting of the Indiana Academy of Science, Indiana University, Bloomington, IN, November 15, 1985.
- *Development of the Fluorescent Materials Test Chamber*, 107th Annual Fall Meeting of the Indiana Academy of Science, Evansville, IN, November 8, 1991.
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- *Repairing a Column Leak in a 5SDH-2 Pelletron Accelerator*, 1999 Symposium of Northeastern Accelerator Personnel (SNEAP), Knoxville, TN, October 26, 1999.
- *The Trials and Tribulations of a Small Accelerator Physicist*, Department of Physics, Alabama A&M University, Normal, AL, January 11, 2000.
- *Use of Students to Operate and Repair a 5SDH-2 Pelletron Accelerator*, Spring Meeting, Physics Section, Louisiana Academy of Sciences, Centenary College, Shreveport LA, February 4, 2000.
- *Potential New Uses for the Electrostatic Particle Accelerators at NASA/MSFC/ED31*, Department of Physics, University of Louisiana at Lafayette, Lafayette, LA, September 20, 2000.
- *Improvements at the Louisiana Accelerator Center*, Symposium of Northeastern Accelerator Personnel (SNEAP), New Haven, CT, October 9, 2000.
- *New Developments at the Louisiana Accelerator Center*, National Electrostatics Corporation (NEC) User's Meeting, 16th International Conference on the Application of Accelerators in Research and Industry, Denton, TX, November 2, 2000.
- *Simulating the Space Environment Using Small Electrostatic Accelerators*, 16th International Conference on the Application of Accelerators in Research and Industry, Denton, TX, November 4, 2000.
- *Review of Recent Research Projects at the Louisiana Accelerator Center*, Spring Meeting, Physics Section, Louisiana Academy of Sciences, University of Louisiana at Monroe, Monroe LA, February 2, 2001.
- *Review of Recent Research Projects at the Louisiana Accelerator Center*, Department of Physics, University of Southern Mississippi, Hattiesburg, MS, March 30, 2001.
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- *Determination of Mercury Concentrations in Tree Ring Samples Using Ion Beam Methods*, Naval Research Laboratory, Washington, DC, December 4, 1998.
- *Low Level Mercury Detection and Remediation Research at the Louisiana Accelerator Center:*
  - ◇ Northwestern Louisiana State University, Natchitoches, LA, February 22, 1999.
  - ◇ Department of Chemical Engineering, University of Texas, Austin, TX, April 12, 1999.
  - ◇ Chemistry Department, University of Louisiana at Lafayette, Lafayette, LA, April 16, 1999.
- *Mercury and Me: Research into Detecting the Silvery White Toxic Metal*, Department of Physics, University of Louisiana at Lafayette, Lafayette, LA, February 12, 2003.
- *Measuring Mercury and Other Elemental Components in Tree Rings Using Particle Induced X-Ray Emission*, 2003 American Geophysical Union (AGU) Fall Meeting, San Francisco, CA, December 8, 2003.
- ***Radiation Principles:***
  - *Radiation Principles for Hazardous Materials Managers*, Certified Hazardous Materials Manager Review Course, Selected locations in the United States, 1994 to 1998.
- ***Internet:***
  - *Internet and the Environmental Professional:*
    - ◇ North Central Partnership for Environmental Technology Education, Kansas City, MO, April 12, 1996.
    - ◇ Water Environment Association and Air and Waste Association, Orange Beach, AL, April 15, 1996.
    - ◇ Southeast Partnership for Environmental Technology Education, Nashville, TN, June 27, 1996.
    - ◇ West/Northwest Partnership for Environmental Technology Education, Anaheim, CA, August 8, 1996.
  - *Accessing Environmental/Safety Information Using the Internet:*
    - ◇ Academy of Certified Hazardous Materials Managers (ACHMM), New Orleans, LA, August 19, 1996;
    - ◇ Memphis Chapter, ACHMM, Memphis, TN, November 12, 1996.
    - ◇ Heartland Chapter, ACHMM, Kansas City, MO, March 18, 1997.
    - ◇ Birmingham Southern, Birmingham, AL, January 25, 1997.
    - ◇ Muscle Shoals, AL, February 27, 1997.
    - ◇ Florence, AL, May 16, 1997.
    - ◇ Alabama Water Environment Association and Air and Waste Association, Orange Beach, AL, April 22, 1997.

## **Awards and Honors:**

- Undergraduate Student Research Participation Program, Argonne National Laboratory, Fall 1980.
- McKee Graduate Research Fellowship, Western Michigan University, 1982.
- Outstanding Graduate Student Teaching and Research Awards, Western Michigan University, 1982 and 1983.
- Sigma Pi Sigma, Physics Honor Society, Purdue University, May 1986.
- Outstanding Scientist Award, Science and Engineering Group, Nichols Research Corporation, 1990.
- Reappointed to graduate faculty at the University of Louisiana at Lafayette, 2004.
- Awarded tenure at the University of Louisiana at Lafayette, August 2005.

## Professional References:

1. Dr. Lawrence R. Holland  
Professor Emeritus  
Department of Physics  
Alabama A&M University  
Normal, Alabama 35762  
(256) 851-5866  
lholland@cim.aamu.edu
2. Dr. Daryush Ila  
Vice President  
Alabama A&M University Research Institute  
P.O. Box 741  
Normal, Alabama 35762-0741  
(256) 851-5866  
ila@cim.aamu.edu
3. Dr. David D. Chesak, PE  
Professor Emeritus  
Department of Mathematics and Physics  
St. Joseph's College  
Rensselaer, Indiana 47978  
(219) 866-8591  
davec@saintjoe.edu
4. Dr. John R. Meriwether  
Chair and Professor  
Department of Physics  
University of Louisiana at Lafayette  
Lafayette, Louisiana 70504  
(337) 482-6593  
meriwether@louisiana.edu
5. Dr. Jonathan H. Fisher  
Senior Scientist  
GH Systems, Incorporated, 655 Discovery Dr., Suite 302  
Huntsville, Alabama 35806  
jonathan.fisher@gh-systems.us  
(256) 428-0050 (x805)
6. Dr. David L. Edwards  
Lead, Natural Environments Branch  
NASA Marshall Space Flight Center  
Huntsville, Alabama 35812  
(256) 544-4081  
David.L.Edwards@nasa.gov
7. Dr. Steven W. Allison  
Oak Ridge National Laboratory  
P.O. Box 2008, MS-6054  
Oak Ridge, Tennessee 37831-6054  
(865) 576-2725  
allisonsw@ornl.gov
8. Dr. Shawn M. Goedeke  
Oak Ridge National Laboratory  
P.O. Box 2008, MS-6054  
Oak Ridge, Tennessee 37831-6054  
(865) 576-6930  
goedekesm@ornl.gov

## U.S. Citizen.

**Copies of presentations and publications available upon request.**