Waipapa Taumata Rau
University of Auckland

Doctoral Study at the University of Auckland

China Scholarship Council Fairs 2025

October 2025

Kia ora!

Welcome to the University of Auckland's stand at the China Scholarship Council Fairs 2025! We're delighted to connect with aspiring doctoral candidates who are passionate about advancing knowledge and making global impact. As New Zealand's leading research university, we offer a rich tapestry of PhD opportunities across disciplines - from cutting-edge biomedical engineering and sustainable urban design to pioneering work in linguistics, economics, and indigenous studies. Our vibrant academic community is deeply collaborative, with transdisciplinary research centres and world-class facilities that support innovation and excellence. Whether you're drawn to the humanities, sciences, engineering, or health, we invite you to explore how your doctoral journey can flourish here in Aotearoa.

Our faculties and large-scale research institutes:

Faculty of Arts and Education

Faculty of Business and Economics

Faculty of Engineering

Faculty of Law

Faculty of Medical and Health Sciences

Faculty of Science

Auckland Bioengineering Institute

Liggins Institute

Scan here for the digital version of this document and other University of Auckland doctoral study links:

Faculty of Arts and Education

We contribute to more informed, imaginative, compassionate and equitable worlds through our research and creative practice, and by speaking truth to power as 'critic and conscience of society'.

Further information on these key research themes for Arts and Education are listed on this subject page.

Doctoral areas	Contact person	Contact email
English and Drama	Alex Calder	a.calder@auckland.ac.nz
Māori Studies	Daniel Hikuroa	d.hikuroa@auckland.ac.nz
Communication	Ethan Plaut	e.plaut@auckland.ac.nz
Politics and International Relations	Victoria Woodman	victoria.woodman@auckland.ac.nz
Art History	Greg Minissale	g.minissale@auckland.ac.nz
Anthropology	Heather Battles	h.battles@auckland.ac.nz
Criminology	Claire Meehan	c.meehan@auckland.ac.nz
Gender Studies	Claire Meehan	c.meehan@auckland.ac.nz
Sociology	Claire Meehan	c.meehan@auckland.ac.nz
Global Studies	Jamie Gillen	jamie.gillen@auckland.ac.nz
Public Policy	Stephanie D'Souza	s.dsouza@auckland.ac.nz
Development Studies	Jesse Grayman	j.grayman@auckland.ac.nz
Media and Screen	Allan Cameron	allan.cameron@auckland.ac.nz
Ancient History and Classics	Lisa Bailey	lk.bailey@auckland.ac.nz
Linguistics and Applied Linguistics	Louisa Buckingham	l.buckingham@auckland.ac.nz
Theology	Mike Mawson	michael.mawson@auckland.ac.nz
Philosophy	Emily Parke	e.parke@auckland.ac.nz
History	Paul Taillon	p.taillon@auckland.ac.nz
Asian Studies	Rumi Sakamoto	r.sakamoto@auckland.ac.nz
Chinese	Rumi Sakamoto	r.sakamoto@auckland.ac.nz
Comparative Literature	Rumi Sakamoto	r.sakamoto@auckland.ac.nz
European Studies	Rumi Sakamoto	r.sakamoto@auckland.ac.nz
French	Rumi Sakamoto	r.sakamoto@auckland.ac.nz

German	Rumi Sakamoto	r.sakamoto@auckland.ac.nz
Pacific Studies	Yvonne Underhill-Sem	y.underhill-sem@auckland.ac.nz
Fine Arts (Elam)	Ruth Watson	r.watson@auckland.ac.nz
Dance	Sarah Foster-Sproull	s.foster-sproull@auckland.ac.nz
Music	Millie Locke	millie.locke@auckland.ac.nz
Critical Studies in Education	Louisa Allan	le.allen@auckland.ac.nz
Social Practice	Liz Beddoe	e.beddoe@auckland.ac.nz
Education: Curriculum and Pedagogy	Graham McPhail	g.mcphail@auckland.ac.nz
Education: Learning, Development and Professional Practice	Helen Dixon	h.dixon@auckland.ac.nz
Indigenous Education	Stephen May	s.may@auckland.ac.nz

General enquiries about doctoral study in the Faculty of Arts and Education can be sent to: aeddoctoral@auckland.ac.nz

Faculty of Business and Economics

The Faculty of Business and Economics consists of eight departments: Economics, Accounting and Finance, Property, Marketing, Commercial Law, Management and International Business (MIB), and Information Systems and Operational Management (ISOM). We offer PhD supervision in the following areas: Economics, Finance, Accounting, Marketing, Commercial Law, Management, International Business, Innovation and Entrepreneurship, as well as ISOM. We have a vibrant PhD community and offer lots of opportunities for PhD students to interact with their peers and faculty members, and to develop their skills, across a variety of initiatives and events (e.g., specialised training and workshop sessions, academic workshops and conferences, research seminars, opportunities for PhD students to engage in teaching and research assistance throughout their PhD studies).

More on the research conducted within our Faculty, as well as specialisations covered in each of its departments can be found here.

We are open to attracting high-achieving students wanting to pursue their PhD studies with us, in any of those subject areas.

We are also open to PhD proposals involving transdisciplinary research across departments and cross-faculty collaborations. Below are some examples of such research:

- Economics and mathematics (mathematical social science) leveraging our expertise and connections built within the Centre for Mathematical Social Science, in partnership with the Faculty of Science; or
- Commercial law and law more generally, in partnership with the Faculty of Law; or
- Energy studies, involving economics and engineering, leveraging our expertise and connections built within the Energy Centre, in partnership with the Faculty of Engineering and Design; or
- Sustainable and inclusive capitalism, leveraging our expertise and connections built within Juncture: Dialogues on Inclusive Capitalism; or
- Economics and psychology, including experimental methods, leveraging our expertise and connections built within the DECIDE Lab and in partnership with the Faculty of Science; or
- Economics and health sciences, in partnership with the Faculty of Medicinal and Health Science; or
- Finance and machine learning, in partnership with computer science within the Faculty of Science; or
- Anything at the intersection between decision sciences and computer science and AI more in general.

General enquiries about doctoral study in the Faculty of Business and Economics can be sent to: PhD-Bus@auckland.ac.nz

Faculty of Engineering and Design

Research is a prominent feature in the Faculty of Engineering and Design, and we are proud to be recognised as a pioneering force in a broad range of interdisciplinary work – from fundamental to applied – with demonstrable positive impacts on society and industry.

School of Architecture and Planning

- Māori and Pacific Housing Research Centre (MĀPIHI) – which supports Māori and Pacific whānau (family) to live in healthy, sustainable, and affordable homes. The Centre creates the knowledge, design and construction techniques, workforce and policy advice needed for transformational change in housing quality and supply.
- Urban Design - working across a range of different spatial scales, to research and create urban forms that are resilient, equitable, diverse, green, healthy, inclusive, and responsive.
- Architecture and Planning History and Theory - research in historical and theoretical fields across the disciplines of architecture, urban planning, urban design and heritage conservation.
- Future Cities Research Centre – aims to shape future cities to combat climate change, affirm spatial justice and improve urban well-being through innovative research, planning and sustainable designs that combine principles, creative and data-driven methodologies and instrumentalities.
- Architecture Exhibitions Research - promotes architectural exhibition making as a form of high-quality research inquiry and dissemination. It is a platform to experiment with ways of producing and conveying knowledge, and to collaborate with other researchers and our communities.

Design Programme

Design is naturally transdisciplinary, providing bridges between stakeholders. The staff in the Design Programme work on a wide range of topics, for example:

- Design for conservation and environmental sustainability, methodologically integrating the technical and rational elements with human experiential, emotional, and spiritual perspectives, and enabling representation of non-human voices. Environmental sustainability of products, experiences and services.
- Investigating anti-racism, matriarchal contributions to society, indigenous approaches to living, community-based economies, and social interaction using extended reality methods.
- Design for diversity, equity and inclusion, education from a decolonial, intersectional, and pluriversal lens. Using design, craft and art for activism and socio-ecological transformation. Social change and social innovation.
- Exploring mātauranga Māori, māramataka (Māori lunar calendar), bi-cultural capacity building and use of social media for cultural expression.
- Design for use of technology in education and learning, including educational games, and measuring indicators of cognition.

- Design cognition and design thinking research, role of visualisation within complex socio-technical environments.

Chemical and Materials Engineering

- Energy - energy storage materials and batteries, solar energy and photovoltaics, organic rankine cycle, biofuels, waste to energy, hydrogen, energy harvesting materials, process modelling, control and optimisation.
- Food engineering - developing novel food processing technologies for production of value-added food products and ingredients. This includes spray drying, freeze drying, evaporation, pasteurisation, extraction, non-thermal and thermal processing of food, simulation and control.
- Health and Wellbeing - studying the biomechanics of the soft-hard tissue junction between bone and cartilage and degenerative processes in tissues. We design and create biomaterials to better mimic, understand or control cells and tissues and use self-assembly to create dynamic, reconfigurable and functional materials.
- Innovative Processes – including separation and purification technologies, bioprocessing, thermochemical and hydrothermal processing, catalysis, industry 4.0, and process modelling, optimisation and control.
- Novel Materials - engineering and fundamental science of materials and surfaces. Approaches include coatings, surface wear and corrosion resistance, porous materials, nanostructures, semiconductors, energy materials, magnetic materials, etc.
- Resource Recovery - developing methodologies and technological solutions that enable the practical and cost-effective implementation of waste minimisation, recycling, and resource recovery. Includes novel separation technologies based on membrane filtration, green solvents, adsorption and critical fluid extraction to recover high-value constituents from waste, by-products and secondary streams.
- Water - drinking water, wastewater treatment, process water treatment, adsorption, membrane filtration, persistent pollutants and process modelling, optimisation and control.

Civil and Environmental Engineering

- Construction Management - developing new forms of construction contracts, and management or people through the construction life-cycle including clients, contractors, consultants and other stakeholders.
- Environmental Engineering – we examine urban stormwater management, coastal engineering, ecohydraulics, infrastructure asset management, contaminated soil remediation and innovative wastewater treatment technologies.
- Geotechnical Engineering - covers all aspects of civil engineering at the interface between the built and natural environments, including the design of foundations for buildings and bridges, design and construction of earth dams, tunnelling, and the impact of natural hazards associated with earthquakes on the built environment.

- Water Engineering – including river, coastal and estuarine hydrodynamics and sediment transport, hydraulics and hydraulic modelling, river and coastal engineering, ecohydraulics, catchment hydrology.
- Transportation - ensuring the safe and efficient movement of people and goods by land, sea, and air. This encompasses planning, design, construction, maintenance and operations of transport systems, including their economic, social and environmental impact.

Electrical, Computer and Software Engineering

- Embedded Systems - high performance heterogeneous embedded systems combining reactive (control-driven) and data-flow processing, semiconductor-based systems open to emerging implementation technologies such as nanomechanical and biological systems.
- Forensics and Biometrics - image and acoustic forensics, image and acoustic biometrics, acoustic analysis as it pertains to human physiology and numerous tangential applications of these methods.
- Human Aspects in Software Engineering - improving coordination on software teams, investigating novel techniques to help software developers understand what users want, studying software developer work patterns, and investigating novel ways to ensure high quality software through better testing techniques.
- Industrial Informatics and Automation – control of distributed automation systems within the context of the industrial internet of things and cloud computing. 'Next generation' controllers, embedded into machines and their components.
- Parallel and Reconfigurable Computing - our investigations range from fundamental problems like task scheduling to the development of visual tools. Exploiting new forms of parallelism, be it the use of reconfigurable hardware for high-performance computing or the parallelisation of (object-oriented) desktop applications.
- Power Electronics - we are a recognised world leader in medium-to-high powered systems within wireless power transfer research. Areas of research include improved low-cost power supplies, high band width communications, self-tuned high-power pick-up regulators, better magnetic structures and improved controllers.
- Power Systems - our current focus is on the integration of distributed/renewable energy sources (wind, solar and tidal) to New Zealand power systems, with emphasis on protection, economics and innovation (smart-grid, storage).
- Robotics - projects tailored towards a long-term goal to create robot assistants to interact with and assist humans in our daily lives.
- Systems and Control – includes process optimisation, synthesis and analysis of hybrid systems, control design on nonlinear dynamical systems with multiple time scales.
- Telecommunications and Electromagnetics - mobile radio systems, including characterisation of the radio channel in a broad range of physical environments, microwave engineering and electromagnetics.

Engineering Science and Biomedical Engineering

- Operations Research - following an interdisciplinary approach, we employ data analysis, statistics, mathematical modelling, optimisation and computing to assist decision-making in organisations, industry and many sectors of society. Examples include aircrew scheduling, electricity marketing policy and optimal ambulance system configurations.
- Mechanics - problems studied include modelling geothermal systems, petroleum reservoirs, tidal flows, sediment transport, analysing and designing manufacturing processes for composite materials.
- Biomedical Engineering - incorporating aspects of mathematical modelling, bioinstrumentation and experimentation. A major theme is to improve the basic understanding of integrative biological function from the scale of molecular proteins to that of organ systems. The novel techniques developed and knowledge gained target a variety of biomedical applications, including device design, disease diagnosis and therapy.

Mechanical Engineering

- Aerodynamics and wind engineering - research to improve our understanding, efficiency, performance and safety of all interactions with the air around us.
- Acoustics and vibrations research - The Acoustics and Vibrations Research Centre undertakes theoretical, computational and experimental research on a broad range of subjects within the fields of acoustics and vibrations.
- Dynamics and control - heavily involved in system modelling and simulation, sensing, computation and actuation.
- Smart manufacturing and industrial automation - conducting need-driven research on smart manufacturing and industrial automation to embrace Industry 4.0 for future manufacturing.
- Mechanics of materials, polymers, and composites - engineering these new materials for specific applications with a multidisciplinary approach including mechanical engineering, theoretical mechanics, polymer science and materials engineering.
- Thermofluids research - fundamental and applied studies into thermal and fluid dynamic systems, from conventional scales down to micro scales, using experimental testing and numerical-computational fluid dynamics methods.

Mechatronics Engineering

- Smart materials and structures - incorporating smart materials into the design of mechatronic systems.
- Medical devices and technologies - cutting-edge research, development, and translation of innovative medical devices and technologies to clinical and commercial uptake
- Neural engineering - a multidisciplinary field of engineers, scientists and clinicians who aim to understand, repair, replace, and enhance the nervous system.
- Robotics and biomechatronics - using robotic science and technologies to solve real-world problems.

Research Centres within the Faculty of Engineering and Design:

Infrastructure, Built Environment and Transport

- Transportation Research Centre
- Future Cities Research Centre
- Water Research Centre
- Engineering Solutions for Natural Hazards Mitigation

Energy

- Green Energy Engineering Centre
- Geothermal Institute

Sustainability and Health

- Circular Innovations (CIRCUIT)
- Centre of Neural Engineering and Cell Technologies (CoNECT)

Materials, Manufacturing and Robotics

- Centre for Advanced Materials Manufacturing and Design
- Centre for Automation, Robotics and Engineering Science (CARES)

Indigenous research

- Māori and Pacific Housing Research Centre (MĀPIHI)
- Māori and Pasifika Engineering

Engineering in Society

- Engineering Education Research Centre
- Acoustics and Vibration Research Centre
- Te Pūnaha Ātea - Space Institute

General enquiries about doctoral study in the Faculty of Engineering and Design can be sent to: FoED-Phd@auckland.ac.nz

Faculty of Law

Doctoral study at the University of Auckland's Faculty of Law offers a dynamic and diverse research environment, anchored by New Zealand's largest community of legal academics. Key areas of focus include Environmental Law, Indigenous Peoples and the Law, Human Rights Law, ICT Law, Taxation, Legal Theory, and Policy and Practice. These fields are supported by dedicated research groups that foster interdisciplinary collaboration and global engagement. PhD candidates are encouraged to contribute to the vibrant academic discourse that defines Auckland Law School's international reputation

For general enquiries about the PhD programme in the Faculty of Law email: lawphd@auckland.ac.nz

You can also contact the Associate Dean Postgraduate Research at j.tolmie@auckland.ac.nz

Faculty of Medical and Health Sciences

University Research Centres:

Centre for Brain Research

The mission of the Centre for Brain Research (CBR) is to improve our understanding of the brain in order to improve outcomes for people throughout Aotearoa New Zealand with neurological disorders, through world-class collaborative brain research, clinical care, education and community interaction. At the core of the CBR mission is the development of reciprocal transdisciplinary relationships, which span from the laboratory to the clinic to whānau and the community, enabling us to address research problems of critical concern, provide novel insights on the brain, and develop new treatment strategies to enhance care and give hope to people and families affected by brain diseases. The CBR recognises the unique status of Māori as the tangata whenua of Aotearoa. The CBR will develop strong interactions with the Māori community to promote and achieve equitable outcomes for those whānau living with neurological disorders as guaranteed under Te Tiriti o Waitangi.

Homepage: Centre for Brain Research

Contact: d.robinson@auckland.ac.nz

Te Aka Mātauranga Matepukupuku | The Centre for Cancer Research

Cancer is the number one cause of mortality in Aotearoa New Zealand. Tangata Māori are disproportionately and unjustly affected by cancer. Cancer research in Aotearoa New Zealand is increasingly diverse in range and scope. Without underpinning scholarship, cancer research risks becoming siloed, disjointed and unable to support excellence and equity of health outcomes. The mission of Te Aka Mātauranga Matepukupuku, The Centre for Cancer Research, is to provide national leadership in transdisciplinary cancer research. This will improve the understanding, care, prevention and treatment of cancer in Aotearoa New Zealand, in a way that meets the needs of our communities. The work is of global relevance, not only for its content, but also for the way it is done. Te Aka Mātauranga Matepukupuku is the largest cancer research centre in Aotearoa New Zealand and is co-led by Māori. It connects over 300 researchers from multiple backgrounds, disciplines and institutions. It links their work meaningfully and equitably with community aspirations, in multiple domains including cancer prevention, science, care and workforce development.

Homepage: Te Aka Mātauranga Matepukupuku - Centre for Cancer Research

Contact: cancer@auckland.ac.nz

Te Poutoko Ora a Kiwa | Centre for Pacific and Global Health

Our mission is to positively impact health in the Pacific region and globally, through high-quality research founded in partnership and local ownership. Our transdisciplinary approach focuses on co-created solutions, equity, capacity development and fostering local, regional and global leadership. We build on our existing relationships within the University and beyond. We work collaboratively to design and deliver solutions to our region's most pressing challenges: non-communicable diseases,

the health impact of the climate crisis, pandemic preparedness and the health of children and young people. We promote Pacific values, priorities and knowledge.

We acknowledge diversity in knowledge processes, grounded in the principles and values of Pacific data sovereignty. We draw on Pacific Indigenous knowledge and frameworks such as talanoa and wayfinding, mātauranga Māori, epidemiology, clinical medicine, social sciences and humanities. We welcome scholars, students and partners from government, non-government, regional and global organisations to work with us within a co-creation model. Pacific-led research (building capacity, enhancing capabilities in growth areas) will advance policy, advocacy, leadership and innovative initiatives for promoting health and wellbeing for Pacific populations. Working with interconnected research hubs and research platforms, we offer training and leadership opportunities for emerging scholars.

Homepage: Te Poutoko Ora a Kiwa

Contact: j.mccool@auckland.ac.nz

CCREATE-AGE: Centre for Co-Created Ageing Research

Mission: To develop a transdisciplinary centre that will deliver creative and innovative solutions to realise opportunities, needs, and concerns identified by older people, to improve health, wellbeing and human flourishing. To walk alongside Māori and Pacific communities as equitable partners, unlocking human potential by giving older people, researchers and other stakeholders the opportunity to co-create world-class ageing research. To be guided by kotahitanga, fostering inclusivity that is respectful of the diversity of older people and the communities to which they belong, which includes: Aroha ki te tangata, Respectfulness and allowing people to define their own space and meet on their own terms; He kanohi kitea, Meeting face-to-face, being seen and engaging within communities; Titiro, whakarongo…kōrero, Looking, listening and then maybe speaking; Developing an understanding of communicating with iwi Māori (and other ethnicities) in order to find a place from which to speak; Manaaki ki te tangata, providing a hospitable, safe, physical and social environment to share knowledge; Kia tūpato, being cautious, respectful and having a critical approach to engagement; Kaua e takahia te mana o te tangata, Respecting the mana of all involved and affected by research through partnership and power-sharing; Kaua e mahaki, Inclusion and co-creation of many knowledge forms.

Homepage: Centre for Co-Created Ageing Research

Contact: ccreateage@auckland.ac.nz

Centre of Research Excellence:

Pūtahi Manawa | Healthy Hearts for Aotearoa New Zealand Centre of Research Excellence

Pūtahi Manawa focuses on collaborative research and educational initiatives as we strive to make a significant impact in cardiovascular health in Aotearoa, New Zealand. Our goal is to create a future where every individual enjoys improved heart well-being and overall cardiovascular health.

At the heart of our research is an innovative "business not as usual" approach, fostering collaboration with our Māori and Pacific communities to cultivate a more equitable health research workforce and a dynamic research environment.

Hompage: https://www.putahimanawa.ac.nz/

Contact: putahimanawa@auckland.ac.nz

Faculty Research Centres:

Aotearoa New Zealand National Eye Centre

The Aotearoa New Zealand National Eye Centre aims to eliminate preventable blindness, to reduce visual impairment, and to become a foremost international vision research, clinical and teaching centre through excellence, innovation and collaboration.

Auckland Cancer Society Research Centre

The Auckland Cancer Society Research Centre is a world leading drug discovery centre with the mission to improve treatment outcomes for cancer patients in New Zealand and globally. We conduct and publish international-quality research on all aspects of cancer; from basic discovery to cancer prevention, focusing on cancer types common in New Zealand patients or where disparities exist for Māori. We work to discover and develop new drugs for cancer therapy, including kinase inhibitors, radiosensitisers, immune modulators, and hypoxia-activated prodrugs. We train future cancer researchers and health professionals throughout participation in post-graduate student supervision and research-led teaching.

Find out more

Centre for Addiction Research

The Centre for Addiction Research brings together researchers from across the University of Auckland Faculty of Medical and Health Sciences, and researchers from other Faculties, who are exploring the impact of dangerous consumptions (such as tobacco, alcohol, illicit drugs, and gambling) and addictive behaviours on individuals, their families (whānau), communities, and wider society. Our mission is to undertake world-leading research to enhance the health and wellbeing of individuals, families, and communities in Aotearoa New Zealand, the Pacific and beyond through the generation of robust evidence to inform practice and policy around the understanding, prevention, and treatment of addiction.

Find out more

Centre for Translational Health Research: Informing Policy and Practice

The Centre for Translational Health Research: Informing Policy and Practice exists to achieve better health, health equity and wellbeing through innovative research informing practice and policy - translating, where applicable, into accessible services, programmes, products and policies.

Find out more

Eisdell Moore Centre (EMC)

Enabling and accelerating a national and transdisciplinary research effort that will deliver innovative solutions to provide hearing and balance health to all communities in Aotearoa so they can thrive.

Find out more

Manaaki Manawa - The Centre for Heart Research

Working in partnership with Māori and Pacific Peoples, Manaaki Manawa is a vibrant world-class centre for heart health research, aiming to deliver meaningful benefit and equity to Aotearoa New Zealand. We do this through workforce development, outreach and community engagement and research that is evidence-based, multi-disciplinary and collaborative. The Centre fosters transdisciplinary research with the aim of facilitating the integration of evidence-based research into practice and training opportunities for Māori, Pacific Peoples and women to improve heart health equity.

Find out more

Medical Imaging Research Centre

The mission of the Medical Imaging Research Centre (MIRC) is to improve health outcomes for patients through world-class research in medical imaging. MIRC aims to be a hub for medical imaging research through driving researcher development, innovation, and excellence in the field. Through the MIRC we will strengthen and build new collaborations with the wider University and co-design research with community partners.

Schools:

School of Nursing

Research is conducted across the following themes:

- Applied research in health
- Kia Mau Te Ora: Promoting wellbeing
- Te Ārai Palliative Care and End of Life Research Group

Contact: r.parke@auckland.ac.nz

School of Medical Sciences

Research is conducted across the departments below:

- Anatomy and Medical Imaging
- Auckland Cancer Society Research Centre
- Biomedical Imaging Research Unit
- Centre for Brain Research
- Molecular Medicine and Pathology
- Discipline of Nutrition and Dietetics
- Discipline of Oncology
- Pharmacology and Clinical Pharmacology
- Physiology

Contact: s.vlajkovic@auckland.ac.nz

School of Optometry and Vision Science

Academic staff in the School of Optometry and Vision Science conduct world-leading research spanning the breadth of the optometry and vision science fields. Starting with basic science – understanding how things work – visual neuroscience explores the extensive brain systems that support vision. This discipline combines diverse but complementary techniques such as physiology (studying cells in the eye and brain), human psychophysics (quantifying the limits of our vision) and computational modelling (linking brains/eyes to human vision). This work in turn informs clinical research into issues related to vision throughout the lifespan such as amblyopia (lazy-eye), myopia (short-sightedness), and age-related conditions of the eye such as glaucoma and age-related macular degeneration.

Our research can be categorised under six broad themes: Ageing Vision, Children's Vision, Myopia, Physiological Optics of the Eye, Technology & Vision, and Vision Neuroscience.

Contact: m.acosta@auckland.ac.nz

School of Pharmacy

Research is conducted across the clusters below:

- Pharmacy policy, law, ethics and the pharmacy profession
- Pharmacy health service delivery
- Pharmacoepidemiology and health outcomes research
- Formulation and drug delivery for various applications
- Improving paediatric medicines, drug delivery technologies and medicine use
- Investigating experience and developing treatments for spinal cord injury

- Pharmacy education and curriculum development
- Safety and efficacy of herbal medicines and other natural health products
- Neuropsychopharmacology and substance use
- Technology and digital innovations in health

Contact: sd.muthu@auckland.ac.nz

School of Medicine

Research takes place across our eight departments:

- Anaesthesiology
- Centre for Medical and Health Sciences Education
- Medicine
- Obstetrics and Gynaecology
- Ophthalmology
- Paediatrics
- Psychological Medicine
- Surgery

Contact: j.thompson@auckland.ac.nz

School of Population Health

The School of Population Health is organised into discipline-specific sections. It also hosts a number of multi-disciplinary research units, centres or institutes:

- Audiology
- Epidemiology and Biostatistics
- General Practice and Primary Health Care
- Health Systems
- Pacific Health
- Social and Community Health
- Growing Up in New Zealand
- The National Institute of Health Innovation (NIHI)
- Centre for Addiction Research (CFAR)

Contact: r.edlin@auckland.ac.nz

General enquiries about doctoral study in the Faculty of Medical and Health Sciences can be sent to: FMHS_PhD@auckland.ac.nz

Faculty of Science

Subjects in the Faculty of Science

Included below is a selection of research projects that represent just a fraction of the diverse opportunities available for doctoral study within the Faculty of Science at the University of Auckland. To explore additional areas of active research where doctoral supervision may be available, please visit the following webpages:

Doctoral study in Marine Science

Doctoral study in Exercise Sciences

Doctoral study in Biological Sciences

Doctoral study in Statistics

Doctoral study in Environmental Science

Doctoral study in Geography

Doctoral study in Geology

Doctoral study in Mathematics

Doctoral study in Mathematics Education

Doctoral study in Chemistry

Doctoral study in Food Science

Doctoral study in Forensic Science

Doctoral study in Computer Science

Doctoral study in Psychology

Doctoral study in Speech Science

Doctoral study in Physics

Institute of Marine Sciences

The Institute of Marine Science has state-of-the art laboratories, aquaria, research vessels and dive support operations based at Leigh Marine Laboratory offering world class facilities for conducting ocean science. Many of our research projects are multi-disciplinary involving staff from computing, mathematical, health, social and engineering sciences. Through joint graduate schools with external research organisations students can also opt for a more applied research focus. Our key areas of research include:

- **Aquaculture and Fisheries**

  Topics: new species aquaculture; optimising hatchery production; farmed fish health; shellfish aquaculture; fisheries ecology; selective breeding programs.

- **Marine Conservation, Restoration and Management**

  Topics: marine protected area design and monitoring; valuation of marine protection; large-scale seafloor restoration; marine mammals and seabirds; population connectivity; marine social-ecological systems.

- **Ecophysiology and Behaviour**

  Topics: Sensory systems in elasmobranchs; acoustic ecology; animal energetics; macroalgae and phytoplankton physiology; fish, seabird and marine mammal movement.

- **Seafloor Ecology**

  Topics: sediment biogeochemistry and blue carbon, human impacts on biodiversity, ecosystem functioning and services, development of new monitoring techniques; temperate reef and soft sediment ecology; trophic cascades.

- **Coastal Processes**

  Topic: pelagic ecosystems, physical oceanography, coastal erosion, remote sensing, bio-physical modelling, marine sediments.

Further information about doctoral studies in marine sciences can be found on this website.

Exercise Sciences: Health, Rehabilitation and Human Performance

The Department of Exercise Sciences (QS subject ranking number 24) has specialist laboratories and research projects available in the following areas:

- **Exercise and Physical Activity**

  We investigate how specially designed exercise programmes can impact health outcomes for people with chronic disease and across the lifespan. Our on-site Health and Rehabilitation Clinic is a central resource for supporting research activity in this area.

- **Health and Reablement**

  We investigate new approaches to enhancing health and recovery in people living with acute and chronic conditions, from childhood to the older adult. We study effects of novel interventions on function and recovery, and the impact of disease and injury on physical activity, sedentary behaviour, and quality of life.

- **Human Performance**

We investigate physical function and performance in healthy individuals, athletes and non-athletes. We aim to further understanding of exercise metabolism and nutrition, improve movement efficiency through biomechanical analysis, and understand how various psychophysiological states associated with performance influence human movement.

- **Neurodiscovery**

We investigate underlying principles in the preparation, planning and execution of action. We explore how the brain controls the actions of muscles to produce human movement, develop novel rehabilitation strategies for people with impaired movement, investigate brain fatigue, and examine interventions that improve brain health and performance.

Further information about doctoral study in Exercise Sciences can be found on this webpage, or requested via email: pgadvice-exercise@auckland.ac.nz.

School of Biological Sciences

- **Biomedical and Human Biology:**
    - **Genome Biology**

      We are interested in how genetic information produces the diverse phenotypes, and our research investigates genomes and how it evolves.

    - **Infection, Immunology, Lymphatics, and Cancer Therapy**

      We are interested in developing treatments to alter the immune and lymphatic systems for cancer and infectious diseases.

    - **Molecular Genetics and Inherited Disease**

      We use genetic, molecular, and bioinformatic tools in various organisms to improve health, agriculture and ecological outcomes. Our research spans neurodegenerative and neurodevelopmental conditions to monogenetic skin conditions and cellular immunotherapies.

    - **Neuroscience**

      Our interests cover a breadth of development, from the neonatal period to the ageing brain. We discover new genetic variants and their impact on neuronal function. We conduct research to understand neurological disorders and to develop novel therapies.

    - **Nutrition, Metabolism, Cell Signalling and Physiology**

      We research how diet and metabolic processes contribute to human health and metabolic disorders. We aim to enhance diet, accelerate drug discovery efforts and identify new therapeutic strategies to treat metabolic disorders.

    - **Stem Cell Biology**

      Our research focuses on human adult stem/stromal cells, specifically in skin and adipose tissue. Our research investigates the role of these stem cells in tissue repair

and regeneration of developing new treatments for skin diseases and unhealed wounds.

- **Ecology and Evolutionary Biology**
    - **Applied Ecology**

      We study the management of the natural environment, protection from invasive threats and ecosystem restoration for conservation outcomes across a wide range of biosecurity and conservation topics.
    - **Behaviour**

      We focus on how animals interact with other organisms, their physical environment, and responses to entrainment, animate or inanimate stimuli under experimental and natural conditions.
    - **Entomology**

      We explore the relationship between insects and humans, the environment, and other organisms, including arthropod biodiversity, biological control, beneficial and pest invertebrates and insect ecology.
    - **Environmental and Applied Microbiology**

      The ecology and physiology of microorganisms in natural and engineered environments is considered, including aspects of microbial ecology, aquatic microbiology and geomicrobiology and the interactions of microbes, animals and plants. Genomic microbiology, biotechnology, bioremediation and the microbiology of food and beverages feature strongly.
    - **Evolution**

      We study mechanisms/processes of heritable change within and among populations of organisms over multiple generations to understand the diversification of life, and the potential of species to adapt in a changing world.
    - **Global Change Ecology**

      Global change processes include land use change, pollution, habitat fragmentation and climate change. We engage in projects across marine, terrestrial and freshwater systems.
    - **Marine Ecology**

      We study the factors that determine the distribution and abundance of marine organisms, including habitat, populations and interactions of organisms in the marine environment.
    - **Plant and Animal Ecophysiology**

      We examine how the physical and biological environment interacts with an organism's physiology, including the effects of climate and nutrients on plants and animal physiological processes.
    - **Systematics and Biodiversity**

We focus on measures of variation in living organisms, from genetic diversity within species to species-to-species variety across ecosystems. We investigate levels of biodiversity, its functional effects, and how and why it changes over time.

- **Terrestrial Ecology**

  The active processes and interactions in terrestrial environments are explored, to conserve and restore them and understand how land-based organisms interact with each other and the environment.

- **Cellular, Molecular and Physiological biology**

  - **Biochemistry**

    We study cell biology, structural biology, chemistry, enzymology, physiology and genetics. Biochemistry involves applying multiple techniques to answer important questions in these overlapping areas of expertise.

  - **Computational Biology**

    Our research encompasses computational and evolutionary analysis of genomes, RNA and proteins and modelling of molecules, evolutionary processes, populations and ecosystems.

  - **Infectious Disease**

    We focus on the microorganisms that cause sickness in humans, plants and animals. Using various techniques, ranging from microbiology to modern genomics and structural analysis methods.

  - **Plant Molecular Science**

    Our research focuses on the mechanisms determining plant traits with agricultural, environmental, nutritional and health benefits, including flowering time regulation, nitrogen regulation and fixation, fruit development, ripening and colour, and disease resistance.

  - **Structural Biology**

    The three-dimensional structure of biological macromolecules, such as proteins and nucleic acids, at atomic resolution, focusing on understanding chronic and infectious diseases at a molecular level to aid in developing compounds with therapeutic benefits.

Further information about doctoral study in Biological Sciences can be found on this webpage.

Department of Statistics

The Department of Statistics has expertise and strong international collaboration in many areas of the Life and Social Sciences.

- **Ecology**

We have expertise in developing statistical methods in a wide range of ecological applications including population estimation, spatial data in ecology, mark-recapture, remote sensing. Our

research also extends to dynamics systems such as population dynamics, fisheries management and sustainability, and pest eradication.

- **Genetics**

Our expertise in genetics includes population genetics, genetic risk prediction models, population-based and family-based studies, high-dimensional data, next-generation sequencing, high throughput biological assays, multi-omics.

- **Biomedical**

We have researchers investigating climate change effects on human health and the targeting of personalized medicine from genetic data. We also devise methods for meta-analysis across different populations or groups, and for complex sampling designs. We influence international policy through global dietary and global vaccine studies.

- **Social Science**

We have strong expertise in analysing high-dimensional population data collected at individual level, and its use for informed policy making. Our researchers on statistical education are internationally renowned and are transforming the learning experience of statistics both nationally and abroad.

- **Research in Statistical Theory, Data Science & Interdisciplinary Sciences**

The Department of Statistics has expertise in developing methodology and tools that enhance research capabilities in a wide range of areas.

- **Bayesian Methods**

We advance new theory and algorithms for Bayesian analysis. Current research provides better tools for model evaluation and comparison, robust inference, assessment of model misspecification, and approximations to intractable models.

- **Stochastic Processes**

We create new theory and tools for stochastic processes. We apply these developments to areas such as genealogy of stochastic populations, numerical approximations for novel point processes, optimization of queueing processes, nonlinear state-space models.

- **Statistical Theory**

We establish new theoretical results and properties. These are the foundation for novel developments in sequential analysis, multiple testing, model selection, vector generalized additive mixed models, mixed-effects models, high-order theory, saddle-point approximation.

- **Interdisciplinary**

Our department possesses world leaders in several interdisciplinary fields. We develop methods to quantify forensic evidence, and predictive models in econometrics. Our optimization research enhances the experience of users of public transport and health care. Our research on signal detection in gravitational waves is increasing what is known about the origins of the universe.

- **Data Science**

We are the birthplace of the R language and continually provide improvements such as novel tools for graphical methods. We develop innovative tools for prediction, including use of dictionary learning for sparse representation and anomaly detection.

Further information about doctoral study in Statistics can be found on this webpage, or requested via email: bj.brewer@auckland.ac.nz.

School of Environment

The School of Environment has specialist laboratories and research projects available in the following areas:

- **Imaging with Seismic Waves**

  Large numbers of seismic and meteor impact events have been recorded on Mars and the Moon. This research looks at unravelling the physical properties of crustal rocks in these planetary bodies and explores the potential for subsurface water and/or ice.

- **Coastal Processes Research**

  We have a range of topics available for students interested in Coastal Processes Research at the University of Auckland such as: determining drivers of historical coastal change in New Zealand; quantifying reef vertical accretion rates on Pacific coral reefs using photogrammetry; resolving wave driven coastal cliff erosion with physical model experiments; understanding marine heat waves in shallow estuarine and coastal environments; tracking the spatial footprint of river plumes in the coastal ocean.

- **Carbon Exchange in Mangrove-estuarine Systems**

  Mangrove ecosystems are critical systems in global blue carbon research. Mangroves engage in complex carbon exchanges with water, sediments, and microorganisms through tidal interactions, affecting both carbon storage and fluxes between mangroves and the estuary/coast. Field measurements, remote sensing data, and numerical simulations will be integrated to explore the carbon exchange between New Zealand's mangroves and the wider estuary. Specific objectives could be: (1) to determine the exchange of carbon between mangrove forests and estuaries, using field measurements; (2) to analyse the environmental drivers behind carbon exchange in mangrove forests, using causal modelling techniques; and (3) to assess the future dynamics of carbon exchange in mangrove ecosystems, using simple numerical models.

- **Ecosystem Resilience under Environmental Change**

  Research in the broad area of ecosystem resilience to environmental change could use methods such as a blend of simulation modelling, species distribution modelling, and fieldwork. This is a broad research area with strong fundamental and applied components.

- **Fate and Effect of Nano Pesticides**

  To harness its full innovation potential and impact, the development of nano-enabled agrochemicals needs to be carefully guided so that products that are beneficial to end-users are effectively developed and applied in a sustainable way.

  This project will look at a range of nano-enabled agrochemicals and investigate their mobility and degradation in soil in comparison to non-nano equivalents. Ecotoxicity towards soil and aquatic organisms will also be studied and critically evaluated in the context of the sustainable applications of nanotechnology in agriculture.

- **Integration of Remote Sensing and AI for Real-Time Monitoring of Urban Mobility and Air Quality**

As urban populations expand, cities encounter growing challenges in managing mobility and air quality. Traditional monitoring methods often lack the real-time capabilities necessary for effective decision-making and intervention. This project focuses on integrating remote sensing data with artificial intelligence (AI) to develop a comprehensive system for real-time monitoring and analysis of urban mobility and air quality.

Further information about doctoral study in Environmental Science, Geology, and Geography can be found on this webpage or contact the doctoral advisors: Martin Brook m.brook@auckland.ac.nz or Luitgard Schwendenmann l.schwendenmann@auckland.ac.nz

Department of Mathematics

The Department of Mathematics has a vibrant community of PhD students and there are a number of academic and social activities to support them. The research in the department is structured into four broad areas.

- **Algebra and Combinatorics**

  Members of the algebra and combinatorics group conduct research in the fields of group theory, representation theory, graph theory, geometry, number theory, and applications.

- **Analysis, Geometry and Topology**

  The Analysis, Geometry and Topology Unit consists of a strong team of researchers, offering exciting projects in harmonic analysis, PDEs, tight frames, conformal and differential geometry, to name just a few.

- **Applied Mathematics**

  The Applied Mathematics Unit is internationally renowned for its expertise in Applied Dynamical Systems. Related research involves chaotic fluid mixing, spatio-temporal pattern formation, advanced numerical methods and industrial mathematics.

- **Mathematics Education**

  The Mathematics Education Unit has been an integral part of the Department of Mathematics since 1992, covering a wide range of research topics pertaining to secondary and university mathematics education.

Further information about doctoral study in Mathematics can be found on this webpage.

School of Chemistry

- **Green Chemical Science for a Sustainable Future**

  Green Chemical Science is the use of chemical principles, science and technology to advance society in ways that are benign to the environment and sustainable for the foreseeable future.

  Globally, humanity faces many challenges such as pollution, resource depletion, energy demands, inadequate food supply and lack of clean water.

  Our research aims to address these challenges by using Green Chemical Science approaches to develop sustainable solutions. We focus on the use of renewable feedstocks, methods of

pollutant remediation, designing environmentally benign chemical synthesis and reducing waste in food production and storage.

Research areas include use of renewable feedstocks, sustainable chemical synthesis, reducing and reusing food waste, remediation of pollutants, renewable energy production and storage.

Follow this link to explore academic staff in Green Chemistry

- **Advanced Materials and Technologies**

Materials science addresses many of the challenges facing modern society by developing new substances for use in areas such as sustainable living, the environment, energy and health.

This highly interdisciplinary field of research combines chemistry, physics, biology, medicine and engineering to understand and design desired properties in the development of new substances.

Our research in advanced materials and technologies comprises the synthesis, characterisation and applications of new functional materials including self-assembled peptide systems, polymers, catalysts for energy applications, and novel inorganic/magnetic materials. Electrochemical synthetic methods and studies of material degradation such as corrosion science, are an important part of this work.

Research areas include solid-state inorganic materials, energy materials and catalysis, functional polymeric materials, bioactive materials and coatings, surfaces including biological systems, electrochemical characterisation and synthesis of materials, dynamic microfluidics and nanofluidics.

Follow this link to explore academic staff in Advanced Materials

- **Pushing the Boundaries of Fundamental Chemistry**

Fundamental research in the School of Chemical Sciences spans all areas of chemistry to advance knowledge, better understand the universe and seed development of the next generation of technological breakthroughs.

Chemistry is often referred to as the central science, given the strong connections between chemistry and the other natural sciences. Our research focuses on advancing the current understanding of chemical science in terms of explaining the mechanisms of reactions, developing new methods in chemical synthesis, uncovering novel aspects of molecular structure and, revealing different modes of chemical bonding.

Our fundamental discoveries help propel chemistry as the central science by facilitating interdisciplinary outcomes in areas such as chemical biology and chemical physics.

Research areas include chemical synthesis and catalysis, reaction mechanisms, photochemistry, biochemical reactions, organocatalysis, mechanochemistry, electrochemistry.

Follow this link to explore academic staff in Fundamental Chemistry

- **Innovations in Food and Beverages: Wine and Food Science**

The phrase "We are what we eat" reflects the important role food and beverage play in our lives. This area of research covers food and beverage properties, agricultural and production practices, and food safety.

Our research covers a wide range of products, including fruits and vegetables, seafood, meat products, dairy, and wine. Using a fundamental approach, we investigate food structure,

macromolecular interactions and their properties functionalities and digestive attributes, and the biosynthesis of bioactive molecules.

Our applied research with New Zealand companies focuses on the stabilisation of functional ingredients and their application in functional foods. We are investigating quality parameters in wine, and differences in wine styles, including the impacts of winemaking processes involved in yeast fermentation. Our wine research maintains close links to the New Zealand wine industry and the export success of sauvignon blanc and pinot noir wines in particular.

Key research areas include structure and functionality of food macro-components, bioactives and functional food, food processing, quality and safety, sustainability in agricultural and food systems, wine analysis, yeast metabolism, winemaking factors.

Follow this link to explore academic staff in Food and Beverage Science

- **Forensic Science**

Forensic Science is the application of science to matters of law. This is a postgraduate programme suitable for entry from undergraduate degrees in a range of subjects including chemistry and biology.

As our knowledge and technical expertise in science increases, so does the complexity and importance of the science presented to the courts in the legal system. The Forensic Science programme is jointly run by the University of Auckland and the New Zealand Institute for Public Health and Forensic Science (the suppliers of forensic science to the New Zealand Police). Students benefit from expert guest lecturers, including Crown Prosecutors and independent forensic practitioners.

Our graduates can be found in forensic science organisations, the New Zealand Police, academic and commercial science organisations and government agencies. Forensic Science covers a broad range of topics, from the statistical evaluation of glass evidence to the development of new molecules to aid in the visualisation of fingerprint residues.

Research areas include environmental forensic science, field science, forensic biology, illicit drugs and drug chemistry, physical evidence.

Follow this link to explore academic staff in Forensic Science

- **Chemical Sciences for Human Health**

Advances in chemical science underpin all aspects of modern medicine from disease treatment to sanitation, diagnosis, detection and the understanding of disease mechanism and progression.

To ensure healthcare development keeps pace with the many healthcare challenges facing our society, novel chemical science research is vital. We dedicate our research to making an impact in this area both locally and internationally.

Research topics include infectious disease and antimicrobials, target identification and drug discovery, organic reaction mechanisms, natural products, organic synthesis of natural products and therapeutic compounds, cancer, enzyme biochemistry, diabetes and obesity, devices and sensors.

Follow this link to explore academic staff in Chemical Sciences for Human Health

Further information about doctoral study in Chemical Sciences can be found on this webpage, or contact one of the doctoral advisers: Jon Sperry j.sperry@auckland.ac.nz or Danaé Larsen d.larsen@auckland.ac.nz

School of Computer Science

The School of Computer Science has research projects available in the following areas:

- **Artificial Intelligence**

We investigate fundamentals of learning in AI (knowledge use, life-long learning, capability learning, learning to reason, adversarial learning, reliability, causal and ethical inference); applications of AI to environmental, medical and social needs, and topics related to interdisciplinary cognitive science. One focus is understanding human and AI learning in a joint framework, another is the development of adaptive agentive systems for research assistance and service improvement, ensuring that advances in AI theory translate into impact across domains.

- **Human-Centered Computing and Interaction Design**

Human-computer interaction (HCI) is a growing area of research at the School, encompassing usability, accessibility, and user experience design. Our researchers investigate how people engage with digital systems, including extended reality (XR), multimodal education technologies, and assistive interfaces such as gaze tracking. The HCI Group collaborates across disciplines to improve interaction paradigms in healthcare, education, and public services. Flagship initiatives such as the Digital Twin Collaboratory and the EXTREME project and others with a focus on inclusive design and digital wellbeing highlight the School's dedication to designing technology that enhances human capabilities and experiences.

- **Computing Education**

We explore how students learn computing, and how modern tools, including the use of Generative AI, support students in their learning. We study the interaction between the learners and the tools.

- **Theoretical Computer Science (and Quantum Computing)**

We are active in a range of areas that span theoretical computer science including the design and analysis of algorithms, combinatorics, computational complexity, computability and randomness, and (quantum) information theory. We are driven by fundamental questions in computer science and apply our results to questions that arise, for example, in computational biology and physics.

- **Computer Graphics, AR/VR, Games, and Visualization**

Visual Computing is the intersection of computer science and visual information. It focuses on how computers can process, analyse, generate, understand, and use visual data—like images, videos, and 3D models—to enable intelligent interaction with the world. This includes computer graphics research such as rendering, animation, and 3D modelling, AR/VR research such as innovative applications in education and healthcare, games research such as serious games, game AI, and use of procedural content generation in games, and visualization research such as novel techniques for scientific, biomedical and information visualisation. A major focus of our research is education and training, e.g., novel approaches to teach computer graphics and game development, e.g., by using LLMs/LMMs, but also using computer graphics/AR/VR/games for teaching other subjects such as AR piano tutoring, VR spatial skills training, computing education, and exergames.

- **Software Engineering**

  Software engineering research seeks to improve the efficiency of software system construction while maintaining or improving quality. Efficiency covers such things as the time to completion, the cost of completion and resource requirements, such as staff. Quality considers areas of functional correctness, formal verification, code readability, design quality, short-term and long-term maintainability, reusability, return on investment, and staff satisfaction and effectiveness.

  Our research covers a range of artefacts, including the source code that makes up the software system, the requirements, formal specifications, design, architecture, documentation, and test plans. It encompasses the software development environment, such as tools, and processes such as agile development. We also investigate how to determine the quality of the software system and the efficiency of the development practices used. We have also recently examined the reliability and compatibility of AI toolchains and hardware, with a focus on their integration and performance in supporting AI software development.

- **Cyber security**

  Our cybersecurity research tackles the growing challenges of protecting people, organisations, and societies in a digital world. We bring together expertise in network and systems security, cryptography, cybercrime prevention, and human–centred security to develop innovative approaches that strengthen resilience against evolving threats. Our researchers work across technical, behavioural, and policy dimensions—ranging from building secure systems and defending against large-scale attacks, to protecting individuals from scams and online harms. By combining fundamental research with real-world impact, we aim to make cyberspace safer for all.

Further information about doctoral study in Computer Sciences can be found on this webpage.

School of Psychology

The University of Auckland's School of Psychology offers a comprehensive and interdisciplinary research portfolio in the psychological, cognitive, and neural sciences that underpin health, wellbeing, decision-making, human development, behaviour, attitudes, and social interactions. Key research areas include cognitive processes and their neural underpinnings, examination of sociocultural contexts and social justice issues through Indigenous, feminist, and critical lenses, human development across the lifespan, perception and attention in visual and auditory domains, and the evolution of the human mind and its parallels in other species.

Interested students should identify a research area they wish to apply in from the listing on this webpage and contact potential supervisors to discuss the possibility of applying.

Department of Physics

The Department of Physics is small but has a vibrant research culture focussed on collaborative research with other groups both within the University and worldwide. We are part of several of NZ's Centres of Research Excellence with particular strengths in photonics, quantum technologies and materials research. In recent years a focus has been on applying cutting edge technologies to solving relevant industrial problems as well as creating the new technologies to solve tomorrow's problems. In photonics we have looked at problems ranging from imaging cancer cells to monitoring volcanos and we work on understanding the quantum nature of light and how this can be used for computation and sensing. Coming to Auckland means that students would be part of a larger post-graduate community

that regularly hosts events and helps run international student conferences. Many of our academics have supervised previous CSC scholarship holders and are thus well placed to understand and support new applications.

Further information about doctoral study in Physics can be found on this webpage.

General enquiries about doctoral studies in the Faculty of Science can be sent to:
sciencephd@auckalnd.ac.nz

Auckland Bioengineering Institute

Website: https://www.auckland.ac.nz/en/abi.html

The Auckland Bioengineering Institute (ABI) is a world-leading research institute dedicated to improving medical diagnosis and treatment through the application of engineering sciences and technical innovation to human physiology. Our researchers investigate many organ systems in the body, integrating computational modeling, experimental physiology, and device development to advance healthcare.

ABI offers a wide range of postgraduate research opportunities across interdisciplinary themes, including medical devices, computational physiology, biomimetics, and augmented human technologies. A list of ABI research themes and associated supervisors can be found here.

Computational and Experimental Physiology

- Combining experimental data with computational simulations to understand disease mechanisms and predict treatment outcomes.
- Heart: Modelling cardiac energetics, mechanics, electrophysiology, and blood flow dynamics to understand normal function and disease states.
- Brain: Simulating brain activity and injury mechanisms to explore neurological function, cognitive processes, and recovery strategies.
- Lungs: Investigating lung mechanics and respiratory function through computational simulations to improve diagnosis and treatment of pulmonary conditions.
- Musculoskeletal System: Studying musculoskeletal dynamics, including gait analysis, joint biomechanics, and muscle function to support rehabilitation and prosthetic design.
- Physiome Project: Leading the international Physiome Project, which provides open-source tools and standards for physiological modelling across organ systems.

Engineering for Clinical Technologies

- Creating diagnostic and therapeutic tools tailored to clinical needs.
- Collaborating with clinicians to translate engineering innovations into real-world healthcare solutions.

Examples include AI-powered gait analysis for stroke rehabilitation and 3D planning tools for joint replacement surgery.

Medical Devices and Instrumentation

- Designing implantable and wearable devices for monitoring and intervention.
- Developing bioinstrumentation for real-time physiological measurements.

Innovations include soft sensors, artificial muscles, and smart implants.

Biomimetics and Augmented Human Technologies

- Mimicking biological systems to create adaptive, responsive technologies.
- Exploring augmented reality, animate technologies, and empathic computing.

Applications range from robotic systems to immersive rehabilitation environments.

Translational Impact

ABI research spans basic science, engineering design, clinical trials, and commercialisation. With over 20 spin-out companies and strong industry partnerships, ABI is a hub for innovation that transforms research into societal impact. ABI graduates are highly sought after in both academia and the high-tech sector.

General enquiries about doctoral study in the Auckland Bioengineering Institute can be sent to: n.mamnani@auckland.ac.nz

Liggins Institute

Website

Research at the Liggins Institute is focused on maternal and child health. We have a diverse range of doctoral projects available in areas spanning pregnancy, perinatal and maternal health research, influence of the early life environment on later disease, genomics and the microbiome, scientific and health literacy, nutrition, childhood growth, and childhood obesity and diabetes.

A list of Liggins Institute supervisors with current postgraduate research opportunities can be found here. A full list of Liggins supervisors can be found here.

Fetal, Perinatal, and Maternal Health

- Understanding how pregnancy complications (e.g. pre-eclampsia, gestational diabetes, severe morning sickness) impact offspring health.
- Investigating how maternal, fetal and neonatal treatments, including nutrition and intrauterine environment, influence growth, development and long-term disease risk.
- Investigating how the immune system develops and impacts later life.
- Determining how paternal health impacts the offspring.
- Collaborative work to reduce preterm birth in New Zealand and improve outcomes for at-risk babies.

Adolescent and Childhood Health

- Exploring how early-life nutrition affects risk of obesity, diabetes, and cardiovascular disease during adolescence and beyond.
- Studying hormonal influences on growth, puberty, and long-term metabolic health.
- Designing interventions to support healthy weight, wellbeing, and resilience in children and young people.

Genome Biology and the Microbiome

- Mapping how genetic variation influences disease susceptibility and co-morbidities across the life course.
- Advancing diagnosis of acute and chronic childhood diseases through genomic and multi-omics approaches.
- Investigating how restoring or reshaping the gut microbiome can improve metabolic, immune, and mental health outcomes.

Nutrition, Growth, and Metabolic Health

- Clinical and experimental studies on the effects of maternal, infant, and child nutrition on growth, body composition, and long-term metabolic outcomes.
- Evaluating strategies for preventing and treating childhood obesity and diabetes.
- Research on dietary supplements, fortified foods, and optimal feeding practices.

Translational Impact

Across all themes, Liggins Institute research links basic science, clinical trials, longitudinal cohort studies, and community engagement. Our ultimate goal is to improve health outcomes for mothers, babies, children, and future generations through evidence-based practice and policy.

General enquiries can be sent to: grace.ho@auckland.ac.nz