Zachary Kemp

BSc (Hons), PhD (Physics)



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| education | | | |
| 2012–2016 | **Doctor** of Philosophy (Physics) | | Monash University, Clayton |
|  | thesis title: | “*Sources and effects of errors in vector field electron tomography”* | |
|  | description: | This work addresses the accuracy of methods used to reconstruct three-dimensional electromagnetic vector fields using transmission electron microscopy. | |
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| 2007–2011 | **Bachelor** of Science (Hons) | | Monash University, Clayton |
|  | thesis title: | “*Tomographic reconstruction of vector fields in the presence of noise”* | |
|  | description: | This work examines the noise-stability of the vector tomography reconstruction process. | |
|  | majors: | physics, pure mathematics | |
|  | minors: | astrophysics | |

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| experience | | | |
| 2017–present | **Teaching** Associate (Level Three) | | Monash University, Clayton |
|  | PHS3000–Laboratory |  | |
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| 2012–present | **Teaching** Associate (Level Two) | | Monash University, Clayton |
|  | PHS2011–Quantum Concepts and Technologies |  | |
|  | PHS2022–Electromagnetism, Light, and Entropy |  | |
|  | PHS2061–Quantum and Thermal Physics |  | |
|  | PHS2062–Electromagnetism and Optics |  | |
| 2010–2011 | **Teaching** Associate (Level One) | | Monash University, Clayton |
|  | PHS1011–Classical Physics and Relativity | ENG1080–Foundation Physics | |
|  | PHS1021–Radiological Physics | PHS1042–Environmental Physics | |
|  | PHS1022–Fields and Quantum Physics | BMS1031–Medical Biophysics | |

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| awards | | |
| 2012–2015 | **Dean’s PostGraduate Research Scholarship** | Monash University, Clayton |
|  | Awarded to students pursuing a Higher Degree by Research after achieving first class honours. | |

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| publications | |
| 2017 | **Propagation based phase retrieval using artificial neural networks** |
|  | ZDC Kemp  (in peer review) |
| 2016 | **Sources and effects of errors in vector field electron tomography** |
|  | ZDC Kemp  PhD thesis, Monash University (2016) |
| 2016 | **Effect of specimen orientation on the accuracy of vector field electron tomography** |
|  | ZDC Kemp, DM Paganin, TC Petersen, MJ Morgan  Optics Express 24.20 (2016): 22366 |
| 2014 | **Analysis of noise-induced errors in vector-field electron tomography** |
|  | ZDC Kemp, TC Petersen, DM Paganin, KM Spiers, M Weyland, MJ Morgan  Physical Review A 90.2 (2014): 023859 |
| 2011 | **Tomographic reconstruction of vector fields in the presence of noise** |
|  | ZDC Kemp  Honours thesis, Monash University (2011) |

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| interests and skills | |
|  | **Physics/mathematics** |
|  | Error analysis, tomography, phase retrieval, image simulation, numerical methods, image processing, electron optics, machine learning, mathematical modelling |
|  | **programming and software** |
|  | C++, MATLAB, python, LaTeX, Photoshop, Blender |
|  | **other skills** |
|  | technical writing, teaching, using scientific instrumentation |
|  | **laboratory topics taught** |
|  | optical spectroscopy, γ-spectroscopy, nuclear decay, Fourier analysis, operational amplifiers, dynamics, buoyancy, photoelectric effect, AC signal filters, Ramsauer-Townsend effect, charge-to-mass ratio of electron, microwave optics, Hall effect in water, and many others |
|  | **personal interests** |
|  | music production, 3D modelling, game development |

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| referees | | |
|  | **Prof. David Paganin** | PhD supervisor |
|  | [david.paganin@monash.edu](mailto:david.paganin@monash.edu)  (03) 9396 1574 |  |
|  | **Dr Tim Petersen** | PhD supervisor |
|  | [timothy.petersen@monash.edu](mailto:timothy.petersen@monash.edu)  (03) 9905 9765 |  |
|  | **Prof. Michael Morgan** | PhD supervisor |
|  | [michael.j.morgan@monash.edu](mailto:michael.j.morgan@monash.edu)  (03) 9905 3645 |  |
|  | **Theo Hughes** | manager |
|  | [theo.hughes@monash.edu](mailto:theo.hughes@monash.edu)  (03) 9905 1602 |  |