

Daniel A. Russell

EDUCATION

- Ph.D. Acoustics 1995** The Pennsylvania State University
The Theory of Fuzzy Structures and Its Application to Waves in Plates and Shells. Mid frequency analysis of the effects of a statistical distribution of fuzzy attachments on the vibration of plates and shells, and the related radiation and scattering of sound from cylindrical shells and plates with fuzzy attachments. Contributed to the Pierce-Sparrow-Russell model of fuzzy structures.
- M.S. Applied Physics 1991** Northern Illinois University
Residual Shock Spectrum of Piano Hammers: An Experimental Study of Hammer Felt Nonlinearity and Energy Transfer Efficiency. Investigation of the nonlinear behavior of piano hammer felt using residual shock spectrum and mapping the frequency content of the shock spectra to explain the frequency content of resulting struck string spectra.
- B.S. Physics 1988** Bradley University
- B.Mus. Piano Performance 1988** Bradley University

ACADEMIC EXPERIENCE

- Professor of Acoustics & Director of Distance Education 2011-present**
GRADUATE PROGRAM IN ACOUSTICS, THE PENNSYLVANIA STATE UNIVERSITY, UNIVERSITY PARK, PA 16802
Developing and teaching graduate courses in acoustics, vibration, and noise to both in-residence and distance education students. Overseeing, marketing and managing the distance education component of acoustics instruction, including oversight of the M.Eng. in Acoustics online degree program. Conducting research on the acoustics and vibration of sports equipment.
- Associate Professor of Applied Physics (Acoustics) 1999-2011**
- Assistant Professor of Applied Physics (Acoustics) 1995-1999**
PHYSICS DEPT, KETTERING UNIVERSITY, 1700 UNIVERSITY AVE, FLINT, MI 48504
Developed and taught several upper level undergraduate elective courses in acoustics and vibration including lecture and laboratory components. Developed and taught senior level advanced laboratory course in acoustics. Developed and oversaw academic minor in acoustics. Developed, equipped, and managed acoustics laboratory for faculty and student research projects. Mentored undergraduate students on research projects and undergraduate theses in acoustics. Conducted research on the acoustics and vibration of sports equipment (baseball bats, hockey sticks, rackets) and musical instruments. Also taught introductory and mid-level core lecture and laboratory courses toward physics degree (mechanics, electricity & magnetism, physics of waves, computational physics, theoretical mechanics).
- Teaching Assistant, Pennsylvania State University, State College, PA Spring 1995**
Developed lecture material for and taught one third of the undergraduate course in acoustics.
- Physics instructor, Bradley University, Peoria, IL Spring 1991**
Taught both the mechanics and electricity lecture components of the two-term introductory calculus-based physics sequence.
- Teaching Assistant, Northern Illinois University, DeKalb, IL 1989-1990**
Taught the mechanics and electricity laboratory components of the two-term introductory non-calculus based physics course sequence.

ACOUSTICS TEACHING AT PENN STATE (2011 TO PRESENT)

COURSES DEVELOPED AND TAUGHT AT PENN STATE

- ACS-501, Fundamentals of Acoustics** (3 lecture credits)
This is the vibration half of the two-course core fundamentals in acoustics sequence for first year graduate students at Penn State. Developed lecture material covering 1-dof oscillators, impedance, 2-dof and multi-dof oscillator systems, longitudinal waves in solids, effects of boundary conditions and variations in material, vibration of strings with various boundary conditions, rectangular and circular membranes, flexural bending in beams and plates. Taught 2 times to a total of 29 resident and 56 distance graduate students.

ACS-537, Noise Control Engineering (3 lecture credits)

Offered in 2012 for the first time in 10 years. Developed lecture material covering source-path-receiver model, human hearing and psychoacoustics, human response to noise and vibration, sound quality metrics and criteria for quantifying noise, acoustic standards related to noise and vibration control, instrumentation for measuring and analyzing noise and vibration, noise sources (distributed sources, impact sources, flow noise), absorption (materials, measurement, placement), control of sound in large and small rooms, partitions and barriers, mufflers, and vibration control techniques. Taught 1 time to a total of 14 resident and 36 distance graduate students.

ACS-597A, Acoustics of Musical Instruments (3 lecture credits)

Offered in 2013 for the first time in 13 years. Developed lecture material covering musical intervals, acoustic impedance models for pipes and horns, nonlinear vibration of strings, acoustic radiation from structures, mechanisms of sound production by stringed instruments (plucked, struck, and bowed), percussion (drums, marimba), brass winds (lip reed, cylindrical bore, conical bore), woodwinds (flutes, single-reed, double reed). Taught 1 time to a total of 16 resident and 14 distance graduate students.

ACOUSTICS TEACHING AT KETTERING UNIVERSITY (1995 TO 2011)

COURSES DEVELOPED AND TAUGHT AT KETTERING UNIVERSITY BETWEEN 1995 AND 1998

ME-530/PHYS-580, Acoustics, Noise, and Vibration (3 lecture credits, 1 lab credit)

This course brought acoustics back to Kettering University after a 12-year absence. Developed lecture material and handouts covering derivation of wave equation for sound, radiation from sound sources (monopoles, dipoles, quadrupoles, baffled piston), microphones and sound level meters, intensity and sound power, human hearing, room acoustics and sound absorption, transmission loss in pipes and filters, 1-dof and 2-dof vibration, waves in bars and plates. Developed 10 laboratory experiments including source directivity, FFT analysis, sound intensity, reverberation time, impedance tube, acoustic filters, and modal analysis. Taught 5 times to a total of 95 students.

COURSES DEVELOPED AND TAUGHT AT KETTERING UNIVERSITY BETWEEN 1998 AND 2001

Popularity of courses in acoustics led to the development of two new courses, with in-depth study of acoustics topics.

PHYS-480, Fundamentals of Acoustics (3 lecture credits, 1 lab credit)

Modeled after an introductory graduate level course at Penn State, this course introduces students to sound waves in air. Developed lecture material and handouts covering wave phenomena, sound pressure levels, human hearing, frequency analysis, derivation of the acoustic wave equation, plane waves, spherical and cylindrical waves, intensity and impedance, radiation from sound sources (monopoles, dipoles, quadrupoles, baffled piston), room acoustics, sound absorption, transmission lines, acoustic filters. Developed laboratory experiments including measurements of sound speed, sound levels, human hearing, signal analysis and manipulation, FFT analysis, directivity, room acoustics, absorption and impedance tube, acoustic filters. Taught 6 times to a total of 66 students.

PHYS-580, Applied Structural Acoustics (3 lecture credits, 1 lab credit)

Modeled after an introductory graduate level course at Penn State, this course introduces students to oscillation, damped and forced response, base excitation and transmissibility, mechanical impedance, circuit analogies, loudspeaker design and analysis, vibration of strings and membranes, torsional and bending waves in bars, effects of boundary conditions, waves in solids. Developed laboratory experiments including Chladni patterns, Theile-Small parameters for loudspeakers, plucked and struck strings, mechanical impedance, experimental modal analysis. Taught 3 times to a total of 21 students.

COURSES DEVELOPED AND TAUGHT AT KETTERING UNIVERSITY BETWEEN 2001 AND 2007

In 2001, Kettering University underwent a complete overhaul of its entire curriculum changing credit allocations, contact hours, and topical content in all degree programs. A new academic minor in acoustics was developed.

PHYS-382, Acoustics I: Sounds and Sources (4 lecture credits)

Developed and revised lecture content and handouts covering oscillation, damped and forced response of mechanical and acoustic oscillators, wave phenomena, sound levels, frequency analysis, human hearing, derivation of acoustic wave equation, plane waves, spherical and cylindrical waves, radiation from sound sources (monopole, dipole, quadrupole, linear arrays, baffled piston), radiation impedance, acoustics in large and small rooms, waveguides, end corrections, acoustic impedance and transmission lines, thermoacoustic refrigerators. Wrote 6 draft chapters for an acoustics textbook, used for this course. Taught 9 times to a total of 264 students.

PHYS-482, Acoustics II: Sound and Vibration (4 lecture credits)

Developed and revised lecture content and handouts covering damped and forced oscillation, nonlinear oscillation, transmissibility and vibration isolation, mechanical impedance and circuit analogies, loudspeaker design and frequency response, coupled 2-dof oscillation, dynamic absorbers, vibrating string with boundary conditions, plucked and struck string, rectangular and circular membranes, longitudinal and torsional waves in solids, flexural bending waves (derivation of equation of motion and application of boundary conditions), hoop modes in cylinders, transmission of sound through walls. Developed 9 mini-laboratory experiments to coincide with weekly lecture topics. Taught 8 times to a total of 81 students.

PHYS-484, Acoustical Measurements (4 laboratory credits)

Combined and revised laboratory experiments into a full-blown laboratory course covering topics in sound waves in air and structural vibration. Students performed 7 required experiments and an extended experimental project (room acoustics, modal analysis, response of a musical instrument, binaural hearing, etc.). Taught 2 times to a total of 14 students.

COURSES DEVELOPED AND TAUGHT AT KETTERING UNIVERSITY FROM 2007 THROUGH 2010

In 2007, the applied physics and engineering physics degree programs underwent significant curriculum revision including a complete redesign of the optics and acoustics minors to reflect needs of students with industrial co-op employers.

PHYS-302, Vibration, Sound and Light (4 lecture credits)

Developed new lecture course in waves with differential equations. Topics include oscillation in mechanical,

electrical and acoustic systems, damping and resonance, wave motion, dispersive media, Fourier synthesis, mechanical waves, derivation of wave equation for sound waves and waves on strings, boundary conditions and standing waves, waveguide modes and evanescent waves, Doppler effect and waves in 3D, electromagnetic waves in coaxial cable, wave equation for EM waves, EM waves in dielectric materials and conductors, interference and diffraction. Taught 6 times to a total of 69 students.

PHYS-388, Acoustics in the Human Environment (4 lecture credits)

Assisted colleague Dan Ludwigsen in the development of a new science elective course aimed at industrial applications of acoustics that Kettering students might encounter at their co-op jobs or everyday life. Computer simulations (using Audacity, Raven, MATLAB) explore recording and manipulating audio signals physiology and psychology of hearing, fundamentals of signal analysis, sound quality as a means of relating acoustic metrics to perception of performance, and the acoustics of rooms, listening spaces, and outdoor environments. Group projects encourage students to take the role of a consultant, learn by case studies and provide solutions to client problems. Taught 2 times to a total of 17 students.

PHYS-485, Acoustic Testing and Modeling (4 laboratory credits)

Developed new advanced laboratory course utilizing a three-fold approach to investigating an acoustic problem including theoretical models, computational models (COMSOL Multiphysics) and experimental results (STAR Modal). Two five-week modules explore an air-borne sound problem and a structural vibration problem. Each module begins with essential laboratory techniques, development of theoretical fundamentals and computational tutorials. Each module culminates in an investigation of a complex phenomenon, such as the vector sound intensity around a tuning fork, or the structural vibration of a baseball bat or tennis racket. Experimental results are used to refine finite element computer models both expand on approximate theoretical models. Much of the student work is done in teams, but a substantial part of the course grade comes from rubric-based evaluation of mandatory laboratory notebooks. Taught 5 times to a total of 28 students.

INDEPENDENT STUDY AND UNDERGRADUATE STUDENT RESEARCH PROJECTS

Paul Pedersen, Fall 1998, Modal analysis of a Gibson Hummingbird acoustic folk guitar

Wesley Haveman, Winter 1999, Modal analysis of a Gibson Explorer electric guitar

Pontus Weibull, Spring 1999, Tabletop thermoacoustic refrigerator for demonstrations

Jason Kolenda, Winter 2003, Binaural hearing and localization

Wesley Haveman, Winter 2003, Modal analysis of a Djembe drum

Willis Broden, Winter 2003, Modal analysis of a Gibson ES335 hollow body electric guitar

Josh Dunn, Spring 2004, Development of a pendulum test for determine softball bat stiffness

Scott Porter, Fall 2004, Assessment of Pulsed Magnetic Treatment of aluminum baseball bats

Jeremy Bemis, Summer 2005, Indirect methods of assessing the performance of softball bats

Justin Junell, Winter 2005, Vector intensity map of near and far-field radiation from a tuning fork

Josh Rea, Summer 2006, Acoustic impedance of an open-ended pipe and the design of a PVC flute

Chaz Ott, Fall 2006, Acoustics of the Djembe drum

Scott Duhamel and Michael Tebbe, Summer-Fall 2008, Large thermoacoustic fridge demonstration

Jon Johnson, Spring 2009, Investigation of dead spots on the neck of an electric bass guitar

Linda Hunt, Spring, Fall 2010, Vibration analysis of hockey sticks correlated to player perception

EDUCATIONAL WWW SITES (ANIMATIONS & ARTICLES)

Acoustics and Vibration Animations <http://www.acs.psu.edu/drussell/demos.html>

42+ webpages with animations illustrating vibration and wave phenomena. Animations created with

Mathematica to show physically correct acoustic processes are accompanied by explanatory text.

Original site (www.kettering.edu/~drussell/demos.html) had over 2 million visits between 2001-2011.

THIS ACOUSTICS ANIMATIONS WEBSITE HAS BEEN REVIEWED IN THE FOLLOWING PUBLICATIONS:

Ear and Hearing, **31** (4), p. 585-586 (2010).

The Physics Teacher, **43** (1), p. 57 (2005) with correction in *Phys. Teach.*, **43** (3), p. 190 (2005).

Physics Today, **56** (5), p. 29 (2003).

Science, **293**, p. 1563 (August 31, 2001)

Sound & Communications, **21** (2), p. 18 (2000).

THIS ACOUSTICS ANIMATIONS WEBSITE HAS ALSO RECEIVED THE FOLLOWING AWARDS:

2002 Science-Web Award (<http://www.science-web-award.com/>)

5-star peer-review rating from MERLOT (<http://www.merlot.org>)

5-star rating by Schoolzone (<http://www.schoolzone.co.uk>)

Yahoo! Pick of the Week for 8-27-2001

**Physics and Acoustics of Baseball
and Softball Bats** <http://www.acs.psu.edu/drussell/bats.html>

25+ articles summarizing the physics of the bat-ball collision and the vibration and acoustic signatures of baseball and softball bats. Site has more than 433,700 visits since August 2002.

**PUBLICATIONS
AND
PRESENTATIONS**

PAPERS PUBLISHED IN PEER-REVIEWED JOURNALS AND CONFERENCE PROCEEDINGS

- D.A. Russell, J. Junell, and D.O. Ludwigsen, "Vector acoustic intensity around a tuning fork," *Am. J. Phys.*, **81**(2), 99-103 (2013).
- D.A. Russell, and D.O. Ludwigsen, "Acoustic testing and modeling: An advanced undergraduate laboratory," *J. Acoust. Soc. Am.*, **131**(3), 2515-2524 (2012).
- A.M. Nathan, J. J. Crisco, R.M. Greenwald, D.A. Russell, and L.V. Smith, "A Comparative Study of Baseball Bat Performance," *Sports Eng.*, **13**, 153-162 (2011).
- A.M. Nathan, L.V. Smith, W.L. Faber, and D.A. Russell, "Corked bat, juiced balls, and humidors: The physics of cheating in baseball," *Am. J. Phys.*, **79** (6), 575-580, (2011).
- D.A. Russell, "Swing Weight of Softball Bats," *Phys. Teach.*, **48** (10), 471-474 (2010).
- D.A. Russell, "Basketballs as spherical acoustic cavities," *Am. J. Phys.*, **78** (6), 549-554 (2010).
- D.A. Russell, D.E. Parker, and Russell S. Hughes, "Analysis of standing sound waves using holographic interferometry," *Am. J. Phys.*, **77** (8), 678-682 (2009).
- D.A. Russell, "Bending Modes, Damping, and the Perception of Sting in Baseball Bats," *Engineering of Sport 6, Vol.1 Developments for Sports*, pp. 11-16 (International Sports Engineering Association, 2006).
- L.V. Smith, C. Cruz, A.M. Nathan, and D.A. Russell, "How bat modifications can affect their response," in *Proceedings of the Asia-Pacific Congress on Sports Technology – APCST 2005*, September 12-14, Tokyo Institute of Technology, Tokyo, Japan (2005)
- A.M. Nathan, D.A. Russell, and L.V. Smith, "The physics of the trampoline effect in baseball and softball bats," *Engineering of Sport 5, Vol. 2*, pp. 38-44 (International Sports Engineering Association, 2004).
- D.A. Russell, "Hoop frequency as a predictor of performance for softball bats," *Engineering of Sport 5, Vol. 2*, pp. 641-647 (International Sports Engineering Association, 2004).
- D.A. Russell and N.P. Weibull, "Table-top thermoacoustic refrigerator for demonstrations," *Am. J. Phys.*, **70** (12), 1231-1233 (2002).
- D.A. Russell, "On the sound field radiated by a tuning fork," *Am. J. Phys.*, **68** (12), 1139-1145 (2000).
- D.A. Russell, J.P. Titlow, Y.J. Bemmen, "Acoustic monopoles, dipoles, and quadrupoles: An experiment revisited," *Am. J. Phys.*, **67**(8), 660-664 (1999).
- D.A. Russell, T.D. Rossing, "Testing piano hammer nonlinearity using residual shock spectra," *Acustica—acta acustica*, **84**(5), 967-975 (1998).
- D.A. Russell, V.W. Sparrow, "Backscattering from a baffled finite plate strip with fuzzy attachments," *J. Acoust. Soc. Am.*, **98** (3), 1527-1533 (1995).
- A.D. Pierce, V.W. Sparrow, D.A. Russell, "Fundamental Structural-Acoustic Idealizations for Structures with Fuzzy Internals," *J. Vib. Acoust.*, **117**, 339-348 (1995).
- V.W. Sparrow, D.A. Russell, J.L. Rochat, "Implementation of discrete fuzzy structure models in *Mathematica*," *Int. J. Numer. Methods Eng.*, **37** (17), 3005-3014 (1994).
- T.D. Rossing, D.A. Russell, and D.E. Brown, "On the Acoustics of Tuning Forks," *Am. J. Phys.*, **60** (7), 620-626 (1992).
- T.D. Rossing and D.A. Russell, "Laboratory observation of elastic waves in solids," *Am. J. Phys.*, **58** (12), 1153-1162 (1990).

INVITED PAPERS PRESENTED BEFORE PROFESSIONAL SOCIETIES (PRINTED ABSTRACTS)

- D. A. Russell and V.W. Sparrow, "25 years of distance education in acoustics," Invited paper 2aED8 for 164th meeting of the Acoustical Society of America, Kansas City, MO, Oct. 22-26, *J. Acoust. Soc. Am.*, **132** (3) Pt. 2., 1923 (2012).
- D.O. Ludwigsen and D. A. Russell, "Three approaches to understanding sound radiation from a tuning fork," Invited paper for 162nd meeting of the Acoustical Society of America, San Diego, CA, Oct. 31 – Nov. 4, 2012. Paper 2aEDa2 for special session: Education in Acoustics, Tools for Teaching Advanced Acoustics I. *J. Acoust. Soc. Am.*, **130**(4) Pt.2, 2361 (2012).
- D. A. Russell, "Sweet spot of a hollow baseball or softball bat," Invited paper for the 148th Meeting of the Acoustical Society of America, November 15-19, 2004, San Diego, CA. Paper 4aSA in special session: Structural Acoustics and Vibration: Vibration of Sports Equipment. *J. Acoust. Soc. Am.*, **116** (4) Pt. 2, 2602 (2004).
- D. A. Russell, "Acoustics and vibration animations: A surprisingly successful website." Invited paper for the 146th Meeting of the Acoustical Society of America, November 10-14, 2003, Austin, TX. Paper 1pED1 in special session: Education in Acoustics and Musical Acoustics Neat Acoustics Websites and Software for Teaching Acoustics. *J. Acoust. Soc. Am.*, **114** (4) Pt. 2, 2308 (2003).
- D. A. Russell, "Integration of a full co-op job experience (and direct job placement) with an applied physics curriculum." Invited paper for American Physical Society March Meeting 2002, March 18-22, Indianapolis, IN. Paper D7-3 in special session on Educating Physicists for Industrial Careers: Bachelor's to Ph.D. (2002)
- D. Russell, "Animations for teaching more advanced acoustics topics," 138th meeting of Acoustical Society of America, Columbus, OH, November 1-5, 1999. *J. Acoust. Soc. Am.*, **106** (4) Pt. 2, 2197 (1999).

- D. Russell, "Implementing a 'Just-In-Time' Approach to Engineering Physics Courses," AAPT Summer Meeting, Lincoln, NE, August 3-8, 1998.
- V. Sparrow and D. Russell, "Animations created in *Mathematica* for Acoustics Education," 16th International Congress on Acoustics and 135th meeting of the Acoustical Society of America, Seattle, WA, June 20-26, 1998. *J. Acoust. Soc. Am.*, **103** (5) Pt. 2, 1454 (1998).
- D. Russell, V. W. Sparrow, C. Soize, "A mathematical formulation for modeling the type I fuzzy parameters for a continuous line fuzzy attachment," *J. Acoust. Soc. Am.*, **95** (5) Pt. 2, S2846 (1994).

PAPERS PRESENTED BEFORE PROFESSIONAL SOCIETIES (PRINTED ABSTRACTS)

- D. A. Russell, "Vibration damping mechanisms for the reduction of sting in baseball bats," paper 1aSA5, 164th meeting of the Acoustical Society of America, Kansas City, MO, Oct. 22-26, *J. Acoust. Soc. Am.*, **132** (3) Pt. 2, 1893 (2012).
- D. A. Russell, "Teaching graduate level acoustics courses to a blended enrollment of resident and distance education students," paper 2aED10, 164th meeting of the Acoustical Society of America, Kansas City, MO, Oct. 22-26, *J. Acoust. Soc. Am.*, **132** (3) Pt. 2, 1923 (2012).
- D.A. Russell, "Flexural vibration and the perception of sting in hand-held sports implements," paper 1215, *Proceedings of InterNoise 2012*, August 19-22, New York City, NY (2012).
- L.J. Hunt and D. A. Russell, "Vibrational characteristics of wood, aluminum, and composite hockey sticks," 162nd meeting of the Acoustical Society of America, San Diego, CA, Oct. 31 – Nov. 4, 2012, *J. Acoust. Soc. Am.*, **130**(4) Pt.2, 2429 (2012).
- L.J. Hunt and D. A. Russell, "Vibrational assessment of ice hockey goalie sticks," 162nd meeting of the Acoustical Society of America, San Diego, CA, Oct. 31 – Nov. 4, 2012, *J. Acoust. Soc. Am.*, **130**(4) Pt.2, 2327 (2012).
- D. Russell, W. Haveman, W. Broden, N. P. Weibull, and P. Pedersen, "Effect of body shape on the vibration of electric guitars," 145th meeting of the Acoustical Society of America, Nashville, TN, April 28 - May 2, 2003, *J. Acoust. Soc. Am.*, **113**(4) Pt 2., 2316, (2003).
- D. Russell and W. Haveman, "Acoustic and modal analysis of an African djembe drum," 140th meeting of the Acoustical Society of America, Newport Beach, CA, December 4-8, 2000, *J. Acoust. Soc. Am.*, **108**(5) Pt 2., 2591, (2000).
- D. Russell, "Musical instruments of antiquity as illustrated in *The Adventures of Asterix the Gaul*," 140th meeting of the Acoustical Society of America, Newport Beach, CA, December 4-8, 2000, *J. Acoust. Soc. Am.*, **108**(5) Pt 2., 2618, (2000).
- D. Russell, "Comparing the vibrational behavior of wood and aluminum baseball bats," 138th meeting of Acoustical Society of America, Columbus, OH, November 1-5, 1999. *J. Acoust. Soc. Am.*, **106** (4) Pt. 2, 2292 (1999).
- D. Russell, "New experiments on an old NeXT computer," 138th meeting of the Acoustical Society of America, Columbus, OH, November 1-5, 1999. *J. Acoust. Soc. Am.*, **106** (4) Pt. 2, 2140 (1999).
- R. Hughes, D. Russell, and D. Parker, "Holographic analysis of standing waves in a resonance tube," 133rd meeting of the Acoustical Society of America, State College, PA, June 16-20, 1997. *J. Acoust. Soc. Am.*, **101**(5) Pt. 2, 3033 (1997).
- D. Russell, "Making Waves on the World Wide Web," Fall 1996 meeting of the Ohio Section, American Physical Society, Athens, OH, Nov. 1-2, 1996.
- D. Russell and T. Cameron, "Laboratory Instruction in Acoustics and Vibration," ASEE Annual Meeting, June 23-26, 1996, Washington DC, session 2526.
- D. Russell and T. Cameron, "Coupling Computer Simulation and Experiment," ASEE Annual Meeting, June 23-26, 1996, Washington DC, session 3226.
- D. Russell and V. W. Sparrow "An asymptotic analysis of the added damping effect of a distribution of fuzzy attachments with steady state excitation," 129th meeting of the Acoustical Society of America, Washington DC, May 30 - June 3, 1995. *J. Acoust. Soc. Am.*, **97** (5) Pt. 2, 3414 (1995). [winner of best student paper award].
- D. Russell and V. W. Sparrow, "Coupling Between Flexural and Membrane Wave Types due to Multi-degree of Freedom and Rotational Fuzzy Attachments," 129th meeting of the Acoustical Society of America, Washington DC, May 30 - June 3, 1995. *J. Acoust. Soc. Am.*, **97** (5) Pt. 2, 3415 (1995).
- D. Russell, J. L. Rochat, A. D. Pierce, and V. W. Sparrow, "Scattering from a finite width panel with attached internal resonances in an infinite baffle," 125th meeting of the Acoustical Society of America, Ottawa, Canada, May 17-21, 1993. *J. Acoust. Soc. Am.*, **93** (4) Pt. 2, S2412 (1993).
- T. Rossing and D.A. Russell, "Simple demonstrations with tuning forks," 124th meeting of the Acoustical Society of America, New Orleans, LA, Oct. 31–Nov. 4, 1992. *J. Acoust. Soc. Am.*, **92**(4) Pt. 2, 2401 (1992)
- D. Russell and V. W. Sparrow, "Acoustic scattering from a fluid loaded plate with an attached structural fuzzy," 123rd meeting of the Acoustical Society of America, Salt Lake City, UT, May 11-15, 1992. *J. Acoust. Soc. Am.*, **91**(4) Pt. 2, S2440 (1992).
- D. Russell and T. D. Rossing, "Shock spectra of piano hammers," 120th meeting of the Acoustical Society of America, San Diego, CA, Nov. 26-30, 1990. *J. Acoust. Soc. Am.*, **88**, Suppl. 1, S186 (1990)

D. Russell and R.R. Korte, "Demonstrating modes of vibration in bars and plates with simple apparatus," 119th meeting of the Acoustical Society of America, State College, PA, May 21-25, 1990. *J. Acoust. Soc. Am.*, **87** Suppl. 1, S33 (1990).

OTHER PRESENTATIONS BEFORE PROFESSIONAL SOCIETIES

- D. Russell, "Indirect methods of assessing bat performance," invited presentation before the Sporting Goods & Manufacturers Association Baseball & Softball Council Fall Meeting, Dallas, TX, September 29 - October 1, (2005).
- D. Russell, "Correlation between hoop frequency and performance," invited presentation before the Sporting Goods & Manufacturers Association Baseball & Softball Council Fall Meeting, Dallas, TX, October 1-3, (2004).
- D. Russell, "Progress report on hoop frequency and a portable pendulum test," presented at the annual meeting of the Baseball/Softball Equipment Subcommittee F08.26 of the ASTM, Salt Lake City, UT, May 18-20, (2004).
- D. Russell, "Tuning a bat to optimize the trampoline effect," presented at Sporting Goods & Manufacturers Association Baseball & Softball Fall Meeting, Dallas, TX, Oct. 2-4, (2003).
- D. Russell, "Making Waves on the World Wide Web," paper CF-7 presented at the Fall meeting of the Ohio Section of the American Physical Society, Athens OH, November 1-2 (1996).

GRANTS AND PROPOSALS

Sporting Goods Manufacturers Association – Indirect Methods of Testing Softball Bats	\$25,000	2005-2009
Gibson Guitars – "Proposal to Gibson Musical Instruments for Developing an Acoustics Laboratory at GMI Engineering & Management Institute," (funding includes donated software, musical instruments, and \$36,000 non-recurring retainer)	\$58,500	1998
GMI Research Initiative / Improvement grant – "Experimental methods for determining the mass-frequency distribution of a fuzzy substructure"	\$5,000	1997
NSF (ILI-IP) – D. A. Russell and T. M. Cameron, "Applied Physics Acoustics Laboratory," proposal #DUE-9751029 (not funded)	\$32,571	1996

CONSULTING

Modal Analysis of Baseball Bats for RX Sports	\$850	2010
Vibration Analysis of Field Hockey Sticks – STX Field	\$1,950	2009
Vibration Analysis of Baseball & Softball Bats for PowerMetal Inc.	\$2,150	2007
Vibration Analysis of Baseball/Softball Bats for various bat companies: Nike, Reebok, Easton, Worth, DeMarini, Miken, Louisville Slugger, Mattingly Baseball, R2L Sports	\$13,000	2004-2009
Analysis and Optimization of Harmonic Damper for Marucci Bats	\$9,500	2004-2010
Modal Analysis of Baseball/Softball Bats for CE Composites	\$7,500	2002-2003
Modal analysis of golf club shafts for Gallaway Golf	\$2,000	1997

PROFESSIONAL SOCIETIES

Acoustical Society of America (ASA) [Full member status since 2012]	1990 – present
American Association of Physics Teachers (AAPT)	1997 – present
American Society of Testing Materials (ASTM International)	2005 - present
Institute for Noise Control Engineering (INCE)	2012 - present
American Society of Engineering Education (ASEE)	2001-2004
Sigma Xi, Scientific Research Society	1991-2005
Society of Physics Students (Kettering University Faculty Advisor)	1987-present

COMMITTEE MEMBERSHIP AND SERVICE

ASA Committee on Education in Acoustics	1997-2006
ASA Committee on Online Education	2000-2006
ASA Musical Acoustics Technical Committee	2000-2006
ASA Selection Committee for Rossing Award in Acoustics Education	2004-2008
ASTM Subcommittee F.08.26 Baseball and Softball Equipment	2005-2010
USA Baseball Bat Advisory Committee	2008-present

AWARDS & HONORS

Rodes Professor Appointment – *Kettering University* – 2007
 Educational Scholar Award – *Kettering University* – 2001
 Outstanding Teacher of the Year – *Kettering University Alumni Association* – 2000
 Faculty Member of the Year Award – $\Phi\Delta\Theta$ Fraternity, *Kettering University* – 1996
 ASA Structural Acoustics and Vibration Best Student Paper Award – 1995
 Eugen J. Skudrzyk Memorial Award, *Pennsylvania State University* – 1995
 Kenneth T. Simowitz Memorial Citation, *Pennsylvania State University* – 1995
 Acoustical Society of America Fellowship, *Physical Acoustics Summer School* – 1994
 College of Engineering Dean's Fellowship, *Pennsylvania State University* – 1991-1994
 A.I.P. Summer Internship Program Finalist – 1989
 Bradley University Phi Kappa Phi Academic Hall of Fame (1 of 5 inductees) – 1988-89
 Outstanding Senior in Physics, *Bradley University* – 1988-89
 Icing Physics Scholarship, *Bradley University* - 1987
 Sigma Pi Sigma Physics honor society, *Bradley University* – 1987
 Phi Kappa Phi honor society, *Bradley University* – 1986

STUDENT THESES

PH.D. AND M.S. THESIS COMMITTEES

Ph.D. committee chair for Whitney L. Coyle, "Study of the acoustical properties of the clarinet in order to characterize the ease of playing," The Pennsylvania State University, (2012-2015)
 M.S. defense committee for Whitney L. Coyle, "Using the Green's Function Parabolic Equation Method to Predict Sound Propagation Outdoors in the Presence of Weather and Complex Terrain," The Pennsylvania State University, (2012).
 Ph.D. defense committee for William B. Giannetti, "A Nonlinear Dynamic Impact Analysis of a Composite Hyper-Viscoelastic Sphere," University of Massachusetts – Lowell, (2010-2014)
 M.S. defense committee for Andrew Sutton, "Using Modal Analysis to Investigate the Bat-Ball Performance of Baseball Bats," University of Massachusetts – Lowell, (2010)
 M.S. defense committee for Matt Broe, "Assessment of Accelerated Break-In Techniques and the Performance of Baseball Bats," University of Massachusetts – Lowell, (2010)
 External Examiner for Ph.D. Thesis by Jai Long Cao, "Vibration Control in Cricket Bats Using Piezoelectric-based Smart Materials," School of Aerospace, Mechanical and Manufacturing Engineering, RMIT University, Melbourne, Australia, (August 2006)
 External Examiner for Ph.D. Thesis by Fatmir Gutaj, "The Sensitivity of Bat Performance Characteristics to Geometric and Material Variations," School of Aerospace, Mechanical and Manufacturing Engineering, RMIT University, Melbourne, Australia, (May 2005)

UNDERGRADUATE THESIS SUPERVISION (KETTERING UNIVERSITY, 1995 – 2011)

Kettering University requires undergraduate students to complete a thesis on a topic of interest to the student's co-op employer. The Kettering faculty and the employer advisor mentor the student together. Though most of the work is usually done at the employer's facility, the Kettering faculty member usually contributes expertise, visits the facility, and coaches the writing.

Served as faculty advisor to the following undergraduate theses:

Jeremy Baker, "The Indestructable Guitar and Its Practical Application," Gibson Montana Division, Boseman, MT (2010)
 Anthony Blondell, "Development of More Advanced Resonance Testing Methodology for Automotive Assemblies," Dura Automotive Systems, Rochester Hills, MI (2010)
 Stephen Mohan, "Predicting Vehicle Transfer Case NVH Response Through Dynamometer Testing," Borg- Warner, Auburn Hills, MI (2010)
 Herman Orgeron, "Arbitrary Geometry Beamforming Microphone Array," FBI, Quantico, VA (2009)
 Scott Hooper, "Virtual Car Sound for Engine Noise," LMS North America, Troy, MI (2009)
 Jeremy Foss, "Design Study to Reduce Noise in an Automatic Transmission Shifter Assembly," Dura Automotive Systems, Rochester Hills, MI (2008)
 Christopher Ocedek, "Electric Motor Variability Analysis," Eaton Corp., Galesburg, MI (2008)
 Pierre Phou, "Automation of the HVAC Acoustic Testing Process," Valeo, Auburn Hills, MI (2008).
 Matthew Martens, "Method of Reproducing the Effects of a Firearm Pressure Wave on a Speaker," Bose Corp., Framingham, MA (2007)
 Lidia Forgaciu, "Can You Hear Me Now? The Development of a Sound Quality Standard for a Power Seat," Magna-Seating, Troy, MI (2006)
 Jeremy Bemis, "Absorption Coefficients: Design and Simulation of Test Equipment," Cascade Engineering, Grand Rapids, MI (2006)
 Bryan Wazbinski, "Brake Pad Properties and their Influence upon the Noise Performance of Automotive Brake Systems," Robert Bosch Corp., Farmington Hills, MI

Weber, Rachel, "Automation of Sound Transmission Measurement Process," LEAR Corporation, Southfield, MI
Jared Perez, "Relating Sound Transmission Loss in Flat Steel to that in a Contoured Automotive Dash," Cascade Engineering, Grand Rapids, MI.
Benjamin H. Hodge, IV, "Incorporating Load Sensing into an Electric Parking Brake System," DURA Automotive, Rochester Hills, MI
Faunel Ban, "Application of Sound Quality Metrics to Dynamic Vehicle Interior Acoustic Measurements," Lear Corporation, Southfield, MI
Thomas VandenBerg, "Design & Implementation of a Nondestructive Weld Analysis, Delphi Automotive, Coopersville, MI
Andrew Babian, "Analysis of the Use of Ultrasound for Leak Detection in the Vehicle Production Process," General Motors Truck Group, Dayton, OH
Nathan Dau, "Analysis of Resonant Frequencies of the 500 Switch to Determine Reliability of Switch Firing," First Technology, Grand Blanc, MI
Blong Xiong, "Evaluation of Laminated Dash Concept in Automotive NVH Applications," Lear Corp., Dearborn,
Paul Pedersen, "Design of an Acoustic Predictive Process for Air Intake of the Twin Cam 88 Engine," Harley- Davidson Motor Company, Milwaukee, MI
Michael Szczepniak, "Mirror Vibration: Correlating Objective Data with Visual Perception," Britax Vision Systems, Marysville, MI
Pontus Weibull, "Characterization of the effects of Aerosols on M.O.A.D.S," Michigan Aerospace Corporation, Ann Arbor, MI
Sujay Dave, "Development and validation of noise and vibration test system for transmission assembly line," GM Powertrain Division, Warren, MI
James LeSarge, "Analysis of the noise produced by package conveyor," Mannesmann Dematic Rapistan Systems, Grand Rapids, MI
Kenneth Grulich, "Predicting the Acoustic Design Performance of Weatherstrips Based on Design Parameters," BTR Sealing Systems, NAD, Madison Heights, MI
Helen Xu, "SEA Analysis of Automobile Interior," Lear Corporation, Plymouth, MI
Jeremy Husic, "Dynamic Analysis of a Super Plug™ Door Module During a Door Slam," **[Master's Committee Member]**
Marianne E. Wittmer, "Investigation and evaluation of the signature analysis system for use in detecting faulty seals in the 4T65-E transmission," GM Powertrain Division, Warren, MI. (Co-advisor: R. Bolander)
Chad Taylor, "Acoustic Analysis of a Truck Air Induction System and Coupling to the Vehicle Structure," GM TG, Pontiac MI. (Co-advisor: T. Cameron)
Bradley Ring, "The Use of Vector Intensity Technology to Identify Exhaust Structure-Borne Noise characteristics," AP Parts Company, Toledo, OH. (Co-advisor: T. Cameron)

SERVICE AND CITIZENSHIP

Penn State Acoustics Ph.D. Candidacy Exam Committee (2011-present)
Penn State Graduate Program in Acoustics Admissions Committee (2011-present)
Faculty Advisor, PSU Student Chapter of the Acoustical Society of America (2012-present)

Faculty Advisor, Society of Physics Students and $\Sigma\Pi\Sigma$ physics honor society (1996-2011)
Kettering University Faculty Senate – senator for 6 years (2000-2006)
Kettering University Promotion, Tenure and Ethics Committee (2008-2011)
Active participant in Discover Kettering (lab tours for prospective students & families)

Chaired Sessions at national ASA meetings
Occasional reviewer for *Am. J. Phys.*, and *J. Acoust. Soc. Am.*