

CHRISTOPHER C WILCOX

US Air Force Research Laboratory
Electrical Engineer

Education

Doctor of Philosophy in Engineering (2009)
University of New Mexico

Master of Science in Electrical & Computer Engineering (2005)
University of New Mexico

Bachelor of Science in Electrical Engineering with a Mathematics Minor (2003)
New Mexico Institute of Mining and Technology

Technical Activities/Interests

- Optical Metrology, Adaptive & Active Optics, Aero-Optics
- Advanced Imaging, Fourier Optics
- Machine Learning, Radio & Optical Astronomy

Services to the Technical Community

- SPIE Fellow Member
- University of New Mexico Distinguished Alumni
- National Academy of Engineering US-EU Frontiers of Engineering Symposium Alumni (Helsinki, Finland 2016)
- National Academy of Engineering US Frontiers of Engineering Symposium Alumni (Irvine, CA, USA 2014)
- Research Fellow at the US Naval Postgraduate School in Monterey, CA
- SPIE Information Technologies Committee Chair, Symposia, Publications, and Strategic Planning Committees Member
- Conference/Session Chair at International SPIE Defense, Security, & Sensing and SPIE Optics+Photonics Conferences
- SPIE Field Guide to Geometrical Optics and Conferences Apps for Android-Lead Software Developer
- Successful implementation of supersonic wind tunnel for aero-optical studies for US Air Force Research Laboratory
- Lead architect and manager for various software tools for modeling and simulation with US Air Force Research Laboratory
- Compact Adaptive Optics and Telescope Systems for the US Naval Research Laboratory
- Atmospheric Turbulence Generation Testbed at the US Naval Research Laboratory/Naval Postgraduate School
- Segmented Mirror Telescope Testbed for students at the US Naval Postgraduate School
- Long Range Iris Recognition for the US Naval Research Laboratory/Sandia National Laboratories Program - Lead Software Developer/Optical Designer/Hardware Implementer
- Navy Precision Optical Interferometer Adaptive Optics Upgrade Project and Geostationary Satellite Observations for Space Situational Awareness
- Deformable Carbon Fiber Reinforced Polymer Mirrors and Telescope Systems
- Numerous journal articles in refereed journals
- Various SPIE, IEEE, and NAE proceedings, including representing the US Naval Research Laboratory at international conferences in Beijing, China, Marseilles, France, and Helsinki, Finland
- Lead author of an invited book chapter on Liquid Crystal Technologies (PhD Dissertation topic)

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- Patents developed from MS and PhD Dissertation projects
- Mentor to over a dozen students and engineers vis AFRL Scholars and UNM/AFRL STEM Mentors Programs

Service to SPIE

- SPIE Information Technology Committee (2015–2022, Chair 2018–2020)
- SPIE Symposia Committee (2021–2023)
- SPIE Strategic Planning Committee (2018–2020)
- SPIE Publications Committee (2018–2020)
- Lead developer of SPIE Conferences app for Android (2012–2017)
- Lead developer of SPIE Field Guide to Geometrical Optics app for Android
- SPIE Professional Magazine article about the SPIE Field Guide app for Android
Press release: <http://spie.org/x86626.xml>
- SPIE Professional Magazine article about session chair
Press release: https://spie.org/membership/spie-professional-magazine/archives/2015_july_archive/adventures_chair
- SPIE Professional Magazine article for 2019 2nd Quarter Face of Photonics
Press release: <https://spie.org/membership/spie-professional-magazine/day-in-the-life-wilcox>
- Session Chair at the SPIE Defense, Security, & Sensing Conference (2012–2020)
- Conference Chair at SPIE Optics+Photonics (2019–Present)
- First author of numerous SPIE journal/proceedings/magazine publications
- Co-author of numerous SPIE journal/proceedings/magazine publications

Professional Honors

- University of New Mexico School of Engineering Distinguished Alumni Award 2022
- Fellow Member of SPIE
- Senior Member of SPIE
- SPIE Community Champion (2019–2020)
- Featured in SPIE Professional Magazine (now Photonics Focus) (2012,2015,2019)
- Research Fellow at US Naval Postgraduate School
- Alumni of National Academy of Engineering Frontiers of Engineering
- US Air Force Research Laboratory Publication of the Year Award (2019–2022)
- US Air Force Research Laboratory Team Project of the Year Award (2020–2021)
- US Air Force Research Laboratory Mentorship of the Year Award 2022
- R&D Magazine R&D100 Award 2018

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Election Statement

I have been an active member of SPIE for 19 years. When I was a graduate student working at the US Naval Research Laboratory (NRL), I learned about SPIE from my supervisor at the time. I went to my first conference, Photonics West, and was just amazed at the amount of exciting work there is in this field of optics and photonics. This encouraged me to share my work with as many as I could and get feedback from experts in the field and push the technology that I was working on forward. I had always had an interest in telescopes and astronomy. When I worked for NRL, I had amazing opportunities to work on cutting edge adaptive optical systems for astronomical applications. I worked with different light correcting elements such as deformable mirrors and liquid crystal spatial light modulators. I learned and worked with different types of wavefront sensors and wavefront reconstructors. I deeply enjoyed all of the hardware and computational aspects of my work as an electrical engineer! From there, I was involved in some projects that investigated building lightweighted, large, meter-class mirrors for telescopes and it was all so very interesting and exciting! Soon afterwards, with my work at NRL, I became involved in working with next-generation satellite telescope technology in collaboration with the US Naval Postgraduate School. Throughout my time at NRL, I also was part of the team that worked with technology for the Navy Precision Optical Interferometer - one of the world's largest optical interferometric astronomical instruments!

After I left NRL, I joined the US Air Force Research Laboratory (AFRL) and changed my main applicational focus from optical astronomical applications to high energy laser applications. I worked at and brought online a cutting-edge optical metrology system that performed high-fidelity, high speed optical characterizations of turbulence with a supersonic wind tunnel for the field of aero-optics - the study of optical aberrations and disturbances that are induced from the changing air pressures surrounding an aircraft at high speeds. After the system was up and running, I began to focus on modeling and simulation of optical systems and performance optimizations for many different optical applications including beam control and atmospheric propagation characterizations. Also, during this time, I led a team to develop cutting edge control optimization capabilities that leverages advanced machine learning and neural network technologies.

I enjoy helping others in my community learning about optics - telescopes, in particular. I have given a few guest lectures for The Albuquerque Astronomical Society and enjoy astronomy. Over the years, I have worked with many students, interns, and engineers and enjoy helping them learn and work with optical systems. I recently was awarded the AFRL Directed Energy Directorate Mentorship of the Year Award.

I have always been interested in technology and information technology. With SPIE, I helped build its first interactive smartphone app that was its most popular Field Guide: The Field Guide to Geometrical Optics by John Greivenkamp. At nearly that same time, I helped build and develop the SPIE Conferences app that has now become one of the most depended upon tools for navigating and having a successful SPIE conference experience. It has helped SPIE members in many ways with meetings, technical sessions, and the exhibits! I then worked with SPIE Governance and the Information Technology (IT), Symposia, Publications, and Strategic Planning Committees from 2015 to the present. I served as the Chair of the IT committee for several years and during that time I assisted bringing the latest Digital Library online, integrated machine learning technology to help serve optimized suggestions to members on the website and mobile app, added video recordings of all presentations at SPIE conferences to the Digital Library, and helped implement translations to the transcripts of those videos using Google Translate supporting over 80 languages all accessible via the Digital Library.

I am passionate about optics and photonics and technology. I am passionate about pushing SPIE to effectively utilize cutting edge technology to better service its membership. If I am elected to be a member of the SPIE Board of Directors, I will do all I can to keep SPIE as a leader in using the latest technology. I will push to build the most successful conference and meeting experiences. I will support SPIE's advancement of the best platforms like the Digital Library to assist SPIE members' own advancements in their own research and further push the field of optics and photonics!