

Matías Straub Martínez

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EDUCATION

The University of Arizona, W.A. Franke Honors College | Tucson, AZ

Major: Optical Sciences & Engineering

May 2027

Relevant Courses: Geometrical and Physical Optics, Lens Design, Radiometry, Semiconductor Physics, Optics Laboratory

RESEARCH & INDUSTRY EXPERIENCE

ZEISS Semiconductor Manufacturing Technology | Optomechanical Intern | Germany May - August 2026

- Investigated dynamic projection-optics architectures by analyzing and redesigning optomechanical components in CREO Parametric
- Implemented a thermomechanical deformation-compensation algorithm for semiconductor substrates in MATLAB, and assessed feasibility of the method through Ansys finite-element simulations and parameter studies on representative application examples

Soft Nanophotonics Systems Lab | Undergraduate Researcher | Tucson, AZ December 2023 - Present

- Designed and aligned a spatial light modulator (SLM) system to generate multiple optical traps for integration into an optical tweezers setup
- Developed a MATLAB-based graphical user interface for a Discrete Dipole Approximation (DDA) code to simulate light scattering; publishing the tool on nanoHUB.org to expand access to nanophotonic modeling

Exp. Ultrasound and Neural Imaging Lab | Undergraduate Researcher | Tucson, AZ August 2025 - May 2026

- Aligned and integrated laser, fiber coupling, objective lens, and ultrasound transducer elements for a photoacoustic microscopy system to enable high-resolution imaging

Optical Engineering / Data Science Intern | Topcon Healthcare | Milpitas, CA June - August 2025

- Developed and experimentally validated an OCT spectrometer calibration workflow in MATLAB, improving axial accuracy by 15% through wavelength remapping
- Conducted a market analysis for Topcon's IDHea by identifying high-demand ophthalmic datasets through SQL- and Python-based data pipelines; guiding dataset strategy for commercial AI applications

PROJECTS

High-NA Microscope Objective Design for 3D Optical Data Storage | University of Arizona Spring 2026

- Designed and optimized a high-NA microscope objective in CODE V for voxel-level reading and writing in 3D optical data storage, based on Microsoft's Project Silica architecture
- Developed depth-dependent spherical aberration correction to maintain optical performance across the storage volume; project received the Keysight Robert S. Hilbert Memorial Award for excellence in optical design

Optical Spectrometer Design and Implementation | University of Arizona Fall 2025

- Led optical design calculations for a custom diffraction-grating spectrometer, including grating angle selection and wavelength dispersion, within a five-person experimental optics team
- Executed primary optical setup and alignment, achieving a functional visible-light spectrometer with a resolving power of 10

Arduino Solar Tracker | University of Arizona November 2023

- Designed and 3D printed a solar tracker using an Arduino and optical parts, collaborating with a team of three
- Project received the SRP Innovation Award for optical design contributions

TECHNICAL SKILLS

Programming and Data Analysis: MATLAB, Python, C++, Excel, LaTeX

Optical and Mechanical Design: CODE V, Zemax, SolidWorks, Ansys Mechanical, CREO, Mastercam, Additive Mfg.

Languages: English, Spanish, German