

Jake Bilyk, MS

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Multitalented scientist with strong background in laboratory and manufacturing facilities. Rapid learner of position-related concepts and methods. Pursues work environments that enhance profitability and quality of life. Proven ability to execute tasks leading to the success of multimillion dollar projects. Develops respectful relationships with coworkers, clients, vendors, and management that drive innovation alongside policy adherence.

Accomplishments

- Repaired priceless optics on the world's most scientifically productive optical-IR telescopes.
- Designed and manufactured custom components that assisted in SOP accuracy at two previous positions.
- Led Lean efforts at Pace Analytical that reduced paid-sample turnaround times by 12+ hours.
- Graduated with great distinction from UCSD while working part-time or full-time positions off-campus.
- Performed cutting-edge research of lithium-ion battery anodes during initial silicon-anode wave.

Skill Profile

Design of Experiments	Manufacturing Line	Precision Hardware	Inventory Management
Instrumental Analysis	Data Analysis	Vendor Relationship Management	Quality Control
Product Development	Lean & 5S Principles	CAPA and NC Documentation	Waste Management

Lab & Engineering Skills

Clean Room Manufacturing	Electrical Troubleshooting	Microsoft 365	Laboratory Awareness
Technical writing	CAD Modeling	Peer collaboration	R&D + Production
Programming	SOP Drafting	Safety Protocols	Analytical Chemistry
Board Presentations	Time Management	Research Innovation	Product Validation

Tools & Languages

XRD, SEM, BET, LC-MS	Pipettes, Cytometer	Glove Boxes, "Bunny Suits"	Micrometers, grinders
3D Printers, C/C++ basics	Machine Shop equipment	Front-End (JavaScript)	Python 3, MATLAB basics

Professional Experience

Scientist (PFAS, Analytical Chemistry) | Pace Analytical, Minneapolis MN October 2022 – August 2023

***Pace Analytical** is a nation-wide environmental testing company that produces reliable assays of many medias adherent to EPA and DOD policies.*

Played an important role in shrinking sample back-log by a factor of ten after the first two quarters. Quickly adopted role as waste management leader and automated disposal steps. Reported the Lean Daily Metrics to management and coordinated logistics of department installations. Improved process workflow while growing production output rate.

- Processed and analyzed client samples (water, solids, tissues) to quantify PFAS concentrations. Conducted EPA 537.1 solid phase extraction experiments and LC-MS preparation.
- Documented and recorded process variations during assessment of complex matrices. Coordinated with project managers to eliminate matrix related issues and instrument down-time.
- Redesigned portable vacuum systems and implemented safer standard handling practices. Added pre-emptive inspections and tests to extraction equipment that eliminated variations in technician productivity by ~4 hours.

Scientist (BD Biosciences, 6-mo Contract) | Becton-Dickinson, San Diego CA May 2021 – October 2021

***Becton-Dickinson** is a global medical device company that produces some of the world's hospital essentials and innovative biomedical reagents.*

Generated data that green-lit the consumer-scale production of eleven new antibodies. Worked long or odd hours to maximize instrument accessibility and cell vitality. Built new templates for capstone project that streamlined coherent analyses. Attended ~50% of optional overtime days to assist with packaging and shipping products.

- Followed documented procedures regarding precipitation experiments, cell culturing, tissue preparation/staining, cell media production, liquid nitrogen handling, and flow cytometer operation.
- Performed instrument maintenance and flow cytometry experiments for new product characterization.
- Executed relevant follow-up experiments to verify results or make informed experiment adjustments.
- Trained colleagues on instrument operation, software utilization, and presentation fundamentals.

Engineering Technician (Primary Optics) | WM Keck Observatory, Kamuela HI September 2016 – May 2020

WMKO is an educational institution which houses the world's most scientifically productive optical and infrared telescopes.

Successfully re-manufactured the glass-on-alloy mounts of Keck's primary mirror system. These priceless ZERODUR mirrors required aerospace-grade accuracy in the removal of fractures and installation of newly engineered parts. This position cultivated my knowledge in clean room etiquette, teamwork, and the definition of quality engineering.

- Mastered stepwise mechanical/chemical tasks with signed buyoffs and detailed notes under timed conditions.
- Interpreted engineering drawings and assembled critical mounting hardware using custom jigs, micro calipers, torque wrenches, machine levels, and surface preparation tools.
- Recorded micron-scale positions of mirror assembly components using Radian API Laser metrology package.
- Repeatedly inspected off-the-shelf parts and custom ordered components using microscope and comparator.
- Assisted in mirror recoating via HCl/CuSO₄ wash and operation of 10 kL flash deposition chamber.
- Spent full workdays in hazmat PPE when using hydrofluoric acid solutions to etch glass surfaces.
- Earned "Extra-Mile Award - 2017" for participating in rapid construction of clean room on Mauna Kea summit.

R&D Chemist (Silicon-anode LIBs) | 3M, Maplewood MN September 2015 – September 2016

3M is the well-known materials and manufacturing conglomerate. They have had a successful line of battery enhancement materials for decades.

Made strong conclusions about several parameters in the silicon-anode alloy of interest. Identified optimal anode thickness distribution leading to cycle-life stability. Probed performance of graphitized nano-silicon in novel alloy.

- Coordinated with supervisor via OneDrive to design cell experiments that investigated effects of electrolyte composition. Assembled dozens of cell batches for cycling studies and presented performance data.
- Operated JEOL JSM 700 series SEM to gather post-mortem anode structure imagery and interpreted EDX spectrum to validate cell-failure mechanisms.
- Synthesized electrode materials via ball-milling according to customer performance requirements.
- Successfully coated nano-Si particles with graphite/SiC via CVD process using ethene gas as carbon source and initiated coating optimization studies.
- Validated new lots of active material precursors and in-house alloys via XRD, BET, and electrochemical tests.

Other Relevant Positions

Lead Tutor STEM | College of St. Scholastica, Duluth MN 2013 – 2015

Analytical Chemistry TA | College of St. Scholastica, Duluth MN 2013 – 2015

Seasonal Maintenance Technician | City of Minneapolis, MN 2012 – 2015

Maintained healthy chemical composition of 10,000 hectoliter water park using SCADA and manual testing.

Research Assistant (Metal-Organic Framework Synthesis) | College of St. Scholastica, Duluth MN 2013 – 2014

Academics and Professional Training

Full-Stack Engineer Course, August 2023 – Present
www.codecademy.com/

Master of Science – Materials Engineering, 2022
University of California – San Diego, CA

Certified SolidWorks Associate, 2021
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Bachelor of Science – Chemistry, 2015
College of St. Scholastica – Duluth, MN

Memberships and Awards

American Chemical Society, 2012 – Present

CodeCademy Pro, 2021 – Present

Fusion360 Individual User, 2022 – Present

St. Timothy Kirby Social Justice Scholar, 2011 – 2015

Benedictine Merit Scholar, 2011 – 2015

St. Scholastica Football Team, 2011 – 2013