Travis Sawyer

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EXPERTISE	Biomedical optics, spectral imaging, spatial frequency domain imaging, polarimetry, optical coherence tomography, endoscopy, microscopy, optical design, software administration, algorithm development

EDUCATION

PhD in Optical Sciences, University of Arizona	2021
MS in Optical Sciences, University of Arizona	2019
MPhil in Physics, University of Cambridge	2018
BS in Optical Sciences and Engineering, University of Arizona	2016

ACADEMIC APPOINTMENTS

University of Arizona, Tucson, Arizona

Assistant Professor of Optical Sciences and Health Sciences	2021 – Present
Assistant Professor of Health Sciences	2021 – Present
Assistant Research Professor of Medicine	2021 – Present
Member, Cancer Prevention and Control Program, UA Cancer Center	2021 – Present

ACADEMIC TRAINING

University of Arizona, Tucson, Arizona

NSF Graduate Research Fellow, Tissue Optics Lab — Mar 2017 – May 2021
- Supervisor: Dr. Jennifer Barton
- Research areas: Biomedical optics, endoscopy, optical coherence tomography, fluorescence imaging
- Designed clinical cancer screening devices using optical coherence tomography and fluorescence imaging.
- Used Python to develop algorithms to correctly classify cancerous tissue of the ovaries with over 75% accuracy.

University of Cambridge, Cambridge, United Kingdom

Visiting Researcher, Department of Physics — Jun 2018 – Present

Graduate Research Assistant, Department of Physics — Aug 2016 – Jun 2018
- Supervisor: Dr. Sarah Bohndiek
- Research areas: Hyperspectral imaging, phase imaging, polarimetry, spatial frequency domain imaging
- Developed hyperspectral and polarization imaging systems for clinical imaging to detect cancer.
- Designed filter-based hyperspectral sensors to optimize spatial & spectral resolution.

Korean Advanced Institute for Science and Technology, Daejeon, South Korea

Visiting Researcher — Feb 2020 – Aug 2020
- Supervisor: Dr. Hongki Yoo
- Research areas: Optical coherence tomography, fluorescence lifetime imaging, mechanics, testing
- Develop, assemble, and test a miniature endoscope using optical coherence tomography and near-infrared fluorescence lifetime imaging for coronary artery disease screening.

Yale University, New Haven, Connecticut

Research Assistant, Exoplanet Lab, Astronomy Department — Jun 2016 – Sep 2016
- Supervisor: Dr. Debra Fischer
- Research areas: Optical design, spectroscopy, algorithm design, statistical analysis.
- Developed the calibration optics and software for a $4M spectrograph instrument (EXPRES) to identify exoplanets with high precision (5 cm/s radial velocity).
- Designed and calibrated a custom LED light source to produce spectrally-uniform light for flat-fielding.

University of Arizona, Tucson, Arizona

Research Assistant, Erdmann Research Group — Dec 2012 – Feb 2016
- Supervisor: Dr. Robert Erdmann
- Research areas: Image processing, algorithm design, software development, applied mathematics.
- Created machine learning software using Python and parallel computing for automatic feature detection and recognition in paintings, leading to over two dozen presentations and several painting authentications.

University of Stuttgart, Stuttgart, Germany

Research Assistant, Institute of Applied Optics   Jun 2014 – Aug 2014
- Supervisor: Dr. Alois Herkommer
- Research areas: Optical design, illumination design, data analysis, mathematical modeling.
- Designed and analyzed freeform laser illumination systems, resulting in a method to determine aberrations introduced by each freeform optical surface.

INDUSTRY EXPERIENCE

Alphacore, Inc., Phoenix, Arizona

Optical Engineer   Aug 2019 – Present
- Used Zemax OpticStudio to simulate time-of-flight and LIDAR optical systems to evaluate signal acquisition.
- Designed algorithms to facilitate imaging through turbid media such as atmospheric turbulence.
- Developed algorithms to recover position and orientation information of an object using LIDAR data.

Rigaku Analytical Devices, Wilmington, Massachusetts

Consultant / Optical Engineer   May 2016 – Sep 2016
- Conducted stray light analysis using FRED to design 3D-printed light baffle for a miniature spectrometer.
- Engineered the calibration and data reduction algorithms for laser-induced breakdown spectroscopy.

Bosch Research and Conservation Project, Amsterdam, Netherlands

Software engineer, Systems administrator   Mar 2014 – Feb 2016
- Developed software to analyze and visualize high resolution imagery using infrared, x-ray and visible light.
- Responsible for systems administration including the maintenance of a mysql database and apache server.
- Designed web-based viewing software to dynamically register multiple images and eliminate the need for manual registration.

RESEARCH GRANTS

University of Arizona Cancer Center CRTEC Grant ($575)	2021
SPIE Student Author Conference Support Grant ($170)	2021
NSF GROW (approx. $17,000)	2019
Edmund Optics Educational Award ($7,500)	2019
ASLMS Student Research Grant ($5,000)	2019
GPSC Research and Project Grant ($991.04)	2019
NSF GRFP Travel Grant ($500)	2018,2019
University Fellows Travel Grant ($500)	2018
GPSC Travel Grant ($750, $1,000)	2017,2018
University of Cambridge Winton Programme Pump Prime Grant (approx. $32,500)	2017
Churchill Scholar Special Research Grant ($2,000)	2016
Honors College Research Grant ($2,000)	2014

SCHOLARSHIPS, FELLOWSHIPS, AWARDS

GRADUATE

Valedictorian	2021
ARCS Scholarship ($10,500)	2019 – 2021
*NSF Graduate Research Fellowship ($48,961 per year for 3 years)	2017 – 2021
Student Interface Award for Teaching in Optical Sciences	2020
SPIE Education Scholarship ($4,000)	2019
Paul A. Bonenfant Memorial Scholarship ($8,000)	2019
Outstanding Research Assistant Award ($500)	2019
Southwest Regional Grad Slam 1st Prize ($3,000)	2018
University of Arizona Grad Slam 2nd Prize ($2,000)	2018
University of Arizona Student Showcase First Prize, Graduate Research ($750)	2018
University Fellowship ($46,348)	2017
*John Kiel Scholarship ($10,000)	2017
Shell Research Prize (approx. $3,900)	2017
SPIE Student Travel Scholarship ($2,000)	2016
*Churchill Scholarship (approx. $48,000)	2016

*Nationally competitive award

UNDERGRADUATE

Valedictorian	2016
Robie Gold Medal Award ($1000)	2016
Honors College Outstanding Senior Award ($500)	2016
*Astronaut Scholarship ($10,000 per year)	2014, 2015
*Barry Goldwater Scholarship ($7,500)	2015
Robert S. Hilbert Memorial Optical Design Competition ($800)	2015
John E. Greivenkamp Endowed Scholarship ($750)	2015
Pillars of Excellence Award	2015
Jack D. Gaskill Scholarship in Optical Sciences ($3,000)	2014
SPIE Optics and Photonics Education Scholarship ($2,000)	2014
Departmental Honors in Optical Sciences	2013, 2015
John E. Tipton Scholarship in Optical Sciences ($3,000)	2013

*Nationally competitive award

PUBLICATIONS

JOURNAL (PEER-REVIEWED)

[20] **T. Sawyer**,G. V. Hutchens, C. C. Howard, P. S. Rice, D. G. Besselsen, M. Slayton, J. K. Barton. Multiphoton microscopy assessment of healing from tendon laceration and microthermal coagula. *Las. Surg. Med.* (2021). [In Preparation]

[19] **T. Sawyer**, Taylor-Williams M., R. Tao, R. Xia, C. Williams, and S. Bohndiek. Opti-MSFA: A toolbox for generalized design and optimization of multispectral filter arrays *Opt. Exp.* (2021). [In Preparation]

[18] M. Taylor-Williams, S. Mead, **T. Sawyer**, L. Hacker, C. Williams, and S. Bohndiek. Oxygenation imaging of nailfold capillaries using multispectral LED illumination *J. Biomed. Opt.* (2021). [In Preparation]

[17] D. Schwartz, **T. Sawyer**, N. Thurston, J. Barton, and G. Ditzler. In-vivo Ovarian Cancer Detection Using Optical Coherence Tomography and Deep Neural Networks. *Neural. Comput. Appl.* (2021). [In Review]

[16] K. Kiekens, D. Vega, H. Thurgood, D. Galvez, D. McGregor, **T. Sawyer**, and J. Barton. Effect of an added mass on the vibrational characteristics for raster scanning of a cantilevered optical fiber. *ASME J. Med. Diagost.* 4(2), 021007 (2021).

[15] D. M. Sawyer, **T. Sawyer**, N. Eshghi, and P. Kuo. Pilot Study: Texture analysis of PET imaging demonstrates changes in 18F-FDG uptake of the brain after prophylactic cranial irradiation. *J. Nuc. Med. Tech.* 48(4), (2020).

[14] C. Fitzpatrick, A. Wilson, **T. Sawyer**, T. Wilkinson, S. Bohndiek, and G. Gordon. Robustness to misalignment of low-cost, compact wide-field quantitative phase imaging architectures. *OSA Cont.* 3(10), 2660-2679 (2020).

[13] D. Vega, **T. Sawyer**, N. Pham, and J. Barton. Use of embedded and patterned dichroic surfaces with optical power to enable multiple optical paths in micro-endoscope systems. *App. Opt.* 59(22), G71-G78 (2020).

[12] **T. Sawyer**, J. Koevary, C. Howard, O. Austin, P. Rice, G. Hutchens, S. Chambers, D. Connolly, and J. Barton. Fluorescence and Multiphoton Imaging For Characterization of a Model of Post-Menopausal, Spontaneous Ovarian Cancer *L. Surg. Med.* 52(10), 993-1009 (2020).

[11] R. Blackman, D. Fischer, C. Jurgenson, D. Sawyer, T. McCracken, A. Szymkowiak, R. Petersburg, J. Ong, J. Brewer, L. Zhao, C. Leet, L. Buchhave, R. Tronsgaard, J. Llama, **T. Sawyer**, M. Shao, R. Trahan, B. Nemati, M. Genoni, G. Pariana, M. Riva, P. Fournier, R. Pawluczyk, A. Davis, and S. Cabot. Performance Verification of the Extreme Precision Spectrograph. *Astron. J.* 153(9), (2020).

[10] G. Gordon, J. Joseph, M. Alcolea, **T. Sawyer**, C. Williams, C. Fitzpatrick, P. Jones, M. di Pietro R. Fitzgerald, T. Wilkenson, S. Bohndiek. Quantitative phase and polarisation imaging through an optical fibre applied to detection of early esophageal tumourigenesis. *J. Biomed. Opt.* 24(12), 126004 (2019).

[9] **T. Sawyer**, J. Koevary, P. Rice, C. Howard, O. Austin, D. Connolly, Q. Cai, and J. Barton. Quantification of multiphoton and fluorescence images of reproductive tissues from a mouse ovarian cancer model shows promise for early disease detection. *J. Biomed. Opt.* 24(9), 096010 (2019).

[8] G. Gordon, J. Joseph, **T. Sawyer**, A. Macfaden, C. Williams, T. Wilkinson, and S. Bohndiek Full-field quantitative phase and polarisation-resolved imaging through a flexible fibre bundle. *Opt. Exp.* 27(17), 23929-47 (2019).

[7] **T. Sawyer**, P. Rice, D. Sawyer, J. Koevary, and J. Barton. Evaluation of segmentation algorithms for optical coherence tomography images of the ovaries. *J. Med. Imag.* 6(1), 014002 (2019).

[6] **T. Sawyer**, S. Chandra, P. Rice, J. Koevary, and J. Barton. Three-dimensional texture analysis for optical coherence tomography images of ovarian tissue. *Phys. Med. Biol.* 63(23), 235020 (2018).

[5] **T. Sawyer**. Alignment of sensor arrays in optical instruments using a geometric approach. *App. Opt.* 57(4), 794-801 (2018).

[4] **T. Sawyer**, K. Hawkins, and M. Damento. Using confidence intervals to evaluate the focus alignment of spectrograph detector arrays. *App. Opt.* 56(18), 5295-5300 (2017).

[3] **T. Sawyer**, R. Petersburg, and S. Bohndiek. Tolerancing the alignment of large-core optical fibers, fiber bundles and light guides using a Fourier approach. *App. Opt.* 56(12), 3303-10 (2017).

[2] **T. Sawyer**, A. Siri Luthman, and S. Bohndiek. Evaluation of illumination systems for biomedical hyperspectral imaging. *J. Opt.* 19(4), 045301 (2017).

[1] R. Erdmann, C. Johnson, M. Schafer, J. Twilley, and **T. Sawyer**. Reuniting Poussin's Bacchanals Painted for Cardinal Richelieu through Quantitative Canvas Weave Analysis. *J. Amer. Inst. Conserv.* (2013).

CONFERENCE PROCEEDINGS

[16] **T. Sawyer**, E. Salcin, A. Diaz, and J .Friedman. Using principle component analysis to estimate geometric parameters from point cloud LIDAR data. Proc SPIE 1170403 (2021).

[15] E. Salcin, A. Diaz, **T. Sawyer**, and J. Friedman. Extraction of precise object orientation and position from LIDAR data using maximum-likelihood methods. Proc SPIE 1174404 (2021).

[14] **T. Sawyer**, and J. Barton. Enabling high-throughput autofluorescent spectroscopy of biomarkers with liquid crystal polarization gratings. Proc SPIE 11647 (2021).

[13] M. Taylor-Williams, S. Mead, **T. Sawyer**, C. Williams, M. Berks, A. Murray, and S. Bohndiek. A low-cost LED-based multispectral capillaroscopy system for oximetry of the nailfold. Proc. SPIE 11651 (2021).

[12] S. Santaniello, P. Rice, **T. Sawyer**, and J. Barton. Multispectral fluorescence imaging of murine ovarian tissue for the characterization and classification of early-stage ovarian cancer. Proc. SPIE 11655 (2021).

[11] **T. Sawyer**, and J. Barton. Liquid Crystal Polarization Grating Spectroscopy for Measuring Tissue Autofluorescence. ASLMS Annual Conference (2020).

[10] J. Yoon, G. Gordon, **T. Sawyer**, and S. Bohndiek. Development of a clinical multimodal imaging system for rapid characterisation of intrinsic optical properties of freshly excised tissues. Proc. SPIE 11232 (2020).

[9] **T. Sawyer**, C. Williams, and S. Bohndiek. Spectral Band Selection and Tolerancing for Multispectral Filter Arrays. OSA Technical Digest (2019).

[8] **T. Sawyer**, J. Koevary, P. Rice, and J. Barton. In vivo optical coherence tomography of a mouse model of spontaneous ovarian cancer. Proc. SPIE 11073 (2019).

[7] J. Barton, J. Koevary, P. S. Rice, and **T. Sawyer**. Endogenous and exogenous contrast mechanisms for detection of ovarian cancer. OSA Technical Digest (2019).

[6] **T. Sawyer**, J. Koevary, P. Rice, and J. Barton. Fluorescence and Multiphoton Imaging of a Mouse Model of Spontaneous Ovarian Cancer. OSA Technical Digest (2019).

[5] **T. Sawyer**, P. Rice, J. Koevary, D. Connolly, Q. Cai, and J. Barton. In vivo multiphoton imaging of an ovarian cancer mouse model. Proc. SPIE 10856 (2019).

[4] **T. Sawyer**, P. Rice, D. Sawyer, J. Koevary, and J. Barton. Evaluation of segmentation algorithms for optical coherence tomography images of ovarian tissue. Proc. SPIE 10472 (2018).

[3] C. Fitzpatrick, **T. Sawyer**, and S. Bohndiek. Wide-field phase imaging for the endoscopic detection of dysplasia and early-stage esophageal cancer. Proc. SPIE 10470 (2018).

[2] **T. Sawyer** and S. Bohndiek. Towards a software framework for maximizing the resolution of biomedical hyperspectral imaging. European Conferences on Biomedical Optics. Proc. SPIE 10412 (2017).

[1] **T. Sawyer**, A. Luthman, and S. Bohndiek. Evaluation of illumination systems for wide-field hyperspectral imaging in biomedical applications. Proc. SPIE 9711 (2017).

PRESENTATIONS   **ORAL (*INVITED)**

[19*] **T. Sawyer**. Effective scientific communication. University of Arizona Cancer Center, (August 4, 2021). [Invited]

[18*] **T. Sawyer**. Advanced Optical Imaging Techniques for Endoscopic Cancer Surveillance. University of Arizona Gut Group Seminar (November 25, 2020). [Invited]

[17*] **T. Sawyer**. Emerging imaging techniques and machine learning approaches for gastrointestinal cancer surveillance. Banner Health Center Gastroenterology and Hepatology Fellows Conference (September 9, 2020). [Invited]

[16] **T. Sawyer** and J. Barton. Liquid Crystal Polarization Grating Spectroscopy for Measuring Tissue Autofluorescence. ASLMS Annual Meeting (May 3, 2020).

[15] **T. Sawyer**, J. Koevary, P. Rice, and J. Barton. In Vivo Optical Coherence Tomography of a Mouse Model of Spontaneous Ovarian Cancer. European Conferences on Biomedical Optics (June 25, 2019).

[14] **T. Sawyer**, J. Koevary, P. Rice, and J. Barton. Fluorescence and Multiphoton Imaging of a Mouse Model of Spontaneous Ovarian Cancer. Biophotonics Congress: Optics in the Life Sciences (April 14, 2019).

[13] **T. Sawyer**, J. Koevary, P. Rice, and J. Barton. Texture analysis of multiphoton images from an ovarian cancer model. College of Optical Sciences Industrial Affiliates Meeting. (February 26, 2019).

[12] **T. Sawyer**, J. Koevary, P. Rice, and J. Barton. Texture analysis of multiphoton images from an ovarian cancer model. Photonics West. (February 1, 2019).

[11] **T. Sawyer** . Identifying the spectral fingerprint of disease. Southwest Regional Grad Slam. (May 5, 2018). [Received first prize]

[10] **T. Sawyer** . Identifying the spectral fingerprint of disease. University of Arizona Grad Slam. (May 5, 2018). [Received second prize]

[9] **T. Sawyer** and J. Barton. Evaluation of segmentation algorithms for optical coherence tomography images of ovarian tissue. Photonics West. (January 27, 2018).

[8] **T. Sawyer** and J. Barton. Optimizing Spectral Bands for Biomedical Hyperspectral Imaging. College of Optical Sciences Industrial Affiliates Meeting. (October 23, 2017).

[7] **T. Sawyer** and J. Barton. Optimizing Spectral Bands for Hyperspectral Fluorescence Imaging. BMES Annual Meeting. (October 13, 2017).

[7] **T. Sawyer** and S. Bohndiek. Towards a software framework for maximizing the resolution of biomedical hyperspectral imaging. European Conferences on Biomedical Optics. (June 28, 2017).

[6] **T. Sawyer** . Identifying the spectral fingerprint of disease: a multi-modal imaging system for tissue analysis. Conference on Everything. (April 29, 2017).

[5] **T. Sawyer** . Identifying the spectral fingerprint of disease: a multi-modal imaging system for tissue analysis. College of Optical Sciences Community Speakers. (February 10, 2017).

[4] **T. Sawyer**, A. Luthman, and S. Bohndiek. Evaluation of illumination systems for wide-field hyperspectral imaging in biomedical applications. Photonics West. (February 1, 2017).

[3] **T. Sawyer** . Using Machine Learning to Improve Image Registration. College of Optical Sciences Industrial Affiliates Workshop (October 9, 2015).

[2] **T. Sawyer** . Analysis and Illustration of Freeform Surfaces in Phase Space, University of Arizona College of Optical Sciences. (November 20, 2014).

[1] **T. Sawyer** . Innovations in Art History using Machine Learning, University of Arizona President's Club. (October 29, 2014).

POSTER

[12] J. Montague, H. Shir, **T. Sawyer**, D. Galvez, J. Barton. Quantitative Second Harmonic Imaging of Colon Cancer. University of Arizona Cancer Center, Cancer Research: Present and Future (August 4, 2021).

[11] H. Shir, J. Montague, **T. Sawyer**, J. Barton. Non-Linear Analysis of Collagen in Murine Ovarian Samples Using Second Harmonic Generation. University of Arizona Cancer Center, Cancer Research: Present and Future (August 4, 2021).

[10] M. Aitken, **T. Sawyer**, J. Barton. Textural Analysis of Mice Ovaries to Compare Significance of In-Vivo vs. Ex-Vivo Tissue. Undergraduate Biology Research Program Conference (January 23, 2021).

[9] **T. Sawyer**, C. Williams, and S. Bohndiek. Spectral Band Selection and Tolerancing for Multispectral Filter Arrays. Frontiers in Optics. (September 18, 2019).

[8] A. Wilson, **T. Sawyer**, D. Waterhouse, C. Fitzgerald, and S. Bohndiek. Design and clinical implementation of a multi-modal imaging system for rapid analysis of the optical properties of freshly excised oesophageal tissue. Photonics West. (February 1, 2019).

[7] A. Wilson, **T. Sawyer**, and S. Bohndiek. A wide-field multi-modal imaging system for the rapid characterisation of the optical properties of *ex vivo* tissue in the clinic. TOPIM Tech Summer Workshop. (July 10, 2018).

[6] **T. Sawyer** and J. Barton. Classification of ovarian tissue using texture analysis and optical coherence tomography. TOPIM Tech Summer Workshop. (July 10, 2018).

[5] **T. Sawyer** and J. Barton. Optimizing hyperspectral imaging systems toward targeted screening in clinical biological imaging. University of Arizona Student Showcase. (February 21, 2018). [Received first prize]

[4] **T. Sawyer** . Painting Authentication Using X-ray Imaging and Canvas Analysis. College of Optical Sciences Industrial Affiliates Workshop. (October 8, 2015).

[3] **T. Sawyer** . Image Analysis and Feature Detection with Statistical and Machine Learning Techniques, University of Arizona President's Club. (March 25, 2015).

[2] **T. Sawyer** and R. Erdmann. Automated Image Comparison Using Machine Learning Techniques. University of Arizona. (February 18, 2015).

[1] **T. Sawyer** and A. Herkommer. Phase Space Methods for Illumination Design. University of Stuttgart Institute of Applied Optics. (October 10, 2014).

PROFESSIONAL AFFILIATIONS & SERVICE	**University of Arizona Cancer Center**, Member Cancer Imaging & Engineering Innovative Working Group	2021 – Present
	American Gastroenterological Society, Member	2020 – Present
	University Hearing Board, Member Assessed and made recommendations in cases concerned with breaching academic integrity and student code of conduct.	2018 – Present

American Society of Laser Medicine and Surgery (ASLMS)
Member — 2021 – Present
Student Member — 2014 – 2021

International Society for Optical Engineering (SPIE)
Member — 2021 – Present
Student Member — 2014 – 2021

The Optical Society (OSA)
Member — 2021 – Present
Student Member — 2014 – 2021

Journal Reviewer — 2014 – Present
Applied Optics, Journal of the Optical Society of America A, Optics Express, Journal of Applied Remote Sensing, Journal of Biophotonics, Scientific Reports

TEACHING

Courses and Lectures, University of Arizona

SLHS 649: Survival Skills and Ethics, Co-instructor	Spring 2021
OPTI 306: Radiometry, Sources and Detectors, 0.25 FTE Graduate Teaching Assistant	Fall 2019
SLHS 649: Survival Skills and Ethics, Guest instructor	Spring 2019
GRAD 695: University Fellows Colloquium, Guest instructor	Spring 2019
Science Communication: Effective Presentations Digital Module, Co-instructor	Spring 2019
MSE 350: Numerical Methods in Science and Engineering, 0.25 FTE Teaching Assistant	Spring 2014

Optical Design Tutor, University of Arizona — 2017 – Present
- One of six certified student instructors at the University to teach optical system design using Zemax Opticstudio.
- Taught optical design workshops and provided one-on-one research consulting advice.

Graduate Editor, University of Arizona — 2017 – 2019
- Reviewed and provided feedback on fellowship applications for graduate students at the University of Arizona.
- Taught writing workshops to graduate students focused on grant writing.

OUTREACH

Optics Ambassadors, University of Arizona College of Optical Sciences — 2013 – 2021
- Acted as a liaison between the College of Optical Sciences and its distinguished guests.
- Provided outreach and college tours to prospective students and families.
- Helped organize Industrial Affiliates, a biannual conference to interface students with industry sponsors.

Student Optics Chapter (SOCk), University of Arizona College of Optical Sciences

Outreach Committee — 2014 – 2021
- Organized and participated in over 20 outreach events per year for the Student Optics Chapter.
- Hosted recruitment events at the College of Optical Sciences.
- Traveled to local high schools to present about Optical Sciences and the degree program.

Outreach Chair — 2015 – 2016
- Responsible for organizing over two dozen outreach events per year for the College of Optical Sciences.
- Organized Laser Fun Day, an annual outreach event attracting over 1500 people.
- Participated in dozens of outreach events at local high schools, science events, and other locations, reaching over 2,000 people per year.

| | **SPIE Student Chapter**, University of Cambridge Outreach Committee | 2016 – 2017 |

SPIE Student Chapter, University of Cambridge Outreach Committee   2016 – 2017
- Participated in outreach events to introduce science into disadvantaged areas.
- Developed outreach videos to demonstrate science and expose younger students to the life of a graduate student.

MENTORSHIP

Natzem Lima   2021 – Present
PhD Student, Optical Sciences and Engineering, University of Arizona
Role: PhD Advisor

Justina Bonaventura   2021 – Present
PhD Student, Optical Sciences and Engineering, University of Arizona
Role: PhD Advisor

Jenna Montague   2021 – Present
PhD Student, Optical Sciences and Engineering, University of Arizona
Role: Co-Mentor, Primary Mentor: Jennifer Barton

Thomas Knapp   2021 – Present
PhD Student, Biomedical Engineering, University of Arizona
Role: PhD Advisor

Bridget Slomka   2021 – Present
MS Student, Biomedical Engineering, University of Arizona
Role: MS Advisor

Julianne Setiadi   2021 – Present
BS Student, Biomedical Engineering, University of Arizona
Role: Primary Research Mentor

David Mazi   2021 – Present
BS Student, Electrical and Computer Engineering, University of Arizona
Role: Primary Research Mentor

Michaela Taylor-Williams   2020 – Present
PhD Student, Physics, University of Cambridge
Role: Co-Mentor, Primary Mentor: Sarah Bohndiek

REFERENCES

Juanita Merchant, MD, PhD
Chief, Division of Gastroenterology
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Professor of English

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[CV compiled on 2021-08-18]