Xander Linzel

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Education

University of Waterloo **In Progress**

Bachelor of Applied Science in Nanotechnology Engineering *94.59% GPA: 3.99/4.0*

Relevant Skills

Equipment: SEM, Optical Microscopy, Spectroscopy (Raman, FTIR, UV-Vis), X-Ray Diffraction, Ellipsometry, Oscilloscope, Soldering.

Technical: Laser Systems, Bio/Organic Chemistry Techniques, Fiber Optics, Ultra-fast Pulse Lasers, Photonics Research, Nanofabrication, Polarization Quantum Systems, Robotic Systems Design

Software: Fusion, SolidWorks, Ansys, AutoCAD, Linux, Git, Lumerical, Zemax, FEMM.

Programming: C/C++, Python, MATLAB, Pytorch, Tensorflow, OpenGL, VBA.

Experience

Irradiant Technologies **Sept 2025 - Present**

Photochemistry and Optical Design R&D Engineer *Boston, Massachusetts*

- Developed and optimized photosensitive silver reduction material platforms, investigating chromophore photophysics, and thermoviscosity modulation for high-resolution 3D lithography and nanofabrication.
- Operated, debugged, and maintained advanced two-photon lithography systems for direct laser writing, troubleshooting optical alignment, beam delivery, and photochemical process parameters to achieve high-resolution 3D printing in photosensitive media.
- Designed and constructed Class 4 laser assemblies and optical systems, integrating precision optics and focusing assemblies components for femtosecond laser-based nanofabrication applications.

IQC - Nano-Photonics and Quantum Optics Laboratory **Sept 2024 - Present**

Research Assistant *Waterloo, Ontario*

- Led the design and fabrication of Bragg gratings inside hollow-core photonic crystal fibers to enhance slow-light effects and light-matter interactions for quantum repeater photon memory systems.
- Developed femtosecond laser irradiation techniques to modify the refractive index of optical materials, leveraging multi-photon and avalanche ionization for precision microstructuring.
- Designed and fabricated a dual-beam Dichroic Atomic Vapor Laser Lock (DAVLL) using cesium vapor, achieving precise infrared laser frequency stabilization.

KM-RoBoTa SA **May 2024 - Sept 2024**

Intern, Electromechanical Design *Renens, Switzerland*

- Independently designed, and constructed an advanced 2-meter robotic system, successfully replicating the unique locomotion biomechanics of an extinct species for evolutionary biorobotics research.
- Played a key role in the design, control, and biomechanical evaluation of a multi-million dollar robotic system and two additional systems, ensuring accurate replication of extinct and extant species' locomotion for commercial and research applications.

Projects

UWSiO - Founder and Team Lead **Dec 2023 - Present**

- Founded and led a design team of 21 nanotechnology engineers, focused on the development of optical data storage in fused silica glass using femtosecond laser lithography and birefringent voxel encoding.
- Designed a Class 4 femtosecond laser system and developed an integrated lithography platform, implementing custom software for binary to multidimensional data encoding through two-photon absorption and precision optical assemblies.

Awards

First in Class Engineering Scholarship **Jan 2025**

Awarded to the top student in each engineering cohort based on academic performance.

University of Waterloo President's Scholarship of Distinction **Sept 2023**

Overall application average of 95 percent or greater.

President's Research Award **Feb 2025**