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Summary

Materials scientist and mechanical engineer with deep expertise in electron microscopy, advanced manufacturing, and thermal systems. Proven ability to lead advanced R&D, deliver cost-effective engineering solutions, and build research infrastructure from the ground up. Published researcher and inventor with a track record of innovation across industry and academia.

Skills

- Electron microscopy (TEM, SEM, CBED, STEM, HOLZ Analysis)
- Advanced manufacturing (DMLS, FDM, Stereolithography, CNC Machining)
- Mechanical design (SolidWorks, AutoCAD, ProNest, SDS/2)
- Thermal systems (Microchannel Cooling, Solvent Recovery, Vapor Chambers)
- Lab instrumentation (PID Control, DAQ systems, Analog Logic Automation)
- Smart materials (Shape Memory Alloys, Piezoelectric Materials)
- System integration and automation (LabVIEW, RS-485, modular control systems)
- Rapid prototyping and fabrication (Laser Cutting, Sheet Metal, Welding, Machining)
- Structural and failure analysis (Creep Testing, Hydrostatic Testing, Weld Analysis)
- Project and facility management (MS Project, OneNote, Regulatory Compliance)

Experience

Champion Fiberglass

R&D Technical Lead | 05/2024 – 07/2025

- Led a $6M facility expansion, reducing timeline from 8 to 4 months and saving $3.8M in opportunity costs by accelerating execution and avoiding auxiliary construction

- Maintained full operational uptime during construction by deploying modular, OSHA-compliant chemical storage and coordinating over 60 internal and external personnel
- Streamlined project execution using MS Project and OneNote to manage critical path tasks, delegate responsibilities, and drive transparent cross-team coordination
- Resolved regulatory setbacks within 30 days by repurposing legacy inventory, relocating equipment outdoors, and deploying portable power and process systems
- Designed and built a 10,000 PSI hydrostatic test rig in two weeks, securing a major geothermal tubing client and enabling in-house pressure validation
- Developed a collapsible mold system for filament-wound FRP elbows, unlocking new product lines with reusable, technician-friendly tooling
- Built a 40,000 lb adhesive joint pull tester for validating bonded FRP assemblies in-house
- Engineered a cable friction tester with integrated load and pressure sensing to evaluate cable-conduit combinations
- Executed CAD design, procurement, and build coordination across all custom test systems

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Northern Arizona University

School of Applied Physics and Materials Science

Research Assistant | 05/2021 – 05/2024

- Converted a cluttered under-equipped lab into a high-performance TEM facility in 3 weeks, managing logistics and upgrades for immediate startup
- Exceeded manufacturer resolution specs (0.93 Å vs. 1.0 Å) via acoustic, electrical, and HVAC refinements
- Designed advanced CBED/STEM workflows to analyze carbynes and quasicrystals with reduced beam damage
- Derived a generalized formula enabling off-axis HOLZ-ring analysis for 3D quasicrystal characterization
- Built a research instrumentation workshop and mentored students on metal evaporation and Seebeck-effect systems
- Created SMA-powered instructional tools used for ongoing smart materials instruction
- Purchased & Refurbished a $50K plasma cleaner for under $6K

Ambercycle

Engineer Sr. | 08/2018 – 12/2020

- Designed three pilot-scale reactor systems for polymer recycling, including a 600 psi, 400°F chlorinated-solvent reactor with full remote automation
- Reduced development time fourfold using modular tri-clamp technologies
- Repurposed and refurbished equipment, including a Nutsche Filter, to deliver a working pilot system under extreme deadlines
- Developed a compact 6-channel PID controller system with RS-485 remote control
- Built a compressor-assisted solvent condensation system enabling multiple daily batch cycles and improved solvent lifespan
- Engineered a crystallization nozzle that eliminated clogging, boosting process uptime
- Designed a supercooled condenser/degasser that reduced solvent loss by ~83%.
- Directed buildout of lab/shop/office space from shell, including compressed air and fume hoods
- Built custom analog logic automation systems with DIN-rail components and 12-channel PID racks

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Intel

Design Engineer / Metrology Expert | 06/2017 – 08/2018

- Redesigned DAQ systems with modular connectors and precision shunt PCBs, reducing assembly time by 90% and calibration downtime from days to hours
- Designed microchannel thermal solutions for high-performance computing systems under tight spatial constraints
- Delivered production-ready designs using 3D printing and CNC machining
- Engineered an automated chip packaging system for thermal interface testing, achieving ±0.2 lb force precision and ±3°C stability
- Developed LabVIEW software for test control, data logging, and traceability

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Centrix Engineering

Failure Analysis Engineer | 03/2017 – 06/2017

- Investigated failure modes in plumbing systems via microscopy, hydrostatic testing, and destructive disassembly
- Produced technical reports identifying corrosion, weld, and stress-related defects for use in insurance and legal contexts
- Diagnosed a concealed weld seam defect in a water heater by identifying mineral residue and dismantling the unit
- Validated failure mechanisms through direct testing and optical characterization

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Arizona State University | Honeywell

School of Engineering

Research Assistant | 06/2016 – 05/2017

- Investigated creep behavior in DMLS vs. wrought Inconel 718 by analyzing large test datasets using advanced methods
- Performed SEM and TEM of post-creep samples to examine dislocations, grain boundaries, and precipitates
- Identified key microstructural differences impacting long-term high-temperature performance
- Presented findings at the 2018 TMS Conference on additively manufactured superalloys

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Implementing Ideas

Administrator | 05/2016 – 08/2016

- Coordinated procurement and logistics for PCB assembly projects
- Digitized all production documentation and deployed a secure tablet-accessible server, improving workflow and traceability

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Van Dellen Steel West

Drafter / Detailer | 06/2015 – 01/2016

- Created fabrication-ready steel drawings using SDS/2 and ProNest, optimizing material use
- Designed retrofit cooler hangers and spring-loaded parking signs to resolve persistent safety and integration issues

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Arizona State University | Intel

Equipment Engineer | 11/2014 – 06/2015

- Developed a patented (US10468331B2) non-destructive electromigration test system for evaluating microelectronic solder joints
- Designed precision 50 µm joint hardware and a flexible platform for material screening

Zero Mass Labs

Solar System Engineer / Fabricator | 08/2014 – 12/2014

- Cut solar panel lead time and cost in half by redesigning assembly methods and replacing machining with advanced sheet metal techniques
- Reengineered production workflows for improved scalability

Arizona State Universtiy Dept. of Chemistry

Laboratory Research Assistant | 05/2010 – 08/2014

- Built custom deposition tools and seal systems for corrosive environments
- Installed lab infrastructure, developed waste systems, and authored control/data software for repeatable experimentation

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Education

Northern Arizona University

Degree earned: PhD

School: Applied Physics & Materials Science

Dissertation: TEM strain analysis of multimetallic nanomaterials

Graduated: 2024

Arizona State University

Degree earned: Master of Science

School: Ira Funton School of Engineering

Thesis: Strain in DMLS Inconel microstructure

Graduated: 2017

Degree earned: Bachelor of Science and Engineering

School: Ira Funton School of Engineering

Thesis: Strain in DMLS Inconel microstructure

Graduated: 2017

Patents

- US10468331B2 – Heat Management System — Intel Corp, 2018
- US10043720B2 – Interconnect Simulation & Characterization — ASU, 2016

Publications

- Rogers, B. et al. Decahedral Multimetallic Nanoparticles via CBED. PCCP, 2025
- Rogers, B. Structure and Strain Analysis.... ProQuest, 2025
- Rogers, B. et al. Anomalous Crystallization of Au and Other Metals. Crystal Research and Technology, 2023
- Velázquez Salazar, J. J., Rogers, B., et al. Pseudo Carbynes via Gold-Thiol Stabilization. Carbon, 2024
- Castañeda, J., Rogers, B., et al. Nanoclusters for Microswimmer Motility. Small, 2025