Elvin Beach

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The Ohio State University
Materials Science & Engineering Dept.
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EXPERIENCE

10/2019 – present **The Ohio State University** (Columbus, OH)
Materials Science & Engineering Dept., *Associate Professor of Practice*
- Primary responsibility is to develop & improve laboratory based courses
- Develop teaching methods to improve technical writing skills

6/2013 – 10/2019 **Worthington Industries, Inc.** (Columbus, OH)
Corporate Materials Laboratory, *R&D Manager*
- R&D support, failure analysis, materials characterization, and consulting
- Lead a group of 6 full-time staff and 3 materials science student interns
- Lab completes 400 or more projects annually

5/2010 – 6/2013 **Battelle Memorial Institute** (Columbus, OH)
Advanced Materials Applications Group, *Principal Research Scientist*
- Physical metallurgy, failure analysis, materials characterization, and consulting
- Supercapacitor and high energy density battery development

9/2009 – 5/2010 **Owens Corning – Science & Technology Center** (Granville, OH)
Roofing & Asphalt Division R&D, *Product Development Engineer*
- Algae-resistant coating development and accelerated aging of materials

9/2005 – 8/2009 **The Ohio State University** (Columbus, OH)
Materials Science & Engineering Department, *Graduate Research Assistant*
- Solid state microsensor array development, metal oxide nanoparticle synthesis
- Sensor array testing at NIST & 4 month research assignment at WPAFB
- Teaching assistant with the Service Learning in Engineering program

7/2001 - 8/2005 **The Dow Chemical Company** (Midland, MI)
Analytical Science Department, *Analytical Scientist*
- Failure analysis and problem solving using advanced electron microscopy
- FIB-SEM owner, in-situ testing equipment design & construction
- Vacuum transfer system design for OLED & Li-ion battery analysis
- Development of high speed & automated atomic force microscopy (AFM)

5/2000 - 9/2000 **IBM** (East Fishkill, NY)
Microelectronics Division - BSM Interconnect Development Group, *Co-op student*
- Flux development for Pb-free solder, solder reflow process design
- Intermetallic compound characterization and mechanical testing

9/1998 - 6/2001 **Michigan Technological University** (Houghton, MI)
Materials Science & Engineering Department, *undergrad & grad research assistant*
- Colloidal force microscopy and surface characterization using AFM techniques
- SEM, EMPA, and Auger electron microscope operator for research support

EDUCATION

The Ohio State University
Ph.D. - Materials Science & Engineering, 2009

Michigan Technological University
M.S. - Materials Science & Engineering, 2001

Michigan Technological University
B.S. - Metallurgical & Materials Engineering, 2000

HONORS

2024 David C. McCarthy Engineering Teaching Award Nominee
2023 Ralph L. Boyer Award for Excellence in Undergraduate Teaching & Engineering Innovation
2023 Mars G. Fontana Award – Outstanding Teaching in MSE
2021 Mars G. Fontana Award – Outstanding Teaching in MSE
2017 International Metallographic Contest
- Jacquet-Lucas Award & DuBose- Crouse Award
2005 – 2008 National Science Foundation Graduate Fellow
2003 Dow Golden Beaker Award Nominee
- (one award annually across the company – excellence in creativity/innovation)
2003 & 2002 Analytical Sciences Teamwork Award
- (one team awarded annually in global R&D)
2002 Dow Chemical Company Leadership Team Special Recognition Award
2000 Michigan Technological University Rising Researcher Award
1999 MRS Undergraduate Materials Research Initiative Grant Recipient
1999 ASM International Foundation - Nicholas J. Grant Scholarship

PROFESSIONAL ENDEAVORS

Editor in Chief for the *Journal of Failure Analysis & Performance:* 2021 - present
Associate Editor for *Metallography, Microstructure and Analysis:* 2013 – present
Associate Editor for the *Journal of Materials Engineering & Performance:* 2014 – 2020
TMS Education Committee: 2021 – present
Edison Welding Institute (EWI) Industrial Advisory Board Member: 2015 – 2019

SELECTED PUBLICATIONS

1. Picoliter drop deposition of SnO_2 nanoparticles onto microsensor platforms, E. Beach, K. Benkstein, C. Montgomery, S. Semancik, P. Moris, *Sensors and Actuators B: Chemical*, Vol. 403, 2024, pp. 135152.
2. A Two-Step Etchant to Reveal Grain Boundaries in Multiple Aluminum Alloys, W. Papageorge, G. Janas, E. Beach, *Advanced Materials & Processes* (AM&P, ASM digital publication), November/December 2023 (highlighting the work by Wayne Papageorge that won the 2022 DuBose-Crouse Award).
3. Development of a Versatile Two-Step Etchant to Reveal Grain Boundaries in Multiple Aluminum Alloys, W. Papageorge, G. Janas, E. Beach, *Metallography, Microstructure, and Analysis*, Vol. 12, No. 6, 2023, pp. 865 – 871.
4. Development of a Heat Treating Process for 9254 Steel Used to Create the Winning Entry in the 2022 Heat Treating Society Strong Bar Competition, G Janas, G Clark, N Heniken, D Wynn, W Papageorge, E Beach, *Metallography, Microstructure, and Analysis*, Vol. 12, No. 1, 2023, pp. 152-157.
5. Workshops and Focused Prompts: Strategies for Integrating Technical Writing in Undergraduate MSE Courses, E Beach, N Hoffman, JOM, Vol. 74, No. 8, 2022, pp. 2885-2888.
6. An Etching Technique for Characterizing Friction Stir Welds in Aluminum Alloy Tailor Welded Blanks, E. Beach, T. Luzanski, D. Marshall, B. Dix, *Metallography, Microstructure, and Analysis*, Vol. 7, No. 5, 2018, pp. 630-634.
7. Tensile Test Sample Preparation Techniques for Hot Dip Galvanized, Light Gauge Steel (Editorial), E. Beach, *Metallography, Microstructure, and Analysis*, Vol. 4, No.2, 2015, pp. 63-64.
8. Welding Simulation used in the Design of Metallic Armor Systems, L. Fredette, E. Beach, *Advanced Materials Research*, Vol. 996, 2014, pp. 518-524.
9. Solvothermal Synthesis of Crystalline Nickel Oxide Nanoparticles, E. Beach, K. Shqau, S. Brown, S. Rozeveld, P. Morris, *Materials Chemistry and Physics*, Vol. 115, No. 1, 2009, pp. 371-377.
10. Solvothermal Synthesis of Nanostructured NiO, ZnO and Co_3O_4 Microspheres, E. Beach, S. Brown, K. Shqau, M. Mottern, Z. Warchol, P. Morris, *Materials Letters*, Vol. 62, 2008, pp. 1957-1960.
11. Cross-sectional Analysis of Hollow Latex Particles by Focused Ion Beam - Scanning Electron Microscopy,

    E. Beach, M. Keefe, W. Heeschen, D. Rothe, *Polymer,* Vol. 46, No. 25, 2005, pp. 1195-1197.
12. Development of a hybrid VD/SOD integration sequence for reliable, high performance interconnect systems, J. Waeterloos, S. Cummings, Y. Ohmoto, L. Archer, R. Stevens, S. Lucero, K. Yang, J. Im, M. Mills, R. Strittmatter, E. Beach, S. Rozeveld, *Microelectronic Engineering*, Vol. 76, 2004, pp. 46-51.
13. Analysis of Atomic Force Microscope Pull-off Forces for Gold Surfaces Portraying Nanoscale Roughness and Specific Chemical Functionality, G.W. Tormoen, J. Drelich, and E.R. Beach III, *Journal of Adhesion Science and Technology,* Vol. 18, 2004, pp. 1-17.
14. Using FIB (focused ion beam) for TEM analysis of semiconductor materials, M. V. Moore, S. Rozeveld, E. Beach, *Solid State Technology* - Supplement, 2002, pp. S18-S20.
15. Pull-off Force Measurements between Rough Surfaces by Atomic Force Microscopy, E. Beach, G.W. Tormoen, J. Drelich and R.Han, *Journal of Colloid and Interface Science*, Vol. 247, No. 1, 2002, pp. 84-99.
16. Pull-off Forces Measured between Hexadecanethiol Self-Assembled Monolayers in Air Using an Atomic Force Microscope: Analysis of Surface Free Energy, E. Beach, G.W. Tormoen and J. Drelich, *Journal of Adhesion Science and Technology*, Vol. 16, No. 7, 2002, pp. 845-868.