

M. CATHER SIMPSON

CEO & Director, Orbis Diagnostics

Professor of Physics & Chemical Sciences, The University of Auckland Partner, Pacific Channel Ltd.

Education

PhD, Medical Sciences, University of New Mexico

BA, Interdisciplinary Studies – Echols Scholar, University of Virginia

Certificate of Specialization in Finance and Accounting, Harvard Business School Online

Technical Activities/Interests

- Ultrafast spectroscopy and chemical physics
- Advanced laser micromachining & manufacturing
- Light-based research & development in the diagnostics & primary industries
- Innovation and translation of science, engineering & technology

Service to the Technical Community

- Academy Executive Committee & Convenor of the Technology, Applied Science & Engineering Domain, Royal Society Te Apārangi (New Zealand) (2022–)
- Vice-Chair, Commission on Laser Physics and Photonics (C17), International Union of Pure and Applied Physics, (2022–; Member 2018–2021).
- Governance Board, Dodd Walls Centre for Quantum & Photonic Technologies (2023–; Steering Committee and/or Executive Committee Member 2006–2023)
- Director, Fisher & Paykel Healthcare (2022–)
- Chair, Optics & Photonics Winter College, Intl. Centre for Theoretical Physics (2019)
- Advisory Board, Robinson Research Institute, Victoria University Wellington (2021–)
- President, NZ Institute of Physics (2013–14; Council Member 2008–14)
- Steering Committee, NZ Ministry of Primary Industries Science Roadmap (2017–21)

Service to SPIE

- Chair, Publications Committee & Board Advisor (2023–; Member, 2020–22)
- Board Member (2021–23)
- Member, Presidential Task Force on Artificial Intelligence (2024–)
- Member, Strategic Planning Committee (2024–)
- co-Chair, SPIE Micro + Nano Materials, Devices & Applications, ANZOS (2019)
- Judge, Catalyst Awards, Prism Awards & Startup Challenge
- Member, Education Committee (2019–21)
- Member, Equity, Diversity & Inclusion Committee (2021–22)
- Speaker, panel member, organizing committee member & mentor for various SPIE events

Professional Honours

- W. H. (Beattie) Steel Medal, Australia New Zealand Optical Society
- Te Tohu mō Whaihua i te Mātai Ahupūngao – inaugural Physics Impact Award, New Zealand Institute of Physics

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- KiwiNet Commercialisation Icon Award, Researcher Entrepreneur & Supreme Awards
- Pickering Medal, Royal Society Te Apārangi (New Zealand)
- AgTech Winner, Silicon Valley World Cup Tech Awards
- Primary Industries Champion, Ministry of Primary Industries
- National Tertiary Teaching Excellence Award, Ako Aotearoa
- Fellowship: SPIE, Royal Society Te Apārangi, New Zealand Institute of Chemistry
- Inventor on >12 patent families
- Speaker for >100 invited presentations, including 20+ Plenary / Keynote talks

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Election Statement

- **Why am I keen to serve SPIE as Vice-President?**

My motivation comes from a deep commitment to improving the world and its people through better understanding, appreciation and application of scientific thinking and knowledge. We have some big challenges ahead of us – climate change, AI, clean water and food for all and more. Our core passion, our core business – light, optics and photonics – will be key in not just meeting these challenges, but doing so with ambition to make the world a better place.

SPIE is THE professional organization for those who are driven to translate innovations in optics and photonics into advancements that positively transform the lives of people everywhere. I would consider it a privilege to use my skills to the best of my abilities to help SPIE achieve its mission “to advance light-based research and technologies for the betterment of the human condition.”

- **What’s in the future for SPIE?**

Photonics is the technology of the 21st century, in the same way that electronics underpinned most of 20th century’s advances. Each day, we experience the benefits of light-based information and communication, consumer devices, manufacturing, medicine, food and agriculture. We are, however, still near the beginning of the photonics revolution, and SPIE has a major leadership role to play in the world’s realizing the power and potential of optics and photonics.

Along the way, SPIE will need to adapt. An immediate and significant opportunity (and challenge) that affects SPIE across conferences, publications, exhibitions – virtually everywhere – is the recent emergence of generative artificial intelligence. Longer term, one of SPIE’s core value-adds lies in bringing people together in our ~25 conferences, exhibitions and other events. SPIE has embraced the value of face-to-face interactions, however climate change and increasing awareness of carbon footprints also presents SPIE with both a challenge and an opportunity.

Whether through sustainably fostering and growing the essential human connections that underpin success for and by the communities we serve, or through wisely, ethically and effectively using artificial intelligence to make that experience better for everyone, I am confident that SPIE will meet the future with optimism and innovation.

- **What would I bring to this role?**

Broadly speaking, my career has three facets: (1) Basic research to understand how light works. I received tenure at CWRU in the USA using femtosecond lasers to explore how molecules convert light into more useful forms of energy. (2) Applied, industry-facing and entrepreneurial R&D to make light work for us, to do useful things. At U. Auckland, I established the Photon Factory, a laser facility with a mission to translate excellent photonic research into impact outside the university. I am CEO of one of our 3 spin-out companies. (3) Service in executive and governance roles to help companies and organizations – including SPIE – to make light work for them and for all of us. Throughout, I maintain a strong, overarching focus upon education, outreach, service and the public good.

This experience provides me with a broad range of skills and perspectives, and a deep appreciation for and commitment to all of the key communities that SPIE serves. Active engagement with SPIE also has provided me with a working understanding of SPIE’s goals, challenges and operations. In addition to “traditional” academic/technical roles (session organizer, speaker, attendee), I have served at the committee level (Publications – currently Chair; Education; Equity, Diversity & Inclusion), the board level (Board Member, Strategic Planning Committee, Presidential AI Task Force), and through judging and mentoring in the Startup Challenge, Prism and Catalyst Awards.

I experience SPIE as a thriving community of professionals who are ambitious and resilient for a future transformed by our science and engineering in a way that reflects our global values, with sustainability, equity, innovation and economic success at the fore. We are linked by our engagement with the world through the lens of optics and photonics. I find this an empowering way to think about SPIE, and I would be honoured to serve as SPIE Vice President.