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EDUCATION

Ph.D. Physics, University of Maine, Orono, ME, 2009
Major Advisors: Robert J. Lad (Physics) & Mauricio Pereira da Cunha (Electrical Engineering)

A.B. Physics, Bowdoin College, Brunswick, ME, 2003

PROFESSIONAL APPOINTMENTS

2013-Present Research Scientist 2, Los Alamos National Laboratory

2016-2017 Visiting Assistant Professor, Bates College

2010-2012 Postdoctoral Research Associate, Los Alamos National Laboratory

PUBLICATIONS

Refereed Journal Articles

- 2017 A. Cattaneo, **B.T. Sturtevant**, D.N. Sinha, J. Schrodt, T.A. Jankowski, "A Steam Quality Discriminator Device Based upon Principal Component Analysis and a Support Vector Machine Regression Model." (submitted for review)
- 2016 **B.T. Sturtevant**, C. Pantea, D.N. Sinha, "High Frequency Signal Acquisition using a Smartphone in an Undergraduate Teaching Laboratory: Applications in ultrasound resonance spectra," *J. Acoust. Soc. Am.*, **140** (4), October 2016, pp. 2810-2816. doi: 10.1121/1.4965289.
- 2016 E.S. Davis, **B.T. Sturtevant**, D.N. Sinha, C. Pantea, "Resonant Ultrasound Spectroscopy Studies of Berea Sandstone at High Temperature," (2016), *J. Geophys. Res.: Solid Earth*, **121**, (10 pages), doi:10.1002/2016JB013410.
- 2016 **B.T. Sturtevant**, C. Pantea, D.N. Sinha, "Measured Sound Speeds and Acoustic Nonlinearity Parameter in Liquid Water up to 523 K and 14 MPa," *AIP Advances* **6**, 075310, 11 pages (2016); doi: 10.1063/1.4959196.
- 2015 **B.T. Sturtevant**, C. Pantea, D.N. Sinha, "The Acoustic Nonlinearity Parameter in Fluorinert up to 381 K and 13.8 MPa," *J. Acoust. Soc. Am. Express Letters* **138**(1), pp. EL31-EL35 (2015); doi: 10.1121/1.4922537.

- 2014 G.P. Bernhardt, J.I. Krassikoff, **B.T. Sturtevant**, R.J. Lad, “Properties of Amorphous SiAlON Thin Films Grown by RF Magnetron Co-Sputtering,” *Surface & Coatings Technology* **258** (2014), pp. 1191-1195; doi: 10.1016/j.surfcoat.2014.07.011.
- 2013 **B.T. Sturtevant**, M. Pereira da Cunha, R.J. Lad, “Properties of SiAlO₂N Protective Coatings on Surface Acoustic Wave Devices,” *Thin Solid Films* **534** (2013), pp. 198-204; doi: 10.1016/j.tsf.2013.02.062.
- 2013 **B.T. Sturtevant**, C. Pantea, D.N. Sinha, “Evaluating the Effectiveness of the Transmission Line Model in Pulse Echo Couplant Layer Corrections,” *IEEE Trans. Ultrason., Ferroelect., Freq. Contr.*, Vol 60, No. 5, May 2013, pp. 943—953; doi: 10.1109/TUFFC.2013.2651.
- 2012 **B.T. Sturtevant**, C. Pantea, D.N. Sinha, “An Acoustic Resonance Measurement Cell for Liquid Property Determinations up to 250°C,” *Rev. Sci. Instrum.* **83**, 115106, 6 pages (2012); doi:10.1063/1.4765746.
- 2010 **B.T. Sturtevant**, M. Pereira da Cunha, “Assessment of Langatate Material Constants and Temperature Coefficients Using SAW Delay Line Measurements,” *IEEE Trans. Ultrason., Ferroelect., Freq. Contr.*, Vol 57, No.3, March 2010, pp. 533—539; doi: 10.1109/TUFFC.2010.1444.
- 2009 **B.T. Sturtevant**, P.M. Davulis, M. Pereira da Cunha, “Pulse Echo and Combined Resonance Techniques: a Full Set of LGT Acoustic Wave Constants and Temperature Coefficients,” *IEEE Trans. Ultrason., Ferroelect., Freq. Contr.*, Vol 56, No.4, April 2009, pp. 788—797; doi: 10.1109/TUFFC.2009.1101.
- 2005 Bender, M. L., D. T. Ho, M. B. Hendricks, R. Mika, M. O. Battle, P. P. Tans, T. J. Conway, **B. Sturtevant**, and N. Cassar (2005), Atmospheric O₂/N₂ changes, 1993–2002: Implications for the partitioning of fossil fuel CO₂ sequestration, *Global Biogeochem. Cycles*, 19, GB4017, 16 pages; doi: 10.1029/2004GB002410.

Conference Proceedings (full length papers with peer-reviewed abstracts)

- 2017 V.K. Chillara, **B.T. Sturtevant**, C. Pantea, D.N. Sinha, “Ultrasonic sensing for noninvasive characterization of oil-water-gas flow in a pipe,” In *43rd Annual Review of Progress in Quantitative Nondestructive Evaluation*, 2017
- 2012 **B.T. Sturtevant**, D.N. Sinha, C. Pantea, “Determination of the parameter of nonlinearity in liquid water up to 250°C and 14 MPa,” *Proc. of 2012 IEEE Int’l Ultrason. Symp.*, pp. 285-288 doi: 10.1109/ULTSYM.2012.0070.
- 2009 **B.T. Sturtevant**, M. Pereira da Cunha, “Assessment of Langatate Material Constants and Temperature Coefficients Using SAW Delay Line Measurements,” *Proc. 2009 IEEE Int’l Freq. Cont. Symp.*, pp. 160-165.
- 2008 **B.T. Sturtevant**, M. Pereira da Cunha, R.J. Lad, “Determination of the Absolute Orientation of Langatate Crystals Using X-ray Diffraction,” *Proc. 2008 IEEE Int’l Ultrason. Symp.*, pp. 741—744.
- 2008 D.J. Frankel, G.P. Bernhardt, **B. Sturtevant**, T. Moonlight, M. Pereira da Cunha, R.J. Lad, “Stable Electrodes and Ultrathin Passivation Coatings for High Temperature Sensors in Harsh Environments,” *Proc. IEEE Sensors 2008*, pp. 82-85.

- 2007 P. M. Davulis, **B.T. Sturtevant**, S. L. Duy, M. Pereira da Cunha, "Revisiting LGT dielectric constants and temperature coefficients up to 120 °C," *Proc. 2007 Int'l Ultrason. Symp.*, pp 1397-1400.
- 2007 **B.T. Sturtevant**, P.M. Davulis, M. Pereira da Cunha, "A New Set of LGT Constants and Temperature Coefficients Extracted through Resonant and Pulse Echo Techniques," *Proc. 2007 IEEE Int'l Freq. Cont. Symp.*, pp 754-758.
- 2006 **B.T. Sturtevant**, M. Pereira da Cunha, "BAW phase velocity measurements by conventional pulse echo techniques with correction for couplant effect," *Proc. 2006 IEEE Int'l Ultrason. Symp.*, pp 2261-2264.

Patents

- 2017 "Fluid characterization using acoustics," Alessandro Cattaneo, Dipen Sinha, Todd Jankowski, **Blake Sturtevant**, James Schrodt, U.S. Provisional Patent, March 2017.
- 2017 "High-pressure, high-temperature hollow sphere acoustic pressure sensor," Cristian Pantea, Dipen Sinha, **Blake Sturtevant**, U.S. Patent Application, submitted September 2017
- 2017 "Noninvasive acoustical property measurement of fluids," Dipen N. Sinha, Cristian Pantea, **Blake T. Sturtevant**, Anirban Chaudhuri, U.S. Provisional Patent, July 2017.
- 2013 "High-temperature, high pressure acoustic resonance cell," **Blake T. Sturtevant**, Cristian Pantea, Dipen N. Sinha, U.S. Patent application (#61/909,304) submitted November 2013.

HONORS & AWARDS

- 2016 Los Alamos Awards Program Recipient, Los Alamos National Laboratory
- 2011 Los Alamos Awards Program Recipient, Los Alamos National Laboratory
- 2009 Student Travel Award, International Frequency Control Symposium in Besançon, France, IEEE Society of Ultrasonics, Ferroelectrics, and Frequency Control
- 2008 Chase Distinguished Research Assistantship, University of Maine Graduate School
- 2007 Student Travel Award, International Frequency Control Symposium in Geneva, Switzerland, IEEE Society of Ultrasonics, Ferroelectrics, and Frequency Control
- 2005 IGERT Traineeship, National Science Foundation and University of Maine

TECHNICAL PRESENTATIONS

Invited Talks

- 2017 "Extreme Environment Ultrasonic Sensors for Enhanced Geothermal Systems," University of Maine, Department of Physics and Astronomy Colloquium, April 28
- 2016 "Extreme Environment Ultrasonic Sensors for Enhanced Geothermal Systems," Bates College, Physics Department Colloquium, November 15.

- 2014 “A Resonance Technique for the Acoustic Characterization of Liquids in Harsh Environments,” The 167th Meeting of the Acoustical Society of America, Providence, RI, May 7.
- 2013 “High Pressure and Temperature Acoustics Capabilities,” Los Alamos Neutron Science Center, Static High Pressure Science at LANL Workshop, April 24.
- 2012 “High Precision Ultrasonic Measurement and Characterization Capabilities for Harsh Environments,” Los Alamos National Laboratory, Materials Physics and Applications Division, December 18.
- 2009 “Characterization of Single Crystal Langatate for Acoustic Wave Device Applications,” Los Alamos National Laboratory, October 19.

Contributed Talks

- 2016 “High Frequency Sound Speed Measurements in Liquids and Solids Using a Smartphone,” 171st Meeting of the Acoustical Society of America, Salt Lake City, UT, May 23-27.
- 2012 “The nonlinearity parameter, B/A , in FC-43 Fluorinert up to 373 K and 13.8 MPa,” 164th Meeting of the Acoustical Society of America, Kansas City, MO, October 22-26.
- 2012 “Determination of the acoustic nonlinearity parameter in liquid water up to 250°C and 12 MPa,” 2012 IEEE International Ultrasonics Symposium, Dresden, Germany, October 7-10
- 2011 “Coupling Layer Corrections in Pulse-Echo Time-of-Flight Measurements in Solids Revisited,” 161st Meeting of the Acoustical Society of America, Seattle, WA, May 23-27.
- 2009 Ultrasonic Characterization of Single Crystal Langatate,” University of Maine, November 19 (Oral Thesis Defense).
- 2009 “Assessment of Langatate Material Constants and Temperature Coefficients Using SAW Delay Line Measurements,” IEEE Int’l Freq. Cont. Symp., Besançon, France, April 20-24
- 2008 “Determination of the Absolute Orientation of Langatate Crystals Using X-ray Diffraction,” IEEE Int’l Ultrason. Symp., Beijing, China, Nov. 2-5

Poster Presentations

- 2015 “*In situ* Ultrasonic Monitoring of Additively Manufactured Structures,” Advanced Qualification of Additive Manufacturing Materials Workshop, Santa Fe, NM, July 20
- 2012 “Sound Speed Measurements in Water up to 563 K and 11.7 MPa using a Novel and Rugged Sensor,” 2012 LANL Postdoc Research Day, June 6
- 2011 “Coupling Layer Corrections in Pulse Echo Time-of-Flight Measurements in Solids Revisited,” 2011 LANL Postdoc Research Day, June 16
- 2009 “Assessment of Langatate Material Constants and Temperature Coefficients Using SAW Delay Line Measurements,” IEEE Int’l Freq. Cont. Symp., Besançon, France, April 20-24
- 2007 “A New Set of LGT Constants and Temperature Coefficients Extracted Through Resonant and Pulse Echo Techniques,” IEEE Int’l Freq. Cont. Symp., Geneva, Switzerland, May 28-30

- 2006 “BAW phase velocity measurements by conventional pulse echo techniques with correction for couplant effect,” IEEE Int’l Ultrason. Symp., Vancouver, Canada, Oct. 4-6
- 2006 “Localization by Signal Strength (LoSSt),” NSF IGERT PI Meeting, Arlington, VA, May 15

PUBLIC OUTREACH

- 2016 “Sound: Beyond Speech and Music,” Interactive demonstration booth, *Discover E (K-12)*, Los Alamos Public Schools
- 2012 Scientist visitor to 4th grade classroom, Pojoaque Valley (NM) Elementary School, Teacher: Ms. Roberta Carter

SERVICE

- NSF Review Panelist, 2014, 2015, 2017
- LANL Laboratory Directed Research & Development, Review Panelist, 2016
- MS Cookies & Tea (LANL Materials Science Colloquium), Co-Host, 2015
- Referee for: *Physical Review Letters*; *Physical Review B*; *Physical Review E*; *Physical Review Applied*;
IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control; *Applied Acoustics*;
Sensors; *Coatings*; *IET Science, Measurement & Technology*
- LANL Annual Student Symposium Judge, 2010-2013
- Los Alamos Postdoc Association, President, 2011