GEORGE A. LESIEUTRE

Technical Expertise Structural dynamics of aerospace systems. Passive vibration damping, active structures, piezo actuation, energy harvesting, composite mat'ls.

Education Ph.D., Aerospace Engineering, UCLA, 1989. M.S. 1986.
B.S., Aeronautics and Astronautics, MIT, 1981.

Honors and Professional Activities
2015 General Chair, AIAA SciTech Conference (3400 attendees)
2014 SDM Lecturer, AIAA (Structures, Structural Dynamics, Materials)
2013 Board of Award, Daniel Guggenheim Medal (AIAA, AHS, ASME)
2012 Adaptive Structures Keynote, AIAA SDM Conference
2011 Materials Panel, NASA Technology Roadmap study, NRC
2010 Director at-Large, AIAA Board of Directors
2009 Fellow, American Institute of Aeronautics and Astronautics (AIAA)
2009 UCEA Mid-Atlantic Program & Activities Award (Wind Energy)
2008 ASME Best Paper (Adaptive Structures)
2008 AIAA Sustained Service Award
2007 Hirschorn IAC Best Paper Prize (Institute of Noise Control Engineering)
2006 CIC (Big 10) Department Executive Officers Program Fellow
2001 AIAA Zarem Educator Award
2000 ASME Best Paper (AIAA Structures, Structural Dynamics and Materials Conference)
2000 Penn State Engineering Society (PSES) Outstanding Research Award
1999 American Society of Mechanical Engineers (ASME) Best Paper (Adaptive Structures)
1995 American Helicopter Society (AHS) Best Paper (AHS Forum, Dynamics)
Deputy Director, Structures: AIAA Technical Activities Committee (TAC), 2004-2009
AIAA Structural Dynamics TC, 1990-1996; Adaptive Structures TC, 1997-; Chair, 2000-2002
National Merit Scholarship, 1977 • General Motors Scholarship, 1979-1981 • Tau Beta Pi, 1981

Experience The Pennsylvania State University, Department of Aerospace Engineering, 1989-present
SPARTA, Inc., Aerospace Technology, La Jolla and Laguna Hills, CA, 1983-1989
Rockwell International (now Boeing), Satellite Systems Division, Seal Beach, CA, 1981-1983
General Motors, Allison Gas Turbines Division, Indianapolis, IN, summers 1979-1980
Argonne Nat'l Laboratory, Energy and Environmental Systems, Argonne, IL, summers 1977-8
LaSalle: Expedition II, Montreal to New Orleans, 1976-1977

Penn State: Professor and Head, Aerospace Engineering, Director of the Center for Acoustics and Vibration. Teach and research in aerospace structural dynamics. Oversee undergraduate and graduate instructional and research programs in aerospace engineering. Develop personnel and facilities. Develop strategic direction for the department and pursue support to make it happen.

SPARTA: Director of Space Structures. Developed, managed, and performed research programs involving composite materials and structures for space applications.

Rockwell International: Stress and Dynamics Engineer. Analysis and testing of space structures, including truss sizing, composite stress analysis, fracture, damping, and structural control.

General Motors: GM Scholar. Supported gas turbine engine project groups. Single-stage gasifier for T63/250. Foreign object ingestion of 501/D22F. Reduced emissions combustor.

Argonne National Laboratory: Student Intern. Modeled and optimized engineering and economic performance of solar heating energy storage systems.

LaSalle: Expedition II: Voyageur. Paddled birchbark canoe from Montreal to the Gulf of Mexico during 8-month reenactment of LaSalle's voyage, part of U.S. Bicentennial celebration.

Personal 57 years old, married 34 years, 2 sons. Advisor for two Philmont treks. Runner, sub-20 5K, 3:10 marathoner (Boston '06-'14), 4th place (masters) USATF 50 Mile Championship ('09); bicyclist, 2 double centuries. Guitarist, singer. Instrument-rated private pilot. U.S. Citizen. SECRET clearance.

GEORGE A. LESIEUTRE

Highlights of Academic CV

Honors

1 AIAA educator award, 1 AIAA service award, 5 society or conference best paper awards, 1 Penn State research award, 2 admin awards. Fellow, AIAA. Board of Directors, AIAA. AIAA SDM Lecturer; Adaptive Structures Keynote. General Chair, AIAA SciTech 2015.

Service and Leadership Positions in Penn State Aerospace Engineering Department

Department Head since 2004. Director of Graduate Studies. Executive Committee.
Committee Chair. Strategic Planning, Faculty Search, Promotion and Tenure, Laboratory Facilities and Safety (Space); Newsletter Editor.
Member. Undergraduate Curriculum Committee, Ad Hoc Committee on Structures and Dynamics Curriculum, Ad Hoc Committee on Ph.D. English Proficiency.

Service and Leadership Positions in Penn State College of Engineering

Director, Center for Acoustics and Vibration. Leader, Adaptive Structures interest group.
Chair, Strategy Working Group, Resilient Infrastructure Systems.
Chair, Task Force on Research Centers. Chair, Task Force on the graduate program in Acoustics.
Engineering Faculty Council. Secretary, Newsletter Editor, Graduate Studies Committee.

Penn State University Service

Applied Research Laboratory Advisory Board. Evan Pugh Professor selection committee.
Graduate Council. Research, Student Affairs Committees. Liaison to Engineering Faculty Council.
University Faculty Senate. Computer Systems Committee, Outreach Committee.
Member, Energy University Task Force, Renewables committee.

Service and Leadership in Professional Societies and Government

AIAA General Chair, AIAA Science and Technology Forum and Exposition (SciTech), 2015.
Board of Directors. (American Institute of Aeronautics & Astronautics), 2010-2013.
Adaptive Structures TC (Chair). General & Technical Chair, Adaptive Structures Forum.
Lifetime Fellow, AIAA. Life Member, Tau Beta Pi. Member, ASEE, AWEA, AHS, ASC.
Materials Panel of the NASA Technology Roadmap study, National Research Council, 2011.
Board of Award, Daniel Guggenheim Medal (AIAA, AHS, ASME, SAE), 2013-.

Refereed Journal Articles

More than 70 refereed journal articles, most co-authored with students, some with colleagues.
SCI h-factor 19, more than 2100 citations. Google Scholar h-index 29, almost 5000 citations.

Proceedings Papers / Conference Presentations. More than 230.
Patents. 3 patents, all involving piezoelectric devices.

Grants and Contracts

More than 85, some with collaborators.

Courses Taught

Topics in structures, dynamics, and controls; 10 distinct undergraduate and 4 graduate courses.

Theses Supervised or co-Supervised

23 Ph.D. (20 complete), 48 M.S. (47), 10 B.S. Honors. More than 75 additional committees.

Honors

2015 Forum General Chair, AIAA Science and Technology Forum and Exposition (SciTech)
2014 SDM Lecture, AIAA Science and Technology Forum and Exposition (SciTech)
2012 Adaptive Structures Keynote, AIAA Structures, Structural Dynamics & Materials conference
2010 Board of Directors, American Institute of Aeronautics & Astronautics (AIAA) aiaa.org
2009 AIAA Fellow
2009 UCEA Mid-Atlantic Program & Activities Award (Wind Energy Symposium, 2008)
2008 ASME Best Paper (Adaptive Structures), (with M. Frecker and co-advisee V. Mehta)
2008 AIAA Sustained Service Award
2007 Hirschorn IAC Best Paper Prize, Institute of Noise Control Engineering. (w/ advisee M. Yang and co-advisors S.A. Hambric and G.H. Koopmann)
2006 CIC (Big 10) Department Executive Officers Program Fellow
2001 AIAA Zarem Educator Award
2000 ASME Best Paper (AIAA Structures, Structural Dynamics and Materials Conference) (w/ D.J. Inman and co-advisee R. Rusovici)
2000 Penn State Engineering Society (PSES) Outstanding Research Award
1999 ASME Best Paper (Adaptive Structures) (w/ advisee C.L. Davis)
1995 American Helicopter Society (AHS) Best Paper (AHS Forum, Dynamics) (w/ E.C. Smith)
Several students won independent awards. (Brackbill, Hébert, Culler, Bernard, Loverich, Marr, Wissa)

Aerospace Engineering Department Service

Department Head, 2004-present. aero.psu.edu

Led major revision of aerospace engineering curriculum.
Increased emphasis on systems, software, hands-on projects, and active learning. Established (EE-led) certificate in space systems eng. (for non-aerospace students).
Led department through a successful ABET review.
Renewed emphasis on quality teaching and advising. Use faculty mentoring and training to provide constructive peer reviews of teaching. Hired M.S. instructional designer.
Led numerous successful faculty, staff and student award nominations.
Worked with university to streamline procedures for export control (ITAR) and industry sponsorship (IP, publications issues).
Led *campus* wind energy working group, resulting in new funding, new faculty, and new programs and courses (wind energy certificate; wind energy option in online MS).
Successfully advocated for a co-funded Rock Ethics position on "the ethics of drones."
Invested in low-turbulence wind-tunnel, cluster computing, and rotor facilities, as well as undergraduate laboratories.
Implemented a "6-S" laboratory organization and safety program.
Developed student ambassador program to lead tours of department for visitors.
Established the "McCormick Fund," "McLaughlin Fund," "Wolk Thesis Award" and other funds with alumni support. Attracted significant additional deferred gifts.
Helped secure two 5-year renewals of Rotorcraft Center of Excellence research program.
Facilitated increase of annual department research funding to $7M from under $3M.
Led administrative alignment of the Graduate Program in Acoustics with Aerospace Eng.
Increased aerospace engineering faculty size from 14 to 18, and acoustics from 3 to 5.

Director of Graduate Studies, 1999-2004.
Executive Committee, 1998-present.
Strategic Planning Committee, 1989-90; 1992; 1995-; Chair, 1995-1997.
Faculty Search Committee, 1994-1995; 1998-1999; Chair, 1994-5.
Associate Professor Promotion and Tenure Committee, 1997-8, Chair.
Promotion and Tenure Committee, 2001-, Chair, 2003.
Laboratory Facilities and Safety (Space) Committee, 1989-1996; 1998-9; Chair, 1998-9.
Undergraduate Curriculum Committee, 1990-1997.
Newsletter. Editor. 1990-1996.
Ad Hoc Committee on Structures and Dynamics Curriculum, 1989-2004.
Ad Hoc Committee on Ph.D. English Proficiency, 1993-1994.
Aerospace Graduate Students Association, Advisor, 1996-2004.
Sigma Gamma Tau (Honor Society), Advisor, 1994-2001.

College of Engineering Service

Center for Acoustics and Vibration, 1990-. cav.psu.edu
Director, 2009-. Increased internal participation and number of industrial members (>20). Catalyzed partnerships in research, education, and economic development.
Associate Director, 1993-2009. Leader, Adaptive Structures technical group, 1992-.

Chair, Resilient Infrastructure Systems, CoE Strategy Working Group, 2014-15.

COE Strategic Planning Process Task Force, 2013.
Search Committee, Associate Dean for Administration, 2008.
COE Task Force on Systems Engineering, 2011-.
COE Task Force on New Graduate Programs, 2007-2008. Chair.
COE Task Force on the Graduate Program in Acoustics, 2006-7. Chair.
COE Task Force on Research Centers, 2005-2007. Chair.
Search Committee, Department Head, Civil Engineering, 2005-2006.
AD-14 Review Committee, Department Head, Industrial Engineering, 2005-2006.
AD-14 Review Committee, Associate Dean for Administration, 2002-2003.
Whitaker Award review committee, 2003-2005.
Nominating Committee, 2002-2004.
PSES Research Award Selection Committee, 2001-2003.

Engineering Faculty Council, 1992-1995.
Secretary, College of Engineering Faculty, 1992-1993. Newsletter Editor, 1993-1994.
Graduate Studies Committee, 1993-1995.
CQI Team on Graduate Student Recruiting. 1994-1995.
Structures Coordination Team, 1994-1995. Controls Coordination Team, 1995.
Composites Manufacturing Technology Center Space Committee, 1991-1993.

Penn State University Service

Member, PSU Energy University Task Force (Renewables) 2015.
Evan Pugh Professor selection committee, 2011-4.
Applied Research Laboratory, Advisory Board (ARLAB), 2010-. arl.psu.edu
NSF Engineering Research Center (ERC) proposal planning team, 2008-2010.
Panelist, Integrated Planning, Assessment and Improvement; PSU Leadership Academy, 2010.
Internal selection committee, NSF limited submissions (IGERT, SRN), 2009-.
Panelist, seminar for new department heads and associate deans, 2007.
Guest Lecturer, Higher Education 597A, Planning, Budgeting, & Strategic Management, 2006-.
Graduate Council, 2002-2004.
    Research Committee, 2002-2003.
    Graduate Student and Faculty Issues. 2003-2004.
    Liaison to Engineering Faculty Council. 2002-2004.
University Faculty Senate, Engineering Caucus, 1997-2001.
    Computer Systems Committee, 1997-1999.
    Outreach Committee, 1999-2001.
Leonhard Center Technical Writing Initiative, Guest Lecturer, English 202C, 1995-present.
Judge, Graduate Research Exhibition (3 yrs); Judge, Undergraduate Research Exhibition, 2003.
Participated in numerous high school and other outreach programs.

Professional Activities and Service

American Institute of Aeronautics and Astronautics (AIAA), 1979-. Fellow. Lifetime member.
American Society for Engineering Education (ASEE). Member, 2002-.
Tau Beta Pi, Lifetime Member, 1980-. Sigma Xi, Member, 1989-, not continuous.
American Wind Energy Association (AWEA), 2008-.
American Helicopter Society (AHS). Member, 1993-, not continuous.
American Society for Composites (ASC). Member, 1991-, not continuous.

AIAA General Chair, AIAA Science and Technology Forum and Exposition (SciTech), 2015.
    Membership Committee, 2012-. Liaison to TAC.
    Board of Directors, At-Large Director, 2010-2013.
        Committees: Membership, Compensation, Fellows Selection (2010).
    Deputy Director, Structures, AIAA Technical Activities Committee (TAC), 2004-2009.
    Liaison to AIAA Honors and Awards Committee (HAC), 2006-2010.
    Strategic Directions Committee, SDM Conference, 2002-2009.
    Adaptive Structures Technical Committee, 1997-present. Chair, 2000-2002. Vice-Chair, 1999; subcommittees: Conferences (Chair).
        General Chair, AIAA Adaptive Structures Forum, Atlanta, GA, April, 2000.
        Technical Chair, AIAA Adaptive Structures Forum, St. Louis, MO, April, 1999.

Organizer and Presenter, AIAA Adaptive Structures Short Course, 2000-1.

Organizing Committee (representing the Adaptive Structures Technical Committee), AIAA Adaptive Structures Forum, 1998-2000 (3 years).

Structural Dynamics Technical Committee, 1990-1995.

Organizing Committee (representing the Structural Dynamics Technical Committee), 36th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics and Materials Conference, New Orleans, April, 1995.

Orange County Section Guidance, Control & Dynamics TC, Steering Committee, 1983-1989; Programs Chair, 1984.

Judge, AIAA national student paper "Jefferson Goblet" competition, 1993.

Materials Panel of the NASA Technology Roadmap study, National Research Council, 2011-12.

Board of Award, Daniel Guggenheim Medal (AIAA, AHS, ASME, SAE), 2013-.

Aerospace Department Chairs Association (ADCA)
Led successful effort to redefine subfields for the NRC decadal survey of doctoral programs.
Led annual fall enrollment survey and transitioned it to National Institutes of Aerospace.
Led investigation of visa issues for international graduate students in aerospace engineering.

International Conference on Adaptive Structures Technologies (ICAST), Organizing Committee, 2001-. Host and General Chair, Penn State, 2010.

USNCTAM conference. Local Organizing Committee Member, Penn State, June, 2010.

NSF CMMI Workshop on Multifunctional Materials And Distributed Renewable Energy For Sustainable Infrastructure, Honolulu. Organizer, June 2009.

Pennsylvania Wind Energy Symposium 2008: Power for the Future, Organizer. State College, PA, November 17-18, 2008. (**2009 UCEA Mid-Atlantic Program & Activities Award**)

ESF-NSF Workshop on the Applications of Adaptive Structures and Materials to Sustainable Energy and the Built Environment, Morgon, France. Organizer, October 2008.

Engineering Foundation Conference on "Engineered Adaptive Structures." Organizing Committee, 1997, 1999, 2001, 2003, 2006, 2008. Co-Chair, 2001-2008.

SPIE Smart Structures Conference. Organizing Committee, 1997-.

ASC. Organizing Committee Member, 1992 ASC Conference, Penn State, October, 1992.

SES. Organizing Committee Member, 2002 SES Conference, Penn State, October, 2002.

Italian National Evaluation of Research Quality (VQR 2004-2010), peer reviewer, 2012-.

"Vertical Lift Research Center of Excellence program," invited presentation to Board on Army Science And Technology (BAST), Washington, DC, May 11-12, 2010.

Review Panel, ARPA-E Grid Storage and Non-Solar Renewable Energy, September 15, 2009.

AFOSR Future Flight Structures Workshop, Arlington, VA, Invited Participant, 15-16 October 2007.

Numerous proposal review panels for NSF and AFOSR, Arlington, VA.

Served as session chair at technical conferences more than 35 times.

Reviewed more than 165 papers for professional technical journals.

Invited Keynote Lectures and Seminars

"Damping: The Turbulence of Solid Mechanics?," Invited Plenary Keynote (SDM Lecture), AIAA Science and Technology Forum and Exposition (SciTech), January 16, 2014.
"Damping Models for Vibration Analysis," Invited Plenary Keynote, International Conference on Vibration and Vibroacoustics (ICVV2014), Harbin, China, January 13, 2014. (deferred)
"Adaptive Structures: The Journey to Flight," Invited Plenary Keynote (Adaptive Structures), 53rd AIAA Structures, Structural Dynamics and Materials conference, Honolulu, April 25, 2012.
"Piezoelectric Energy Harvesting for Vibration Control and Resource Conservation," Invited Plenary Keynote, at the International Workshop on Electro-Active Materials and Sustainable Growth, Abbaye Les Vaux de Cernay, France, May 24, 2005.

"Piezoelectric Devices for Helicopter and Turbomachinery Blade Response Reduction," ESF-NSF Smart Structural Systems Technologies Workshop (S3T-2010), University of Porto, Portugal, Sponsored Participant, 6-9 April 2010.
U.S.-Italy Aerospace Business Networking Forum, Puglia Region, Sponsored U.S. academic delegate, February 28 - March 6, 2010.
ESF-NSF Workshop on the Applications of Adaptive Structures and Materials to Sustainable Energy and the Built Environment, Château de Pizay, Morgon, France. Sponsored Participant, October 2008.
"Future Flight Structures Research for the Next Half-Century," Special Session, AIAA SDM Conference, Panel Member, April, 2008.
U.S.-Europe Workshop on Adaptive Aerospace Structures and Materials, Couvent Royal, Saint-Maximin, France, Sponsored Participant, 4-7 November 2007.

"Acoustic Metamaterials to Increase Damping of Sandwich Panels in Tension," UC Irvine, November 6, 2015.
"Adaptive Structures: The Journey to Flight," KAIST, Daejeon, South Korea, October 12, 2015.
"Damping: The Turbulence of Solid Mechanics?," RPI, Troy, NY, February 4, 2015.
"Damping: The Turbulence of Solid Mechanics?," NASA JPL, Pasadena, CA, April 9, 2014.
"Damping: The Turbulence of Solid Mechanics?," Boeing Distinguished Researcher and Scholar Seminar, Huntington Beach, CA, April 8, 2014.
"Damping: The Turbulence of Solid Mechanics?," MSC Software, Glendale, CA, April 7, 2014.
"Adaptive Structures: The Journey to Flight," NC State, December 5, 2013.
"Vibration Reduction for Turbomachinery Bladed Disks using Piezoelectric Materials and Resonance Frequency Detuning," Beihang University, Beijing, China, October 16, 2012.
"Damping Models for Shear Beams with Applications to Spacecraft Wiring Harnesses," Aerospace Engineering, Georgia Tech, September 20, 2012.
"Damping Models for Shear Beams with Applications to Spacecraft Wiring Harnesses," Aerospace Engineering, Texas A&M University, February 9, 2012.
"How Membrane Loads Influence the Modal Damping of Flexural Structures," Sandia National Laboratories, Albuquerque, NM, September 21, 2011.
"Vibration Reduction for Turbomachinery Bladed Disks under Changing Excitation using Piezoelectric Materials," Caltech, Guggenheim Aeronautical Laboratory, February 18, 2011.
"Damping: The Turbulence of Structural Mechanics?" University of Michigan, Aerospace Engineering, February 10, 2011.
"A Potpourri of Damping Models in Structural Dynamics," General Dynamics Electric Boat, Groton, CT, December 13, 2010.
"Vibration Reduction for Turbomachinery Bladed Disks under Changing Excitation using Piezoelectric Materials," University of Michigan, November 11, 2010.
"Actively-Enhanced, Periodically-Layered Mount for Helicopter Gearbox Isolation," PSU Great Valley, Systems Engineering, May 29, 2009.

"Piezoelectric Energy Harvesting," PSU Materials Science & Engineering, February 4, 2009.
"How Membrane Loads Influence the Modal Damping of Flexural Structures," TU Delft, The Netherlands, Aerospace Engineering, October 13, 2008.
"A Potpourri of Piezoelectric Devices for Vibration Control," NASA Glenn Research Center, Cleveland, OH, June 26, 2008.
"Piezoelectric Energy Harvesting," INSA-Lyon, EE, Lyon, France, November 8, 2007.
"Harvesting Energy from Vibration using Piezoelectric Devices," Duke University, Mechanical and Civil Engineering, April 4, 2007.
"Effects and Uses of Membrane Loads in Structural Dynamics – More than Frequency Shifts," Chalmers University of Technology, Göteborg, Sweden, February 8, 2007.
"Effects and Uses of Membrane Loads in Structural Dynamics – More than Frequency Shifts," University of Minnesota, Aerospace Engineering, November 17, 2006.
"Smart Materials Systems and Structures," ETH Zürich, Centre of Structure Technologies, Switzerland, November 9, 2006.
"Piezoelectric Structures and Vibration Control," University of Colorado, Boulder, Aerospace Engineering Sciences, February 16, 2006.
"Effects and Uses of Membrane Loads in Structural Dynamics – More Than Frequency Shifts," Cornell University, Mechanical and Aerospace Engineering, February 14, 2006.
"Actively-Enhanced, Periodically-Layered Mount For Helicopter Gearbox Isolation," University of Michigan, Aerospace Engineering, March 17, 2005.
"Recent Research in Aerospace Vibration Damping and Active Structures," Texas A&M University, Aerospace Engineering, May 20, 2004.
"Structural Damping as a Result of Piezoelectric Energy Harvesting," Inha University, Mechanical Engineering, Incheon, Korea, October 6, 2003.
"A Piezoelectrically Driven Rotary Motor," University of Florida, Mechanical and Aerospace Engineering, October 13, 2000.
"Can Device Electromechanical Coupling be Higher than Material Coupling?" University of California, Los Angeles, Mechanical and Aerospace Engineering, February 12, 1998.
"A Semi-Actively Tuned Solid-State Vibration Absorber," University of California, Los Angeles, Mechanical and Aerospace Engineering, September 22, 1997.
"A Semi-Actively Tuned Solid-State Vibration Absorber," Chalmers University of Technology, Applied Mechanics, Göteborg, Sweden, May, 1997.
"Actuator Research at the CAV," PSU Materials Science & Engineering, September 26, 1995.
"Damping of Composite Materials and Structures," PSU ESM, February 23, 1994.
"Passive Damping of Composites using Resistively-Shunted Piezoceramic Fibers," University of Southampton, Institute for Sound and Vibration Research, UK, March 11, 1993.
"Passive Damping of Composites using Resistively-Shunted Piezoceramic Fibers," Ecole Central de Lyon, France, March 8, 1993.
"ATF-Based Viscoelastic Plate Finite Elements," University of Naples, Aerospace Engineering, Italy, March 2, 1993.
"Finite Element Modeling of Frequency-Dependent Material Damping," The Pennsylvania State University, May 16, 1989.
"Finite Element Modeling of Frequency-Dependent Material Damping," University of Colorado, Aerospace Engineering Sciences, Boulder, May 10, 1989.
"Damping of Composites," San Diego State University, Mechanical & Aero Eng'g, May 3, 1989.
"Finite Element Modeling of Frequency-Dependent Material Damping," University of Illinois, Aerospace Engineering, April 19, 1989.
"Time-Domain, Finite Element Modeling of Material Damping using Augmenting Thermodynamic Fields," University of Wisconsin, Engineering Mechanics, April 17, 1989.
"Finite Element Modeling of Frequency-Dependent Material Damping," Ohio State University, Aerospace Engineering, March 29, 1989.

Refereed Journal Articles and Book Chapters

Kauffman, J.L., Lesieutre, G.A. and Babuska, V., "Damping Models for Shear Beams with Applications to Spacecraft Wiring Harnesses," *Journal of Spacecraft and Rockets*, Vol. 51, No.1, February, 2014, pp. 16-22. doi: 10.2514/1.A32440.

Lesieutre, G.A. and Kauffman, J.L., "A Viscous 'Geometric' Damping Model for Nearly Constant Beam Modal Damping," *AIAA Journal*, Vol. 51, No. 7, July, 2013, pp. 1688-1694. doi: 10.2514/1.J052174

Han, Dong, J. Wang, E.C. Smith, and G.A. Lesieutre, "Transient Loads Control of a Variable Speed Rotor During Lagwise Resonance Crossing," *AIAA Journal*, Vol. 51, No. 1 January 2013, pp. 20-29. doi: 10.2514/1.J050598

Mehta, V., M. Frecker, and G.A. Lesieutre, "Two-Step Design of Multicontact-Aided Cellular Compliant Mechanisms for Stress Relief," *Journal of Mechanical Design*, Vol. 134, No. 12, December 2012, pp. 121001-1 – 121001-12. doi: 10.1115/4007694

Cirone, S.A., G.R. Hayes, B.L. Babcox, M. Frecker, J.H. Adair, and G.A. Lesieutre, "Design of Contact-Aided Compliant Cellular Mechanisms with Curved Walls," *J. Intelligent Materials and Structural Systems*, November 2012, Vol. 23, No. 16, pp. 1773-1785.

Kauffman, J.L., and G.A. Lesieutre, "Piezoelectric-based Vibration Reduction of Turbomachinery Bladed Disks via Resonance Frequency Detuning," *AIAA Journal*, May 2012, Vol. 50, No. 5, pp. 1137-1144. doi: 10.2514/1.58331

Lesieutre, G.A., J. Browne, and M. Frecker, "Scaling of Performance, Weight and Actuation of a 2-D Compliant Cellular Frame Structure for a Morphing Wing," *Journal of Intelligent Materials Systems and Structures*, Vol. 33, No. 10, July 2011, pp. 979-986.

Lesieutre, G.A., "Frequency-Independent Modal Damping for Flexural Structures via a Viscous 'Geometric' Damping Model," *Journal of Guidance, Control, and Dynamics*, Vol. 33, No. 6, pp. 1931-1935, 2010.

Lesieutre, G.A., "Damping in Structural Dynamics," *Encyclopedia of Aerospace Engineering*, John Wiley & Sons, R. Blockley and W. Shyy, Editors, October, 2010.

Zhang, L., T. Simpson, M. Frecker, and G.A. Lesieutre, "Supporting Trade Space Exploration for Multi-dimensional Data with Interactive Multi-Scale Nested Clustering and Aggregation," *Journal of Engineering Design*, 23 June 2010. DOI: 10.1080/09544828.2010.487260.

Koo, K.N., and G.A. Lesieutre, "Vibration and Critical Speeds of Composite-Ring Disks for Data Storage," *Journal of Sound and Vibration*, Vol. 329, No. 7, 29 June 2010, pp. 833-847.

Lesieutre, G.A., "How Membrane Loads Influence the Modal Damping of Flexural Structures," *AIAA Journal*, Vol. 47, No. 7, July 2009, pp. 1642-1646.

Mehta, V., M. Frecker, and G.A. Lesieutre, "Stress Relief in Contact-Aided Compliant Cellular Mechanisms," *ASME Journal of Machine Design*, 18 August 2009, Vol. 131, No. 9, DOI: 10.1115/1.3165778. (**2008 Best Paper in Adaptive Structures, ASME**)

Bharti, S., M. Frecker, G.A. Lesieutre, "Optimal Design of a Morphing Wing Using Parallel Non-Dominated Sorting Genetic Algorithm II," *AIAA Journal*, Vol. 47, No. 7, July 2009, pp. 1627-1634

Kauffman, J.L., and G.A. Lesieutre," A Low-Order Model For The Design Of Piezoelectric Energy Harvesting Devices," *Journal of Intelligent Material Systems and Structures*, Vol. 20, March, 2009, pp. 495-504.

Ramrakhyani, D., M. Frecker, and G.A. Lesieutre, "Hinged Beam Elements for the Topology Design of Compliant Mechanisms Using the Ground Structure Approach," *ASME J. Structural & Multidisciplinary Optimization*, Vol. 37, No. 6, February, 2009, pp. 557-567.

Ramachandran, S., and G. Lesieutre, "Dynamics and Performance of a Vertical Impact Damper," *Journal of Vibration and Acoustics*, Vol. 130, No. 2, article number 021008, April, 2008.

Loverich, J.J., G.H. Koopmann, G.A. Lesieutre, "A New Piezoelectric Actuator using a Feed-Screw for Quasi-Static Motion Accumulation – Part II: Mathematical Modeling and Design Optimization," *Journal of Intelligent Materials Systems and Structures*, Vol. 19, No. 1, January 2008, pp. 83-91.

Loverich, J.J., G.H. Koopmann, G.A. Lesieutre, J.E. Frank, W. Chen, "A New Piezoelectric Actuator using a Feed-Screw for Quasi-Static Motion Accumulation – Part I: Experimental Development," *Journal of Intelligent Materials Systems and Structures*, Vol. 19, No. 1, January 2008, pp. 73-81.

Kinzel, M.P., M.D. Maughmer, G.A. Lesieutre, "Miniature Trailing-Edge Effectors for Rotorcraft Performance Enhancement," *Journal of the American Helicopter Society*, Vol. 52, No. 2, April, 2007, pp. 146-158.

Kang, H., Smith, E.C., and Lesieutre, G.A., "Experimental and Analytical Study of Blade Lag Damping Augmentation using Chordwise Absorbers," *Journal of Aircraft*, Vol. 43, No. 1, January 2006, pp. 194-200.

Ramrakhyani, D., G.A. Lesieutre, M. Frecker, and S. Bharti, "Aircraft Structural Morphing Using Tendon Actuated Compliant Cellular Trusses," *Journal of Aircraft*, Vol. 42, No. 6, Nov–Dec 2005, pp. 1615-1621.

Yang, M.Y., G.A. Lesieutre, S.A. Hambric, and G.H. Koopmann, "Development of a Design Curve For Particle Impact Dampers," *Noise Control Engineering Journal*, Vol. 53, No. 1, 2005, pp. 5-13. (**Hirschorn IAC Best Paper Prize, Institute of Noise Control Engineering**)

Ramrakhyani, D., G.A. Lesieutre, and E.C. Smith, "Modeling of Elastomeric Materials Using Nonlinear Fractional Derivative and Continuously Yielding Friction Elements," *International Journal of Solids and Structures*, Vol. 41, July, 2004, pp. 3929-3948.

Lesieutre, G.A., J. Loverich, G.H. Koopmann, and E.M. Mockensturm, "Increasing the Mechanical Work Output of an Active Material Using a Non-Linear Motion Transmission Mechanism," *J Intelligent Materials Systems and Structures*, Vol. 15, January 2004, pp. 49-58.

Rusovici R., J.J. Dosch, G.A. Lesieutre, "Design Of Single-Crystal Vibration Absorbers," *Journal of Intelligent Materials Systems and Structures*, Vol. 13, No. 11, 2002, pp. 705-712.

Lesieutre, G.A., Hofmann, H., and Ottman, G., "Damping as a Result of Piezoelectric Energy Harvesting," *Journal of Sound and Vibration*, Vol. 269, 2004, pp. 991-1001.

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More than 235 proceedings papers, conference or workshop presentations (if no paper). A complete list can be furnished. A few selected papers follow.

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Thurier, P.F., Lesieutre, G.A., Frecker, M.I., and Adair, J.H., "Design of Cellular Compliant Cell Mechanism for Thermal Control using Topology Optimization," AIAA SciTech 2015, Kissimmee, FL, January 5-9, 2015.

Lesieutre, G.A., "Creep Buckling of Viscoelastic Columns Modeled using Anelastic Displacement Fields," AIAA SciTech 2015, Kissimmee, FL, January 5-9, 2015.

Goldschmidt, M., Jonson, M. and Lesieutre, G.A., "Unsteady Force Measurement for a Beam Using Small Piezoelectric End Sensors," ASME 2014 International Mechanical Engineering Congress & Exposition, IMECE-2014-36590, Montreal, November 14-20, 2014.

Thurier, P.F., Lesieutre, G.A., Frecker, M.I., and Adair, J.H., "Two-material Topology Optimization of a Contact-aided Compliant Cell for Thermal Control," 25th Int'l Conference on Adaptive Structures and Technologies (ICAST), The Hague, The Netherlands, October 6-8, 2014.

Mahmood, R.S., Smith, E.C. and Lesieutre, G.A., "Visco-Electric Energy Harvesting for Rotorcraft Applications," 55th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, AIAA SciTech 2014, National Harbor, MD, January 13-17, 2014.

Adair, J.H., Frecker, M., Lesieutre, G.A., Babcox, B., and Stavely, R., "Design and Manufacture of Mesoscale Components and Devices," 12th International Conference on Ceramic Processing Science, Portland, Oregon, August 4-7, 2013.

Autran, P., Materkowski, D., and Lesieutre, G.L., "Multi-layered Radial Isolator for Helicopter Interior Noise Reduction," 54th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, Boston, April 8-11, 2013.

Stavely, R.L., Lesieutre, G.A., Frecker, M. and Adair, J.H., "Variable Thermal Conductivity, Contact-Aided Cellular Structures for Spacecraft Thermal Control," 23rd International Conference on Adaptive Structures and Technologies, Nanjing, China, October 11-13, 2012.

Hyland, J.E., Frecker, M., and Lesieutre, G.A., "Optimization of Honeycomb Contact-aided Compliant Cellular Mechanisms for Strain-Energy Absorption," ASME International Design Engineering Technical Conferences (IDETC), Chicago, August 12-15, 2012.

Babcox, B.L., M.J. Haider II, M.S. Bresnehan, D.S. Snyder, M.I. Frecker, G.A. Lesieutre and J.H. Adair, "Evaluation of Colloidal Properties of Submicron and Nanoscale Diamond for Structural Applications," Materials Science and Technology 2011, Columbus Ohio, 16-20 October 2011.

Kauffman, J.L., G.A. Lesieutre, "Optimal Switching for Piezoelectric-Based Resonance Frequency Detuning for Turbomachinery Blade Vibration Reduction," 22nd International Conference on Adaptive Structures and Technologies, Corfu, 10-12 October 2011.

Lesieutre, G.A., "A Viscous 'Geometric' Damping Model that Yields Frequency-Insensitive Modal Damping for Flexural Structures," 15th International Forum on Aeroelasticity and Structural Dynamics, Paris, 26-30 June 2011.

Kauffman, J.L., G.A. Lesieutre, "How Biaxial Membrane Loads Influence the Modal Damping of Flexural Structures," 16th US National Congress on Theoretical and Applied Mechanics, June 27 - July 2, 2010, University Park, PA. Paper USNCTAM2010-1396.

Thiel, M., G.A. Lesieutre, "New Actuation Methods for Miniature Trailing-Edge Effectors for Rotorcraft," AIAA-2009-2104, 50th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, Palm Springs, California, May 4-7, 2009.

Marr, C., G.A. Lesieutre, and E.C. Smith, "Nonlinear, Temperature Dependent, Fluidlastic Lead-Lag Damper Modeling," American Helicopter Society 64th Annual Forum, Montreal, May, 2008.

Kauffman, J.L., and G.A. Lesieutre, "A Nonlinear Model of a Bimorph-Based Piezoelectric Energy Harvesting Device," 18th International Conference on Adaptive Structures and Technologies (ICAST), Ottawa, Canada, October 3-5, 2007.

Szefi, J.T., E.C. Smith, G.A. Lesieutre, A. Badre-Alam, and D. McGuire, "Design Of Fluidic, High-Frequency Periodically Layered Isolators For Model 427 Gearbox Isolation," 62nd American Helicopter Society Annual Forum, May 2006, pp. 954-964.

Lesieutre, G.A., H. Hofmann, Y. Liu, G.H. Koopmann, J. Frank, "Piezoelectric Energy Harvesting For Wireless Sensor Networks," ICAST 2005, Paris, October 10-12, 2005.

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Kinzel, M., M.D. Maughmer, G.A. Lesieutre, and E. Duque, "Active Gurney Flap Aerodynamics," AIAA Aerospace Sciences Meeting, Reno, NV, January 10-13, 2005

Rusovici, R., and G.A. Lesieutre, "Design of a Single-Crystal Piezoceramic-Driven, Synthetic-Jet Actuator," SPIE 11th Annual International Symposium on Smart Structures and Materials, San Diego, CA, March 14-18, 2004.

Bernard, J. and Lesieutre, G.A., "Variable Frequency Flexural Piezoelectric Transducers For High Power Linear Chirp Transmission," 11th International Conference on Adaptive Structures Technology (ICAST), Nagoya, Japan, October 23-26, 2000.

Ruhl, L.E., E.C. Smith, G.A. Lesieutre, and C.R. Brackbill, "Temperature-Dependent Behavior of Elastomeric Damper Materials," 40th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics and Materials Conference, St. Louis, MO, April 12-15, 1999. .

Bernard, J.E. and G.A. Lesieutre, "Active Broadband Force Isolation Using a Flexible Piezoelectric Actuator," AIAA/ASME/AHS Adaptive Structures Forum, St. Louis, MO, April 12-15, 1999.

Lesieutre, G.A, L. Fang, and U. Lee, "Hierarchical Failure Simulation for Machinery Prognostics," 51st Meeting of the Machinery Failure Prevention Technology Society, Virginia Beach, VA, April 15-17, 1997.

Yarlagadda, S., G.A. Lesieutre, S. Yoshikawa, and J. Witham, "Resistively-Shunted Piezocomposites for Passive Vibration Damping," 37th AIAA/ASME Adaptive Structures Forum, Salt Lake City, UT, April 18-19, 1996, pp. 217-227.

Lesieutre, G.A., S.P. Pai, L. Fang, S. Yoshikawa, G. Koopmann, "Heat Generation of a Piezoceramic Induced-Strain Actuator Embedded in a Glass/Epoxy Panel," 1996 North American Conference on Smart Structures and Materials, San Diego, CA, February 25-29, 1996.

Grants and Contracts In Progress

"Piezoelectric Actuator Development for Synthetic Jet Actuators," Boeing, $274,2951/16-12/17, PI (with T. Shrout), 75%.

"Multifunctional Thermal Structures Using Cellular Contact-Aided Compliant Mechanisms," AFOSR, $1,054,686, 8/11-8/16, PI (with M. Frecker, J. Adair), 34%.

"Rotorcraft Elastomeric Component Research," Lord Corporation, $75,000 annually, 1/12-1/17, co-PI (with E.C. Smith), 50%.

Grants and Contracts Completed

"Placement of Circular Force Generators for Vibration Cancellation," Sikorsky Aircraft Company, $10,000, 11/14-6/15, PI.

"Dynamometer for Measurement of Unsteady Fluid Loading," PSU/ARL, $60,000 annually, 8/12-8/15, co-PI (with M. Jonson), 50%.

"Penn State Wind for Schools Program," NREL, $60,000, 8/10-7/14, co-PI (with S.W. Stewart), 20%.

"Wind Energy Workforce Development: Engineering, Science, & Technology: Meeting the Needs of the Future, Now," DOE, $400,000, 1/10-12/12, PI (with S.W. Stewart), 50%.

"Dynamic Test Stand for Fundamental Experiments in Rotor Energy Harvesting, Aeroelastic Stability, and Loads," Defense University Research Instrumentation Program, $55,000, 8/11-11/12, PI (with E.C. Smith), 50%.

"Damping Models for Shear-Deformable Beams with Applications to Spacecraft Wiring Harnesses," AFRL, $15,000, 12/11-5/12, PI, 100%.

"High-Strength High-Strain Structures Using Ceramic Cellular Contact-Aided Compliant Mechanisms (C3M)," NSF, $622,554, 5/09-8/12, co-PI (with M. Frecker, J. Adair), 33%. (plus $50,000 REU supplement)

"High Fidelity Helicopter Lag Damper Model for Comprehensive Rotor Analysis," Advanced Rotorcraft Technology, NAVAIR Phase I STTR, $24,000, 9/11-4/12, PI (with E.C. Smith), 50%.

"Rotorcraft Elastomeric Component Research," Lord Corporation, $50,000 annually, 1/07-1/12, co-PI (with E.C. Smith), 50%.

"Damping Formulations for Spacecraft Wiring Harnesses," Sandia National Laboratories, $23,000, 7/11-10/11, PI, 100%.

"Penn State Rotorcraft Center of Excellence," U.S. Army, Faculty Associate (3 tasks: adaptive mount, active Gurney flap, in-blade vibration absorber), $50,000 annually (plus $15,000 matching), 9/06-9/11, task PI, 100%.

"Reduction of High-Cycle Fatigue in Integrally Bladed Rotors through Piezoelectric Vibration Damping and Control," NASA Glenn Research Center (J. Kauffman NASA GSRP award), $30,000 annually, 8/08-8/11, PI, 100%.

"Workshop on Multifunctional Materials and Distributed Renewable Energy for Sustainable Infrastructure," NSF, $50,000, 4/09-1/11, PI, 100%.

"Joint ESF-NSF Workshop on the Applications of Adaptive Structures and Materials to Sustainable Energy and the Built Environment," NSF, $40,000 (plus $56,000 from ESF), 9/08-1/09, PI, 100%.

"Fatigue Testing for Composite Structural Durability Analysis," Rhombus Consultants Group (Phase II SBIR, U.S. Navy), $138,954, 7/06-5/08, co-PI (with C.E. Bakis), 20%.

"Actuation of an Active Gurney Flap for Rotorcraft Applications," NASA Ames (M. Thiel NASA GSRP award), $26,000 annually, 8/05-8/08, 100%.

"Low Cost Vibration Power Harvesting for Industrial Wireless Sensors," KCF Technologies (Phase II STTR, DOE), $347,965, 9/05-9/08, co-PI (with H. Hofmann), 50%.

"Compliant Frame: A New Paradigm To Enable Reconfigurable Aircraft Structures," AFOSR, $631,559, 1/05-11/07, co-PI (with M. Frecker), 50%.

"Lag Damping Research," Bell Helicopter Textron, $20,000 annually, 1/07-1/09, co-PI (with E.C. Smith), 50%.

"Matching Funds for Aerospace Engineering Cluster Computing," State of Pennsylvania, $131,000, 1/06-1/07, PI. (With K.S. Brentner), 50%.

"Penn State Rotorcraft Center of Excellence," NASA Ames, Faculty Associate (3 tasks: adaptive mount, active Gurney flap, in-blade vibration absorber), $50,000 annually per task (plus $15,000 matching), 1/01-1/07, 100%.

"Blade-Mounted Vibration Absorbers for Lag Damping," Lord Corporation, $20,000 annually, 1/01-1/06, co-PI (with E.C. Smith), 50%.

"Layered High-Frequency Gearbox Isolation Mounts," Invercon (Lord Corporation (RITA)), $60,000 annually, 1/04-12/05, co-PI (with E.C. Smith), 50%.

"Fatigue Testing for Composite Structural Durability Analysis," Rhombus Consultants Group (Phase I SBIR, U.S. Navy), $24,000, 4/05-9/05, co-PI (with C.E. Bakis), 50%.

"Low-Cost Autonomous Wireless Sensors With Integrated Vibration Power Harvesting," KCF Technologies (Phase I STTR, DOE), $33,132, 7/04-4/05, co-PI (with H. Hofmann), 50%.

"Tendon-Actuated Compliant Cellular Truss: Controlled Conformity in 3-D Shape-Changing Structures," NASA (DARPA Morphing Aircraft Structures), $508,958, 1/03-12/05, co-PI (with M. Frecker), 50%.

"Rotor Damping Technology," Bell Helicopter (RITA), $60,000, 1/04-12/04, co-PI (with E.C. Smith), 50%.

"Energy Harvesting from a Backpack," Office of Naval Research, 10/03 - 09/04, $5,500, Faculty Associate (with Q. Zhang and H. Hofmann), 100%.

"High Torque Single Crystal PMN-PT Driven Motor to Morph Naval Flow Control Surfaces," KCF Technologies (U.S. Navy, Phase I SBIR), $15,000, 6/02-12/02, co-PI (with G.H. Koopmann), 50%.

"Time-Domain Damper Modeling for Fluidlastic Lag Dampers," Bell Helicopter, $64,000, 12/02-3/03, co-PI (with E.C. Smith), 50%.

"Frequency Agile Vibration Absorber Utilizing Single-Crystal Piezoceramic," STI Technologies (DARPA Phase I SBIR), $10,000, 3/01-11/01, 100%.

"Mechanical Diode Resonant Rectifying Actuator (MEDIRRA)," Army Research Office (DARPA), $672,500 (plus $48,000 PSU match), 6/00-12/02, PI (with G.H. Koopmann), 50%.

"Acoustic Transduction," Office of Naval Research (MURI), 8/96-12/01, Faculty Associate $1,000,000 annually to PSU, (with K. Uchino et al.), $80,000 annually (with G.H. Koopmann), 50%.

"Piezomotor Electronics," Wilcoxin Research (DARPA Phase 1 SBIR), $15,000, 10/99-7/00, co-PI (with G.H. Koopmann), 50%.

"Smart Aircraft and Marine Propulsion Structures (SAMPSON)," Boeing St. Louis (DARPA), $1,132,000, 9/97-9/01, co-PI (with G.H. Koopmann), 50%.

"Innovative Design, Analysis and Experimental Validation of Energy Reclamation for Acoustic Signature Reduction," University of Florida (Office of Naval Research), $87,000, 5/99-3/01, co-PI (with H. Hofmann). 50%.

"Penn State Rotorcraft Center of Excellence," NASA Ames, $37,000 annually (plus $12,000 PSU matching), 1/96-12/00, Faculty Associate (with E.C. Smith, L.N. Long, PIs), 100%.

"ONR High School Summer Intern Program in Engineering and Technology," Office of Naval Research, $40,000 annually, 1/91-12/00, co-PI, (with D.L. Hall, R.J. Hansen, R. Stern, et al.), 50%.

"Health Monitoring and Virtual Containment for Composite Flywheel Energy Storage System," Applied Materials Technologies, Inc. (U.S. Air Force Phase II STTR program) $198,000, 1/98-6/01, co-PI (with C.E. Bakis), 50%.

"Characterization and Modeling of Layered Elastomeric Mounts," United Technologies Research Center, $90,000, 6/98–12/00, co-PI (with E.C. Smith), 50%.

"Blade-Mounted Vibration Absorbers for Lag Damping," Lord Corporation, $20,000, 6/99-6/00, co-PI (with E.C. Smith), 50%.

"Elastomeric Modeling Research," Lord Corporation, $20,000 annually, 1/98-12/00, co-PI (with E.C. Smith), 50%.

"Defense University Research Instrumentation Program (DURIP)," Army Research Office, $250,000 (plus $250,000 PSU matching), 1/98-12/99, co-PI (with E.C. Smith, et al), 20%.

"Piezoelectric Isolation for Precision Spacecraft Payloads," EMF Technologies, (Phase I STTR with NASA Langley Research Center, $30,000, 1/99-8/99, PI.

"Active Noise and Vibration Control: Improved Sensors, Measurements and Control Strategies," PCB Piezotronics (NSF, Phase II SBIR), $150,000 (of PCB $300,000), 5/96-12/98, co-PI (with G.H. Koopmann), 50%.

"Hierarchical Mechanical Modeling," task on larger project "Integrated Predictive Diagnostics MURI," Office of Naval Research, $100,000, 4/95-4/98, Research Associate (with D. Hall et al), 100%.

"Health Monitoring and Virtual Containment for Composite Flywheel Energy Storage System," Applied Materials Technologies, Inc. (U.S. Air Force Phase I STTR program) $42,000, 7/96-12/97, co-PI (with C.E. Bakis), 50%.

"Experimental Characterization and Analytical Modeling of Elastomeric Mounts," United Technologies Research Center, $20,000, 6/97-12/97, co-PI (with E.C. Smith), 50%.

"Elastomeric Component Technology," United Technologies Research Center, $10,000, 11/96-3/97, co-PI (with E.C. Smith), 50%.

"Experimental Characterization and Analytical Modeling of Elastomeric Dampers and Bearings," Boeing Helicopters, $35,000, 12/95–12/96, co-PI (with E.C. Smith), 50%.

"Synthesis and Processing of Intelligent Cost Effective Structures (SPICES) II," McDonnell Douglas Corporation (DARPA), $100,000, 4/96-12/96, co-PI (with G.H. Koopmann), 50%.

"High Power Density Piezoelectric Actuator for Noise and Vibration Reduction," PCB Piezotronics (NASA, Phase II SBIR), $250,000 (of PCB $500,000), 5/94-3/96, PI (with G.H. Koopmann, S. Yoshikawa), 40%.

"Education in Design for Manufacturing," PSU part of ECSEL coalition to ARPA (TRP program), $300,000 of $1,500,000, 6/94-3/96 (with T. Litzinger, et al.), 13%.

"Synthesis and Processing of Intelligent Cost Effective Structures (SPICES)," McDonnell Douglas Corporation (DARPA), $1,200,000 ($720,000, $480,000 PSU in-kind), 6/93-3/96, co-PI (with G.H. Koopmann), 40%.

"Refined Modeling for the Aeroelastic and Aeromechanical Analysis of the RAH-66 Comanche Snubber-Damper for 2GCHAS," Advanced Rotorcraft Technology (U.S. Army), $18,100, 1/95-12/95, co-PI (with E.C. Smith), 50%.

"Experimental Characterization and Analytical Modeling of Elastomeric Dampers and Bearings," Boeing Helicopters, $35,000, 12/94-12/95, co-PI (with E.C. Smith), 50%.

"Passive Vibration Damping Materials: Piezoelectric Ceramic Composites for Vibration Damping Applications (renewed)," Office of Naval Research, $247,200, 2/93-7/95, Faculty Associate (with S.K. Kurtz and S. Yoshikawa), 18%.

"Damped Composite Honeycomb Sandwich Panels for High-Speed Aircraft Interior Noise Reduction," Boeing Commercial Airplane Group, $90,100, 11/93–6/95, PI, 100%.

"Refined Modeling for the Aeroelastic and Aeromechanical Analysis of Helicopters with Elastomeric Lag Dampers," Sikorsky Aircraft, $15,000, 3/94-10/94, co-PI (with E.C. Smith), 50%.

"LEADA: Laboratory for Electronic Aircraft Design Apprenticeship," CBEL - Teaching and Learning Technologies Group, 3/92-3/94, in-kind, Content Expert (with L.N. Long), 50%.

"Integrally-Shunted Piezoelectric Reinforcement for Tailored Frequency-Dependent Passive Damping of Composite Materials," National Science Foundation Small Grants for Exploratory Research Program, $25,000, 9/92-2/94, Co-PI (with S. Yoshikawa), 78%.

"ATF-Based Viscoelastic Plate Finite Element," Centro Italiano Ricerche Aerospaziali, $96,240, 6/92-2/94, PI, 100%.

"Cryogenic Characterization of Thermal Properties of Piezoelectric Ceramics," McDonnell Douglas Astronautics, 1/93-10/93, $50,000, co-PI, (with D.W. Jensen and M. Chan (Physics)), 22%.

"Piezoelectric Damping and Actuation Module for Noise and Vibration Control," PCB Piezotronics (NSF, Phase I SBIR), $16,700 (of PCB $50,000), 1/93-8/93, PI (with G.H. Koopmann), 50%.

"High Power Density Piezoelectric Actuator for Noise and Vibration Reduction," PCB Piezotronics (NASA, Phase I SBIR), $15,070 (of PCB $45,210), 2/93-9/93, PI (with G.H. Koopmann), 50%.

"LIDAR and RADAR Sounder (LARS)," Department of Energy, $708,000, 10/92- 5/93, Faculty Associate (Mechanical Systems, with C.R. Philbrick et al.), $18,100, 100%.

"Dynamics and Control Laboratory for Research in Three-Dimensional Rotational Motions," National Science Foundation Engineering Research Equipment Grants Program, $80,200, 8/91-1/93, co-PI (with R.C. Thompson, R.G. Melton and A.K. Amos), 25%.

"Passive Vibration Damping Materials: Piezoelectric Ceramic Composites for Vibration Damping Applications," Office of Naval Research, 3/92-12/92, $102,200, Faculty Associate (with S.K. Kurtz and S. Yoshikawa (MRL)), 13%.

"Automated Vibration and Environmental Control System for Material and Structural Damping Research," National Science Foundation Engineering Research Equipment Grants Program, $74,500, 8/90-6/92, PI (with R.C. Thompson and A.K. Amos), 34%.

"Matching Funds for Aerospace Engineering Structures, Dynamics and Controls Equipment," State of Pennsylvania, $10,000, 1991, Contributor. (With D.K. McLaughlin, A.K. Amos, R. Auhl.)

"The Fiber Contribution to Composite Material Damping," SPARTA, Inc., $50,100, 3/90-5/91, PI, 100%.

"High Damping Graphite Fiber and Structural Composite Material," $470,000 (Phase II SBIR), PI and Program Manager. (at SPARTA, Inc.; in progress November, 1989.)

"High Damping Graphite Fiber," Naval Surface Warfare Center, $50,000 (Phase I SBIR), PI. (at SPARTA, Inc.; completed March, 1988.)

"Generic Satellite Laser Vulnerability," Air Force Weapons Laboratory, $450,000, co-PI and Program Manager. (at SPARTA, Inc.; completed February, 1989.)

"Carbon-Carbon and MMC for Space Structures," Naval Surface Warfare Center, $490,000, PI and Program Manager. (at SPARTA, Inc.; completed August, 1989.)

More than 80 research proposals were declined.

Courses Taught (Aerospace Engineering, unless noted)

001S	Aerospace Explorer (First-Year Seminar) (most recently, Spring 2012)
EMch 212	Dynamics
301	Aerospace Structures I
302	Aerospace Structures II (now AERSP 470)
406	Structures Laboratory (now AERSP 305W)
497F	Advanced Composite Structures
460	Automatic Controls
402A	Aircraft Preliminary Design
402B	Aircraft Detail Design
420	Flight Testing
571	Structural Dynamics (most recently, Fall 2011)
597D	Passive Damping and Vibration Control
597F	Advanced Composite Structures
597A	Control of Flexible Structures

Numerous guest lectures in English 202C, Technical Writing.

Numerous guest lectures in Higher Education 597A, Planning, Budgeting, and Strategic Management.

Theses Supervised

Jeffrey A. Zapfe	Ph.D.	12/95	Prediction of Damping in Laminated Beams Using a Discrete Layer Finite Element Model and an Iterative Full Domain Smeared Laminate Model
Kiran Govindswamy	Ph.D.	12/95	Modeling of Strain-, Temperature-, and Frequency-Dependent Properties of Elastomeric Damper and Bearing Materials (co-advisor)
Suresh Pai	Ph.D.	12/96	Detecting Buckling in Filament-Wound Cylinders using Embedded Fiber-Optic Sensors (co-chair)
Christopher Davis	Ph.D.	12/97	A Tunable Solid State Piezoceramic Vibration Absorber
Shridhar Yarlagadda	Ph.D.	12/99	Resistively Shunted Piezocomposites for Passive Damping
Razvan Rusovici	Ph.D.	5/00	Dynamic Effects of an Elastomeric O-Ring in a Hopkinson Bar (co-advisor; VA Tech degree program)
Christian Brackbill	Ph.D.	12/00	Effects of Nonlinear Elastomeric Damper Behavior on Rotor Dynamics (co-advisor)
Julien Bernard	Ph.D.	5/01	Design and Realization of Actively Tunable Sonar Transducers
Jeremy Frank	Ph.D.	5/01	Design and Development of Piezoelectric Motors (co-advisor)
Hao Kang	Ph.D.	8/01	Rotor Blade Lag Damping Using Embedded Chordwise Absorbers (co-advisor)
Fuh-Wen Shiue	Ph.D.	12/01	Virtual Containment of Composite Flywheels for Integrated Power and Attitude Control of Spacecraft (co-advisor)
Joe Szefi	Ph.D.	8/03	Helicopter Gearbox Isolation Using Periodically Layered Fluidic Isolators (co-advisor)
Mike Yang	Ph.D.	8/03	Development of Master Design Curves for Particle Impact Dampers (co-advisor)
Jacob Loverich	Ph.D.	8/04	High Power Density Piezoelectric Motor with Hybrid Clamps (co-advisor)
Deepak Ramrakhyani	Ph.D.	5/05	Tendon-Actuated Compliant Truss for Morphing Aircraft Structures
Smita Bharti	Ph.D.	5/07	Optimal Structural Design Of A Morphing Aircraft Wing (co-advisor)
Vipul Mehta	Ph.D.	8/10	Contact-Aided Stress Relief in Compliant Mechanisms (co-advisor)
Conor Marr	Ph.D.	5/12	Semi-Active Lag Damping (co-advisor)
Jeffrey Kauffman	Ph.D.	8/12	Piezoelectric Damping of Turbomachinery Blades
Margalit Goldschmidt	Ph.D.	8/17	Reduction of Unsteady Pressure Loads on Turbomachinery (co-advisor)

Tianliang Yu	Ph.D.	5/18	Topology Optimization for Thermoelastic and Piezoelectric Structures
Kaan Yildiz	Ph.D.	5/18	Tensegrity Structures for Compact Deployable Space Structures with Tendon Actuation and Joint Fixity
Michael Thiel	Ph.D.		Actuation for an Active Gurney Flap for Rotorcraft
Shridhar Yarlagadda	M.S.	12/91	Fiber Contribution to Flexural Damping of Polymer-Matrix Composites
Kiran Govindswamy	M.S.	5/92	A Subresonant Method for Measuring Material Damping in Low-Frequency Uniaxial Vibration
Christopher Davis	M.S.	3/93	Frequency-Shaped Passive Damping using Resistively-Shunted Piezoceramics
Tom Manning	M.S.	8/93	Design, Manufacture, and Testing of Volume Scanning Mechanisms for LIDAR and RADAR Sounder
Emanuele Bianchini	M.S.	12/93	Dynamic Modeling of Viscoelastic Materials and Structures using Anelastic Displacement Fields
Scott Parent	M.S.	12/94	Validated Modeling of Space Truss Dynamics
Michael Beale	M.S.	8/95	Characterization of the Amplitude-Dependent Dynamic Behavior of Elastomeric Materials used in Rotorcraft Lag Dampers (co-advisor)
Razvan Rusovici	M.S.	12/95	Modeling and Characterization of Inertial Piezoceramic Actuators
Moreshwar Deshpande	M.S.	8/95	Mechanical Interaction of an Embedded Induced Strain Actuator with a Host Composite Structure (co-advisor)
Brian Dershem	M.S.	5/96	Characterization of an Embeddable Induced Strain Actuator (co-advisor)
Thomas Klein	M.S.	5/96	Effects of the Space Environment on the Dynamic Properties of Graphite/Epoxy Composites
Christian Brackbill	M.S.	12/96	Formulation and Validation of a Thermomechanical Model for Elastomeric Materials (co-advisor)
Lynn Byers	M.S.	5/97	Thermomechanical Characterization of Elastomeric Damper and Bearing Materials (co-advisor)
Tim Galante	M.S.	5/97	Design of a Piezoelectric Inchworm Actuator for Dynamic Forcing Capability (co-advisor)
Hao Sun	M.S.	5/98	Failure Modeling for Machinery Prognostics Using Component Damage Modes
Jeremy Frank	M.S.	5/98	Optimization of Inchworm Drive Signals for High Force Performance (co-advisor)
Julien Bernard	M.S.	7/98	Dynamic Force Isolation using Piezoelectric Proof Mass Actuation (co-advisor)
Kati Hufnagel	M.S.	7/98	Dynamic Analysis of Stiffened Panel Structures Using Component Mode Synthesis (co-advisor)

L. Eric Ruhl	M.S.	9/98	Characterization and Modeling of the Thermo-Mechanical Behavior of Elastomers in the Low Dynamic Strain Regime (co-advisor)
Chad Hébert	M.S.	12/98	Frequency-Agile Piezoceramic Transducers Obtained Through Application of In-Plane Loads
Sumit Sarkar	M.S.	12/98	Two-Dimensional FE Modeling of Elastomeric Components with Pre-Stress (co-advisor)
Joe Szefi	M.S.	5/00	High Frequency Dynamic Behavior of Elastomeric Mounts (co-advisor)
David Ericson	M.S.	5/02	Use of Superelastic SMA as a High-Strain-Capable Structural Material in Adaptive Structures (co-advisor)
Deepak Ramrakhyani	M.S.	5/02	An Efficient Nonlinear Model of Dynamic Elastomer Behavior using Fractional Derivatives and Plastic Yielding (co-advisor)
Geff Ottman	M.S.	5/02	A Standalone Piezoelectric Energy Harvesting Circuit for Wireless, Remote Power Supply (co-advisor)
Jacob Loverich	M.S.	8/02	A Reversible, Linear Mechanical Diode for High Power Density Piezoelectric Motors (co-advisor)
Tom Leffler	M.S.	8/03	Mechanical Fusing for Predictable Failure of Composite Flywheels (co-advisor)
Kristin Culler	M.S.	12/03	Active Isolation using a Piezoelectric Stack with Motion Amplification
Jason Petrie	M.S.	5/04	Blade-Embedded Vibration Absorber for Rotorcraft Lag Damping (co-advisor)
Sanjiv Ramachandran	M.S.	5/04	Nonlinear Dynamics and Damping Performance of an Impact Damper
François LeHen	M.S.	5/05	An Actively-Tuned Periodically-Layered Fluid-Elastic Mount for Helicopter Gearbox Isolation (co-advisor)
Michael Thiel	M.S.	5/06	Actuation for an Active Gurney Flap for Rotorcraft
Jamie Browne	M.S.	8/07	Scaling of Structural Concepts for Morphing Airframes
Jeffrey Kauffman	M.S.	12/07	Piezoelectric Vibration Energy Harvesting for Wireless Sensor Nodes
Conor Marr	M.S.	12/07	Frequency Domain Modeling of Fluidlastic Lead-Lag Dampers (co-advisor)
Joseph Shenglan Wang	M.S.	5/10	Experiments with Blade-Embedded Fluidic Vibration Absorbers (co-advisor)
Samantha Cirone	M.S.	8/11	Design, Fabrication and Testing of C3M Parts with Curved Walls (co-advisor)
Pauline Autran	M.S.	8/12	Layered Radial Mounts for Helicopter Interior Noise Reduction
Jennifer Hyland	M.S.	8/12	Cellular Structures for Impact Absorption (co-advisor)
Anna Winslow	M.S.	12/12	Control of a Variable Lag Damper (co-advisor)

David Materkowski	MEng	12/12	Experimental Characterization of Radial Isolation Mounts
Penelope Campbell	MEng	5/13	Stress Analysis of a Helicopter Tailboom and Hoist
Rebecca Stavely	M.S.	12/13	A Passive Thermal Switching Structure using Compliant Cellular Mechanisms with Internal Contact
Margalit Goldschmidt	M.S.	8/14	A Dynamometer for Unsteady Pressure Load Characterization (co-advisor)
Pierre Thurier	M.S.	8/14	Design Optimization for Variable-Thermal Conductivity Structures
Raheel Mahmood	M.S.	12/14	Piezoelectric Energy Harvesting for Structural Health Monitoring (co-advisor)
Tianliang Yu	M.S.	8/15	Direct Digital Deposition for Metamaterial Sandwich Panel Cores with High Damping
Amey Chaudhari	M.S.	8/16	Origami-inspired Deployable Solar Arrays for Cubesats
Robert Grogan	B.S.	5/92	Thermally-Induced Vibration of Flexible Spacecraft Solar Array Booms
Tom Reising	B.S.	8/92	Experimental Determination of Resonance Frequencies and Damping of Graphite/BMI Plates
Albert Turney	B.S.	12/94	Visualization of Wave Propagation in a Viscoelastic Rod
Andrew Foose	B.S.	12/95	Redesign of the Bell/Boeing V-22 "Osprey" FS-535 Cargo Floor Frame
Tom Leffler	B.S.	5/97	A Virtual Containment System for Spacecraft Energy Storage and Momentum Management (co-advisor)
Smith Thepvongs	B.S.	5/02	A Piezoelectric Bender for Gurney Flap Actuation
Tom Jakub	B.S.	5/03	Active Isolation of Flywheel Vibration using Piezoelectric Mounts
Alicia Cole-Quigley	B.S.	5/04	Modeling of Non-Linear Solar Sail Deformation
Jamie Browne	B.S.	12/04	Analysis And Testing Of An Isogrid-Paneled Nano-Satellite Structure
Aimy Wissa	B.S.	12/08	Damage Detection in Aluminum Plates Using the Electro-Mechanical Impedance Method *(Wolk Best Senior Thesis Award)*

Served on more than 75 additional graduate student thesis committees.

Served as the "faculty opponent" at a Ph.D. defense at Chalmers University of Technology, Gothenburg, Sweden, May, 1997. (Åsa Fenander, "Modelling Stiffness and Damping by Use of Fractional Calculus with Application to Railpads.")

Served as the "external examiner" at a Ph.D. defense at the Swiss Federal Institute of Technology (ETH), Zürich, Switzerland, Centre of Structure Technologies, November, 2006. (Niccolò Pini, "Development and Processing of Novel Active Fibre Composites.")

Served as the "faculty opponent" at a Ph.D. defense in Solid Mechanics at Chalmers University of Technology, Gothenburg, Sweden, February, 2007. (Magnus Alvelid, "Dynamic Analyses of Structures with Applied Rubber Damping Materials.")

Serving as the "external examiner" at a Ph.D. defense at the Swiss Federal Institute of Technology (ETH), Centre of Structure Technologies, Zürich, Switzerland, November, 2015. (Giulio Molinari, "Aero-Structural Optimization of 3-D Adaptive Wings with Embedded Smart Actuators.")