

Dr Shaban B. Sulejman

Physicist | Optics & Photonics Researcher

Position Research Fellow & Lead Entrepreneur, School of Physics, The University of Melbourne, Victoria 3010, Australia.
Centre ARC Centre of Excellence for Transformative Meta-Optical Systems (TMOS).
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Languages English (fluent) and Albanian (native).

Research Profile

Research

My research interests lie in nanophotonics and meta-optics, with a focus on ultrathin optical metasurfaces. Motivated by growing up in a rural community, my work aims to design metasurfaces that could reduce the size and cost of advanced diagnostic and sensing instruments so that access to them is not confined to well-equipped laboratories. My research spans tunable all-optical image processing, phase-contrast microscopy, single-pixel imaging, nanoscale colour printing, all-optical feature recognition and single-shot birefringence imaging. I also serve as the Lead Entrepreneur on a project investigating non-invasive gender determination of chicken eggs before incubation, in collaboration with the Melbourne Veterinary School and Australian Eggs, funded by an Ignite grant from Australia's Economic Accelerator program.

Summary

8 refereed journal articles across *Nature Photonics*, *Nature Communications*, *Small* and *ACS Photonics*, with 5 of them as first or co-first author. 8 refereed conference proceedings and 15 conference presentations. Recipient of 31 competitive scholarships, prizes and awards totalling more than AUD 300,000. Fulbright Future Scholar (2024). PhD thesis awarded the 2026 Chancellor's Prize for Excellence in PhD Research and nominated for the 2026 Bragg Gold Medal for Excellence in Physics.

Education

Feb 2022 –
Dec 2025

Doctor of Philosophy, Physics | The University of Melbourne

- Thesis: *Metasurfaces for tunable all-optical image processing*. [Read here](#).
- Supervised by Prof. Ann Roberts, Dr Lukas Wesemann, Prof. Kenneth B. Crozier and Prof. Andrey A. Sukhorukov within the ARC Centre of Excellence for Transformative Meta-Optical Systems (TMOS).
- Funded by the Ernst & Grace Matthaei Scholarship.
- Awarded for the Chancellor's Prize for Excellence in PhD Research.
- Nominated for the 2026 Bragg Gold Medal for Excellence in Physics.
- Conferred 30 January 2026.
- Established and coordinated collaborations with the City University of New York, University of Stuttgart, RMIT University, Dorevitch Pathology, St Vincent's Hospital and the Florey Institute of Neuroscience and Mental Health.

Feb 2020 –
Dec 2021

Master of Science, Physics | The University of Melbourne

- First class honours (H1).
- Thesis: *Single-pixel ghost imaging with classical correlations and optical metasurfaces*.
- Supervised by Prof. Ann Roberts and Prof. Kenneth B. Crozier within TMOS.
- Computational research report: *Computational techniques in atomic and molecular quantum chemistry* (COMP90072 The Art of Scientific Computation).
- Conferred 8 December 2021.

Feb 2017 –
Dec 2019

Bachelor of Science, Mathematical Physics | The University of Melbourne

- First class honours (H1).
- Conferred 16 December 2019.

Research Appointments

Aug 2026 –
present

Research Fellow | TMOS, The University of Melbourne

- Meta-optics research on all-optical feature recognition and single-shot birefringence imaging.
- Supervised by Prof. Ann Roberts.
- 0.5 full-time equivalent.

Aug 2026 –
present

Lead Entrepreneur | School of Physics, The University of Melbourne

- Lead the experimental program in fluorescence lifetime imaging for non-invasive *in-ovo* gender determination of chicken eggs, responsible for building and managing the optical configuration, conducting the experiments, managing samples including the incubation of fertilised eggs, collecting and processing the experimental data.
- Collaboration with the Melbourne Veterinary School and Australian Eggs.
- Lead the commercialisation pathway for the gender determination of chicken eggs, in partnership with the University of Melbourne's commercialisation office, Australian Eggs, Australian and international hatcheries.
- Funded by the Australia's Economic Accelerator Ignite grant.
- 0.5 full-time equivalent.

Apr – Aug 2026

Hardware Engineer | School of Physics, The University of Melbourne

- Lead the design and development of a laboratory-based confocal microscopy system for non-invasive *in-ovo* gender determination of chicken eggs using fluorescence lifetime imaging.
- Supervised by Dr Snjezana Tomljenovic-Hanic and Dr Asma Khalid.
- Funded by the Australia's Economic Accelerator Ignite grant.
- Collaboration with Australian Eggs.

Oct 2025 –
Mar 2026

Research Associate | TMOS, The University of Melbourne

- Meta-optics research developing metasurfaces for all-optical feature recognition and birefringence imaging.
- Supervised by Prof. Ann Roberts while awaiting examination of the PhD thesis.
- \$5,000 funding provided by the Dr Albert Shimmins Postgraduate Writing-Up Award.

- Jan – Jun 2025** **Fulbright Visiting Researcher** | Advanced Science Research Center, City University of New York (CUNY)
- Five month placement supervised by Prof. Andrea Alù, Founding Director of the CUNY Photonics Initiative.
 - Funded by the Fulbright Future Scholarship.
 - Conceived and led an independent research program on metasurfaces for all-optical feature recognition, coordinating work across CUNY and Melbourne.
- Jan-Feb 2020** **Laby Research Scholar** | School of Physics, The University of Melbourne
- Short research project supervised by Prof. Ann Roberts designing nanostructures for anti-counterfeiting of Australian banknotes.
 - Collaboration with the Reserve Bank of Australia.

Awards, Prizes and Scholarships

Fellowships, Prizes and Distinctions

- 2026** **Chancellor's Prize for Excellence in PhD Research** | The University of Melbourne
- 2026** **(Nominated), Bragg Gold Medal for Excellence in Physics** | Australian Institute of Physics
- 2025** **Dr Albert Shimmins Postgraduate Writing-Up Award** | The University of Melbourne
- Funding of AUD 5,000.
- 2024** **Fulbright Future Scholarship** | Fulbright Australia
- Funded a Visiting Researcher position at the City University of New York for five months from January-June 2025.
 - Funding included a monthly stipend of USD 2,294, an establishment allowance of AUD 2,000, round-trip economy airfares, and health insurance in the USA.
 - Awarded the scholarship at the 2024 Fulbright gala by Caroline Kennedy, then United States Ambassador to Australia.
- 2024** **Postgraduate Student Prize** | Australian and New Zealand Optical Society
- Prize of AUD 1,500.
- 2024** **Best Oral Presentation Award** | TMOS Annual Conference
- 2023** **Leader of the Year Award** | TMOS
- 2023** **Industry Award** | TMOS
- 2023** **Collaboration Award** | TMOS
- 2023** **Best Poster Presentation Award** | International Conference on Materials for Advanced Technologies (ICMAT)
- 2023** **Optics and Photonics Education Scholarship** | International Society for Optics and Photonics (SPIE)
- Funding of USD 4,000.

2022 **Best Poster Presentation Award** | Conference on Optics, Atoms and Laser Applications (KOALA)

2022 **Meta-Together Working Party Award** | TMOS Annual Conference

Travel and Conference Support

2025 **Student Conference Support Grant** | SPIE

- Supported attendance at SPIE Photonics West, San Francisco
- Funding of USD 1,000.

2023 **Dr Alan Kenneth Head PhD International Research Award** | School of Physics, The University of Melbourne

- Supported attendance at APNFO (South Korea) and ICMAT (Singapore)
- Travel funding of AUD 6,000.

2023 **Partner Investigator Exchange Award** | TMOS

- Supported a two-week research visit to the Advanced Science Research Center at CUNY.
- Travel funding of AUD 5,000.
- Culminated in a publication in *Nature Communications*. [Read here](#).

Scholarships and Bursaries

2022–25 **Ernst & Grace Matthaei Scholarship** | The University of Melbourne

- Funded the PhD.
- Living stipend of AUD 37,400 per year for the duration of the PhD.

2022–25 **Research Training Program Scholarship (Fee Offset)** | Australian Government

- Subsidised full PhD tuition fee.

2022–25 **Bright Spark PhD Top-Up Scholarship** | TMOS

- Top-up funds to the PhD stipend.
- Living allowance of AUD 5,000 per year.

2022 **Dixson Scholarship in Experimental Physics** | School of Physics, The University of Melbourne

- Prize of AUD 2,192.

2021–23 **Lift Off Margaret Attwood Trust Education Scholarship** | Greater Shepparton Foundation

- Living allowance of AUD 5,000.

2021 **Dr Jean E. Laby Bursary** | School of Physics, The University of Melbourne

- Living allowance of AUD 2,000.

2020–24 **Rural and Regional Enterprise Scholarship** | Queensland Tertiary Admissions Centre

- Living allowance of AUD 4,500 per year.

2020 **Laby Research Scholarship** | School of Physics, The University of Melbourne

- Funding of AUD 3,000.
- 2020** **N. D. Goldsworthy Scholarship for Physics** | School of Physics, The University of Melbourne
- Living allowance of AUD 1,500.
- 2020** **Dr Jean E. Laby Bursary** | School of Physics, The University of Melbourne
- Living allowance of AUD 2,600.
- 2020** **Melbourne Graduate Access Scholarship** | The University of Melbourne
- Living allowance of AUD 2,000.
- 2020** **Muriel Ramm Science Bursary** | The University of Melbourne
- Living allowance of AUD 8,000.
- 2018** **Peter Cole Scholarship** | International House, The University of Melbourne
- Half-fee exemption, valued at approximately AUD 14,000, for residency at International House for the 2018 academic year.
- 2017–21** **Relocation Scholarship** | Department of Health & Human Services, Australia
- Living allowance of AUD 5,707 per year in the first year of the Bachelor of Science (2017), AUD 2,854 per year in the second year (2018) and AUD 1,425 per year for subsequent years (2019–21).
- 2017–19** **Dafydd Lewis Trust Scholarship** | Equity Trustees Melbourne
- Living allowance of AUD 10,000 per year for the duration of the Bachelor of Science (2017–19).
- 2017–19** **Melbourne Access Scholarship** | The University of Melbourne
- Living allowance of AUD 5,000 per year for the duration of the Bachelor of Science (2017–19).
- 2017** **Hilda Trevelyan Morrison Scholarship** | The University of Melbourne
- Living allowance of AUD 1,000.

Publications

† Denotes authors who contributed equally and share first authorship. Author name in bold.

Refereed Journal Articles

1. Haiwei Wang, Shikun Ma, **Shaban B. Sulejman**, Niken Priscilla, Wendy S.L. Lee, Peter Francis Matthew Elango, Lukas Wesemann, Elizabeth Hinde and Ann Roberts, “Wavelength and Polarization Multiplexed Nonlocal Metasurface for Quantitative Phase Microscopy”, *Nanophotonics* **15**, e70190 (2026). [doi:10.1002/nap.2.70190](https://doi.org/10.1002/nap.2.70190)
2. Serkan Arslan[†], **Shaban B. Sulejman**[†], Sebastian Klein, J. Haener, Julian Schwab, Dominik Ludescher, Lukas Wesemann, Ann Roberts, Harald Giessen and Mario Hentschel, “Polarisation-dependent elliptical and rectangular Mie voids”, *Small* **21**, e11992 (2026). [doi:10.1002/smll.202511992](https://doi.org/10.1002/smll.202511992)

3. Dominik Ludescher, Lukas Wesemann, Julian Schwab, Julian Karst, **Shaban B. Sulejman**, Monika Ubl, Brad O. Clarke, Ann Roberts, Harald Giessen and Mario Hentschel, “Optical sieve for nanoplastic detection, sizing and counting”, *Nature Photonics* **19** (10), 1138–1145 (2025). doi:10.1038/s41566-025-01733-x
4. **Shaban B. Sulejman**, Lukas Wesemann, Mikkaela McCormack, Jiajun Meng, James A. Hutchison, Niken Priscilla, Gawain McColl, Katrina Read, Wilson Sim, Andrey A. Sukhorukov, Kenneth B. Crozier and Ann Roberts, “Metasurfaces for infrared multimodal microscopy: phase contrast and bright field”, *ACS Photonics* **12**(3), 1494–1506 (2025). doi:10.1021/acsp Photonics.4c02097
5. Niken Priscilla[†], **Shaban B. Sulejman**[†], Ann Roberts and Lukas Wesemann, “New avenues for phase imaging: optical metasurfaces”, *ACS Photonics* **11**(6), 2843–2859 (2024). doi:10.1021/acsp Photonics.4c00359
6. Niken Priscilla, Lukas Wesemann, Lincoln Clark, **Shaban B. Sulejman**, Jon Rickett, Timothy J. Davis and Ann Roberts, “Rapid inverse design of metasurfaces with an asymmetric transfer function for all-optical image processing using a mode matching model”, *Optics Express* **32**, 26964–26978 (2024). doi:10.1364/OE.521874
7. Michele Cotrufo[†], **Shaban B. Sulejman**[†], Lukas Wesemann[†], Md. A. Rahman, Madhu Bhaskaran, Ann Roberts and Andrea Alù, “Reconfigurable image processing metasurfaces with phase-change materials”, *Nature Communications* **15**, 4483 (2024). Ranked among the journal’s top 20 Physics publications of 2024. doi:10.1038/s41467-024-48783-3
8. **Shaban B. Sulejman**[†], Niken Priscilla[†], Lukas Wesemann, Wendy S. L. Lee, Jieqiong Lou, Elizabeth Hinde, Timothy J. Davis and Ann Roberts, “Thin film notch filters as platforms for biological image processing”, *Scientific Reports* **13**, 4494 (2023). doi:10.1038/s41598-023-31528-5

Refereed Conference Proceedings

1. Dominik Ludescher, Bekim Hisenaj, Lukas Wesemann, Julian Schwab, Julian Karst, **Shaban B. Sulejman**, Monika Ubl, Brad O. Clarke, Ann Roberts, Harald Giessen and Mario Hentschel, “Optical sieve for nanoplastic detection, sizing, and counting: improved detection efficiency through principal component analysis”, *Proc. SPIE* **14076**, Nanophotonics XI, 1407608 (2026). doi:10.1117/12.3099388
2. **Shaban B. Sulejman**, Lukas Wesemann, Mikkaela McCormack, Jiajun Meng, James A. Hutchison, Niken Priscilla, Gawain McColl, Katrina Read, Wilson Sim, Andrey A. Sukhorukov, Kenneth B. Crozier and Ann Roberts, “Metasurfaces for infrared multimodal microscopy”, *Proc. SPIE* **13378**, High Contrast Metastructures XIV, 1337804 (2025). doi:10.1117/12.3036240
3. Lukas Wesemann, **Shaban B. Sulejman**, Niken Priscilla, Lincoln Clark, Haiwei Wang, Iryna Khodasevych, Krishna M. Nair, Md. Aatur Rahman, Timothy J. Davis, Michele Cotrufo, Andrea Alù, Francesca Iacopi, Madhu Bhaskaran and Ann Roberts, “Innovations in all-optical image processing: the promise of meta-optics”, *Proc. SPIE* **PC13030**, Image Sensing Technologies: Materials, Devices, Systems, and Applications XI, PC130300B (2024). doi:10.1117/12.3012563
4. Niken Priscilla, Neuton Li, Lukas Wesemann, **Shaban B. Sulejman**, Jiajun Meng, Rajour T. Ako, Madhu Bhaskaran, Andrey A. Sukhorukov and Ann Roberts, “High resolution bio-imaging via inverse design of metasurfaces”, *Proc. SPIE* **12895**, Quantum Sensing and Nano Electronics and Photonics XX, 128950P (2024). doi:10.1117/12.3000841
5. Lukas Wesemann, **Shaban B. Sulejman**, Niken Priscilla, Wendy S. L. Lee, Lincoln Clark, Jon Rickett, Jingchao Song, Jieqiong Lou, Elizabeth Hinde, Timothy J. Davis and Ann Roberts, “Meta-optics for new approaches to all-optical image processing”, *Proc. SPIE* **PC12622**, Optical Methods for Inspection, Characterization, and Imaging of Biomaterials VI, PC126220B (2023). doi:10.1117/12.2678073
6. Saleh S. M. Khaleghi, Sivacarendran Balendhran, Nima S. Azar, **Shaban B. Sulejman**, Ann Roberts and Kenneth B. Crozier, “High resolution, low noise and full colour single pixel imaging camera

using cyclic patterns”, in *CLEO 2023*, Technical Digest Series (Optica Publishing Group, 2023), paper ATu3K.6. [Read here](#).

7. Niken Priscilla, **Shaban B. Sulejman**, Wendy S. L. Lee, Lukas Wesemann, Timothy J. Davis and Ann Roberts, “Shedding new light on phase contrast imaging with nanophotonics”, in *Optica Imaging Congress*, Technical Digest Series (Optica Publishing Group, 2023), paper FTh3G.1. [doi:10.1364/FLATOPTICS.2023.FTh3G.1](https://doi.org/10.1364/FLATOPTICS.2023.FTh3G.1)
8. **Shaban B. Sulejman**, Niken Priscilla, Lukas Wesemann, Wendy S. L. Lee, Timothy J. Davis and Ann Roberts, “Biological phase contrast imaging with notch filters”, in *Frontiers in Optics + Laser Science 2022 (FiO, LS)*, Technical Digest Series (Optica Publishing Group, 2022), paper JW4A.74. [doi:10.1364/FIO.2022.JW4A.74](https://doi.org/10.1364/FIO.2022.JW4A.74)

Public Science Writing

1. **Shaban B. Sulejman**, “New type of ‘sieve’ detects the smallest pieces of plastic in the environment more easily than ever before”, *The Conversation*, 8 September 2025. Sole-authored; syndicated by Yahoo News Australia. [Read here](#).

Conference Presentations

Presentations delivered by me as presenting author.

1. “Metasurfaces for all-optical object recognition”, *TMOS Annual Conference*, Sydney, Australia, 2025. *Poster presentation*.
2. “Metasurfaces for infrared multimodal microscopy”, *SPIE Photonics West*, San Francisco, California, USA, 2025. *Oral presentation. Participation funded by the SPIE Student Conference Support Grant*.
3. “Tunable metasurfaces for infrared multi-modal image processing”, *TMOS Annual Conference*, Perth, Australia, 2024. *Oral presentation — Best Oral Presentation Award*.
4. “Tunable metasurfaces for infrared multi-modal image processing”, *Conference on Optics, Atoms and Laser Applications (KOALA)*, Melbourne, Australia, 2024. *Oral presentation*.
5. “Tunable metasurfaces for infrared multi-modal image processing”, *Australian Institute of Physics Congress*, Melbourne, Australia, 2024. *Oral presentation*.
6. “Polarization-controlled meta-optics for infrared multimodal microscopy”, *TMOS Annual Conference*, Brisbane, Australia, 2023. *Poster presentation*.
7. “Nanophotonic wavefront sensing with nonlocal metasurfaces for biological quantitative phase imaging”, *International Conference on Materials for Advanced Technologies (ICMAT)*, Singapore, 2023. *Poster presentation*.
8. “Dielectric metasurface for polarisation-switchable phase visualisation”, *International Conference on Materials for Advanced Technologies (ICMAT)*, Singapore, 2023. *Poster presentation — Best Poster Presentation Award. Participation funded by the Dr Alan Kenneth Head PhD International Research Award*
9. “Phase imaging using polarisation-sensitive dielectric metasurfaces”, *Asia-Pacific Conference on Near-Field Optics (APNFO)*, Busan, South Korea, 2023. *Oral presentation. Participation funded by the Dr Alan Kenneth Head PhD International Research Award*
10. “Classical ghost phase imaging using metasurfaces”, *Conference on Optics, Atoms and Laser Applications (KOALA)*, Adelaide, Australia, 2022. *Poster presentation — Best Poster Presentation Award*.
11. “Classical ghost phase imaging using dielectric Mie metasurfaces”, *TMOS Annual Conference*, Murray Bridge, Australia, 2022. *Oral presentation*.

12. “Phase contrast imaging with thin film notch filters”, *Australian Institute of Physics Congress*, Adelaide, Australia, 2022. *Oral presentation*.
13. “Biological phase contrast imaging with notch filters”, *Frontiers in Optics + Laser Science (FiO, LS)*, Rochester, New York, USA, 2022. *Poster presentation. Participation funded by the Optica Student Leadership Conference Travel Grant*.
14. “Classical ghost image processing using nanostructures”, *KOZWaves*, online, 2022. *Oral presentation*.
15. “Ghost phase imaging using metasurfaces”, *Australia and New Zealand Conference on Optics and Photonics (ANZCOP)*, online, 2021. *Oral presentation*.

Invited Talks and Seminars

Academic Seminars

- | | |
|-----------------|--|
| Jun 2026 | Invited Seminar, University of Melbourne Melbourne, Australia <ul style="list-style-type: none"> • 15-minute departmental seminar on postdoctoral research in meta-optics. • Hosted by the School of Physics. |
| Apr 2025 | Invited Seminar, Harvard University Cambridge, USA <ul style="list-style-type: none"> • 60-minute seminar on “Metasurfaces for image processing applications”. • Hosted by the group of Prof. Federico Capasso. |
| Feb 2025 | Invited Seminar, City University of New York New York, USA <ul style="list-style-type: none"> • 60-minute seminar on “Metasurfaces for image processing applications”. • Hosted by the group of Prof. Andrea Alù. |
| Jul 2024 | Invited Seminar, University of Stuttgart Stuttgart, Germany <ul style="list-style-type: none"> • 60-minute seminar on “Tunable metasurfaces for multimodal microscopy”. • Hosted by the group of Prof. Harald Giessen. |
| Jun 2021 | Invited Seminar, University of Melbourne Melbourne, Australia <ul style="list-style-type: none"> • 15-minute departmental seminar on “Imaging the invisible using nanoscale physics”. • Part of the Faculty of Science Work Experience Program for Year 10 secondary school students. |

Public and Community Talks

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|-----------------|--|
| Aug 2025 | Invited Speaker, Rotary Club Shepparton, Australia <ul style="list-style-type: none"> • 30-minute presentation on my story. |
| Aug 2024 | Invited Speaker, Greater Shepparton Foundation Shepparton, Australia <ul style="list-style-type: none"> • 20-minute address to the Greater Shepparton community on the impact of the Lift Off Scholarship program. • Part of the Bella Ainsworth Perpetual Lift Off Scholarship fundraising dinner. |
| May 2024 | Invited Speaker, Dafydd Lewis Trust and Mary Jane Lewis Foundation Melbourne, Australia <ul style="list-style-type: none"> |

- 20-minute address to the Trust and Foundation community on research career pathways and the impact of the scholarship program.
- Part of the Dafydd Lewis Trust and Mary Jane Lewis Foundation annual networking event.

Aug 2022 **Invited Speaker, Rotary Club** | Shepparton, Australia

- 30-minute presentation on “My story: from Shepparton to optical physics”.

Peer Review and Professional Memberships

Peer Review

Dec 2024 – present **Journal Referee**

- *Optics Express*, *Optics Letters* and *Optical Materials Express* (Optica Publishing Group).
- *npj Nanophotonics* (Nature Portfolio).

Professional Memberships

Feb 2022 – present **Member**

- International Society for Optics and Photonics (SPIE).
- Optica (formerly the Optical Society of America).
- Australian and New Zealand Optical Society (ANZOS).
- Australian Institute of Physics (AIP).

Research Impact

Sep 2025 **“Optical sieve for nanoplastic detection, sizing and counting”, *Nature Photonics***

- International press coverage including the [University of Stuttgart](#), [ScienceDaily](#), [SciTechDaily](#), [Analytica World](#), [Mirage News](#) and [TMOS](#).
- Authored an accompanying article in [The Conversation](#), syndicated by Yahoo News Australia.

May 2024 **“Reconfigurable image processing metasurfaces with phase-change materials”, *Nature Communications***

- Ranked among the journal’s top 20 Physics publications of 2024.
- Press coverage including [Phys.org](#), [City University of New York](#) and [RMIT University](#).

Teaching, Mentoring and Other Professional Experience

Mar 2026 – present **Mentor, NanoSteps Mentoring Program** | [TMOS](#)

- Mentored postgraduate researchers within [TMOS](#), providing technical guidance in experimental optics.

2022–2023 **Mentor, Scholar Mentor Program** | [Dafydd Lewis Trust](#)

- Mentored scholarship recipients across their tertiary studies.

Feb-Dec 2022	Tutor and Assessment Marker School of Physics, The University of Melbourne • Tutorials: PHYC10003 Physics 1; PHYC10004 Physics 2: Physical Science & Technology; PHYC20015 Special Relativity & Electromagnetism; SCIE10005 Today's Science, Tomorrow's World. • Assignment and examination marking: PHYC10003, PHYC10004, PHYC20015 and PHYC30016 Electrodynamics.
Feb-Jun 2022	Mentor, Melbourne Peer Mentor Program The University of Melbourne • Mentored a cohort of commencing undergraduates through their first semester. • Awarded a Melbourne Plus: People Leadership credential for the role.
Mar-Jul 2021	Program Coordinator, Nanoscale Imaging Stream Year 10 Work Experience Program, The University of Melbourne • Designed and coordinated the Nanoscale Imaging stream for secondary students.
2020–21	Laboratory Demonstrator School of Physics, The University of Melbourne • Undergraduate laboratory teaching for PHYC10003 Physics 1 and PHYC10004 Physics 2: Physical Science & Technology.
Dec 2019 – Jan 2020	Tutor, VCE Summer School Program The University of Melbourne • Specialist Mathematics Units 3 & 4. • Weekend training camp in December 2019 in Ballarat, followed by a two-week intensive summer school in January 2020.
2019–22	Private Tutor Evolutionary Tutors • Mathematics tutoring for students in Years 4–10.
2013 – present	Event DJ and Master of Ceremonies Self-employed • Have run an event services business for over a decade. • Role has involved client acquisition, pricing, contracting and delivery for weddings, galas, engagements, birthdays and other private events.

Leadership and Professional Service

2022	Co-President, SPIE and Optica Student Chapters The University of Melbourne • Co-organised events for the Melbourne optics student cohort. • Selected as one of 100 students worldwide for Optica's fully-funded 2022 Student Leadership Conference held in Rochester, New York. • Interviewed by the Optica Foundation, watch here.
Mar-Aug 2022	Organising Committee, Student and Early Career Researcher Conference TMOS • Responsible for node activities across the Melbourne TMOS partners (RMIT University and The University of Melbourne).
Aug 2021 – Jan 2023	Activities Officer, then Secretary Postgraduate Physics Students' Society, The

University of Melbourne

- Organised the cohort event program as Activities Officer.
- As Secretary, acted as vice-president and worked with the President to run the society.

- 2021** **Science Student Ambassador** | Faculty of Science, The University of Melbourne
- Represented the Faculty at academic panels, information evenings, interviews and university advertising campaigns.
 - Completed the University's Student Ambassador Leadership Program.
- 2020–21** **Staff–Student Liaison Committee Representative** | School of Physics, The University of Melbourne
- Student representative for Masters-level subjects, channelling cohort feedback on teaching programs to academic staff.
- 2017– present** **Scholar and Alumnus** | Dafydd Lewis Trust and Mary Jane Lewis Foundation
- Joined the Trustees' selection panel to interview applicants in 2018.
 - Promoted the scholarship at Shepparton High School in 2017.
 - Continued alumni engagement and invited addresses to the community.
 - Article published online, [read here](#).

Outreach and Public Engagement

- 2022** **Outreach Committee** | TMOS
- Developed and delivered public science shows to encourage STEM participation and future leadership.
 - Selected as one of 10 TMOS researchers for a three-day science communication workshop at Questacon, the National Science and Technology Centre, Canberra.
 - Created, organised and hosted a two-hour public event at Shepparton Library — a science show on the history of light plus hands-on optics workshops. Promoted it across regional radio and print media ([article 1](#), [article 2](#) and [article 3](#)).
 - Delivered optics workshops at schools across Victoria and South Australia.
- 2021–23** **Lift Off Scholar** | Greater Shepparton Foundation
- Spoke to Goulburn Valley secondary students alongside the Foundation committee on scholarships, careers and post-secondary study options.
- 2021–23** **Media Coverage** | Regional Media Outlets
- Interviewed on the impact of regional education scholarships and on meta-optics research by WIN News Shepparton, *Shepparton News*, *The Adviser*, ABC Radio and One FM.
- Jul-Dec 2019** **Science Delivery Outreach Program** | Faculty of Science, The University of Melbourne
- Developed an outreach science show over a semester of weekly training.
 - Delivered the show to low socio-economic schools on a two-week roadshow across metropolitan and regional Victoria.

- Schools included Keilor Downs Secondary College, Lalor Secondary College, River City Christian College, Kyabram P-12 college and Mooroopna Secondary College.

Jan 2017 **Future Rural Leaders Residential Program** | YouThrive Victoria (formerly Macpherson Smith Rural Foundation)

- Week-long leadership, teamwork and communication intensive, Narmbool, Victoria.

2015–16 **Coach** | Shepparton High School Soccer Club

- Assistant coach of the Under 15s and coach of the Senior Boys team 2015.
- Co-coach of the Senior Boys team in 2016.

Technical Skills

Project Conception & Theory	Project conception, planning and management.
Photonic Design & Simulations	Design of optical nanostructures and metasurfaces; finite element method modelling in COMSOL Multiphysics; computational modelling of optical devices.
Laboratory Instrumentation	Free-space optical bench design, construction and alignment; end-to-end development of laboratory imaging systems; experimental design and execution; sample preparation and handling.
Optical Measurement	Phase-contrast, bright-field and infrared multimodal microscopy; quantitative phase imaging; confocal microscopy; fluorescence lifetime imaging; polarisation-resolved measurements; spectrometry; single-pixel and ghost imaging.
Computing & Data	Scientific computing and numerical methods in Python and MATLAB; experimental data processing and analysis; Linux environments.
Design & Visualisation	CAD, Blender and Adobe Illustrator for optical layout, device schematics and scientific figure preparation.
Research Translation	Collaboration with research and industry partners; optimisation of optical designs against industry requirements; commercialisation pathway development