

Isabella Aguilera Cuenca

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EDUCATION

Wyant College of Optical Sciences, University of Arizona

Tucson, USA | 2023 - Present

PHD IN OPTICAL SCIENCES

Research Focus: Biomedical Optics. Polarimetry. Optical Coherence Tomography. Diffusion Magnetic Resonance Imaging.

Advisor: Dr. Travis Sawyer.

Universidad del Valle

Cali, CO | 2018 - 2023

B.S IN PHYSICS

Thesis: Characterizing Optical Scattering of Stable Intralipid Infused Tissue Phantoms Using Imaging Sensors.

Advisor: Prof. Efraín Solarte Rodríguez Dr.rer.nat.

RESEARCH EXPERIENCE

BIOMEDICAL OPTICS AND OPTICAL MEASUREMENT LAB | U. ARIZONA

Tucson, USA | Jan 2024 - Present

- Conduct collaborative research with the Multi-Scale Brain Imaging Lab, led by Dr. Elizabeth Hutchinson, to evaluate microstructural properties of brain tissue using Polarization-Sensitive Optical Coherence Tomography and Diffusion Magnetic Resonance Imaging.
- Apply imaging techniques such as Optical Coherence Tomography and Brightfield Microscopy to image and assess properties of liquid crystal phantoms.

QUANTUM OPTICS RESEARCH GROUP | U. DEL VALLE

Cali, CO | Feb 2022 – Jul 2023

- Designed and carried out experiments employing optical spectroscopy techniques to study biological systems.
- **Research Projects:**
 - Spectroscopy characterization of white blood cells.
 - Optical characterization of insular and continental populations of the diurnal Lepidoptera *Heliconius sara* to examine the potential for evolutionary fractionation.

GLOBALINK RESEARCH INTERNSHIP | SFU

Burnaby, CAN | May 2023 - Jul 2023

Offered by the Canadian organization MITACS to work on the project *Seeing through Tissue Using Lasers and Micromachined Devices* under the supervision of Dr. Glenn Chapman at Simon Fraser University in Canada.

- Designed and constructed an optical set-up to measure scattering characteristics of test phantoms at various wavelengths using lasers and a DSLR camera.
- Collected, processed and analyzed data using the Matlab software to calculate scattering coefficients of the samples at each wavelength.

ACADEMIC DISTINCTIONS

- **Academic honors** awarded by Universidad del Valle for being among the best 5 students of the Physics program in the corresponding cohort during the 2018-II, 2020-II, 2021-II and 2022-I academic terms.
- **Academic Excellence Scholarship** awarded by Coopetrol Cooperative 2020-2022.
- **OPTICA WOMAN SCHOLAR 2023.** (*Internationally competitive award*) Recipient of the Optica Women Scholars scholarship awarded by the Optica Foundation. This program recognizes the work of 20 undergraduate and master's level students from all over the world who focus their careers on optics.
- **James C. Wyant Graduate Student Scholarship in Optical Sciences** 2023-2024.
- **John P. Schaefer Graduate Student Scholarship** 2023-2024.

CONFERENCE PROCEEDINGS

- Glenn H. Chapman, **Isabella Aguilera**, and Matthew Schilling. “Fast scattering coefficient measurement of intralipid-infused tissue phantoms using imaging sensors”, Proc. SPIE 12840, Optical Interactions with Tissue and Cells XXXV, 1284002 (12 March 2024); <https://doi.org/10.1117/12.3003941>.
- **Isabella Aguilera**, Elizabeth Hutchinson, and Travis Sawyer. “Estimation and Comparison of Brainstem Fiber Orientation Via Diffusion MRI Tractography and Polarization Sensitive Optical Coherence Tomography”, *Frontiers in Optics + Laser Science* (September 2024). Accepted for publication.

POSTER AND ORAL PRESENTATIONS

- **Isabella Aguilera**, Danielle Ochoa, Raúl Sedano and Efraín Solarte. *XXIX Physics National Congress, Armenia, Colombia, September 2022*. “Optical characterization, using LASER or LED sources, of insular and continental populations of the diurnal Lepidoptera *Heliconius sara* to examine the potential for evolutionary fractionation.” (Poster).
- **Isabella Aguilera**, Danielle Ochoa, Raúl Sedano and Efraín Solarte. *10th International Symposium “Optics & its Applications”, Cali-Armenia, Colombia, December 2022*. “Optical characterization, using LASER or LED sources, of insular and continental populations of the diurnal Lepidoptera *Heliconius sara* to examine the potential for evolutionary fractionation.” (Poster).
- **Isabella Aguilera**, Danielle Ochoa, Raúl Sedano and Efraín Solarte. *Iberoamerican Congress of Physics Students, Virtual Congress, December 2022*. “Optical characterization, using LASER or LED sources, of insular and continental populations of the diurnal Lepidoptera *Heliconius sara* to examine the potential for evolutionary fractionation.” (Poster).
- **Isabella Aguilera**. *Invited speaker with virtual presentation at “Fotónica: La Tecnología de la Luz” Congress, Universidad de Guadalajara, Mexico, May 2023*. “Óptica al alcance de todos: La divulgación como herramienta de conocimiento y oportunidades.” (Oral).

OUTREACH AND LEADERSHIP ACTIVITIES

WOMEN IN OPTICS | Vicepresident, U. ARIZONA

Tucson, USA | April 2024 - Present

- Support the group’s leadership and oversee the various committees to ensure they function correctly and collaboratively.
- Manage WiO’s social media.

WOMEN IN OPTICS | Event lead coordinator, U. ARIZONA

Tucson, USA | Sep 2023 - March 2024

- Coordinated events throughout the 2023-2024 academic year to promote diversity and inclusion in the optics community, strengthening the network among college members and with national and international optics student chapters.
- Managed WiO’s social media.

OPTICA AND SPIE STUDENT CHAPTER (CUVO) | President, U. DEL VALLE

Cali, CO | Jan 2022 - Dec 2022

- Organized events and projects that focus on science outreach in optics and photonics for science students and the community in general such as school visits, seminars, contests and workshops; as well as professional events along with other OPTICA and SPIE student chapters across the country.
- Coordinated and hosted the 7th International Advanced School on “Frontiers in Optics & Photonics”, and the National OPTICA and SPIE Chapters Meeting 2022.
- Co-organized and hosted the International Centre for Theoretical Physics (ICTP) event, 10th International Symposium “Optics & its Applications”, which held place in Cali on December 2022.

PHYSICS STUDENTS GROUP (GEF) | President, U. DEL VALLE

Cali, CO | Nov 2021 - Dec 2022

- Organized activities for the physics undergraduate students in order to promote different academic opportunities, offer mentorship and create a strong student support network to avoid academic drop out.

- Coordinated the GEF salon offered to students for them to have group study sessions, additional classes and general academic activities.

OPTICA AND SPIE STUDENT CHAPTER (CUVO) | Secretary, U.DEL VALLE Cali, CO | Jan 2020 – Dec 2021

- Participated in the organization of events and projects that focus on science outreach, as well as formal and informal meetings between young scientists interested in optics and professionals in the field.

TEACHING AND MENTORING EXPERIENCE

ASES STRATEGY | Mentor, U. DEL VALLE Cali, CO | Aug 2021 – Nov 2021

- Offered social-academic mentorship to physics students belonging to social government programs focused on vulnerable populations in order to assist and decrease academic drop out.

CALCULUS I COURSE | Teaching Assistant, U. DEL VALLE Cali, CO | Dec 2021 – Jan 2023

- Mentored students in the Calculus I course offered to all the Natural and Exact Sciences Faculty (Physics, Mathematics, Chemistry and Biology).
- Created student evaluation problems in the course's virtual platform with Moodle using LaTeX and Mathematica.

MEMBERSHIPS

OPTICA (FORMERLY OSA) | STUDENT MEMBER | 2019 - Present

SPIE | STUDENT MEMBER | 2019 - Present

SKILLS

Programming Languages: C, C++, MatLab

Operative Systems: Linux and Windows

Software: Gnuplot, \LaTeX , Mathematica

LANGUAGES

Spanish: Native language

English: Proficient reading, writing and speaking