Benjamin A. Griffin, Ph.D.

3708 NW 54th Lane
Gainesville, FL 32653

ufgriffo@gmail.com

Cell—(352) 281-9280
Work—(352) 846-3029

EDUCATION

Ph.D. Mechanical Engineering, May 2009

- University of Florida, Gainesville, Florida
- Dissertation: *Development of an Ultrasonic Piezoelectric MEMS-Based Radiator for Nonlinear Acoustic Applications* (Co-advisors: Mark Sheplak and Louis N. Cattafesta)
- GPA: 4.0

M.S. Aerospace Engineering, May 2006

- University of Florida, Gainesville, Florida
- GPA: 4.0

B.S. Aerospace Engineering, May 2003

- University of Florida, Gainesville, Florida
- Thesis: *Three-Component Wind-Tunnel Balance* (Advisor: Louis N. Cattafesta)
- GPA: 4.0

APPOINTMENTS

Senior Engineer: Interdisciplinary Consulting Corporation, Gainesville, FL
January 2009-present

- Authored several small business proposals (SBIR/STTR)
- Managed a Phase I SBIR award from NASA entitled "MEMS Skin Friction Sensor" (Total Award Amount: $99,981)
- Managed a Phase I SBIR award from NASA entitled " Micromachined Sensors for Hypersonic Flows" (Total Award Amount: $99,770)
- Managed a Phase II STTR with the Air Force Office of Scientific Research entitled "High Temperature MEMS Sensors for High-Frequency Shear Stress and Pressure Measurements" (Total Award Amount: $749,808)
    - Responsibilities: high temperature capable sapphire optical pressure sensor and shear stress sensor development, fabrication, and characterization
- Consulted with industry partners Analog Devices, Inc. and Honeywell International, Inc.

Postdoctoral Associate / Visiting Research Scientist: Interdisciplinary Microsystems Group, University of Florida
May 2009-present

- Contributed to NSF Sensors and Sensing Systems, Defense University Research Instrumentation Program, and Florida Center for Advanced Aero-Propulsion Center of Excellence proposals
- Provided expertise and technical oversight of graduate students on acoustic and fluidic micro-scale sensor and actuator projects:
    - Piezoresistive aeroacoustic microphones sponsored by Boeing
    - Piezoelectric aeroacoustic microphones sponsored by Boeing
    - Optical shear stress sensors sponsored by the Office of Naval Research

- Provided assistance with acoustic characterization using high frequency ionophone source
- Supervised a team of graduate research assistants on the development of an adaptable packaging scheme for IMG microphones

National Science Foundation Fellow / Graduate Research Assistant: Interdisciplinary Microsystems Group, University of Florida
August 2003-May 2009

- Dissertation: Research focused on the design of a MEMS piezoelectric, ultrasonic actuator involving model development, design optimization, device fabrication with an industry partner, device packaging, and experimental characterization
- Other research involvement:
    - Formalized an extensive set of documents on circular composite plate mechanics (multiple conference papers/publications)
    - Established a new test facility for a thermoacoustic breast cancer imaging project by defining key parameters and metrics for characterization
    - Developed expertise in laser vibrometry and acoustic characterization
    - Modeled and optimized an ultrasonic proximity sensor for an industry partner
    - Developed acoustic impulse testing method
    - Mentored an undergraduate research assistant in the design and fabrication of a vacuum chamber for MEMS characterization
- Other responsibilities:
    - Computer administration for the Interdisciplinary Microsystems Group
    - Acted as liaison for National Science Foundation Graduate Fellow applicants (4 winners, 3 honorable mentions)
    - Presented "Brown Bag" lunch seminars on nonlinear acoustics and referencing software

Langley Aerospace Research Summer Scholars: NASA Langley Research Center, VA
Summer 2002

- Performed experiments on cavity flow control in the Probe Calibration Tunnel by comparing the efficiency of a deflectometer versus a pressure sensor for close-looped control to simultaneously suppress a pair of Rossiter modes resulting from flow-inducer cavity oscillations. Responsibilities included set-up of schlieren flow visualization for deflectometry measurement, data acquisition and analysis programming in LabVIEW and Matlab, and submission of resulting internal technical paper (Mentor: Mike A. Kegerise, Ph.D.)

Undergraduate Research Assistant: Interdisciplinary Microsystems Group, University of Florida
Summer 2001-Spring 2003

- Designed, developed, and fabricated a multi-component strain-gauge wind tunnel balance integral to a Ph.D. dissertation entitled *Adaptive Control of Separated Flow* by Dr. Ye Tian and to continuing research

RESEARCH FUNDING EXPERIENCE

- *Principal investigator* on a Phase I Small Business Innovation Research (SBIR) award from NASA entitled "MEMS Skin Friction Sensor" (Award #NNX11CG91P)
- *Principal investigator* on a Phase I Small Business Innovation Research (SBIR) award from NASA entitled " Micromachined Sensors for Hypersonic Flows" (Award #NNX11CG90P)

- Contributed to successful funding procurement for aeroacoustic microphone research from industry partners Boeing (Total Award Amount $700,000) and Avago Technologies (Total Award Amount $100,000)
- Authored a white paper entitled "High Temperature, Optical Sapphire Pressure Sensors for Hypersonic Vehicles" as part of a successful funding procurement by the Florida Center for Advanced Aero-Propulsion from the Federal Aviation Administration

TEACHING EXPERIENCE

Stand-in Lecturer: University of Florida ……..2005-Present

- Taught multiple lectures in undergraduate and graduate courses
    - Undergraduate
        - Fluid mechanics
        - Aerodynamics
    - Graduate
        - MEMS
        - Incompressible Flow
        - Aeroacoustics

Teaching Assistant: University of Florida……Fall 2004-Spring 2005

- Taught recitation sections, contributed to a set of lecture notes in electronic format for Tablet PC presentation, contributed to course assignments and exams, and graded assignments for the graduate level Incompressible Flow and Viscous Flow courses

LEADERSHIP

Chairman, Graduate Student Council, Mechanical and Aerospace Engineering Department
August 2007-May 2009

- Managed the design and deployment of new departmental website, supported department administration, organized department functions, etc.

Interdisciplinary Microsystems Group Leadership Committee
August 2007-May 2009

- Peer elected student council leader

Graduate Recruiting Assistant:
March 2005- March 2008

- Graduate Student Speaker, Mechanical and Aerospace Engineering Dept……..March 2007 & 2008
- Graduate Student Speaker, College of Engineering……...March 2006

HONORS

- National Science Foundation Graduate Fellowship …….....Awarded Spring 2003
- University of Florida Named Presidential Fellowship…….....Awarded Spring 2003
- University of Florida Student Commencement Speaker …….....Spring 2003
- Engineering Dean's Scholarship …….....Spring 2002

JOURNAL PUBLICATIONS

Homeijer, B., **Griffin, B. A.**, Williams, M. D., Sankar, B. V., and Sheplak, M., "Composite Circular Plates with Residual Tensile Stress Undergoing Large Deflections," *Journal of Applied Mechanics*, 2011, (In Press).

Griffin, B. A., Chandrasekaran, V., Williams, M. D., Sankar, B. V., and Sheplak, M., "Model for thermoelastic actuation of an axisymmetric isotropic circular plate via an internal harmonic heat source," *International Journal of Solids and Structures*, vol. 48, no. 10, pp. 1466-1473, 2011.

Griffin, B. A., Williams, M. D., Coffman, C. S., and Sheplak, M., "Aluminum Nitride Ultrasonic Air-Coupled Actuator," *Journal of Microelectromechanical Systems*, vol. 20, no. 2, pp. 476-486, 2011.

Griffin, B. A., Chandrasekaran, V., and Sheplak, M., "Thermoelastically Actuated Acoustic ProximitySensor with Integrated Through-Silicon Vias," *Journal of Microelectromechanical Systems*, (submitted).

Williams, M.D., Wang, G., **Griffin, B. A.**, Sankar, B.V., Cattafesta, L.N., Sheplak, M. "The electromechanical behavior of piezoelectric composite plates possessing in-plane stresses," (under final review before submission to *Journal of Micromechanics and Microengineering*)

CONFERENCE PAPERS

Rueff, M., Schmitz, T., **Griffin, B. A.**, Mills, D., and Sheplak, M., "Evaluation of Optical Fiber Positioning using Silicon V-Grooves," *39th North American Manufacturing Research Conference*, Corvallis, OR, June 13-17, 2011.

Griffin, B. A., Mills, D. A., Schmitz, T., and Sheplak, M., "A Sapphire Based Fiber Optic Dynamic Pressure Sensor for Harsh Environments: Fabrication and Characterization," *49th AIAA Aerospace Sciences Meeting*, Orlando, FL, January 4-7, 2011 (AIAA-2011-1098).

Griffin, B. A., Mills, D. A., Schmitz, T., and Sheplak, M., "Sapphire Sensors for High Temperature Applications," *Florida Center for Advanced Aero-Propulsion Annual Technical Symposium*, Tallahassee, FL, August 9-10, 2010.

Williams, M. D., **Griffin, B. A.**, Ecker, A., Meloy, J., and Sheplak, M., "An Aluminum Nitride Piezoelectric Microphone for Aeroacoustics Applications," *Hilton Head Workshop 2010: A Solid-State Sensors, Actuators and Microsystems Workshop*, June 6-10. (42% acceptance rate)

Griffin, B. A., Homeijer, B., Williams, M., Sankar, B.V., and Sheplak, M., "Large Deflections of Clamped Composite Circular Plates with Initial In-Plane Tension," *IMAC XXVI A Conference and Exposition on Structural Dynamics*, Orlando, FL, February 4-7 2008.

Williams, M.D., **Griffin, B. A.**, Homeijer, B., Sankar, B.V., and Sheplak, M., "Vibration of Post-Buckled Homogeneous Circular Plates," *Ultrasonics Symposium, 2007*, IEEE, October 28-31, 2007.

Williams, M.D., **Griffin, B. A.**, Homeijer, B., Sankar, B.V., and Sheplak, M., "The Nonlinear Behavior of a Post-Buckled Circular Plate," *Sensors, 2007*, 6th IEEE Conference on, October 28-13, 2007.

CONFERENCE ABSTRACTS

Griffin, B. A., Mills, D. A., Schmitz, T., and Sheplak, M., "Fabrication and characterization of a sapphire based fiber optic microphone for harsh environments," *presentation at the 2nd Pan American/Iberian Meeting on Acoustics,* Cancun, Mexico, November 15-19, 2010.

Alexander, D., Barnard, C., **Griffin, B. A.**, and Sheplak, M., "Characterization of a high frequency pressure-field calibration method," *presentation at the 159th Meeting of the Acoustical Society of America and NOISE-CON*, Baltimore, Maryland, April 19-23, 2010.

Griffin, B. A., Williams, M. D., and Sheplak, M., "A piezoelectric microelectromechanical systems ultrasonic radiator," *presentation at the 158th Meeting of the ASA*, San Antonio, TX, October 26-30, 2009.

Griffin, B. A., Sheplak, M., and Schmitz, T., "High Temperature Direct Shear Stress and Pressure Sensors," *presentation at the NEMS/MEMS Workshop at Redstone Arsenal*, Huntsville, AL, September 9, 2009.

Homeijer, B., **Griffin, B. A.**, Nishida, T., Cattafesta, L., and Sheplak, M., "Design and Optimization of a MEMS Piezoresistive Microphone for use in Aeroacoustic Measurements," *presentation at the 4th Joint Meeting of the ASA and ASJ*, Honolulu, HI, November 28-December 2, 2006.

Griffin, B. A., Homeijer, B., Chandrasekaran, V., Sankar, B.V., and Sheplak, M., "A Nonlinear Model for the Large Deflections and Buckling of Circular Composite Diaphragms," *presentation at the 2005 ASME International Mechanical Engineering Congress & Exposition*, Orlando, FL, November 5-11, 2005.

BOOK

Sheplak, M., **Griffin, B. A.**, and Williams, M. D., *Microelectroacoustics: Sensing and Actuation*, 1st ed. New York; London: Springer, pp. ~500 (expected 2012).

PROFESSIONAL MEMBERSHIPS

- The Acoustical Society of America……..Fall 2009-present
- Institute of Electrical and Electronics Engineers ……Summer 2007-present
- American Society of Mechanical Engineers ……..……..Fall 2005-Fall 2008
- American Institute of Aeronautics and Astronautics……..Fall 2000-present
- Tau Beta Pi…….Spring 2004-present
- Phi Kappa Phi Honor Society ……Spring 2003-present
- Golden Key National Honor Society …….Spring 2001-present

PROFESSIONAL WORKSHOPS/SHORT COURSES

- COMSOL Multiphysics Introductory Workshop, Gainesville, FL ……Fall 2010
- Faculty Workshop on Distressed or Disruptive Students, University of Florida…….Spring 2010
- SBIR/STTR Advanced Topics Proposal Preparation Workshop, Greenwood Consulting ...Fall 2009
- Florida Institute for Development of Engineering Faculty ..…….……..……Fall 2007
- Nonlinear Acoustics and Harmonic Imaging, IEEE International Ultrasonics Symp. ……..Fall 2007
- Photoacoustic Imaging and Sensing, IEEE International Ultrasonics Symposium……Fall 2007
- Micro and Nano Scale Ultrasonic Sensors and Actuators, IEEE Int. Ultrasonics Symp.…...Fall 2007
- Physical Acoustics Summer School, Acoustical Society of America……Summer 2006

COMPUTER SKILLS

- Matlab
- LabVIEW
- Mathcad
- Fortran
- Autocad and Autodesk Mechanical Desktop

REFERENCES

Mark Sheplak
Professor
Department of Mechanical and Aerospace Eng.
P.O. Box 116250
University of Florida
Gainesville, FL 32611-6250
(352) 392-3983
E-mail: sheplak@ufl.edu

Tony L. Schmitz
Associate Professor
Department of Mechanical and Aerospace Eng.
P.O. Box 116250
University of Florida
Gainesville, FL 32611-6250
(352) 392-1071
E-mail: tschmitz@ufl.edu

Louis N. Cattafesta, III
Professor
Department of Mechanical and Aerospace Eng.
P.O. Box 116250
University of Florida
Gainesville, FL 32611-6250
(352) 846-3017
E-mail: cattafes@ufl.edu

Bhavani V. Sankar
Ebaugh Professor
Department of Mechanical and Aerospace Eng.
P.O. Box 116250
University of Florida
Gainesville, FL 32611-6250
(352) 392-6749
E-mail: sankar@ufl.edu

David Arnold
Assistant Professor
Department of Electrical and Computer Eng.
P.O. Box 116200
University of Florida
Gainesville, FL 32611-6200
(352) 392-4931
E-mail: darnold@ufl.edu

James R. Underbrink
Boeing Technical Fellow
Data Systems and Processing Technology
Boeing Aero/Noise/Propulsion/Structural
Dynamics Laboratory
Mail Code: 1W-03
Seattle, Washington 98124
(206) 662-2880
E-mail: james.r.underbrink@boeing.com