

Jacob Peter Kia Ngaha

POSTDOCTORAL RESEARCH FELLOW

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Education

PhD. in Physics

THE UNIVERSITY OF AUCKLAND

Worked under Professor Howard Carmichael and Associate Professor Scott Parkins researching frequency filtering techniques in a quantum optics setting. We developed a theoretical model that allows for an approximation of an ideal bandpass filter, allowing more accurate calculations of frequency-filtered photon correlations to be performed.

Auckland, New Zealand

Sep. 2019 - Present

MSc. in Physics

THE UNIVERSITY OF AUCKLAND

For a year I worked under Professor Howard Carmichael investigating the fluorescence spectrum and photon-correlations of a driven three-level atom. An entire year's worth of directed research was presented in a thesis as part of the degree's requirements.

Auckland, New Zealand

Feb. 2018 - Mar. 2019

BSc. (Hons) in Physics

THE UNIVERSITY OF AUCKLAND

The Honours degree consisted of a mix of course work and a year long research project. For the project, I worked under Professor Howard Carmichael exploring the effects of spontaneous emission, quantum dephasing and thermal photons on the generation of sub-Poissonian light.

Auckland, New Zealand

Mar. 2017 - Nov. 2017

BSc.

THE UNIVERSITY OF AUCKLAND

Double major in Physics and Mathematics.

Auckland, New Zealand

Mar. 2014 - Nov. 2016

New Zealand Diplomas in Te Reo Māori (Rumaki) (Levels 5-7)

TE WĀNANGA O AOTEAROA

These diplomas were awarded after three separate years of full immersion learning of Te Reo Māori in the courses: *Te Rōnakitanga ki te Reo Kairangi* (2022), *Te Aupikitanga ki te Reo Kairangi* (2023), and *Te Pinakitanga ki te Reo Kairangi* (2024).

Auckland, New Zealand

2022 - 2024

New Zealand Certificates in Te Reo (Rumaki, Reo Rua) (Levels 1-4)

TE WĀNANGA O AOTEAROA

These certificates were awarded after two separate years of introductory Te Reo Māori through the *Te Ara Reo Māori* courses: *He Pī Ka Pao* (2020) and *He Pī Ka Rere* (2021).

Auckland, New Zealand

2020 - 2021

Experience

Post-Doctoral Research Fellow

THE UNIVERSITY OF AUCKLAND

I am currently working in the Department of Mathematics with Professors Bernd Krauskopf and Neil Broderick as part of the project "Quantum effects in coupled nano-lasers". Using numerical continuation techniques I am studying phase resetting – the effect that induced perturbations have on stable pulsations – in the Yamada model of a laser with a saturable absorber.

Auckland, New Zealand

2023 - Present

Outreach Assistant - Science Wānanga

THE UNIVERSITY OF OTAGO

Science Wānanga is the University of Otago's Science outreach program aimed specifically at Māori youth, typically aged between 10 - 16. As part of this program, we stay on a marae with the children for two-three days, teaching and engaging them in different science fields. I specifically worked with the Physics team, where we ran several different workshops/demonstrations showing some properties of light and lasers.

New Zealand

2018 - 2024

Graduate Teaching Assistant

THE UNIVERSITY OF AUCKLAND

Over my various years of postgraduate study in the Department of Physics, I have worked in several teaching assistant roles:

- Marking tests and assignments as well as test invigilating for Physics 107 - Planets, Stars and Galaxies. (Jul. 2017 - Nov. 2017)
- Lab demonstrator for the Stage II and III laboratory students. This involves helping students with the experimental equipment and theory and marking reports and providing feedback. (Feb. 2018 - Nov. 2022)
- Tutor for the Physics Tuākana drop in tutorials for Māori and Pasifika students. I would help students from all stages of physics with concepts from their classes, their assignments, as well as test preparation. (Jul. 2018 - Nov. 2022)
- Student coordinator for the Physics Tuākana program. I would organise tutorial times, assist the main coordinator with administration tasks, and attend monthly Faculty meetings with other departments. (July. 2020 - Nov. 2022)
- Marker and tutor for postgraduate courses on quantum mechanics and quantum optics. (Feb. 2022 - Nov. 2022)

Auckland, New Zealand

Jul. 2017 - Nov. 2022

Volunteer Karate Instructor

FUSHIN RYU KARATE ASSOCIATION

I taught two–four classes a week to children from ages 6 to 16 and also two classes of adults. I was responsible for teaching the students new techniques and abilities as well as strengthening current ones.

Auckland, New Zealand

2016 - 2023

Senior Staff Supervisor & Wait Staff

URBAN GOURMET

- Held an alcohol manager's certificate from 2016-2019
- Many years experience in high pressure hospitality environments where I would be responsible for a large team of staff to deliver events at a high standard. These events ranged from private dinners at a client's home to large corporate dinners or weddings of up to 400 people.

Auckland, New Zealand

Mar. 2014 - Oct. 2018

Publications

Multimode array filter of resonance fluorescence

J. NGAHA, S. PARKINS, AND H. J. CARMICHAEL

Phys. Rev. A 100, 023719 (2024).

Physical Review A

Aug. 2024

Frequency-Filtered Photon Correlations

J. NGAHA

PhD. Thesis

ResearchSpace@Auckland

Jun. 2023

Two Photon Resonance Fluorescence in a Ladder System

J. NGAHA

MSc. Thesis

ResearchSpace@Auckland

Feb. 2019

Presentations & Conferences

NZMAS Joint Meeting

PHASE-RESETTING IN THE YAMADA MODEL OF A Q-SWITCHED LASER

Presentation

Auckland, New Zealand

Dec. 2024

Australian and New Zealand Conference on Optics and Photonics (ANZCOP)

PHASE-RESETTING IN THE YAMADA MODEL OF A Q-SWITCHED LASER

Poster

Melbourne, Australia

Dec. 2024

Dodd-Walls Centre Symposium

PHASE-RESETTING IN THE YAMADA MODEL OF A Q-SWITCHED LASER

Presentation

Christchurch, New Zealand

Nov. 2024

Nonlinear Photonics (NP)

PHASE-RESETTING IN THE YAMADA MODEL OF A Q-SWITCHED LASER

Presentation

Quebec City, Canada

Jul. 2024

CLEO-EQEC

MULTI-MODE FREQUENCY-FILTERED PHOTON CORRELATIONS OF A DRIVEN THREE-LEVEL ATOM

Presentation

Munich, Germany

Jun. 2023

Dodd-Walls Centre Symposium

HUNTING FOR PHOTON CORRELATIONS

Presentation

Rotorua, New Zealand

Jun. 2023

Konference on Optics, Atoms, and Laser Applications (KOALA)

FREQUENCY-FILTERED PHOTON CORRELATIONS

Poster

Adelaide, Australia

Dec. 2022

Dodd-Walls Centre Symposium

FREQUENCY-FILTERED PHOTON CORRELATIONS

Poster

Dunedin, New Zealand

May 2022

Australian and New Zealand Conference on Optics and Photonics (ANZCOP)

A BETTER METHOD FOR CALCULATING FILTERED PHOTON CORRELATIONS

Poster

Online :(

Nov. 2021

Dodd-Walls Centre Symposium

MULTI-MODE ARRAY FILTERING OF RESONANCE FLUORESCENCE

Presentation

Auckland, New Zealand

Jun. 2021

Dodd-Walls Centre Symposium

MULTI-MODE ARRAY FILTERING OF RESONANCE FLUORESCENCE

Presentation

Online :(

Jun. 2020

Konference on Optics, Atoms, and Laser Applications (KOALA)

FILTERED PHOTON CORRELATIONS OF RESONANCE FLUORESCENCE

Poster

Dunedin, New Zealand

Dec. 2019

Dodd-Walls Centre Symposium

FILTERED PHOTON CORRELATIONS OF FLUORESCENCE FROM A DRIVEN THREE LEVEL ATOM

Poster

Dunedin, New Zealand

Feb. 2019

Dodd-Walls Centre Symposium

TWO-PHOTON DRESSED STATES AND FLUORESCENCE SPECTRUM OF A DRIVEN THREE-LEVEL ATOM

Poster

Auckland, New Zealand

Jun. 2018

Skills

Technical Skills

Computational simulations of physical systems, numerical continuation of dynamical systems, open quantum systems, cavity quantum electrodynamics (QED).

Programming Languages

Fortran, Python, MATLAB, \LaTeX

Soft Skills

Leadership, decision making, time management, teaching.

Committee Memberships

Te Ao Māori Rōpū - Māori Development Group

AUCKLAND, NEW ZEALAND

The Te Ao Māori Rōpū is an organising committee for Māori staff, student, and research development in the Dodd Walls Centre. Māori are the indigenous people of Aotearoa / New Zealand, and are severely underrepresented in the sciences. One of the main goals of this rōpū is to help develop processes, and research, to achieve a better representation.

Te Whai Ao – The Dodd-Walls Centre

Dec. 2021 - Present

Faculty of Science Research Fellow Society

THE UNIVERSITY OF AUCKLAND

This is a society consisting of research fellows from the Faculty of Science at the University of Auckland. I represent the research fellows from the School of Mathematics.

Auckland, New Zealand

Mar. 2024 - Present

Awards

SCHOLARSHIPS

Oct. 2021 Frederick Douglas Brown Postgraduate Science Research Scholarship

Sep. 2019 The University of Auckland Doctoral Scholarship

Feb. 2018 The Dodd-Walls Centre Masters Scholarship

The University of Auckland

The University of Auckland

Te Whai Ao – The Dodd-Walls Centre