william bowman

Ph.D., materials science & engineering
arizona state university, tempe, arizona, usa
willbowman35@gmail.com | wills-website.com

experience

2012 – 2016	**Ph.D. Research Assistant** | Crozier Group, Arizona State University
2015 – 2016	**Visiting Ph.D. Research Assistant** | Electrochemical Materials Group (J.L.M. Rupp), ETH Zürich
2012 – 2016	**Graduate Research Fellow** | US National Science Foundation, GRFP

education

2016	**Ph.D. materials science & engineering** | Arizona State University (Advisor: Peter Crozier) *Correlating Nanoscale Grain Boundary Composition with Electrical Conductivity in Ceria*
2012	**B.S.E. materials science & engineering** | Arizona State University

skills

experimental techniques	transmission electron microscopy (TEM), electron energy-loss spectroscopy (EELS); scanning EM (SEM); energy-dispersive x-ray spectroscopy; XRD; AC impedance spectroscopy
software & languages	DigitalMicrograph, ImageJ, Inkscape, MS Office, Solidworks, Git, Rails, Python, Matlab, Ruby, HTML, CSS, Javascript, English (native speaker)

online

group webpage	**crozier.faculty.asu.edu**	GitHub	**github.com/willjbowman**

publications

in preparation (2016)	**Modulating grain boundary conductivity with local concentration in $Ca_xCe_{1-x}O_{2-\delta}$** W.J.B., M.N. Kelly, G.S. Rohrer & P.A. Crozier
in preparation (2016)	**Determining grain boundary conductivity in ceria via scanning transmission electron microscopy** W.J.B., A. Darbal & P.A. Crozier
under review (2016)	**Designing Strained Interface Heterostructures for Resistive Switching Devices** S. Schweiger, R. Pfenninger, W.J.B., U. Aschauer & J.L.M. Rupp
Nanoscale **8** 16499 (2016)	**Coupling of strain, stress, and oxygen non-stoichiometry in thin film $Pr_{0.1}Ce_{0.9}O_{2-\delta}$** J. Sheth, D. Chen, J.J. Kim, W.J.B., P.A. Crozier, H.L. Tuller, S.T. Misture, S. Zdzieszynski, B.W. Sheldon & S.R. Bishop
Ultramicroscopy **167** 5-10 (2016)	**Measuring band-gap states in individual nonstoichiometric oxide nanoparticles: The praseodymium-ceria case** W.J.B., K. March, C.A. Hernandez & P.A. Crozier
Solid State Ionics **272** 9-17 (2015)	**Electrical conductivity and grain boundary characterization of Gd-doped and Gd/Pr co-doped ceria electrolytes** W.J.B, J. Zhu, R. Sharma & P.A. Crozier

seminars & invited talks

CIME seminar EPFL, Lausanne, Switzerland 2016	**Correlative Electron Microscopy across Length Scales to Elucidate Grain Boundary Transport in Non-Stoichiometric Oxides**

selected contributed talks

* reviewed conference papers

Microscopy & Microanalysis
Columbus, OH
2016

* **Bandgap State Mapping via Valence-Loss EELS at Grain Boundaries in Non-Stoichiometric $Pr_xCe_{1-x}O_{2-\delta}$**
W.J.B., March, K., Aoki, T., Sediva, E., Rupp, J.L.M., & Crozier, P.A.

Microscopy & Microanalysis
Portland, OR
2015

* **Grain Boundaries across Length Scales; Correlating SEM, Aberration-Corrected TEM Orientation Imaging and Nanospectroscopy**
W.J.B., Darbal, A.D., Kelly, M., Rohrer, G.S., Hernandez, C.H., McGuinness, K., Crozier, P. A.

* **Observation of Inter-Bandgap States in Doped Ceria via Monochromated EELS**
W.J.B., March, K., Aoki, T., Hernandez, C.A., Crozier, P.A.

Mat. Res. Soc.
San Francisco
2015

Application of low-loss ultra-high energy resolution EELS to doped CeO_2
W.J.B., Aoki, T., Rez, P., Crozier, P.A.

Microscopy & Microanalysis
Hartford, CT
2014

* **Nanocharacterization and electrical properties of grain boundaries in Gd/Pr doubly-doped ceria**
W.J.B., Zhu, J., Crozier, P.A.

Int'l Microscopy Congress
Prague, CZ
2014

* **Oxygen Vacancies at Grain Boundaries in Doubly-Doped Ceria Determined using EELS**
W.J.B., Zhu, J., Hussaini, Z., Crozier, P.A.

Materials Research Soc.
San Francisco
2014

Monochromated electron energy loss spectroscopy of transition metal-modified grain boundaries in Gd-doped ceria electrolytes
W.J.B., Crozier, P.A.

Correlating transition metal-modified grain boundary conductivity with atomic level structure and composition in Gd-doped ceria electrolytes
W.J.B., Crozier, P.A.

selected posters

* reviewed conference papers

GRC: Solid State Ceramics
S. Hadley, MA
2016

Correlated Electron Microscopy & AC Impedance Studies of Grain Boundaries in Ceria-Based Electroceramics
W.J.B., Darbal, A.D., Kelly, M., Rohrer, G.S. & Crozier, P. A.

Microscopy & Microanalysis
Portland, OR
2015

* **Quantifying and Correlating the Composition and Conductivity of Grain Boundaries in Ca-doped CeO_2 Electrolytes, an AC-STEM EELS Study**
W.J.B., Hernandez, C.A., McGuinness, K., Crozier, P.A.

Solid State Ionics 20
Keystone, CO
2015

Grain Boundaries across Length Scales; Orientation Imaging and Nanospectroscopy
W.J.B., Darbal, A., Kelly, M., Rohrer, G.S., March, K., Hernandez, C.A., McGuinness, K., Crozier, P.A.

Correlating Conductivity and Composition of CaxCe1-xO2-δ Grain Boundaries via Aberration-Corrected TEM
W.J.B., Hernandez, C.A., McGuinness, K., McCartney, M.R., Crozier, P.A.

Materials Research Soc.
San Francisco
2015

Combining STEM Orientational Imaging and EELS to Statistically Correlate Grain Boundary Orientation and Composition in Polycrystalline Doped CeO_2 Electrolytes
W.J.B., Darbal, A., Crozier, P.A.

GRC: Ceramics
S. Hadley, MA
2014

Modification of grain boundary conductivity in polycrystalline doped ceria
W.J.B., Darbal, A., Zhu, J., Crozier, P.A.

International Microscopy Congress
Prague, CZ (2014)

* **Nanocharacterization and Electrical Properties of Grain Boundaries in Gd/Pr Doubly-Doped CeO_2**
W.J.B., Zhu, J., Crozier, P.A.

awards & recognition

2015 – 2016 **Swiss Government Excellence Scholarship**
9 month visit to ETH Zürich; Swiss Secretariat for Education, Research and Innovation

2012 – 2016 **NSF Graduate Research Fellow**
Support for Ph.D. research activities; US National Science Foundation

2015 **NSF Graduate Research Opportunities Worldwide Award**
Funds for travel and research at ETH Zürich; US National Science Foundation

2015 **Best poster nominee**
Spring meeting; Materials Research Society

2014 **Travel grants for International Microscopy Congress, Prague, CZ**
Awarded by Microscopy Society of America and International Microscopy Congress

2014 **Presidential Scholar Award**
Microscopy Society of America

2014 **Outstanding Graduate Student Award for community outreach**
School for the Engineering of Matter, Transport & Energy, Arizona State University

2012 – 2013 **Doctoral Enrichment Fellowship**
1 year support for Ph.D. research activities; Graduate College, Arizona State University

2011 **NIST Summer Research Fellow**
3 months support for research activities; National Institute of Standards and Technology

mentorship, service & miscellanea

2016 – 2017 **Program Chairperson**
Inaugural Student & Early-Career Pre-Meeting, Microscopy Society of America

2014 – 2016 **Seminar Chairperson**
2016 Gordon Research Seminar: Solid State Studies in Ceramics

2013 – 2016 **Undergraduate student mentor**
SHADES multicultural mentorship program, Arizona State University

2015 **Collection management website development**
Designed, built and deployed web application (fransdollcareandrepair.com)

2013 – 2014 **Outreach Chairperson & founding member**
Electrochemical Society graduate student chapter, Arizona State University

2013 **US National Science Foundation Research Collaborative Network participant**
Visited Ghana to develop international research collaboration with Ghanaian researchers