Zachary Kemp

BSc (Hons), PhD (Physics)

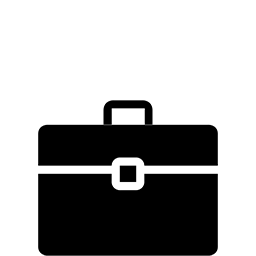


|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| 3/9 Newman Street  Ballarat East  VIC 3350 | 0412 457 974 | [zachary.kemp@monash.edu](mailto:zachary.kemp@monash.edu) | [zac-k.github.io](https://zac-k.github.io/) |

# education

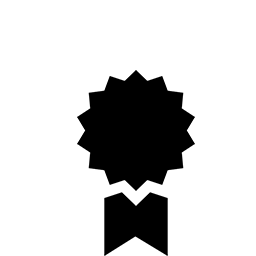
|  |  |
| --- | --- |
| 2012–2016 | **Doctor** of Philosophy (Physics) Monash University, Clayton  thesis title: *“Sources and effects of errors in vector field electron tomography”*  description: This work addresses the accuracy of methods used to reconstruct three-dimensional electromagnetic vector fields using transmission electron microscopy. |
| 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  minor: astrophysics |

**experience**



|  |  |  |
| --- | --- | --- |
| 2017–present | **Teaching** Associate, Third Level | Monash University, Clayton |
|  | PHS3000 **–** Laboratory |  |
| 2012-present | **Teaching** Associate, Second Level | 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, First Level | Monash University, Clayton |
|  | PHS1011 – Classical Physics and Relativity | ENG1080 - Foundation Physics |
|  | RAD1021 – Radiological Physics | PHS1042 - Environmental Physics |
|  | PHS1022 – Fields and Quantum Physics | BMS1031 - Medical Biophysics |

# 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.

# 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)

# 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

# referees

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