

Cash Ponce

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SUMMARY

Doctoral researcher in Materials Science and Engineering preparing for a new college graduate process engineering role in semiconductor and **display manufacturing**. Hands on research spans ALD, CVD, PVD, plasma etch, thin film measurement, hardware characterization, and structured process experiments. Designed controlled studies, collected chamber and film data, analyzed **process behavior**, and connected composition and structure with deposition conditions. Used XPS, XRD, and FTIR for material characterization, then documented findings through **technical reports**, experiment summaries, and research presentations. Applied **Root Cause Analysis** to abnormal results by reviewing run history, equipment status, sample handling, and measurement evidence. Coordinated with facility staff and suppliers under supervision, supported new materials and instrumentation, and communicated technical findings clearly. Prepared to contribute thoughtful experimentation, careful documentation, and practical customer support within semiconductor manufacturing operations.

EDUCATION

Doctor of Philosophy in Materials Science and Engineering 2026
Arizona State University GPA: 4.0 *Tempe, AZ*
Coursework: Semiconductor processing, materials characterization, experimental design, process engineering

Bachelor of Science in Chemical Engineering 2022
University of New Mexico GPA: 4.0 *Albuquerque, NM*
Coursework: Chemical process design, transport phenomena, thermodynamics, materials science

TECHNICAL SKILLS

- **Semiconductor Processes:** ALD, CVD, PVD, plasma etch
- **Material Characterization:** XPS, XRD, FTIR
- **Experimental Methods:** Design of experiments, controlled matrices, repeatability
- **Thin Film Analysis:** Film composition, film structure, process property relationships
- **Process Troubleshooting:** Root Cause Analysis, run history review, corrective actions
- **Hardware Evaluation:** Chamber systems, wafer preparation, equipment status
- **Data Analysis:** Statistical comparisons, data tables, technical plots
- **Technical Documentation:** Technical reports, experiment summaries, process diagrams
- **Presentation Tools:** Research presentations, findings reviews, technical briefings
- **Laboratory Operations:** Cleanroom safety, equipment scheduling, consumable tracking
- **Supplier Coordination:** Materials requests, equipment needs, vendor communication
- **Research Collaboration:** Faculty review, multidisciplinary teams, facility staff

SKILLS

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|-----------------------|--------------|---------------|-----------------------------|
| • Process Engineering | • Thin Films | • Plasma Etch | • Hardware Characterization |
| • Experimental Design | • ALD | • XPS | • Technical Reporting |
| • Data Analysis | • CVD | • XRD | • Customer Communication |
| • Root Cause Analysis | • PVD | • FTIR | |

EXPERIENCE

Doctoral Researcher, Semiconductor Process Engineering August 2023 - Present
University Research Lab *Tempe, AZ*

Conduct supervised semiconductor process research across ALD and CVD thin film experiments, **analytical instrumentation**, process troubleshooting, technical reporting, and supplier coordination. Supported faculty led development work with careful run planning, data review, and clear recommendations for follow up experiments.

- Designed supervised ALD and CVD experiments, defining wafer preparation and characterization plans for repeatable runs.
- Compared chamber and film data across controlled matrices, separating process variation from measurement noise for faculty review.
- Characterized thin films with XPS, XRD, and **FTIR**, linking composition and structure with deposition conditions.
- Applied **Root Cause Analysis** to abnormal films, reviewing hardware status, sample handling, and analytical evidence before confirmation tests.

- Prepared **technical reports**, experiment summaries, and **presentations** that clarified methods, findings, limitations, and next steps.
- Coordinated equipment and consumable needs with facility staff and **suppliers**, supporting new materials and analytical workflows.

Graduate Research Rotation, Plasma and Etch Processes

January 2023 - July 2023

Academic Research

Tempe, AZ

Completed supervised plasma and etch research involving patterned samples, chamber conditions, surface chemistry, metrology, and structured process troubleshooting. Delivered review ready data and **presentations** while coordinating laboratory scheduling, consumables, and reproducible documentation.

- Executed supervised plasma **etch** experiments, documenting recipes, chamber conditions, sample preparation, and post process observations.
- Compiled process data into tables and plots, comparing settings with measured profile and surface changes.
- Used **XPS** and complementary metrology to investigate surface chemistry after processing and explain unexpected results.
- Recorded suspected causes, evidence, corrective actions, and follow up checks during structured process troubleshooting.
- Presented experiment design, characterization methods, uncertainty, and implications during a university research review.
- Coordinated equipment scheduling, consumable tracking, and procedural updates with laboratory personnel for reproducible research.

Graduate Capstone Researcher, Thin Film Process Optimization

August 2022 - December 2022

Capstone Project

Tempe, AZ

Completed a graduate capstone focused on PVD thin film process optimization, traceable data collection, material characterization, outlier investigation, and technical communication. Converted experimental observations into practical recommendations for additional validation and **semiconductor** manufacturing relevance.

- Built a **PVD** study around process optimization, defining factors, characterization methods, and evaluation criteria.
- Produced controlled test films with identifiers, run conditions, measurements, and quality observations for traceable analysis.
- Evaluated film properties with **XRD** and FTIR, comparing responses across deposition conditions and instrument limits.
- Investigated an outlier run through **Root Cause Analysis** covering target condition, substrate preparation, and measurement repeatability.
- Authored a technical report with process diagrams, methods, characterization results, interpretation, and validation recommendations.
- Presented process findings to faculty and peers, answering questions about measurement confidence and manufacturing relevance.

PROJECTS

Integrated Thin Film Characterization Study 📅 2025

Connected ALD and CVD deposition conditions with film composition and structure using XPS, XRD, and FTIR. Careful data review made follow up experiments easier for research collaborators.

Plasma Surface Chemistry Investigation 📅 2023

Investigated surface changes after plasma etch processing through XPS and complementary metrology. Findings gave laboratory reviewers a clearer path for checking unexpected process behavior.

LEADERSHIP & AWARDS

- Graduate Research Fellowship, 2024
- Materials Research Poster Recognition, 2025
- Graduate Student Research Symposium Finalist, 2026

CERTIFICATIONS

- Semiconductor Processing and Cleanroom Safety 📅 2023
- X Ray Photoelectron Spectroscopy User Training 📅 2024
- X Ray Diffraction Instrument User Training 📅 2024

PROFESSIONAL AFFILIATIONS

- Graduate Materials Research Peer Mentor, Arizona State University
- Semiconductor Research Seminar Student Coordinator
- Graduate Research Safety Representative

LANGUAGES

- English (Native)
- Spanish (Intermediate)

ADDITIONAL INFORMATION

Work Status : Authorized to work in United States. No sponsorship required.

REFERENCES

AVAILABLE ON REQUEST