

David Sapiro, Ph.D.
(626) 641-1054 dosapiro@gmail.com
www.linkedin.com/in/david-sapiro
www.schonpiromaterials.com

Employment:

Senior Materials Engineer, Mechanical Systems Functional Group, Ultra Safe Nuclear Corporation - Advanced Technologies Division, Seattle, WA 2021-Present

- Conducted materials selection trade studies
- Liaised between mechanical engineering and materials engineering teams
- Developed test methods for advanced materials systems
- Team member for multiple products in development
 - Portable nuclear reactors
 - Nuclear thermal propulsion rocket engines
 - Radioisotope heater units and radioisotope thermoelectric generators
- Conducted probabilistic risk analysis/failure mode and effects analysis
- Designed radioisotope power unit for spacecraft
- Team member to develop prototyping facility

Self-directed Research and Development 2021-2021

- Developed electrochemical process (patent pending 63/235,689) to improve surfaces finish and composition of metal additively manufactured parts
- Wrote technical documentation and worked with attorney to write patent application
- Developed prototype method and processing parameters

Engineer, Materials Branch, Research, Development, Testing, and Evaluation Department, Naval Surface Warfare Center Indian Head Division, Indian Head, MD 2018-2021

- Lead metallurgist for Naval Surface Warfare Center Indian Head Division providing technical expertise to organization of ~2700 employees
- Developed novel technique (patent pending 16/873,076) to improve surface finish on metal additively manufactured parts
- Collaborated with NSWC Carderock to develop a novel materials systems and manufacturing process
- Collaborated with NSWC Dahlgren to develop a novel materials system and applications
- Optimize metal additive manufacturing parameters
- Team member for restart of mass-production facility and improved manufacturing process
- Conducted failure analyses of in service components
- Conducted quality assurance analyses of in service and developmental components
- Developed manufacturing process to decrease production cost of novel material
- Revitalized and managed materials characterization laboratory
- Wrote successful grant proposals
- Mentored summer interns, Ph.D. student, and entry level engineer

Postdoctoral Research Fellow, Metallic Coatings and Polymer-Metal-Polymer Composite Liners Developments Group, National Energy Technology Laboratory, Pittsburgh, PA 2017-2018

- Developed a novel method to measure corrosion of metallic thin films
- Researched the effect of substrate conductivity on iron thin film corrosion mechanisms and rates
- Researched the effect of Cr, Ni, Mo concentration on stainless steel thin film corrosion
- Mentored doctoral student research

Intern, Space Materials Laboratory, The Aerospace Corp., El Segundo, CA Summer 2010

- Utilized SEM and dye penetrant to conduct analysis of ceramic ball bearing cracking
- Design team member to design apparatus for analyzing shear forces in composites with novel geometries

David Sapiro

Intern, Material Physics Department, The Aerospace Corp., El Segundo, CA

Summers 2008 & 2009

- Employed non-destructive testing of materials including
 - Dye penetrant testing for cracks in welds
 - Ultrasound testing and X-Ray imaging for material void detection
- Helped develop quantification for laser induced ultrasonic testing of surface crack depths

Education:

Ph.D. Materials Science and Engineering, Carnegie Mellon University, Pittsburgh, PA 2017

Thesis: The Effects of Alloy Chemistry on Localized Corrosion of Austenitic Stainless Steels

- Designed and constructed an apparatus to study stress corrosion cracking in austenitic stainless steels
- Performed experimental analyses of a localized corrosion resistance model
- Developed a novel method to measure corrosion of metallic thin films
- Mentored Masters student and undergraduate student research

M.S. Materials Science and Engineering, Carnegie Mellon University, Pittsburgh, PA 2015

Research: The Effects of Alloy Chemistry on Localized Corrosion of Austenitic Stainless Steels

M.S. Materials Science and Engineering, University of Washington, Seattle, WA 2013

Research: Microstructure of friction stir welded titanium alloys

- Performed electron microscopy and image analysis of friction stir welds of titanium alloys
- Analyzed chemical composition gradients along weld interfaces

B.A. Chemistry, Physics minor, Drew University, Madison, NJ 2012

Skills and Experience:

Materials Analysis and Electrochemistry Experience

- Corrosion: Gamry Framework, Scanning Vibrating Electrode Technique (SVET), polarization, stress corrosion cracking
- Mechanical testing: tensile, hardness, Charpy impact
- Metallography: chemical and electrolytic etching, auto- and hand-polishing, fractography
- Microscopy: optical, secondary electron (SEM), energy dispersive spectroscopy (EDS)
- Non-destructive examination: dye penetrant, thermography, ultrasonic testing
- Spectroscopy: FTIR, ATR, UV-Vis

Fabrication Experience

- Computer aided design
- Machining: lathe, milling machine, band saw, surface grinder, belt grinder, bench grinder, hand tools
- Blacksmithing: hot forging, cold forging, tool making, heat treating
- Metal casting: investment casting: gravity casting, centrifugal casting (aluminum, bronze, silver)
- Welding: forge welding, flux core, MIG, soldering (torch and iron)

Laboratory and Workshop

- Maintain personal 670 sqft laboratory and workshop space
- Fabrication equipment: metal lathe, MIG/TIG/stick welder, propane forge, charcoal forge, propane/charcoal metal casting furnace, CO₂ laser cutter/engraver, pneumatic tools, power tools, hand tools, soldering equipment
- Electrochemical equipment: DC power supply, glassware, hotplate/magnetic stirrer, fume extraction
- Other: Solidworks Educational Edition (through EAA membership), digital microscope

Software Proficiencies

- AutoCAD, Chemdraw, Fusion360, GaussView, Igor Pro, ImageJ, Instron Bluehill, Microsoft Office Suite, MTS TestSuite, Solidworks

David Sapiro

Leadership and Organization Experience

- TMS Bladesmithing Committee – ViceChair 2022-2023
- ASM International Archaeometallurgy Committee – Founding Member ,Vice Chair 2022 -Present
- ASM International Central Virginia Chapter Executive Committee – Vice Chair 2020-2021
- TMS Bladesmithing Committee – Committee member 2017-Present
- Mentored entry-level engineers and summer interns 2019-2020
- TMS Bladesmithing Symposium – Session Chair Spring 2020
- ASM International Pittsburgh Chapter Executive Committee – Web Administrator 2015-2018
- TMS Bladesmithing Committee – Student Liaison 2015-2018
- Supervised graduate and undergraduate research 2014-2018
- ASM International Young Members Night – Committee member 2014-2017
- Founded and led Carnegie Mellon University Bladesmithing Organization 2014-2017
- Course assistant and grader 2014-2016
- Volunteer for Engineers Without Borders and REII – Student Supervisor Summer 2014

Patents:

- **David Sapiro**, “Electroplating and Etching System and Method” (pending 63/235,689) 2021
- **David Sapiro**, Gabriel Bjerke, “Hybrid Electro-processing of a metal workpiece” (pending 16/873076) 2020

Publications:

- **David Sapiro**, Ruishu Feng, Bryan Webler, and Paul Ohodnicki. “Effects of Cr and Mo in pitting of austenitic stainless steels in chloride solutions”. *CORROSION 2018* proceedings
- **David Sapiro**, Ruishu Feng, Bryan Webler, Margaret Ziomek-Moroz, and Paul Ohodnicki. “The Effect of Film Thickness and Substrate Resistivity on Corrosion of Fe Thin Films”. *ECS Transactions*. 77 (11) p. 777, 2017
- **David Sapiro** and Bryan Webler. “Fabrication of a Bronze Age Sword using Ancient Techniques”, *JOM*. 68 p. 3180, 2016

Presentations:

- **David Sapiro**, “Reverse Engineering of Historical Swords” ASM International Notre Dame Chapter, Virtual, 19 January 2021
- **David Sapiro**, “Reverse Engineering of Historical Swords” ASM International Eastern Virginia Chapter, Virtual, 22 September 2020
- **David Sapiro**, “Fabricating a Hunga Munga Using Additive Manufacturing Techniques” *TMS*, Phoenix, AZ, 14 March 2018
- **David Sapiro**, Mary Story, Keith Kozlosky, David Landi, Xining Gao, Amy Coronado, Priscilla Chung; “Bowie Knife Forged from a File”, *TMS*, Phoenix, AZ, 14 March 2018
- Ruishu Feng, **David Sapiro**, Bryan Webler, Margaret Ziomek-Moroz, and Paul Ohodnicki. “Electrochemical Corrosion of Stainless Steel in CO₂-saturated Brine Solutions”, *MS&T*, Pittsburgh, PA, October 2017
- **David Sapiro**, Ruishu Feng, Bryan Webler, Margaret Ziomek-Moroz, and Paul Ohodnicki “The Effect of Film Thickness and Substrate Resistivity on Corrosion of Fe Thin Films”, *ECS 231*, New Orleans, LA, 31 May 2017
- **David Sapiro**, Ziheng Wu, and Bryan Webler. “The Effects of Alloy Chemistry on Localized Corrosion of Austenitic Stainless Steels”, *TMS*, San Diego, CA, 1 March 2017
- **David Sapiro**, “Making the First Sword” *TMS*, Nashville, TN, 15 February 2016
- **David Sapiro**, Mary Story, Maxwell Li, Ashley Guertin; “Going Berserk: The Making of a Viking Sword”, *TMS*, Nashville, TN, 15 February 2016

Posters:

- **David Sapiro**, “Fabrication of a Flamberge Longsword”, *TMS*, San Diego, CA, 1 March 2017
- **David Sapiro**, Mary Story, Rachel Lim, Maxwell Li, “Forging a 10th Century Viking Battle Axe”, *TMS*, San Diego, CA, 1 March 2017
- **David Sapiro** and Bryan Webler, “The Effects of Alloy Chemistry on Localized Corrosion of Austenitic Stainless Steels”, *AISTech*, Pittsburgh, PA, 16 May 2016

David Sapiro

- **David Sapiro**, “Fabrication of a Pata Sword Using Hot Forging and Cold Forging Techniques”, *TMS*, Orlando, FL, 15 March 2015
- **David Sapiro**, Mary Story, Maxwell Li, Ashley Guertin, “Forging a Cusped Falchion”, *TMS*, Orlando, FL, 15 March 2015
- **David Sapiro** and Bryan Webler, “The Effect of Molybdenum on Deformation of Austenitic Stainless Steels in a Corrosive Environment”, *MS&T*, Pittsburgh, PA, 13 October 2014

Awards and Fellowships:

- NSWC IHEODTD Safety Excellence Award 2019
- Oak Ridge Institute for Science and Education Science Poetry Contest: Second place 2018
- ASM Pittsburgh Chapter Outstanding Young Member Award 2017
- Bladesmithing competition entries displayed at TMS headquarters 2017-Present
- Pittsburgh Chapter AIST Young Engineers Night 2017: Invited speaker 2017
- Graduate and Postgraduate Research Program - National Energy Technology Laboratory, Oak Ridge Institute for Science and Education 2016-2018
- ASM International Young Members Night graduate student poster contest: Third place 2015
- American Institute of Chemists Award: Outstanding Student 2012

Consulting and Special Projects:

- Root cause analysis of corrosion in vaccine manufacturing equipment 2022
- Analyzed authenticity of 19th century artifact 2021
- Structural consulting for aerialist rigging 2018
- Analyzed damages to antique precious metal jewelry 2015
- Design and manufacture prototype tool for microbiology laboratory 2013
- Root cause failure analysis of microbiology laboratory tool 2012

Professional Societies:

- ASM International
- The Minerals, Metals & Materials Society

Certifications:

- Mobile elevated work platform 2023
- Forklift 2023