ANDREA WATSON

Leesburg, VA | awatson4586@gmail.com | (571) 370-6477 | linkedin.com/in/andrea-l-watson

EDUCATION

University of Virginia, School of Engineering and Applied Science, Charlottesville, VA ***August 2022 - May 2026***

B.S. Materials Science and Engineering

- Minor: Chemistry
- GPA : 3.87 / 4.0
- Relevant Course Work: Origins of Mechanical Behavior; Materials Processing; Statics; Organic Chemistry I / II; Materials for Electronic, Magnetic, and Optical Applications; Structures/Defects of Materials; Corrosion, Batteries, and Fuel Cells; Physical Chemistry – Quantum Theory; Sustainable Energy Systems; Applied Statistics and Probability; Thermodynamics of Materials; Physics I / II
- Achievements: A. Thomas Young Scholarship Recipient, Dean's List Fall 2022 - Spring 2025
- Senior Project: Collaborated with a small team to enhance and characterize environmental barrier coating adhesion through rapid pulse laser surface texturing and annealing. Determined whether laser surface texturing affects coating chemistry for aerospace applications

EXPERIENCE

Undergraduate Research Assistant, **Multi-Functional Thin Film (Ihlefeld) Group,** Charlottesville, VA ***January 2025 - Present***

- Co-Author, "Effect of Precursor Purge Time on Plasma Enhanced Atomic Layer Deposition-Prepared Ferroelectric $Hf_{0.5}Zr_{0.5}O_2$ Phase and Performance," ACS Omega 2025, 10, Article Pages: 20526, 20531
- Fabricated ferroelectric – oxide interfaces using atomic layer deposition, DC magnetron sputtering, and rapid thermal annealing techniques in order to determine correlations between proximity ferroelectricity and varying processing conditions
- Analyzed phase compositions of hafnium zirconium oxide thin films deposited on silicon substrates utilizing x-ray diffraction and FTIR
- Organized and maintained detailed process inventories and experimental records

Tutor, **UVA School of Engineering Undergraduate Programs,** Charlottesville, VA ***August 2024 - Present***

- Formulated and lead 50 tutoring sessions; assessed areas of improvement, clarified complex topics, and developed corresponding study plans in order to encourage success in Chemistry, Physics I / II, and Calculus I / II / III

Materials Engineering Intern, **Rolls-Royce Corporation,** Indianapolis, IN ***May 2025 - August 2025***

- Created and ran etchant test matrix of additively manufactured (ALM) and forged nickel superalloy samples processed with varying heat treatments. Used findings to create an etchant laboratory procedure to improve metallographic evaluation efficiency
- Collected data on thermal spray abradable coatings and interviewed subject matter experts to rewrite laboratory procedures, increasing the speed and accuracy of thermal spraying coating interface evaluations
- Performed metallurgical sample preparation including sectioning, mounting, polishing, etching for microstructural analysis via light microscopy and scanning electron microscopy (SEM)
- Executed and recorded evaluations of aerospace components within technical reports to support process development
- Generated a value stream map of non-destructive evaluation (NDE) critical part documentation to record tribal knowledge and standardize processing

Undergraduate Research Assistant, **Semiconductor (McDonnell) Group,** Charlottesville, VA ***August 2023 - December 2024***

- Developed and characterized metallic-oxide thin film interfaces utilizing atomic layer deposition at varying precursor pulse times. Established correlations between processing conditions and material composition
- Conducted sheet resistance tests and analyzed x-ray photoelectron spectroscopy (XPS) data of samples using KolXPD to determine conductivity, fit experimental data and calculate material composition and uncertainties
- Researched scientific literature in order to interpret acquired experimental data and develop conclusions on mechanisms responsible for correlations between processing conditions and chemical composition
- Collaborated with a small team of graduate students at California State University, Fullerton and presented experimental data and key findings to the Army Research Laboratory

EXTRA CURRICULAR ACTIVITIES

Educational Outreach Lead, **Sustainability Committee,** Charlottesville, VA ***August 2024 - Present***

- Programmed and led educational events on sustainability-related topics and current events within Hereford residential college in order to foster mindfulness within the student population, supporting the 2030 UVA Sustainability Plan

School Visitation Group Leader, **Society of Women Engineers,** Charlottesville, VA ***September 2024 - Present***

- Guided 75 high school and middle school students through UVA engineering facilities to spark interest in STEM fields

SKILLS SUMMARY

- Laboratory Techniques: X-Ray Diffraction (XRD), X-Ray Photoelectron Spectroscopy (XPS), Scanning Electron Microscopy (SEM), Energy Dispersive Spectroscopy (EDS), Light Microscopy, Metallographic Sample Preparation, FTIR spectroscopy, Profilometry
- Processing Techniques: Atomic Layer Deposition, Magnetron Sputtering (Physical Vapor Deposition), Rapid Thermal Annealing, Electrochemical Plating
- Technical Skills: Microsoft Office (Excel, Word, Powerpoint), Java, MATLAB, KolXPD, AutoCAD