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Professional appointments

2023-present Professor, Department of Physics, Central Washington University
2013-2018 Chair, Department of Physics, Central Washington University
2013-2023 Associate Professor, Department of Physics, Central Washington University
2007-2013 Assistant Professor, Department of Physics, Central Washington University
2004-2008 Director, Science Honors Research Program, Central Washington University
2003-2005 Interim Director, Office of Undergraduate Research, Central Washington University
2003-2005 Director, STEP Summer Science Institute, Central Washington University
1997-2007 Lecturer, Department of Physics, Central Washington University
1995-1996 Postdoctoral Researcher, Lawrence Livermore National Laboratory (Livermore, CA)

Education

1995 Ph.D. Acoustics Pennsylvania State University
1991 M.S. Acoustics Pennsylvania State University
1986 B.A. Physics Johns Hopkins University

Teaching

Courses developed at CWU

COTS184 Conspiracy Theories and Cults (co-taught with Psychology faculty)
PHYS 103 Physics of Musical Sound (in-person and online versions)
DHC 161 Physics of Musical Instruments (Honors College version of PHYS103)
PHYS 361 Computational Physics
PHYS 461/561 Advanced Computational Physics (in-person and online versions)
PHYS 454 Acoustics
SHP 301 Science Honors Research Methods Seminar
SHP 401 Science Honors Thesis Seminar
STEP 301 Science Talent Expansion Program Introductory Seminar
STEP 302 Science Talent Expansion Program Research Methods Seminar

Other courses taught

PHYS 101 Introductory Astronomy of Stars and Galaxies
PHYS 111/2/3 Introductory Physics sequence[algebra-based] and Introductory Physics Lab
PHYS 181/2/3 General Physics sequence [calculus-based] and General Physics Lab
PHYS 317 Modern Physics I
PHYS 342 Thermodynamics
PHYS 351/2 Analytical Mechanics sequence
PHYS 363 Optics
PHYS 489 Senior Assessment capstone

Honors and Awards

2022 Elected Fellow, Acoustical Society of America

Publications

Articles in Refereed Journals (* denotes undergraduate co-author)

- *Lowery, S. and Piacsek, A., "A tool for quantifying the uncertainty measurements of violin impact response," *Proc. Meet. Acoust.* **46** (2022). <https://doi.org/10.1121/2.0001675>
- Rajendran, V., Piacsek, A., and Mendez, T., "Design of broadband Helmholtz resonator arrays using the radiation impedance method," *J. Acoust. Soc. Am.*, **151**, 457-466 (2022).
<https://doi.org/10.1121/10.0009317>
- Piacsek, A., *Taylor, R., and *Abdul-Wahid, S., "Resonance frequencies of a spherical aluminum shell subject to static internal pressure," *J. Acoust. Soc. Am.*, **131** (6), pp. EL506-511 (2012).
- McDonald, B.E. and Piacsek, A., "Nonlinear Progressive wave Equation for Stratified Atmospheres," *J. Acoust. Soc. Am.*, **130**, 2648-2653 (2011).
- Piacsek, A., "Atmospheric turbulence conditions leading to focused and folded sonic boom wavefronts," *J. Acoust. Soc. Am.*, **111**, 520-529 (2002).
- Piacsek, A., "A 2D numerical solution for the evolution of shock profiles subject to wavefront focusing and diffraction." *Environmental Acoustics: International Conference on Theoretical and Computational Acoustics, vol. 2*, D. Lee and M. Schultz, eds., World Scientific (1994).

Conference Proceedings

- Piacsek, A., "Name that timbre! An interactive demonstration for teaching concepts of harmonic content in musical sounds." Proceedings of the 26th International Congress on Sound and Vibration, Montreal, Canada (2019).
- Piacsek, A. and Plotkin, K., "SCAMP: Application of Nonlinear Progressive-wave Equation to Sonic Boom Transition Focus," Proceedings of 51st AIAA Aerospace Sciences Meeting, Grapevine, TX, paper x1064 (2013).
- Piacsek, A., Locey, L., and Sparrow, V., "Time-domain modeling of atmospheric turbulence effects on sonic boom propagation," Proceedings of the 29th AIAA Aeroacoustics Conference, Vancouver, BC, paper 3032 (2008).
- Locey, L., Sparrow, V., and Piacsek, A., "Sonic boom post processing to include atmospheric turbulent effects," 29th AIAA Aeroacoustics Conference, Vancouver, BC, paper 3035 (2008).

Technical Reports

- J. Page, K. Plotkin, J. Salamone, A. Piacsek, V. Sparrow, K. Elmer, R. Cowart, D. Maglieri, "Superboom Caustic Analysis and Measurement Program final report," NASA/CR-2015-218871, August 2015.

Other

- A. Piacsek, "Communicating your research to journalists (and your relatives)," *Acoustics Today*, 16 (3), pp. 80-83 (2020).
- A. Piacsek, "Sound," Tutorial article for Access Science, McGraw-Hill (2020). Accessible online at <https://doi.org/10.1036/1097-8542.637200>
- A. Piacsek, "Public Relations Committee overview," *Acoustics Today*, 14 (1), pp. 60-63 (2018).

Conference presentations (published abstracts)

underline indicates undergraduate co-author

- Piacsek, A., "Students are sitting in a room..." *J. Acoust. Soc. Am.* **152**, A168 (2022).
<https://doi.org/10.1121/10.0015911>
- Piacsek, A., "Collaborative online assignments for an introductory course in musical acoustics," *J. Acoust. Soc. Am.* **151**, A81 (2022). <https://doi.org/10.1121/10.0010723>
- Lowery, S. and Piacsek, A., "A quantitative assessment of uncertainty in the measurement of violin impact response," *J. Acoust. Soc. Am.* **151**, A158 (2022). <https://doi.org/10.1121/10.0010963>
- Cameron, N. and Piacsek, A., "Investigation of a noninvasive method for monitoring intracranial pressure using sheep skulls," *J. Acoust. Soc. Am.* **151**, A213 (2022).
<https://doi.org/10.1121/10.0011082>
- Rajendran, V., Méndez Echenagucia, T., and Piacsek, A., "Thin Helmholtz resonators for a broadband acoustic metamaterial," *J. Acoust. Soc. Am.* **150**, A147 (2021).
- Piacsek, A., "Strategies for teaching a musical acoustics class online," *J. Acoust. Soc. Am.* **148**, 2527 (2020).
- Rajendran, V., Méndez Echenagucia, T., and Piacsek, A., "Design of efficient low-frequency sound absorbers using an array of Helmholtz resonators," *J. Acoust. Soc. Am.* **148**, 2798 (2020).
- Adkisson, K. and Piacsek, A., "Quantifying the cumulative effects of sustained excitation on the vibrational response and radiated sound of violins: Preliminary results," *J. Acoust. Soc. Am.* **148**, 2644 (2020).
- Piacsek, A., "Choosing a textbook for the way your students learn," *J. Acoust. Soc. Am.* **146**, 3038 (2019).
- Piacsek, A. and Kloepper, L., "Overview of efforts within ASA to promote effective communication of science to the public," *J. Acoust. Soc. Am.* **146**, 2945 (2019).
- Piacsek, A. and Harris, N., "Resonance frequencies of a spherical aluminum shell subject to prestress from internal fluid pressure," *J. Acoust. Soc. Am.* **145**, 1881 (2019).
- Piacsek, A., "A new pre/post test to assess student mastery of introductory level acoustics and wave mechanics," *J. Acoust. Soc. Am.* **144**, 1785 (2018).
- Piacsek, A., "Using interactive simulations to build understanding and promote scientific inquiry," *J. Acoust. Soc. Am.* **143**, 1839 (2018).
- Dall'Osto, D., Dahl, P., and Piacsek, A., "Preliminary estimates of acoustic intensity vorticity associated with a turbine blade rate," *J. Acoust. Soc. Am.* **142**, 2701 (2017).
- Piacsek, A., and Gee, K., "Preparing students for undergraduate research experiences in acoustics," *J. Acoust. Soc. Am.* **141**, 4020 (2017).
- Piacsek, A., "Structuring an introductory acoustics course to be a vehicle for improving pre-calculus math skills and recruiting students to technical careers," *J. Acoust. Soc. Am.* **140**, 2952 (2016).
- Piacsek, A., "A glass half full: Demonstrations of some surprising effects of fluid loading on the resonance of wine glasses (and other vessels)," *J. Acoust. Soc. Am.* **137**, 2412 (2015).
- Piacsek, A., "Characterization of noise from an isolated intermediate-sized wind turbine," *J. Acoust. Soc. Am.* **135**, 2272 (2014).
- Piacsek, A., "An interactive audio synthesizer for investigating formants and timbre," *J. Acoust. Soc. Am.* **134**, 4019 (2013).
- Piacsek, A., and Palmquist, B., "Community-based inquiry: An example involving wind turbine noise," *J. Acoust. Soc. Am.* **134**, 4014 (2013).
- Piacsek, A., and Abdul-Wahid, S., "Development of a computational model to predict cranial resonance shifts due to changes in intracranial pressure," *J. Acoust. Soc. Am.* **132**, p. 1954 (2012).
- Piacsek, A., and Muehleisen, R., "Using COMSOL multiphysics software to investigate advanced acoustic problems," *J. Acoust. Soc. Am.* **130**, 2363 (2011).
- Abdul-Wahid, S., and Piacsek, A., "Effect of internal pressure on the vibrational response of a fluid-filled spherical shell: finite-element model," *J. Acoust. Soc. Am.* **129**, 2386 (2011).

- Piacsek, A. and Taylor, R., " Effect of internal pressure on the vibrational response of a fluid-filled spherical shell: experiment," *J. Acoust. Soc. Am.* **129**, 2386 (2011).
- Piacsek, A. " Time-domain modeling of atmospheric turbulence effects on sonic boom propagation," Sonic Boom Workshop, ASME International Mechanical Engineering Congress and Exposition, Vancouver, BC. (November, 2010)
- Piacsek, A., McDonald, B.E., and Sparrow, V.W., "A comparison of wide-angle and narrow-angle progressive wave equations for modeling sonic boom propagation through turbulence," *J. Acoust. Soc. Am.* **127**, 1883 (2010).
- McDonald, B.E., and Piacsek, A., "Modification of the nonlinear wave progressive equation model for sonic booms in a stratified atmosphere," *J. Acoust. Soc. Am.* **127**, 1899 (2010).
- Piacsek, A., "Numerical modeling of weak shock propagation: Past, present, and future," *J. Acoust. Soc. Am.*, **125**, 2599 (2009).
- Piacsek, A., "Numerical simulation of sonic boom propagation through atmospheric turbulence ," *J. Acoust. Soc. Am.*, **124**, 2591 (2008).
- Piacsek, A., "Investigating musical sound as a model for the scientific process," *J. Acoust. Soc. Am.*, **123**, 3519 (2008).
- Piacsek, A., and Wright, I., "Effectiveness of physlet computer animations for enhancing student learning of acoustic principles in a course for non-science students," *J. Acoust. Soc. Am.*, **121**, 3157 (2007).
- Smith, A., and Piacsek, A., "Elastic and vibrational properties of a regular tensegrity structure," *J. Acoust. Soc. Am.*, **119**, 3390 (2006).
- Piacsek, A., and Wagner, G., "Environmental impact of modern wind farms," *J. Acoust. Soc. Am.*, **115**, 2414 (2004).
- Grogan, J., Braunstein, M., and Piacsek, A., "An experimental study of changes in the impulse response of a wood plate that is subject to vibrational stimulus," *J. Acoust. Soc. Am.*, **113**, 2315 (2003).
- Piacsek, A., and Roberts, K., "Influence of wall curvature on the resonance behavior of glass bowls" *17th International Congress on Acoustics*, Rome, September 2-7, 2001.
- Piacsek, A., and Hamilton, D., "Measurements of wineglass resonance using a fiber-optic probe," *J. Acoust. Soc. Am.*, **108**, 2623 (2000).
- Piacsek, A., "Atmospheric turbulence conditions leading to focused and folded sonic boom wavefronts," *J. Acoust. Soc. Am.*, **104**, 1830 (1998).
- Piacsek, A. A., "Nonlinearity vs. diffraction within a focusing weak shock," *J. Acoust. Soc. Am.*, **99**, 2539 (1996).
- Clarke, D., Piacsek, A., White, J., "Propagation of signals from strong explosions above and below the ocean," *J. Acoust. Soc. Am.*, **99**, 2525 (1996).
- Piacsek, A., "A multi-dimensional algorithm to simulate the propagation of a shock wave through caustics," *J. Acoust. Soc. Am.*, **94**, 1874 (1993).
- Piacsek, A., "Effects of air-injection upon cavitation noise in condensing two-phase flow," *J. Acoust. Soc. Am.*, **87**, S80 (1990).

Invited talks and Public lectures

- "Physics of Musical Instruments", AccessScience webinar to a national group of educators and librarians, sponsored by McGraw-Hill (April 16, 2021).
- "The Story of Sound", Science on Tap lecture series, Ellensburg, WA (January 7, 2020).
- "The Science of Quiet Supersonic Aircraft." Brigham Young University (October 21, 2015).
- "Effect of Internal Pressure on the Vibrational Response of a Spherical Shell." Utah Valley University (October 20, 2015).

- "Sonic Booms, Skulls, and Tsunamis: Wading into the wide world of wave physics", public lecture, Yakima, WA (May 17, 2011).
- "The Unexamined World and the Value of Scientific Thinking", Douglas Honors College Last Lecture Series, Central Washington University (April 18, 2008).
- "Environmental Noise Impact of a Modern Wind Power Project", Penn State University (July 20, 2007).
- "The Age of the Cosmos", CWU Darwin Week Seminar (February 15, 2006).
- "The Science of Musical Sound", Highline Community College, Des Moines, WA (May, 2005).
- "The Science of Musical Sound", St. Edwards University, Austin, TX (November 8, 2002).
- "Sonic Boom Propagation in a Turbulent Atmosphere", Inland Northwest Chapter of the Acoustical Society of America, Moscow, ID (April 9, 1999).

Grants and Contracts

- WA Dept. of Fish and Wildlife contract no. 16-6377, \$11,010, *Wenas WLA Shooting Range Noise Assessment*, May 16, 2016.
- NASA award NNL10AA08B, \$407,138 (ARMD), *Modeling and Flight Test Validation of Sonic Boom Focusing, Including Low Boom Shaped Signatures*, 2010 - 2012 (subcontract with Wyle Corporation).
- NSF award 0653094 \$1,000,000 (DUE-STEM), *Expand and institutionalize efforts to recruit and retain STEM majors at CWU*, 2007-2012 (Co-PI with Bohrson, Braunstein, Ely, Soltz).
- NSF award, \$250,000 (DUE - STEM), *Pilot program to improve recruitment and retention of STEM majors at CWU*, 2003-2006 (co-PI with Bohrson, Braunstein, Ely, Kurtz).

Undergraduate research projects supervised

2009-2022

Nick Cameron, *The efficacy of sheep head models to assess the utility of measuring skull resonance shifts to noninvasively monitor changes in intracranial pressure*

Seth Lowery, *Quantifying the cumulative effects of sustained excitation on the vibrational response and radiated sound of violins*

Josh Blyther, *Mode shapes of a spherical aluminum shell subject to internal fluid pressure prestress*

Kourtney Adkisson, *Establishing measurement uncertainty of the vibrational response of violins*

Natalie Harris, *Resonance frequency shifts of a spherical aluminum shell due to small changes in internal fluid pressure*

Eric Kuhta, *Design and placement of acoustic panels to attenuate sound transmission across an open room*

Christopher Powers, *Mitigating environmental noise from car wash operations using a computational acoustic model*

Nicholas Collins, *Examination of Sound Transmission Loss Between Adjacent Offices*

Adam Tangocci, *Spherical Shell Resonance and Applications as a Model for the Human Skull*

Joy Westland, *Nonlinear waves in tensegrity structures*

Rafael Avila and Cameron Kastner, *Resonance Measurements of a Pre-Stressed Spherical Shell with Application to Non-Invasive Intracranial Pressure Monitoring*

Richard Grist and Christopher Pearce, *Computational modeling of focused sonic booms*

Drake Mith, *Using COMSOL to model tensegrity structures*

Sami Abdul-Wahid, *Development of a computer model to predict the dependence of skull resonance on intracranial pressure [Science Honors Thesis]*

Robert Taylor, *Experimental investigation of the effect of internal fluid pressure on the resonance behavior of a spherical shell*

Jacob Hastings, *Effect of wind speed and direction on noise produced by wind turbines at a large scale wind farm*

Kevin Ewell, *A Numerical study of the effect of near-shore bathymetry and coastal topography on tsunami wave height and dry land inundation*

1998-2008

Christopher Parker, *Computational study of the effect of internal fluid loading on the resonance frequencies of cylindrical and spherical shells*

Ian Wright, *Development of interactive Java-based computer simulations of acoustics phenomena as an educational tool*

Travis Petersen, *Predicted Environmental Noise Impact of the Proposed Kittitas Wind Power Project*

Anthony Smith, *Elastic properties of a regular tensegrity structure*

Greg Wagner, *A study of the environmental noise due to a proposed windmill farm in Kittitas County*

Apollo Good, *Computational model of the chaotic behavior of a driven double pendulum*

Jared Grogan, *Resonance properties of a wood plate subject to vibrational stimulus.*

Karen Roberts, *Experimental study of the effect of glass shape on resonance frequency*

Dennis Hamilton, *Investigation of wine-glass resonance & Development of an apparatus for the demonstration of glass-breaking via resonance*

Tim Faix, *Quantitative analysis of the “piano tone controversy”*

Professional service activities

Peer review

1997-present	Reviewer of 16 manuscripts submitted to JASA and 8 submitted to other journals
2014-present	Physics Panel Reviewer, National Research Council Research Associateship Program
2020	External reviewer for doctoral dissertation at McGill University
2009, 2011	Panel reviewer, National Science Foundation STEM Talent Expansion Program
2010-2014	Chair, American Institute of Physics Science Writing Award Panel
2008-2010	Member, American Institute of Physics Science Writing Award Panel

Acoustical Society of America (ASA)

2021-present	member, Meetings Reimagined Committee (ad hoc)
2021	<p>General Chair of the Spring 2021 Acoustics in Focus virtual meeting</p> <ul style="list-style-type: none"> Worked closely with EC and VTTF to create a platform for attendees to interact virtually outside of technical sessions Worked closely with President Kewley-Port, members of the VTTF, and the Jam subcommittee to plan virtual social events
2020-present	<p>Chair, Virtual Technology Task Force (VTTF)</p> <ul style="list-style-type: none"> Advise EC on issues related to planning and executing virtual meetings
2020-present	Member, Panel on Public Policy
2019-present	Chair , Technical Committee on Musical Acoustics
2019-present	member, Computational Acoustics Technical Specialty Group
2019-2021	Chair , Web Advisory Committee
2018-present	Member, Web Advisory Committee
2018-2019	Chair , Strategic Goal Task Force 1 (Outreach)
2018	Member, Nominations Committee
2017	<p>ASA Liaison to ComSciCon</p> <ul style="list-style-type: none"> Attended national ComSciCon meeting in Boston Coordinated with Student Council to establish ASA-specific ComSciCon event
2015-2016	TPO representative for TCMU (Pittsburgh, Jacksonville, Honolulu)
2011	TPOM representative for PATC and EDComm (Seattle meeting)
2009-2018	<p>Chair, Committee on Public Relations</p> <ul style="list-style-type: none"> Worked with AIP media liaisons to replace the traditional press room with livestreamed press events Organized special sessions and workshops on science communication and outreach Worked with committee members to develop a new model for ASA to respond to media inquiries, utilizing volunteer media representatives from each TC; worked with AIP media professionals to develop media training workshops at ASA meetings. Updated the ASA Science Communication Awards (formerly Science Writing Award) Worked with ASA members and AIP media staff to produce several short outreach videos highlighting careers, standards, and research topics in acoustics, as well a profile of ASA meetings. Primary author of the script for the video on sonic booms.
2007-present	member, Committee on Public Relations
2004-present	member, Technical Committee on Musical Acoustics
2002-present	member, Technical Committee on Physical Acoustics
2000-present	member, Committee on Education

Special sessions organized at ASA meetings

2019 (San Diego) session 1eID: Tutorial Lecture on Effective Media Interactions Training Workshop (with L. Kloepper); session 2aMU: Experimental Methods in Musical Acoustics: Best Practices
*I also organized a concert by the Hutchins Consort following the Plenary Session

2018 (Victoria) session 2pED: Measuring Educational Outcomes

2018 (Minneapolis) session 3aEDa: Interactive Simulations for Teaching Acoustics (with D. Russell)

2017 (Boston) session 2aEDa: Communicating Scientific Research to Non-scientists (with K. Seger)

2016 (Salt Lake City) session 1aEDb: Strategies for Effectively Communicating Science to Policy Makers, the Media, and the Public (with K. Seger)

2015 (Pittsburgh) session 4aED: Expanding Acoustics Outreach with Social Media (with A. Morrison)

2014 (Providence) session 4aID: Effective Communication Between Acoustics Professionals and the Media

2011 (Seattle) session 3aID: Effective Communication Between Scientists and the Media

2009 (Portland) session 2pPA: Numerical Methods for Weak Shock Propagation (with B. Lonsbury-Martin)

Public outreach and service activities

2015-2016 Developed and moderated an exam on the topic of sound (“Crave the Wave”) for the Yakima region Science Olympiad at the middle school level

2007, 2010 Presented a lecture/workshop on musical acoustics to students attending a regional Suzuki method festival

2014-2015 Presented a lecture/workshop on musical acoustics to students attending the Kairos Lyceum, a regional workshop for high school aged string quartet performers

2005-present Teach an annual guest class on acoustics at the local high school

Consulting work in acoustics

2021 CWU Institute for Innovation and Entrepreneurship. Performed acoustic measurements of a recently vacated space in downtown Ellensburg and made recommendations for acoustical treatments appropriate for the needs of the new tenant. Measurements, analysis, research, calculations, and recommendations were carried out by students in PHYS454 under my supervision. (ongoing)

2019 Cascade Field and Stream. Measured noise levels from gun shots fired at the location of a proposed skeet and trap facility within existing licensed firing range near Thorp, WA.

2018 Windrow Hotel. Performed acoustic measurements of a disused ballroom facility and made recommendations for acoustical treatments as part of a renovation to a multi-use space. Measurements, analysis, research, calculations, and recommendations were carried out by students in PHYS454 Acoustics, under my supervision. Students presented their results at the CWU Symposium on Undergraduate Research.

2017 Brown Bear Car Wash. Measured noise levels in the vicinity of an established automated car wash facility in a gentrifying neighborhood of Seattle, WA; developed model of facility and vicinity in Soundplan and calibrated against measured noise levels; used the model to predict noise levels resulting from different mitigation strategies; prepared detailed report. Supervised undergraduate student, who contributed significantly to all phases of the project.

2012 Yakima County Sheriff’s Office. Provided an assessment of the validity and applicability of a noise study performed by another party with regard to a proposed outdoor firing range and training facility for the Yakima County Department of Corrections.

2003 Cascade Field and Stream. Measured noise levels from gun shots fired at the location of a proposed new firing range near Thorp, WA. Prepared detailed report comparing measured sound attenuation to predicted attenuation due to spreading, demonstrating effect of wind and topography. Work done with undergraduate student and performed gratis.