
Blake T. Sturtevant

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Education	University of Maine	Orono, ME
	<ul style="list-style-type: none">▪ Doctor of Philosophy (Physics), 2009▪ Thesis title: Ultrasonic Characterization of Single Crystal Langatate▪ Thesis advisors: Robert J. Lad (PHY), Mauricio Pereira da Cunha (EECE)	
	Bowdoin College	Brunswick, ME
	<ul style="list-style-type: none">▪ Bachelor of Arts, 2003▪ Physics major, economics minor	
Relevant Experience	Los Alamos National Laboratory Los Alamos, NM	2010 - Present
	<i>Postdoctoral Research Associate</i>	
	<ul style="list-style-type: none">▪ Development of high temperature & high pressure acoustic wave sensor suite for measurement of fluid temperature, pressure, composition, and flow rate for geothermal well characterization▪ Design and construction of high temperature & high pressure (500°C, 5000 PSI) test environment▪ LabVIEW and MATLAB software development for instrument & process control, analog & digital I/O, user interface, data logging and analysis	
	University of Maine Orono, ME	2005 – 2009
	<i>NSF IGERT Trainee (Sensor Science, Engineering & Informatics)</i>	
	<ul style="list-style-type: none">▪ Acoustic wave (AW) material property measurements on single crystals▪ Process control software for fully automated AW data collection over arbitrary temperature ranges▪ Crystal orientation, cutting, optical polishing for acoustic wave devices▪ Design and measurement of surface acoustic wave devices▪ Deposition and characterization of SiAlON thin films	
	University of Maine Orono, ME	2004 – 2005
	<i>Teaching Assistant</i>	
	<ul style="list-style-type: none">▪ Led recitations, workshops, and labs for introductory physics courses for scientists and engineers	

Princeton University Princeton, NJ 2003 – 2004
Laboratory Technician

- Calibrated and installed (Barrow, Alaska; American Samoa; NOAA ship Ka'imimoana) AARDVark automatic air samplers (see below)
- Worked on Ar/N₂ data analysis for verifying atmospheric circulation models
- Worked on project to date fossilized corals using Uranium-Helium dating techniques

Bowdoin College Brunswick, ME 2002 – 2003
SURDNA Fellow

- Developed and constructed an automatic air sampling device, the AARDVark-5
 - Developed computer programs in LabVIEW for motion control, digital and analog I/O, user interface and data logging
- Designed and constructed the electronics of the AARDVark-5

Technical Skills

Acoustics

- **Sample Preparation**
 - X-ray diffraction (XRD) orientation and alignment of single crystal substrates
 - Inner Diameter (ID) saw slicing of single crystals
 - Grinding and optical polishing of acoustic wave substrates
- **Acoustic Wave Measurements**
 - Pulse Echo time-of-flight measurements (RF burst generator, digital oscilloscopes)
 - Wafer bulk acoustic wave resonance measurements (network analyzer)
 - Design and measurement of surface acoustic wave devices (probe stations, network analyzers)
 - Fluid property determinations using Swept Frequency Acoustic Interferometry (SFAI)
 - Resonant Ultrasound Spectroscopy (RUS) measurement and modeling
 - Non-contact surface morphology imaging using non-linear acoustic beams

Pressure Systems

- Design and documentation of safe pressure systems per LANL Engineering Standards Manual
- High pressure (5000 PSI), high temperature (500 °C) systems installation and maintenance

Thin Films

- Ultra-High Vacuum (UHV) chamber/equipment installation and maintenance
- **Film Growth**
 - Electron cyclotron resonance (ECR) sample cleaning
 - RF reactive ion magnetron sputtering
 - Familiar with electron beam evaporation
- **Film Characterization**
 - High Resolution X-ray Diffraction (HRXRD)
 - X-ray Reflectivity (XRR)
 - X-ray Photoelectron Spectroscopy (XPS)
 - Ion sputter gun depth profiling
 - Familiar with atomic force microscopy (AFM), Reflection High Energy Electron Diffraction (RHEED)

Computers

- Windows 95-XP
- Intermediate Linux user
- MATLAB
- LabVIEW
- LaTeX
- Mathematica
- Corel Draw
- AutoCAD
- Adobe Photoshop
- Basic HTML and C++

Honors

- Chase Distinguished Research Assistantship (UMaine, 9/08-5/09)
- Best Student Paper Competition, Finalist. IEEE International Frequency Control Symposium, Besançon, France (04/09)
- NSF IGERT Trainee (NSF / UMaine, 9/05 -12/09)
- SURDNA Fellowship (Bowdoin College, 5/02-5/03)

Service and
Affiliations

- Reviewer for IEEE *Transactions on Ultrasonics, Ferroelectrics and Frequency Control*
- Los Alamos Postdoc Association (LAPA) Active Member, Policy Committee Chairman
- Member of American Physical Society
- Member of IEEE, Society of Ultrasonics, Ferroelectrics, and Frequency Control
- Alumni interviewer (in New Mexico) for Bowdoin College Admissions

Publications

- 1) **B.T. Sturtevant**, M. Pereira da Cunha, R.J. Lad, "Characterization of SiAlON Thin Films for Surface Acoustic Wave Device Protective Layers," [In Preparation].
- 2) **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.
- 3) **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.
- 4) **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.
- 5) **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.
- 6) 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—5..
- 7) 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.
- 8) **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.

- 9) **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.
- 10) 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, doi:10.1029/2004GB002410.

Technical
Presentations

- 1) "Ultrasonic Characterization of Single Crystal Langatate," University of Maine, November 19, 2009 (Oral Thesis Defense).
- 2) "Characterization of Single Crystal Langatate for Acoustic Wave Device Applications," Los Alamos National Laboratory, October 19, 2009 (Invited talk).
- 3) "Assessment of Langatate Material Constants and Temperature Coefficients Using SAW Delay Line Measurements," IEEE Int'l Freq. Cont. Symp., Besançon, France, April 20-24, 2009 (Oral and Poster Presentations by B. Sturtevant).
- 4) "Determination of the Absolute Orientation of Langatate Crystals Using X-ray Diffraction," IEEE Int'l Ultrason. Symp., Beijing, China, Nov. 2-5, 2008 (Oral Presentation by B. Sturtevant)
- 5) "A New Set of LGT Constants and Temperature Coefficients Extracted Through Resonant and Pulse Echo Techniques," Int'l Freq. Cont. Symp., Geneva, Switzerland, May 28-30, 2007 (Poster Presentation by B. Sturtevant)
- 6) "BAW phase velocity measurements by conventional pulse echo techniques with correction for couplant effect," IEEE Int'l Ultrason. Symp., Vancouver, BC, Oct. 4-6, 2006 (Poster Presentation by B. Sturtevant)
- 7) "Localization by Signal Strength (LoSSt)," NSF IGERT PI Meeting, Arlington, VA, May 15-16, 2006 (Poster Presentation by B. Sturtevant)

References

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