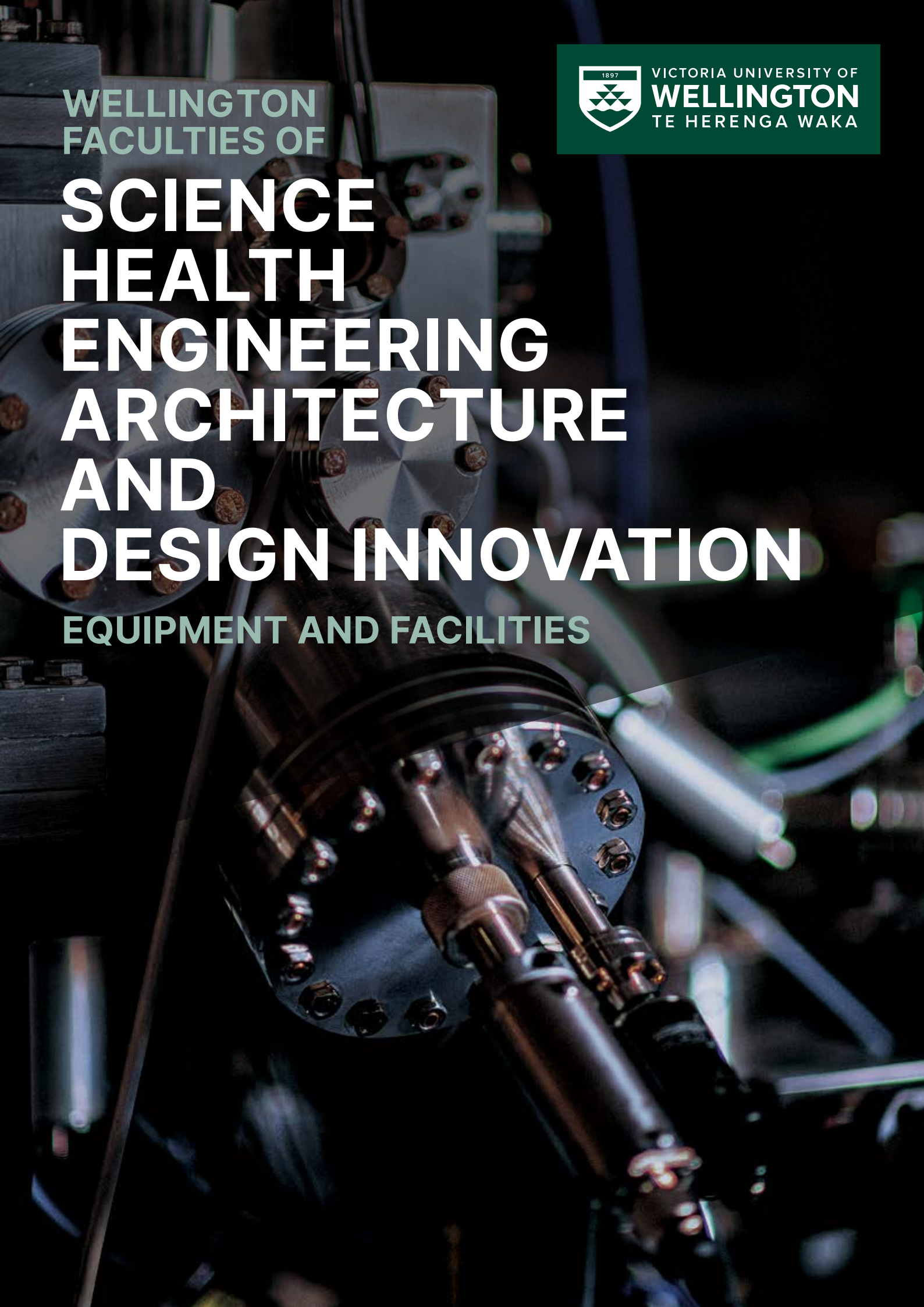
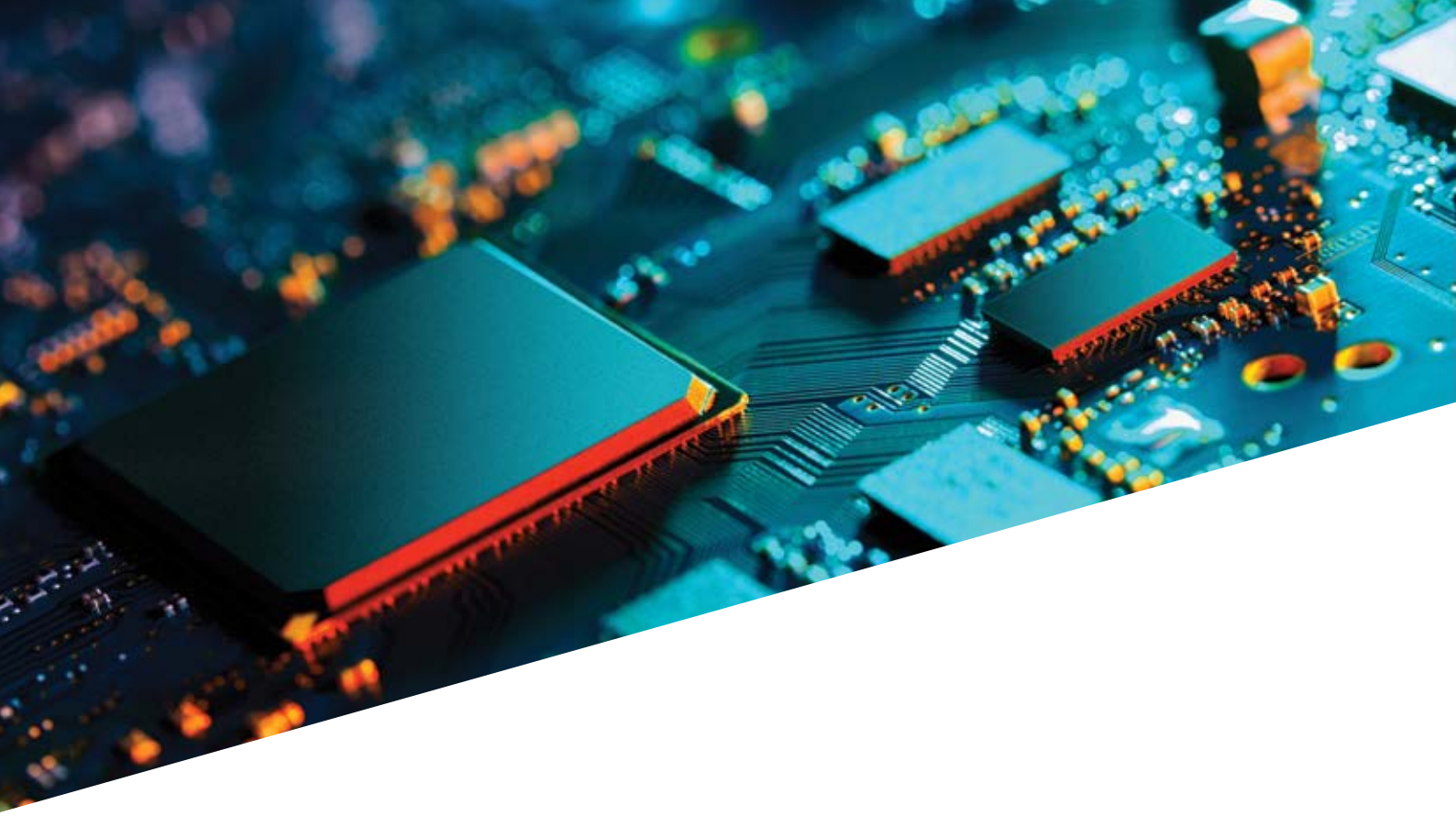


VICTORIA UNIVERSITY OF WELLINGTON
TE HERENGA WAKA

WELLINGTON FACULTIES OF

SCIENCE HEALTH ENGINEERING ARCHITECTURE AND DESIGN INNOVATION

EQUIPMENT AND FACILITIES



To see the online version of this catalogue, scan the QR code or visit our website

www.wgtn.ac.nz/our-equipment

QS STARS™ RATING SYSTEM

Te Herenga Waka—Victoria University of Wellington has been awarded five stars plus overall in the QS Stars university ratings system. In addition, the University received five stars in all eight categories on which it was evaluated.

sheadi@vuw.ac.nz | www.wgtn.ac.nz/sheadi

CONTENTS

WELCOME

At Wellington's Faculties of Science, Health, Engineering, Architecture and Design Innovation, we are focused on anchoring a capital city innovation system and connecting with the world.

We are 'Te Herenga Waka', the mooring place of canoes. A distinctive place where people from around Aotearoa and beyond can 'hitch their boats' away from rough seas; and find shelter, opportunity, connection, and prosperity. Located in the heart of our capital city, we value our close connections and partnerships with government, business and industry, universities, institutes, iwi, and community groups. We strive for new opportunities to collaborate, cooperate, and embark on new journeys with others. We dare to be different and dare to make a difference.

We offer outstanding research capabilities, state-of-the-art equipment, and local and global relationships. We are mission-driven and dedicated to developing productive partnerships and ensuring our research has real-world applications for industry and commerce—helping create and discover innovative, sustainable solutions to heal, feed, fuel, and shape Aotearoa New Zealand and the world.

We are looking outwards: from a thriving university community, to the wellbeing of this city, to helping meet the grand challenges of our time. Our strategy allows us to offer a highly relevant proposition to end-users of what we do and what we achieve—industries, businesses, and the public sector. We can work with you in different ways, on a major long-term project or simply help with short-term support with a single student placement project. We are flexible and agile, and can tailor the way we engage so that it fits your needs precisely.

Te Herenga Waka—Victoria University of Wellington is a progressive and modern university that celebrates its 125th year in 2022. We have a proud tradition of supporting our communities, supporting the economy, and contributing to the society of Aotearoa New Zealand. Our people have helped to shape the modern world through research and education—by creating and transferring knowledge in a variety of fields as diverse as healthcare therapies and electromagnetics.

This brochure showcases just some of our facilities that you can access, as a student, a collaborator, a partner or an industry. In addition to this capacity, we have a comprehensive array of world-class academic capability. We believe our expertise in science, technology, health, engineering, and design innovation can change the world for the better. So why not get in touch and find out just how productive a partnership with Te Herenga Waka can be, or what studying at our university could look like?

Professor Ehsan Mesbahi
Pro Vice-Chancellor Science, Health, Engineering, Architecture and Design Innovation
Te Herenga Waka—Victoria University of Wellington

OUR STRATEGIC CHALLENGE AREAS

Our research and teaching activities are continuously evolving, while at the same time we are focused on some core strategic challenge areas that are of particular importance for the future and which draw on many of our key strengths.

OUR EARTH

Deepening our understanding of earth systems and better predicting future states

NET-ZERO CARBON

Rapidly transitioning our energy and materials systems in a way that ensures sustainability and supports prosperity

BUILD BETTER LIVE BETTER

Using frontier technological and design innovation to enhance our built and material environment and how we live within this

QUANTUM LEAP

Flourishing in a world of big data and advancing our digital and computational capabilities to address the big questions

THRIVE

Harnessing innovation to significantly improve human health and wellbeing

SAFE

Intelligent and ethical systems for keeping people safe

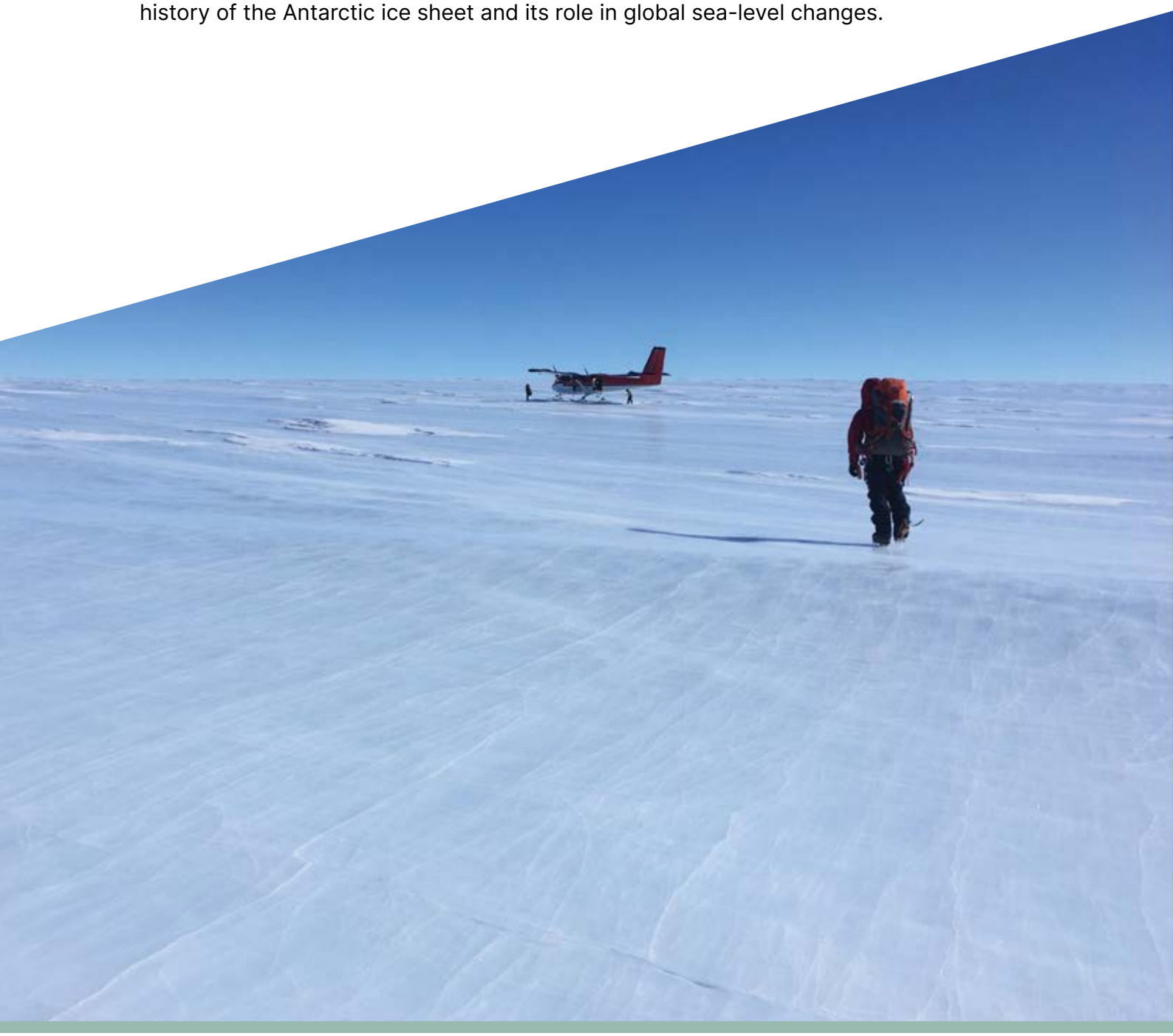
STRENGTH FROM DIVERSITY

Wellington's Faculties of Science, Health, Engineering, Architecture and Design Innovation are made up of highly committed researchers and educators across the STEM disciplines.

Our hub is in Kelburn near the central city, but we are present throughout the Wellington region.

TE PUNA PĀTIOTIO—ANTARCTIC RESEARCH CENTRE

The **Antarctic Research Centre** provides world-leading research on how the Antarctic is responding to climate change and the consequences, both globally and for Aotearoa New Zealand. Most of their recent research is in the area of earth science, with a particular focus on paleoclimate and history of the Antarctic ice sheet and its role in global sea-level changes.



FIELD POWER SYSTEM

The boilers and generators to operate the hot water drill system.

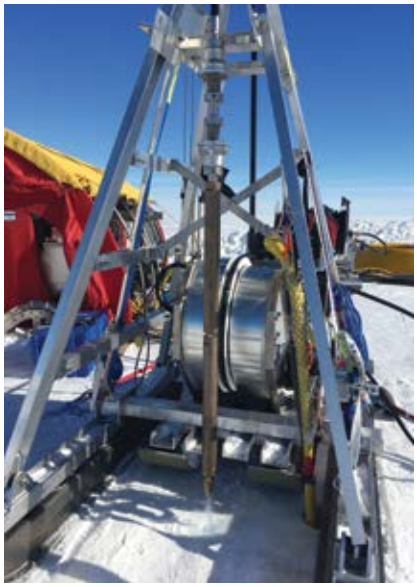
CONTACT: **Darcy Mandeno**
antarctic-research@vuw.ac.nz
04 463 9662

GROUND PENETRATING RADAR

Used to map structures and features underground.

CONTACT: **Huw Horgan**
antarctic-research@vuw.ac.nz
04 463 6918

1000 M HOT WATER DRILL SYSTEM



Large bespoke Antarctic drill.

CONTACT: **Darcy Mandeno**
antarctic-research@vuw.ac.nz
04 463 9662

ICE CORE DRILL

1000 m depth at diameter 98 mm core, includes small field power systems and ice core and drill fluid field processing infrastructure.

CONTACT: **Nancy Bertler**
antarctic-research@vuw.ac.nz
04 463 6196

DIONEX ICS-5000 SYSTEMS

Ion chromatography system used in the ice core laboratory.

CONTACT: **Nancy Bertler**
nancy.bertler@vuw.ac.nz
04 463 6196

DIAMOND ROCK CORE SPLITTING SAW

Can cut HQ 1000 mm long cores.

CONTACT: **Darcy Mandeno**
antarctic-research@vuw.ac.nz
04 463 9662

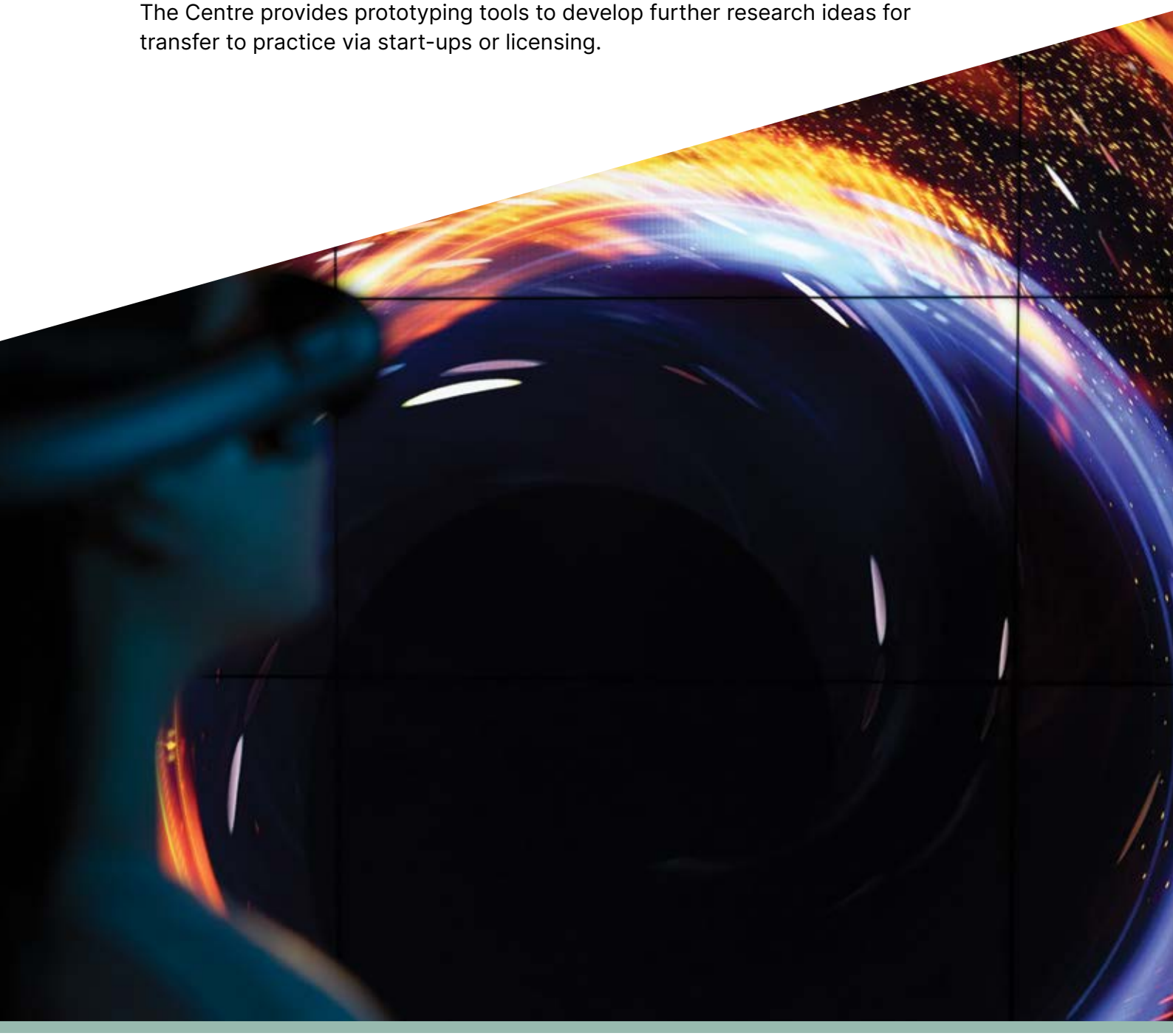
SHALLOW SEISMIC SHOT HOLE HOTWATER DRILL

Can drill ~30 m depth, 85 mm holes, with associated sleds and support equipment.

CONTACT: **Huw Horgan**
antarctic-research@vuw.ac.nz
04 463 6918

TĀURU IHIRANGI— COMPUTATIONAL MEDIA INNOVATION CENTRE

The **Computational Media Innovation Centre** aims to enhance New Zealand's interactive media ecosystem through user-oriented academic research. The Centre collaborates with industry experts, including major international media organisations in areas such as VR/AR, film, animation, special effects, and gaming technologies. The Centre provides prototyping tools to develop further research ideas for transfer to practice via start-ups or licensing.



VIRTUAL REALITY LABORATORY

This lab includes one 6K Production camera, nine 360 cameras, three LIDAR scanners, three AR headsets, six VR motion trackers, nine VR headsets, four motion tracking developer kits, a blue/green screen, and a still image DSLR camera.

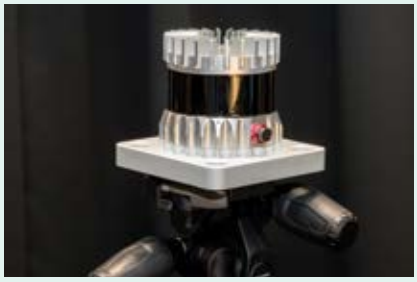
CONTACT: **Warren Butcher**
cmic@vuw.ac.nz
021 246 8373

BLACKMAGIC POCKET CINEMA CAMERA 6K PRO

This 6K production camera is an advanced technology, handheld 6K digital film camera with 6144 x 3456 Super 35 high resolution HDR sensor, dual native ISO, EF lens mount and direct recording to USB-C disks. This powerful model adds an adjustable tilt HDR touchscreen, built in ND filters, and a larger battery for longer run time.

CONTACT: **Warren Butcher**
cmic@vuw.ac.nz
021 246 8373

OS1 LIDAR



This laser environment scanner is used to measure distances by illuminating the target with laser light and measuring the reflection with a sensor. These measurements can then be used to make digital 3D representations.

CONTACT: **Warren Butcher**
cmic@vuw.ac.nz
021 246 8373

INSTA360 PRO 2 CAMERA

The Insta360 Pro 2 VR Camera captures 360 spherical VR videos and stills in configurations up to 8K 3D. It can record immersive 8K video while streaming in 4K and includes the FarSight remote monitoring system. Features include a precise 9-axis FlowState stabilisation, CrystalView monitoring on standard devices, automatic proxy file creation, and stitch-free editing in Adobe Premiere Pro.

CONTACT: **Warren Butcher**
cmic@vuw.ac.nz
021 246 8373

TE KĀURU—FERRIER RESEARCH INSTITUTE

The Ferrier Research Institute is a team of carbohydrate, analytical, and bio-chemistry experts working to bring better drugs, materials, and technology to the world.

The Institute's work includes a broad range of applied research projects and commercial work for clients.

HIGH PERFORMANCE ANION EXCHANGE CHROMATOGRAPHY WITH PULSED AMPEROMETRIC DETECTOR (HPAEC-PAD)

Specialist analytical HPLC for the separation and quantitation of mono- and oligo-saccharides.

CONTACT: **Joel Kidgell**
ferrier@vuw.ac.nz
04 463 3853

IKA MAGIC LAB

Small-scale, portable, laboratory machine designed for mixing, dispersing, wet milling, and incorporation of powders into liquids.

CONTACT: **Alison Daines**
ferrier@vuw.ac.nz
04 463 0046

HIGH PERFORMANCE LIQUID CHROMATOGRAPHY (HPLC)

Separation and detection of chemical compounds in a sample to determine purity and composition. Detectors include UV, fluorescence, and refractive index (RI).

CONTACT: **Susie Carnachan**
ferrier@vuw.ac.nz
04 463 0042

ÄKTA FLUX DIAFILTRATION/ CONCENTRATION SYSTEM

Multi-litre molecular sizing and dialysis/ ultra filtration. A semi-automated tangential flow filtration/cross flow filtration system for concentration and diafiltration as well as cell harvest and clarification.

CONTACT: **Simon Hinkley**
ferrier@vuw.ac.nz
04 463 0052

MICROWAVE REACTOR

Synthesis equipment for conducting organic synthesis reaction under microwave conditions.

CONTACT: **Simon Hinkley**
ferrier@vuw.ac.nz
04 463 0052

SEMI-PREPARATIVE LIQUID CHROMATOGRAPHY

Low pressure (low flow rate) semi-preparative liquid chromatography system with fraction collector suitable for separating compounds (mg scale) on size exclusion, anion-exchange, or other columns.

CONTACT: **Tracey Bell**
ferrier@vuw.ac.nz
04 463 0041

GAS CHROMATOGRAPHY INSTRUMENT WITH MASS SPECTROMETER (GC-MS)

Separation and mass identification of volatile chemical compounds in samples.

CONTACT: **Ian Sims**
ferrier@vuw.ac.nz
04 463 0062

HIGH PERFORMANCE LIQUID CHROMATOGRAPHY (HPLC) WITH ULTRA-VIOLET (UV), REFRACTIVE INDEX (RI), AND MULTI-ANGLE LASER LIGHT SCATTERING (MALLS) DETECTORS

Specialist analytical HPLC for size determination of oligo- and polymeric structures.

CONTACT: **Ian Sims**
ferrier@vuw.ac.nz
04 463 0062

GAS CHROMATOGRAPHY INSTRUMENT WITH FLAME IONISATION DETECTOR (GC-FID)

Separation and quantification of volatile chemical compounds in samples.

CONTACT: **Susie Carnachan**
ferrier@vuw.ac.nz
04 463 0042

LIQUID CHROMATOGRAPHY MASS SPECTROMETRY (LCMS) WITH ULTRA-VIOLET (UV) AND EVAPORATIVE LIGHT SCATTERING (ELSD) DETECTORS

For reaction monitoring, separation, and detection of chemical compounds in a sample to determine purity and composition. Detectors include UV and ELSD.

CONTACT: **Joshua Buckler**
ferrier@vuw.ac.nz
04 463 3856

FLASH AUTOMATED CHROMATOGRAPHY

Multiple Buchi automated flash chromatography systems for automated and quick isolation of compounds using UV and ELSD detection.

CONTACT: **Ralf Schwörer**
ferrier@vuw.ac.nz
04 463 0060

PLATE READER

With cuvette and plate reading capability for UV-Vis absorption and fluorescence.

CONTACT: **Susanna Chan**
ferrier@vuw.ac.nz
04 463 0066

FREEZE DRYER

Concentration of chemical compounds by freeze drying.

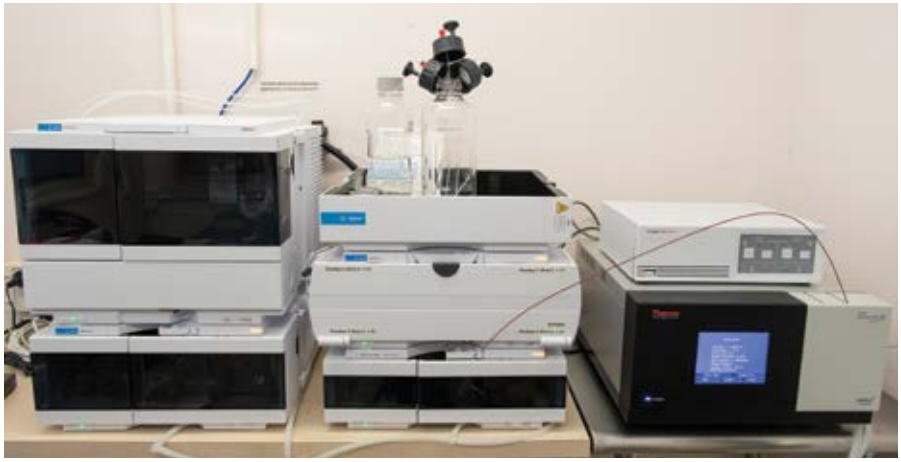
CONTACT: **Sarah Draper**
ferrier@vuw.ac.nz
04 463 9211

INCUBATOR (SHAKING)

Ferrier has six shaking incubators (one dark and five refrigerated) used to grow biological cultures.

CONTACT: **Gerd Mittelstädt**
ferrier@vuw.ac.nz
04 463 9216

HIGH PERFORMANCE LIQUID CHROMATOGRAPHY (HPLC) WITH CAD



Separation and detection of chemical compounds in a sample to determine sample purity and composition. Detectors include UV and charged aerosol detector (CAD).

CONTACT: **Michael Popadynec**
ferrier@vuw.ac.nz
04 886 5723

FERMENTER

For fermentation of biological cultures.

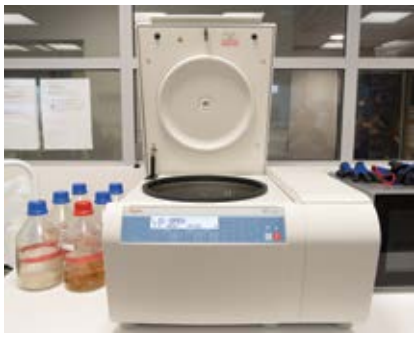
CONTACT: **Gerd Mittelstädt**
ferrier@vuw.ac.nz
04 463 9216

INCUBATOR (STATIC)

Two static incubators used to grow biological cultures.

CONTACT: **Gerd Mittelstädt**
ferrier@vuw.ac.nz
04 463 9216

HERAEUS MULTIFUGE CENTRIFUGE



Sample separation by centrifugal force.

CONTACT: **Gerd Mittelstädt**
ferrier@vuw.ac.nz
04 463 9216

FASTPREP-24 5G BEADBASHER

Bench-top bead beating homogeniser.

CONTACT: **Gerd Mittelstädt**
ferrier@vuw.ac.nz
04 463 9216

FLUOROMETER

Determination of biomolecule concentration.

CONTACT: **Gerd Mittelstädt**
ferrier@vuw.ac.nz
04 463 9216

GENE PULSER ELECTROPORATION SYSTEM

Cell electroporation for uptake of DNA.

CONTACT: **Gerd Mittelstädt**
ferrier@vuw.ac.nz
04 463 9216

NANO DEBEE

Ultra-high-pressure homogeniser.

CONTACT: **Gerd Mittelstädt**
ferrier@vuw.ac.nz
04 463 9216

VACUUM CONCENTRATOR

Concentration of biomolecules.

CONTACT: **Gerd Mittelstädt**
ferrier@vuw.ac.nz
04 463 9216

ROTARY EVAPORATOR

Concentration of chemical compounds.

CONTACT: **Gerd Mittelstädt**
ferrier@vuw.ac.nz
04 463 9216

BENCH-TOP AUTOCLAVE

Pressure sterilisation of instruments, consumables, and liquids.

CONTACT: **Gerd Mittelstädt**
ferrier@vuw.ac.nz
04 463 9216

ÄKTA PURE (RT)

Used for the purification of proteins at room temperature.

CONTACT: **Gerd Mittelstädt**
ferrier@vuw.ac.nz
04 463 9216

ULTRASONIC HOMOGENISER

Cell lysis by sonication.

CONTACT: **Gerd Mittelstädt**
ferrier@vuw.ac.nz
04 463 9216

ISOTHERMAL TITRATION CALORIMETRY (ITC)

Measurement of molecular binding affinity constants.

CONTACT: **Gerd Mittelstädt**
ferrier@vuw.ac.nz
04 463 9216

SPECTROPHOTOMETER

UV-Vis Spectrophotometer with temperature controller.

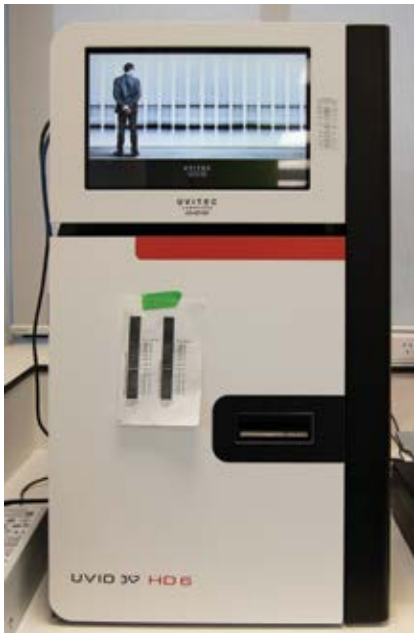
CONTACT: **Gerd Mittelstädt**
ferrier@vuw.ac.nz
04 463 9216

QUANT STUDIO 3 FOR PCR

Real-time PCR system.

CONTACT: **Gerd Mittelstädt**
ferrier@vuw.ac.nz
04 463 9216

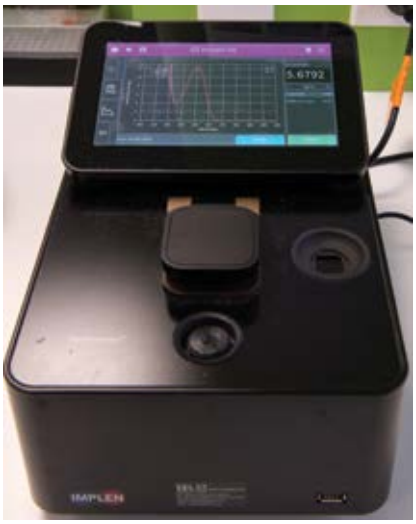
GEL DOC UV IMAGING SYSTEM



Imaging biopolymer gels.

CONTACT: **Gerd Mittelstädt**
ferrier@vuw.ac.nz
04 463 9216

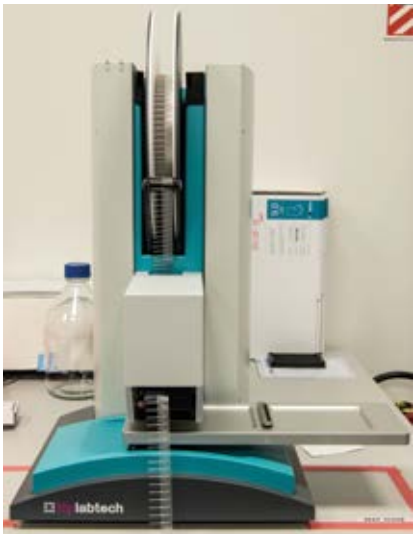
NANOPHOTOMETER



Determination of biomolecule concentration.

CONTACT: **Gerd Mittelstädt**
ferrier@vuw.ac.nz
04 463 9216

MOSQUITO—PIPETTING ROBOT



Robot for protein crystallisation condition screening.

CONTACT: **Gerd Mittelstädt**
ferrier@vuw.ac.nz
04 463 9216

WATER PURIFIER—SARTORIUS-ARIUM

Supply ultrapure (Type I) water for laboratory use..

CONTACT: **Susanna Chan**
ferrier@vuw.ac.nz
04 463 0066

WATER PURIFIER—MILLI-Q

Supply purified Milli-Q water for laboratory use.

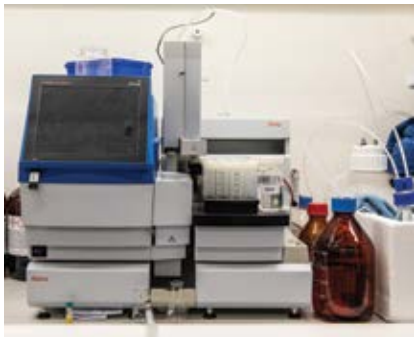
CONTACT: **Gerd Mittelstädt**
ferrier@vuw.ac.nz
04 463 9216

HUMIDITY CONTROLLED OVEN

This oven is used in temperature and humidity experiments, cell culture, and enzyme experiments.

CONTACT: **Simon Hinkley**
ferrier@vuw.ac.nz
04 463 0052

PEPTIDE SYNTHESISER



Automated solid phase peptide synthesis.

CONTACT: **Sarah Draper**
ferrier@vuw.ac.nz
04 463 9211

ÄKTA PURE (FRIDGE)

Used for the purification of proteins at 4°C.

CONTACT: **Gerd Mittelstädt**
ferrier@vuw.ac.nz
04 463 9216

NANO DSC

Differential scanning calorimeter for the determination of melting temperature of biomolecules.

CONTACT: **Gerd Mittelstädt**
ferrier@vuw.ac.nz
04 463 9216

FREEZE DRYER

Concentration of chemical compounds by freeze drying.

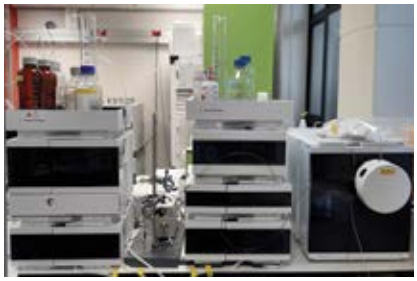
CONTACT: **Alistair Richardson**
ferrier@vuw.ac.nz
04 463 7409

PREPARATIVE HIGH PERFORMANCE LIQUID CHROMATOGRAPHY (PREP-HPLC)

Separation and purification of chemical compounds using UV detection.

CONTACT: **Alistair Richardson**
ferrier@vuw.ac.nz
04 463 7409

HIGH PERFORMANCE LIQUID CHROMATOGRAPHY MASS SPECTROPHOTOMETER (HPLC-MS)



Separation and detection of chemical compounds in a sample to determine sample purification. Detectors include UV and mass spectrometry.

CONTACT: **Alistair Richardson**
ferrier@vuw.ac.nz
04 463 7409

ÄKTA OLIGOPILOT PLUS OLIGONUCLEOTIDE SYNTHESIZER

A fully automated lab-scale (10–50 µmol) DNA/RNA oligonucleotide synthesizer.

CONTACT: **Andrew Marshall**
ferrier@vuw.ac.nz
04 463 0045

PREPARATIVE HIGH PERFORMANCE LIQUID CHROMATOGRAPHY (HPLC) WITH ULTRA-VIOLET (UV) AND EVAPORATIVE LIGHT SCATTERING (ELSD) DETECTORS

Preparative-scale chromatography enabling the isolation, purification, and collection of target compounds.

CONTACT: **Jonathan Singh**
ferrier@vuw.ac.nz
04 463 9210

CENTRIFUGAL CONCENTRATOR

Sample concentration/solvent removal under reduced pressure and centrifugal force.

CONTACT: **Jonathan Singh**
ferrier@vuw.ac.nz
04 463 9210

PAIHAU—ROBINSON RESEARCH INSTITUTE

The multidisciplinary **Robinson Research Institute** melds innovative engineering and applied physics to build advanced technologies for businesses worldwide.

PHYSICAL PROPERTY MEASUREMENT SYSTEM (PPMS)

The PPMS measures magnetic, magnetotransport, and thermoelectric properties of materials from 1.9–1000 K in up to 9 Tesla magnetic field.

CONTACT: **Jasmine Kennedy**
rri-admin@vuw.ac.nz

MAGNETIC PROPERTY MEASUREMENT SYSTEM (MPMS)

The MPMS measures magnetic properties of materials from 1.9–400 K in up to 7 Tesla magnetic field.

CONTACT: **Jasmine Kennedy**
rri-admin@vuw.ac.nz

LAKESHORE VIBRATING SAMPLE MAGNETOMETER (VSM)

The VSM measures magnetic properties of materials in up to 1 Tesla magnetic field and from 300 to 20 K.

CONTACT: **Shen Chong**
rri-admin@vuw.ac.nz
04 763 0072

NANOQUEST I ION MILL

Ion beam etching system for patterning thin film devices.

CONTACT: **Simon Granville**
rri-admin@vuw.ac.nz
04 463 0074

SPUTTERING SYSTEM MULTI-TARGET KURT J LESKER CO CMS-18

The six-target Kurt J Lesker CMS-18 thin film sputtering system is a state-of-the-art thin film deposition system for advanced materials research and development.

CONTACT: **Simon Granville**
rri-admin@vuw.ac.nz
04 463 0074

1.5T PRECLINICAL MRI SYSTEM

Capable of imaging up to 100 mm diameter samples. Single TX/RX RF coil. MR Solutions spectrometer and GUI with standard MRI pulse sequences.

CONTACT: **Ben Parkinson**
rri-admin@vuw.ac.nz
04 463 0081

CRITICAL CURRENT CHARACTERISATION SYSTEM FOR HTS WIRES

Used to accurately determine the critical surface of highly anisotropic superconductors. The Robinson Research Institute, in conjunction with HTS-110 Ltd, has designed and built the only commercially available system specifically designed for the real-world transport characterisation of superconducting wires under the actual conditions of relevance to specific applications. It accurately determines in detail the critical surface of highly anisotropic superconductors.

CONTACT: **Olly Pantoja**
rri-admin@vuw.ac.nz

COIL WINDING MACHINE

Capable of winding coils or coil assemblies up to 1 m diameter and 1.2 m long. Can wind LTS, HTS, or copper wire up to two-in-hand with 5 kg tension.

CONTACT: **Konstantinos Bouloukakis**
rri-admin@vuw.ac.nz
04 463 9035

SEM SAMPLE PREPARATION EQUIPMENT

Equipment to support SEM and TEM work includes a carbon coater, metal coater, and a Gatan Precision Ion Polishing System (PIPS).

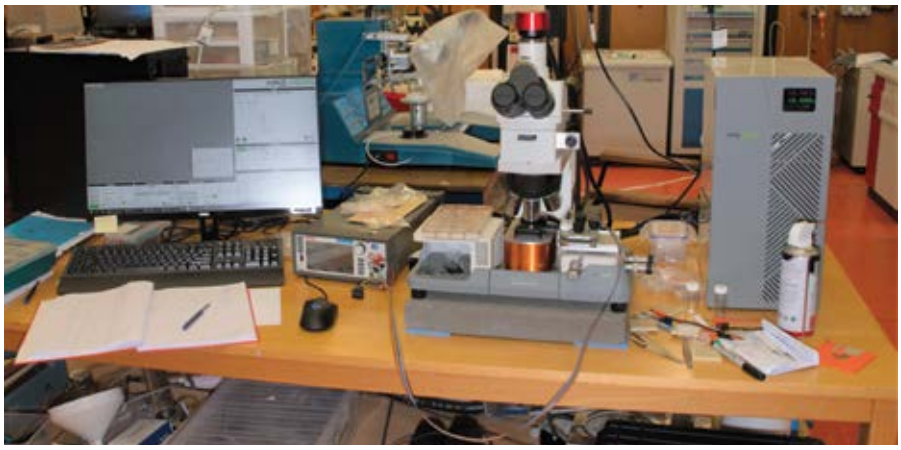
CONTACT: **Sarah Spencer**
rri-admin@vuw.ac.nz
04 463 0085

BRUKER VERTEX 80 V INTERFEROMETER

The Bruker Vertex 80v Interferometer is a research-level Fourier transform infrared vacuum spectrometer. As a vacuum system, it operates from the far IR (30 cm-1) to the UV (35,000 cm-1) and at a high resolution of better than 0.06 cm-1 if required. It has been used to study the electronic and vibrational properties of solids between room temperature and liquid helium temperatures. For instance, an extensive series of spectral measurements have been made over a wide spectral band on the electron correlated rare-earth nitride semiconductors. This confirmed that they are indeed semiconductors and identify the location of the f-bands that harbour the highly correlated electrons. Other studies include the wide band semiconductor, ZnO, a range of Heusler alloys where the role of atomic disorder in the magnetic and semiconductor properties, and the role of defects in determining the physical properties of the topological insulator, Bi2Se3.

CONTACT: **Bob Buckley**
rri-admin@vuw.ac.nz
04 463 0070

VERTISIS TECHNOLOGY MAGVISION KERR SYSTEM (MOKE)



Polarising light microscope with an electromagnet for measuring magneto-optical effects.

CONTACT: **Simon Granville**
rri-admin@vuw.ac.nz
04 463 0074

NANOPLD PULSED LASER DEPOSITION THIN FILM SYSTEM WITH FLANGE MOUNTED SPUTTER SOURCE

Multi-target thin film high vacuum PLD system with heated substrate stage up to 900°C.

CONTACT: **Shen Chong**
rri-admin@vuw.ac.nz
04 463 0072

3T PRECLINICAL MRI SYSTEM

Capable of imaging up to 50 mm diameter samples. Single TX/RX RF coil. MR Solutions spectrometer and GUI with standard MRI pulse sequences.

CONTACT: **Ben Parkinson**
rri-admin@vuw.ac.nz
04 463 0081

MICROSCOPE SCANNING ELECTRON NOVA NANOSEM 450

The FEI Nova is a high-resolution, field emission gun SEM (FEG-SEM), with excellent imaging and analytical performance. It is equipped with an energy dispersive X-ray spectrometer (EDS or EDXS) for elemental analysis and an electron backscatter diffractometer (EBSD) for crystal orientation mapping.

It also has a scanning transmission electron microscopy (STEM) detector for imaging transmission electron microscopy (TEM) samples in a simpler way than using a transmission electron microscope. Up to six TEM samples can be loaded into the chamber for viewing during one session.

The Nova has the following additional features:

- simple sample exchange
- secondary electron detector for topographical contrast imaging
- backscatter detector for compositional contrast imaging
- beam deceleration for imaging semi or non-conductive samples
- stage tilt up to 75° to view surface topography and make structural measurements.

CONTACT: **Shen Chong**
rri-admin@vuw.ac.nz
04 463 0072

MICROSCOPE SCANNING ELECTRON QUANTA 450

The FEI Quanta is the Institute's workhorse instrument and can operate in high, low, and environmental (or ESEM) vacuum modes. It is equipped with an energy dispersive X-ray spectrometer (EDS or EDXS) for the elemental analysis of materials.

It has the following features:

- simple and fast sample exchange
- large chamber to accommodate multiple or large samples
- tungsten filament
- secondary electron detector for topographical contrast imaging
- backscatter electron detector for compositional contrast imaging
- low vacuum mode for semi- or non-conductive samples
- environmental SEM with cooling stage to observe wet samples in their natural state or to hydrate samples in-situ
- stage tilt up to 70° to view surface topography and make structural measurements.

CONTACT: **Sarah Spencer**
rri-admin@vuw.ac.nz
04 463 0085

TENSILE TESTER

Tests the resistance of a material to breaking under tension.

CONTACT: **Mike Davies**
rri-admin@vuw.ac.nz
04 463 0073

CRYOGENIC VACUUM TEST CHAMBER

For testing of coils, magnets, or other assemblies. Internal dimensions are 1 x 1 x 1 m. Comes complete with roughing and turbo pumps, and single stage cryocooler if required.

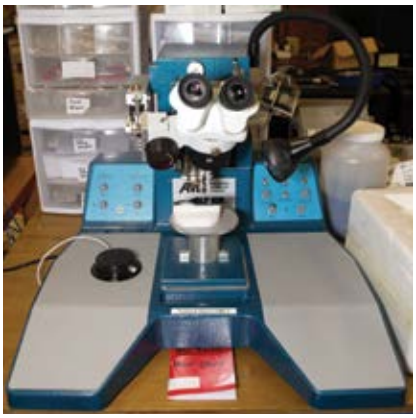
CONTACT: **Konstantinos Bouloukakis**
rri-admin@vuw.ac.nz
04 463 9035

ROEBEL CABLE WINDING MACHINE

For the winding of Roebel cable.

CONTACT: **Mike Davies**
rri-admin@vuw.ac.nz
04 463 0073

ADVANCED MAGNETIC DEVICES QUIKBOND AL WEDGE WIRE BONDER



Manual mode operation wire bonder for attaching wires to make electrical measurements.

CONTACT: **Simon Granville**
rri-admin@vuw.ac.nz
04 463 0074

TE KURA MĀTAURANGA KOIORA—SCHOOL OF BIOLOGICAL SCIENCES

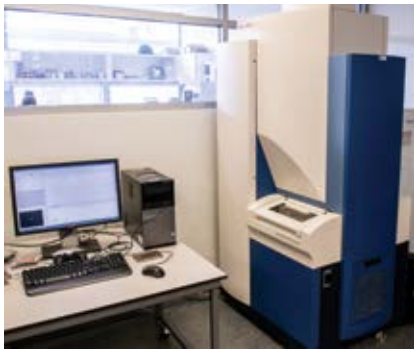
Research in the School spans the full range of contemporary biology—from biochemistry, biotechnology, molecular biology, genetics, and biomedical sciences to ecology, marine biology, systematics, and natural history.

ORBITRAP FUSION LUMOS TRIBRID WITH ULTIMATE 3000 RSLCNANO MASS SPECTROMETER

The Thermo Scientific Orbitrap Fusion Lumos Tribrid Mass Spectrometer is an advanced performance mass spectrometry system that can be upgraded to even higher resolution (1 M), additional dissociation capabilities (UVPD and ETD), and a unique internal calibration (IC). Excels at the most challenging of applications, including low-level PTM analysis, multiplexed relative quantitation using isobaric tags, intact protein characterisation, as well as MSn analysis of small molecules.

CONTACT: **Lifeng Peng**
biosci@vuw.ac.nz
04 463 5233

AB SCIEX 5800 TOF/TOF SYSTEM



The TOF/TOF 5800 system provides the fastest and most confident path to identification and relative quantitation of proteins. The system's unmatched speed and sensitivity make it the ideal platform for biomarker discovery, MALDI mass spectrometry imaging, and protein identification.

CONTACT: **Lifeng Peng**
biosci@vuw.ac.nz
04 463 5233

BD FACSMELODY 3 LASER 9 COLOUR (4B-2R-3V) CELL SORTER 661762

Cell sorter for research use.

CONTACT: **Danyl McLauchlan**
biosci@vuw.ac.nz
04 463 5735

FACSCANTO FLOW CYTOMETER AND HT SAMPLER

CONTACT: **Danyl McLauchlan**
biosci@vuw.ac.nz
04 463 5735

IN CELL ANALYZER 6500HS

The IN Cell Analyzer 6500HS is a laser-based high-content imaging system featuring IRIS confocal technology to optimise cellular imaging for all sample types and experimental goals.

CONTACT: **Andrew Munkacsi**
biosci@vuw.ac.nz
04 463 5171

MMI CELLCUT PLUS LASER MICRODISSECTION MICROSCOPE

The MMI CellCut facilitates precise and contamination-free dissection of cell clusters, single cells, or subcellular compartments from various types of tissues including fresh frozen, paraffin embedded and archived slides, cytospins, smears, and even living cells.

CONTACT: **Janet Pitman**
biosci@vuw.ac.nz
04 463 7450

BIOLOGICAL SAFETY CABINETS

CONTACT: **Juan Larrouyet Sarto**
biosci@vuw.ac.nz
04 463 5579

CENTRIFUGE, SIGMA 3–16

CONTACT: **Juan Larrouyet Sarto**
biosci@vuw.ac.nz
04 463 5579

HIGH PURITY WATER SUPPLY

High purity water supply for research laboratory requirements.

CONTACT: **Juan Larrouyet Sarto**
biosci@vuw.ac.nz
04 463 5579

WORKSHOP LATHE

Small lathe for fabrication of specialist equipment to support research activities.

CONTACT: **Juan Larrouyet Sarto**
biosci@vuw.ac.nz
04 463 5579

WORKSHOP CNC MILL

Tormach PCNC 1100 milling machine.

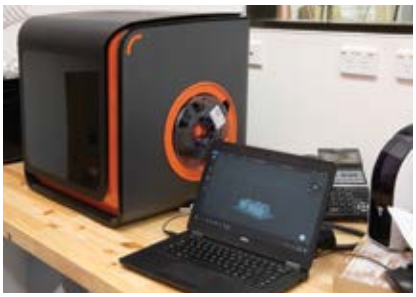
CONTACT: **Juan Larrouyet Sarto**
biosci@vuw.ac.nz
04 463 5579

WORKSHOP LASER CUTTER

TE1390L laser cutter for fabrication of specialist equipment to support research activities.

CONTACT: **Juan Larrouyet Sarto**
biosci@vuw.ac.nz
04 463 5579

WORKSHOP 3D PRINTERS



Fabrication of specialty items for research.

CONTACT: **Juan Larrouyet Sarto**
biosci@vuw.ac.nz
04 463 5579

GETINGE GE6610 WASTE PROCESSING AUTOCLAVE

Autoclave for processing of laboratory waste.

CONTACT: **Juan Larrouyet Sarto**
biosci@vuw.ac.nz
04 463 5579

CLIMATE CONTROL CABINETS

Climate controlled cabinets for environmental experiments.

CONTACT: **Juan Larrouyet Sarto**
biosci@vuw.ac.nz
04 463 5579

THERMOFISHER SORVALL LYNX 6000

Large centrifuges for research laboratory use.

CONTACT: **Juan Larrouyet Sarto**
biosci@vuw.ac.nz
04 463 5579

-20°C AND -80°C FREEZERS

-20°C and -80°C freezer storage for

biological samples.

CONTACT: **Juan Larrouyet Sarto**
biosci@vuw.ac.nz
04 463 5579

SMALL ANIMAL RESEARCH FACILITY

This lab includes cages, cage washers, bedding dispenser and disposal systems, and bottle fillers for the housing and care of rats and mice. Equipment for running experiments includes locomotion experiment boxes and heart rate monitoring equipment. The lab is also fitted with surgical equipment including a vaporiser and Nederman arm, and microtomes and microscopes for sample collection and analysis.

CONTACT: **Juan Larrouyet Sarto**
biosci@vuw.ac.nz
04 463 5579

HISTOLOGY FACILITY

The School has a histology research facility to support research programmes.

CONTACT: **Derek Heath**
biosci@vuw.ac.nz
04 463 5580

TISSUE CULTURE FACILITY

The School has a tissue culture facility to support research programmes.

CONTACT: **Derek Heath**
biosci@vuw.ac.nz
04 463 5580

WORKSHOP ELECTRONICS FACILITY

The School has a workshop for repairs and maintenance of scientific equipment.

CONTACT: **Juan Larrouyet Sarto**
biosci@vuw.ac.nz
04 463 5579

CLIMATE CONTROLLED EXPERIMENTAL ROOMS

Climate-controlled rooms for conducting research under controlled environmental conditions.

CONTACT: **Juan Larrouyet Sarto**
biosci@vuw.ac.nz
04 463 5579

LARGE CHILLER STORAGE

Walk-in chiller storage rooms.

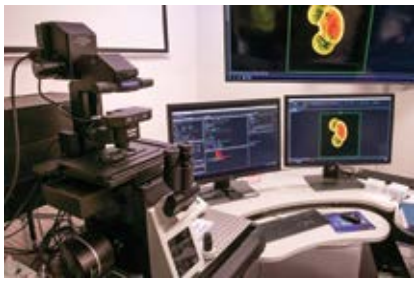
CONTACT: **Juan Larrouyet Sarto**
biosci@vuw.ac.nz
04 463 5579

GLASSHOUSES

The School has four environmentally-controlled glasshouses for research experiments.

CONTACT: **Lesley Milicich**
biosci@vuw.ac.nz
04 463 9733

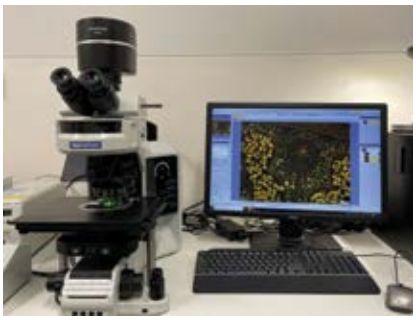
OLYMPUS FV3000RS RESONANCE CONFOCAL MICROSCOPE



This microscope is multi-line and capable of live cell imaging.

CONTACT: **Bronwyn Kivell**
biosci@vuw.ac.nz
04 463 9707

BX63 AUTOMATED FLUORESCENCE MICROSCOPE

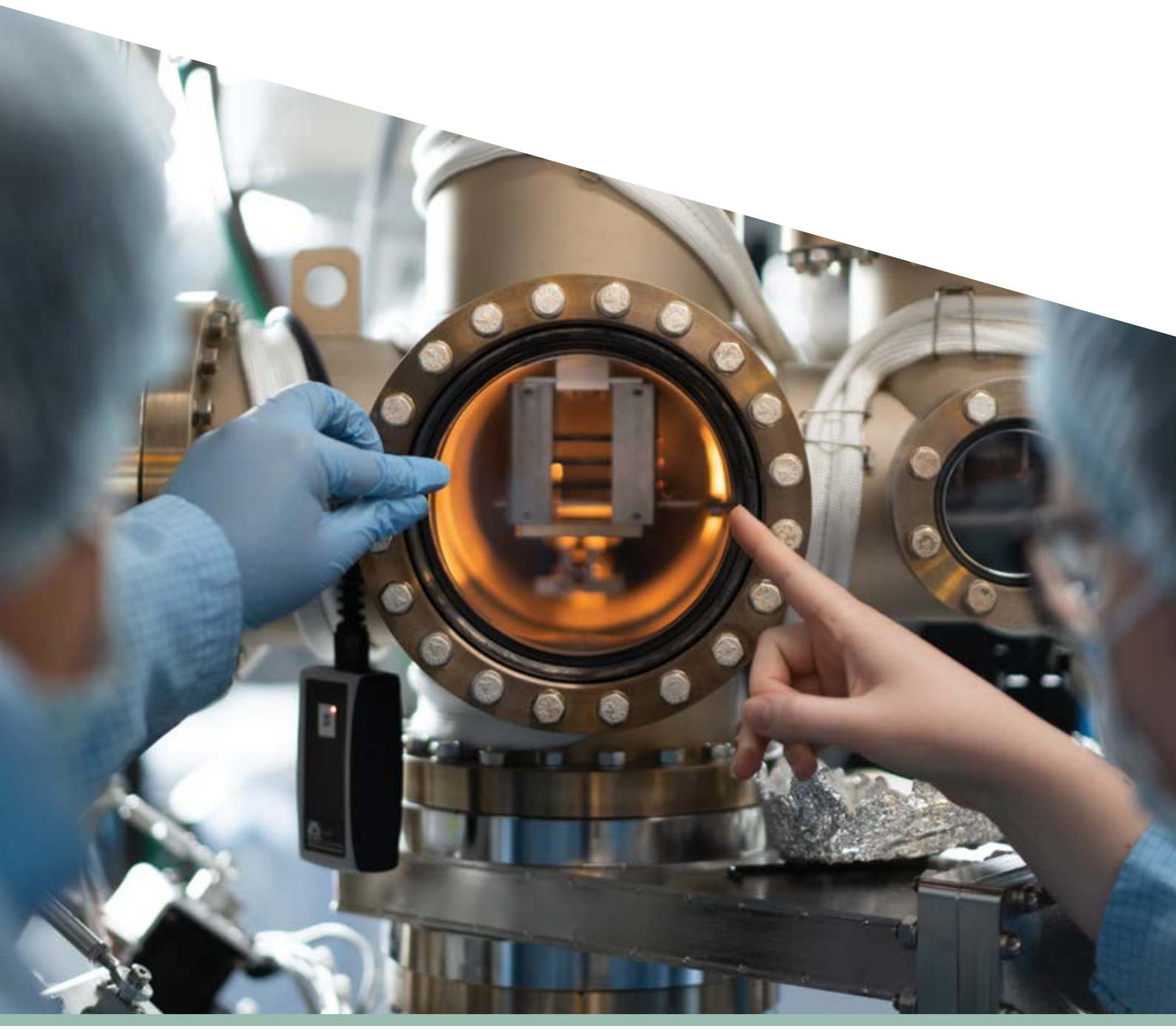


BX63 motorised upright microscope which does brightfield, DIC, and fluorescence. Can also do multi imaging z stacks.

CONTACT: **Sushila Pillai**
biosci@vuw.ac.nz
04 886 4432

TE WĀNANGA MATŪ— SCHOOL OF CHEMICAL AND PHYSICAL SCIENCES

Combining their expertise in chemistry and physics gives the School an edge in materials science research, and collaborations take their discoveries from the lab to the world.



INERT ATMOSPHERE GLOVEBOXES

Used to create an inert atmosphere for the processing of sensitive chemicals.

CONTACT: **Robin Fulton or Martyn Coles**
scps@vuw.ac.nz
04 463 9799

SPUTTER COATER

Deposition of materials.

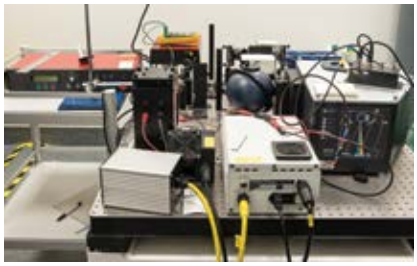
CONTACT: **Nate Davis**
scps@vuw.ac.nz
04 463 9693

PURESOLV MD5 SOLVENT PURIFICATION SYSTEM

The PureSolv MD5 solvent purification system allows easy access to anhydrous solvent by multiple users. Its multi-way valve design is the most efficient and safest air-free dispensing system on the market today.

CONTACT: **Mat Anker**
scps@vuw.ac.nz
04 463 6760

LSC MEASUREMENT RIG—UV-VIS



World-leading measurement rig capable of PLQE measurement at any wavelength excitation. 300–1100 nm.

CONTACT: **Nate Davis**
scps@vuw.ac.nz
04 463 9693

BRAUN GLOVEBOX

Braun glovebox systems are operated using a closed loop circulation method, providing the user with a non-reactive atmosphere.

CONTACT: **Grant Williams**
scps@vuw.ac.nz
04 463 5544

GYROZEN CENTRIFUGE

A multi-purpose large-capacity centrifuge with a maximum speed of 12,000 rpm with high capacity and a large assortment of rotors.

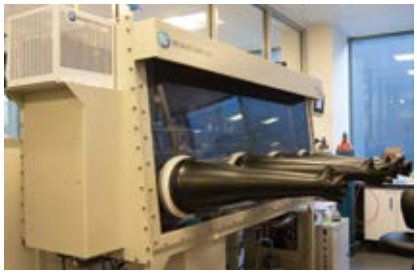
CONTACT: **Grant Williams**
scps@vuw.ac.nz
04 463 5544

FURNACES

The School has three furnaces to support measured and controlled temperatures.

CONTACT: **Grant Williams**
scps@vuw.ac.nz
04 463 5544

PURELAB GLOVEBOX



The PureLab inert glovebox is designed specifically for production and large-scale research applications where time management and maximum efficiency are crucial.

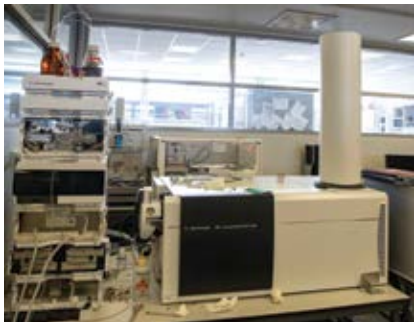
CONTACT: **Grant Williams**
scps@vuw.ac.nz
04 463 5544

DEVICE DEVELOPMENT GLOVEBOX

Inert-atmosphere gloveboxes is available for device fabrication. One has spin coater for thin film. One has a thermal evaporator chamber for the deposition of metal oxides, organics, and electrodes.

CONTACT: **Nate Davis**
scps@vuw.ac.nz
04 463 9693

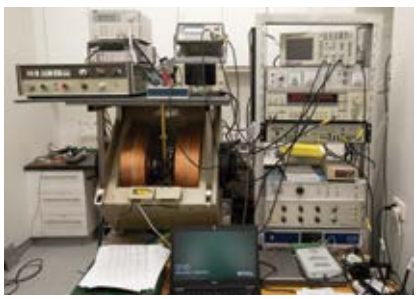
AGILENT 6530 QUADRUPOLE—TIME OF FLIGHT (QTOF) HIGH RESOLUTION LIQUID CHROMATOGRAPH—MASS SPECTROMETER (LCMS)



The Agilent 6530 Quadrupole—Time of Flight (QTOF) high resolution liquid chromatograph—mass spectrometer (LCMS) provides high mass accuracy determination (< 2 ppm uncertainty) on molecular formulae, and also routinely measures <5 ppm mass error uncertainty on fragment ions generated through collision induced dissociation. The instrument is capable of both targeted and untargeted fragmentation, making it an ideal spectrometer for both analysis of known compounds and for hypothesis generation through unbiased selection of parent ions for fragmentation. Equipped with a 100-place autosampler and with real-time mass correction, the 6530 is a sensitive instrument for analyses requiring both high-throughput and high-accuracy.

CONTACT: **Jan Vorster**
scps@vuw.ac.nz
021 159 5755

MERCURY ITC



A cryogenic programmable intelligent temperature controller.

CONTACT: **Grant Williams**
scps@vuw.ac.nz
04 463 5544

CRAFTBOT FLOW IDEX 3D PRINTER

The Craftbot Flow IDEX printer is a duel independent 3D printing system capable of printing using a range of materials up to 300°C. It has a build volume of 425 x 250 x 250 with a layer resolution of 50 µm.

CONTACT: **Chris Lepper**
scps@vuw.ac.nz
04 463 5883

ROCK MAGNETOMETER—AGICO JR6A

For measurement of the remanent magnetisation of rock, sediment, or archaeomagnetic samples for palaeomagnetic studies. Complementary laboratory equipment for thermal demagnetisation, alternating field demagnetisation, magnetic susceptibility studies, including variation with temperature, and isothermal remanent magnetisation studies.

CONTACT: **Gillian Turner**
scps@vuw.ac.nz
04 463 6478

COHERENT LASER—INNOVA TECH

This laser provides the ultimate in high-power ion laser performance, combined with extraordinary ease-of-use. A single digital remote module gives you access and control of all critical laser functions such as wavelength acquisition and tuning, automated TEM00-acquiring shutter, extra-cavity shutter, system monitoring, and diagnostics.

CONTACT: **Grant Williams**
scps@vuw.ac.nz
04 463 5544

X-RAY GENERATOR

The School has two Phillips X-ray generators, PW1720 and PW1730.

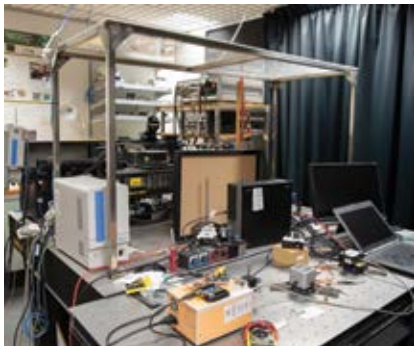
CONTACT: **Grant Williams**
scps@vuw.ac.nz
04 463 5544

APPLIED PHOTOPHYSICS CHIRASCAN PLUS CD SPECTROMETER

The CD spectrometer measures the circular dichroism om a molecule over a range of wavelengths. CD spectroscopy is used extensively to study chiral molecules of all types and sizes, but it is in the study of the secondary structure of large biological molecules where it finds its most important applications. Structural, kinetic, and thermodynamic information about macromolecules can be derived from circular dichroism spectroscopy.

CONTACT: **Chris Lepper**
scps@vuw.ac.nz
04 463 5883

LABRAM RAMAN SYSTEM



The LabRam is a state-of-the-art Raman microscope and the instrument of choice for fast, analytical Raman spectroscopy. It is a fully integrated system designed for many applications, such as electronics, chemicals, biomedical products, pharmaceuticals, forensics, environmental samples, polymers, and thin films.

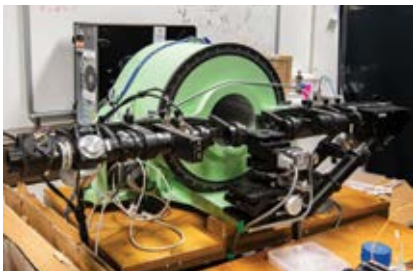
CONTACT: **Eric Le Ru**
scps@vuw.ac.nz
04 463 7509

TRIPLE ADDITIVE/SUBTRACTIVE RAMAN SPECTROMETER

This triple additive/subtractive high resolution Raman spectrometer facility (Jobin-Yvon T64000) is coupled to a confocal Raman microscope and five different lasers: argon, krypton, helium-cadmium, helium-neon, and NIR-solid state. The spectrometer has both a nitrogen-cooled CCD detector and a photomultiplier (GaAs-cathode). It is also possible to access (Raman) mapping stages and low temperature conditions—down to 77 K for the microscope and 8 K in the separate closed cycle cryostat.

CONTACT: **Eric Le Ru**
scps@vuw.ac.nz
04 463 7509

ELLIPSOMETER



This ellipsometer operates by polarisation modulation with an elasto-optic modulator. A wide wavelength range (196 to 2000 nm) can be used with this instrument.

CONTACT: **Eric Le Ru**
scps@vuw.ac.nz
04 463 7509

OCEAN OPTICS QEPRO

The QE Pro is a high sensitivity spectrometer with low stray light performance. It is ideal for a wide range of low light level applications such as fluorescence, DNA sequencing, and Raman analysis.

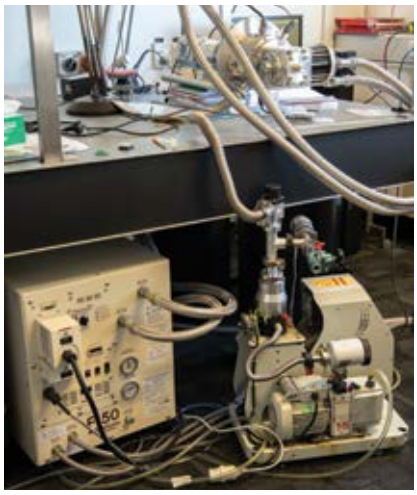
CONTACT: **Nate Davis**
scps@vuw.ac.nz
04 463 9693

MD4 STAINLESS STEEL HELIUM CRYOSTAT WITH MAGNET TAIL

This MD4 cryostat is fitted with an extension tail that houses the sample, allowing measurements to be carried out when the sample is between the poles of a magnet. A carbon glass resistance thermometer measures temperatures from room temperature to 1.3 K. This system has been invaluable for measuring the current-voltage characteristics of superconducting thin films in magnetic fields, both parallel and perpendicular to the film plane. A selection of current sources, voltage meters, and electrometers are available for measurements.

CONTACT: **Ben Ruck**
scps@vuw.ac.nz
04 463 5089

CLOSED CYCLE CRYOSTAT



This closed cycle cryostat is capable of operating from above room temperature to ~4 K. It is equipped with viewports that enable optical measurements from the infrared to the UV, and electrical feedthroughs allowing measurement of the electrical resistance of samples from milliOhms to hundreds of gigaOhms.

CONTACT: **Ben Ruck**
scps@vuw.ac.nz
04 463 5089

SHIMADZU GCNS QP2010 GCMS

The GCMS-QP2010 is a bench-top type gas chromatograph/mass spectrometer intended for high-precision GC/MS analysis. It enables mass spectrum measurement for qualitative analysis or identification of unknowns and Selected Ion Monitoring (SIM) measurement for quantitation of trace constituents.

CONTACT: **Rob Keyzers**
scps@vuw.ac.nz
04 463 5117

VARIAN CARY 100 SCAN EL03040761L UV-VIS SPECTROMETER

The Cary 100 Bio UV-Vis is a powerful double-beam spectrophotometer capable of quickly acquiring data in the spectral range from 200 to 900 nm.

CONTACT: **Rachel Wallace**
scps@vuw.ac.nz
04 463 6516

OXFORD INSTRUMENTS PLASMALAB 80

Reactive ion etching is a common process in microelectronics to carve patterns into silicon or any other substrate material. At present, the School has Ar, O^2, and SF^6 gas for etching. Whether your material can be etched with this system will depend on the gases available and the selectivity between your substrate material and any standard mask. Determining the etch recipe takes time, so users should add this to their expected experimental time.

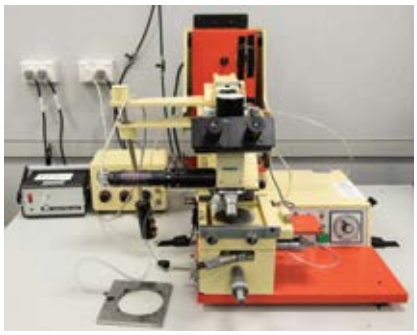
CONTACT: **Natalie Plank**
scps@vuw.ac.nz
04 463 5031

ANGSTROM ENGINEERING DEPOSITION SYSTEM

The Angstrom engineering evaporator has two thermal evaporation sources. It is suitable for the deposition of metals such as Al, Au, and Ag. Both sources have an INFICON rate deposition controller which enables the creation of very accurate film thicknesses, but co-deposition is not possible. The rotating substrate holder is suitable for samples up to four inches in diameter. Users are required to bring their own shadow mask if required, and frequent users should provide their own boats and deposition materials.

CONTACT: **Natalie Plank**
scps@vuw.ac.nz
04 463 5031

KARL SUSS MJB3 MASK ALIGNER



The Karl Suss MJB3 will be familiar to those with experience in lithography and is a great place to start for new students and researchers. The alignment uses a manual process, which means that users are required to become experienced in the intricacies of good alignment. The MJB3 is capable of 2 µm resolution when used correctly.

CONTACT: **Natalie Plank**
scps@vuw.ac.nz
04 463 5031

PLASMA ETCH

The Plasma Etch has both Ar and O^2 gas supplies. This desktop system offers substrate cleaning and surface treatment with a dry process, which is particularly useful for PDMS (polydimethylsiloxane) and other flexible substrate preparations. The procedure is quick—pump down takes only a few minutes and the process time depends on the user. A 20 s O^2 plasma treatment, for example, is a very useful step post-lithography and prior to lift-off as a cleaner substrate results in better material adhesion. Users are asked to consult the cleanroom manager before loading materials into the system.

CONTACT: **Natalie Plank**
scps@vuw.ac.nz
04 463 5031

AGILENT 4156C (PRECISION SEMICONDUCTOR PARAMETER ANALYSER)

The Agilent 4156C is connected to the probe station and comes equipped with four high-resolution source measure units (SMUs) capable of femtoamp resolution. Kelvin probe measurements are possible and nA measurements of nanowire devices are considered routine. The 4156C is also capable of quasi CV measurements. Full details of the capabilities can be found on the Agilent website and users are encouraged to read the manual before using the instrument. It will, however, be familiar to those who have used previous models in the range.

CONTACT: **Natalie Plank**
scps@vuw.ac.nz
04 463 5031

DEKTAK PROFILOMETER

This Dektak is located in the School's cleanroom. This tool is essential for inspecting metal layer thicknesses, resist and etch profiles, and sample surfaces. It is quick and simple to use and allows immediate verification of a process.

CONTACT: **Natalie Plank**
scps@vuw.ac.nz
04 463 5031

VARIAN PROSTAR 335 LC

The Varian ProStar 335 is a HPLC photodiode array detector that can simultaneously detect the absorbance of compounds in the flowcell at wavelengths from 190 to 950 nm.

CONTACT: **Rob Keyzers**
scps@vuw.ac.nz
04 463 5117

RUCKER AND KOLLS 666 PROBE STATION

The probe station is set up with four high-precision Ti probes on micromanipulators and is housed in a custom-made Faraday box with a high-quality co-axial cable running to the micromanipulator. The probe station is equipped with a vacuum chuck and objective lenses of various magnification for maximum flexibility. Users are encouraged to buy their own tips for non-standard samples.

CONTACT: **Natalie Plank**
scps@vuw.ac.nz
04 463 5031

NIKON 66 OPTICAL MICROSCOPE

This Nikon optical microscope with digital camera is used to inspect samples during processing runs.

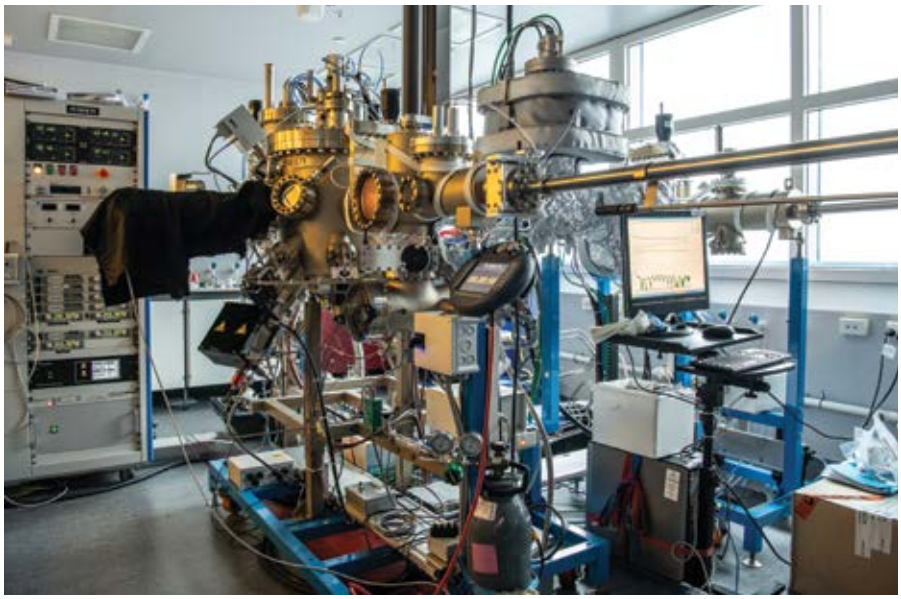
CONTACT: **Natalie Plank**
scps@vuw.ac.nz
04 463 5031

EZZI VISION AUTO500 RF SPUTTERING SYSTEM

The HHV sputter coater by Ezzi Vision has a single-source RF magnetron sputter deposition target. The system is capable of depositing both metals and dielectrics, including Ti, Ag, Ni, SiO^2, and ZnO at present. The system comes equipped with an INFICON rate deposition controller for high accuracy of film thicknesses. Frequent users will be required to provide their own 3-inch diameter source material.

CONTACT: **Natalie Plank**
scps@vuw.ac.nz
04 463 5031

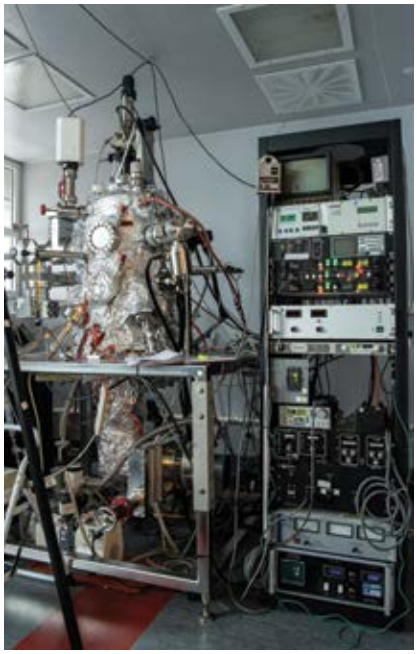
MOLECULAR BEAM EPITAXY GROWTH CHAMBER



The Riber molecular beam epitaxy system is capable of growing epitaxial thin films of extremely high crystalline quality and with atomic level thickness control. Multiple deposition sources allow growth of alloys and multi-layered samples. The system is presently configured for the growth of nitrides.

CONTACT: **Ben Ruck**
scps@vuw.ac.nz
04 463 5089

PHOTOCONDUCTIVITY MEASUREMENT APPARATUS



The interface between the optical and electronic properties of semiconductors can be probed through measurement of their photoconductive response. School researchers have developed equipment suitable for performing such measurements, particularly on samples of very high resistance. Mercury or xenon arc lamps, passed through a monochromator are typically used as the light source, particularly for measurements on wide band gap semiconductors that require UV excitation. Both DC and chopped light experiments are possible.

CONTACT: **Ben Ruck**
scps@vuw.ac.nz
04 463 5089

UV-VIS SPECTROMETER— SHIMADZU UV-2100

Double beam, fully automated scanning system.

CONTACT: **Grant Williams**
scps@vuw.ac.nz
04 463 5544

CNC LATHE

For making complex turned parts.

CONTACT: **Alex Puglisi**
scps@vuw.ac.nz
04 886 4448

3-AXIS CNC MILLING MACHINE

For the automated control of machining.

CONTACT: **Alex Puglisi**
scps@vuw.ac.nz
04 886 4448

TURRET MILL

Manual milling machine.

CONTACT: **Alex Puglisi**
scps@vuw.ac.nz
04 886 4448

COLCHESTER LATHE

General-purpose lathe.

CONTACT: **Alex Puglisi**
scps@vuw.ac.nz
04 886 4448

WEILER PRECISION TOOL LATHE

Tool maker's lathe.

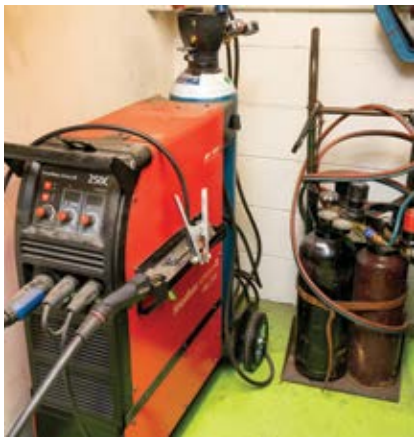
CONTACT: **Alex Puglisi**
scps@vuw.ac.nz
04 886 4448

KEMPI TIG WELDER—200 AMP

Welder for engineering.

CONTACT: **Alex Puglisi**
scps@vuw.ac.nz
04 886 4448

BOC MIG WELDER AND OXY/ACETYLENE PLANT



Mechanical engineering equipment.

CONTACT: **Alex Puglisi**
scps@vuw.ac.nz
04 886 4448

SHEET METAL FOLDER, SHEET METAL GUILLOTINE, PUNCH, ARBOR, AND HYDRAULIC PRESS

Mechanical engineering equipment.

CONTACT: **Alex Puglisi**
scps@vuw.ac.nz
04 886 4448

SCANNING ELECTRON MICROSCOPE—JEOL 6500F

The JEOL 6500F is a superior instrument for use in nanotechnology, materials science, and biology. This field emission scanning electron microscope offers high resolution as well as a high stability and current, in a small spot size. It also offers the ability to generate high x-ray fluxes, enabling chemical analysis at high resolution conditions. The instrument is fitted with a Gatan cryo unit for examination of biological samples and other hydrated materials by stabilising them under the beam at a low temperature.

CONTACT: **David Flynn**
scps@vuw.ac.nz
04 463 5017

TRANSMISSION ELECTRON MICROSCOPE—JEOL 2100F

The JEOL JEM-2100F is a 200 kV field emission transmission electron microscope (TEM) that combines high spatial resolution and analytical performance with an easy to use operation system, ideal for multipurpose operation.

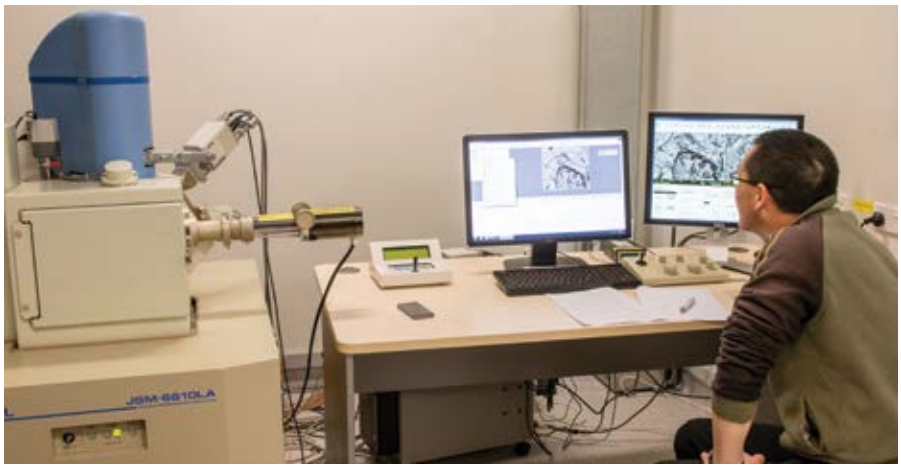
CONTACT: **David Flynn**
scps@vuw.ac.nz
04 463 5017

TRANSMISSION ELECTRON MICROSCOPE—JEOL 2010

The JEOL 2010 transmission electron microscope (TEM) is a high-resolution analytical microscope that is mainly used for materials research and the study of nanoparticulate samples. Its superior point-to-point resolution of 0.15 nm makes this instrument ideal for imaging samples on the atomic scale. The instrument is capable of conventional, dark field, and high resolution TEM as well as energy dispersive spectroscopy, selected area electron diffraction, nanobeam diffraction, and convergent beam diffraction.

CONTACT: **David Flynn**
scps@vuw.ac.nz
04 463 5017

SCANNING ELECTRON MICROSCOPE—JEOL 6610LA



This microscope offers seamless transition between imaging and analysis. A general-purpose, thermal type SEM to meet the needs of a wide range of users, as standard recipes simplify the setting procedures. The standard 5-axis motor stage makes it easy to locate the area of interest.

CONTACT: **David Flynn**
scps@vuw.ac.nz
04 463 5017

SAXS SMALL ANGLE X-RAY SCATTERING BEAM LINE

Small-angle X-ray scattering (SAXS) is a small-angle scattering technique by which nanoscale density differences in a sample can be quantified. In the case of biological macromolecules such as proteins, the advantage of SAXS over crystallography is that a crystalline sample is not needed.

CONTACT: **Davide Comoletti**
scps@vuw.ac.nz
04 463 6029

XPERT-PRO X-RAY DIFFRACTOMETER

Used for the analysis of morphology, mechanical properties, content, and structure of materials. Services include high-resolution powder diffraction, phase identification and quantitative phase analysis, analysis of thin films and coatings, crystallite size and strain determination, kinetic and non-ambient experiments.

CONTACT: **David Flynn**
scps@vuw.ac.nz
04 463 5017

QUORUM 150T PLUS TURBOMOLECULAR PUMPED COATER

The Q150T Plus has been optimally developed for use with a turbomolecular pump, which offers a lower vacuum down to 5 x 10−5 mbar. This allows the sputtering of oxidising metals, which have a lower grain size ideal for high-resolution imaging. Likewise, lower scattering enables the development of high-purity, amorphous carbon films with a high density.

CONTACT: **David Flynn**
scps@vuw.ac.nz
04 463 5017

CARBON COATER—QUORUM Q150T PLUS

The Q150T Plus enables the sputtering of oxidising metals, which have a lower grain size suitable for high-resolution imaging. Similarly, lower scattering allows for high purity, amorphous carbon films of high density.

CONTACT: **David Flynn**
scps@vuw.ac.nz
04 463 5017

BAL-TEC 030 CRITICAL POINT DRYER

The procedure of critical point drying is an efficient method for drying delicate samples. It preserves the surface structure of a specimen which could otherwise be damaged due to surface tension when changing from the liquid to gaseous state.

CONTACT: **John Spencer**
scps@vuw.ac.nz
04 463 5119

ULTRAMICROTOME—REICHERT-JUNG

Ultramicrotome can be used to cut specimens into extremely thin slices, called ultra-thin sections, that can be studied and documented at different magnifications in a transmission electron microscope (TEM).

CONTACT: **David Flynn**
scps@vuw.ac.nz
04 463 5017

JET FREEZER

CONTACT: **John Spencer**
scps@vuw.ac.nz
04 463 5119

FLUOROMETER

Two state-of-the-art fluorometers—one Edinburgh instruments and one Fluorolog. Capable of emission, excitation, synchronsys scans, photoluminescence lifetime scans, and quantum yield measurements. UV–ViS–NIR.

CONTACT: **Nate Davis**
scps@vuw.ac.nz
04 463 9693

INFRA-RED AND TIME-RESOLVED FLUOROMETER

This fluorometer tests all reflective optics, combined with a multitude of light source and detector options, and sample handling accessories. It provides the highest sensitivity and greatest versatility of any spectrofluorometer.

CONTACT: **Grant Williams**
scps@vuw.ac.nz
04 463 5544

FLUORESCENCE SPECTROMETER

For bioresearch applications involving analysis of minute quantities of material.

CONTACT: **Grant Williams**
scps@vuw.ac.nz
04 463 5544

TEKTRONIX DIGITAL OSCILLOSCOPE

This oscilloscope can be used to view oscillations by a display on the screen of a cathode ray tube.

CONTACT: **Grant Williams**
scps@vuw.ac.nz
04 463 5544

QUANTUM DESIGN PHYSICAL PROPERTY MEASUREMENT SYSTEM (PPMS) WITH EVERCOOL DEWAR

This PPMS is capable of measuring a broad range of magnetic, thermodynamic, and electrical transport properties at temperatures from 2–400 K and in magnetic fields up to 7 T. Properties that can be measured include electrical resistivity, Hall effect, thermal conductivity, and magnetisation. It can also be configured for custom user experiments.

CONTACT: **Simon Granville**
scps@vuw.ac.nz

QUANTUM DESIGN MAGNETIC PROPERTY MEASUREMENT SYSTEM (MPMS)

The MPMS provides data acquisition, temperature control and magnetic field control for advanced SQUID magnetometry.

CONTACT: **Simon Granville**
scps@vuw.ac.nz

RESEARCH NMR FACILITY

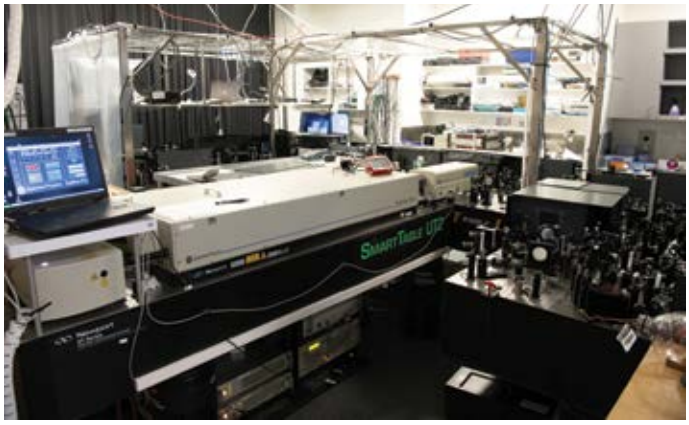
Two Bruker machines—400 MHz Bruker Avance II. Used for studying the rheology and diffusion of soft materials or the flow dynamics of liquids in porous media.

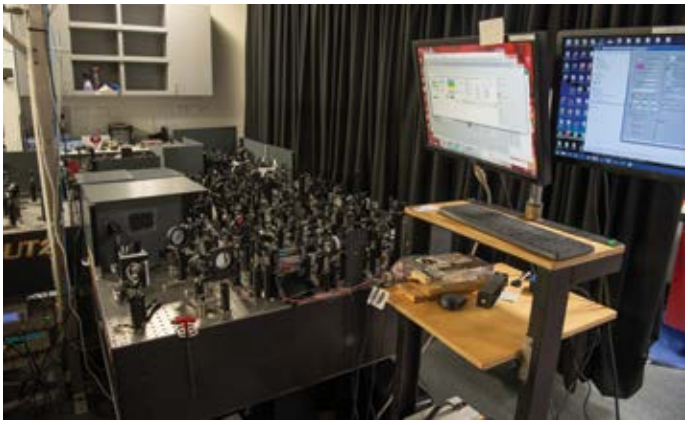
CONTACT: **Petrik Galvosas**
scps@vuw.ac.nz
04 463 5911

GLASSBLOWING EQUIPMENT

Glassblowing services are provided to the School by Grant Franklin of Glasswork. Grant specialises in all aspects of scientific glassblowing, from the design and manufacture of complex specialty items to repairs of laboratory glassware. Glasswork can also be engaged for other contract work such as glass film props, awards, lamp glass repairs, and architectural feature panels.

CONTACT: **Grant Franklin**
scps@vuw.ac.nz
027 687 0990
ⓘ www.glassblowing.co.nz





FEMTOSECOND TRANSIENT ABSORPTION SPECTROSCOPY

The School has a custom-built TA data acquisition system. Excitation pulses are typically provided by the output of an OPA. The effect of excitation is probed by weak broadband visible-near infrared continuum pulses overlapping with the excited region of the sample. The probe pulses are collected via fibre optics, spectrally resolved in a spectrograph, and recorded on photodiode arrays or CMOS cameras. TA spectroscopy can be used to resolve processes including photocurrent generation in photovoltaic cells, photoswitching behaviour, and light harvesting dynamics.

CONTACT: **Justin Hodgkiss**
scps@vuw.ac.nz
04 463 6983

RAMAN SPECTROSCOPY

This custom-built femtosecond stimulated Raman spectroscopy (FSRS) system can resolve the vibrational dynamics of materials in both the ground and excited states. As an addition to the TA data acquisition system, a third laser pulse, the Raman pump, is introduced to stimulate emission of photons that reveal the vibrational modes of materials. This gives insight into the structure of materials as well as their energy dissipation mechanisms upon the excitation of light.

CONTACT: **Justin Hodgkiss**
scps@vuw.ac.nz
04 463 6983

ULTRAFAST BROADBAND PHOTOLUMINESCENCE SPECTROSCOPY

The School has developed a new method to measure broadband PL spectra from the UV to near IR with ultrafast time resolution. Ultrafast PL spectra are gated via deflection from a transient grating formed via the interaction of a pair of gate pulses. The method enables us to resolve ultrafast light harvesting processes, exciton dynamics, and the onset of lasing.

CONTACT: **Justin Hodgkiss**
scps@vuw.ac.nz
04 463 6983

MECHANICAL ENGINEERING LAB

The School has a dedicated mechanical workshop and staff on site to design, manufacture, and repair the wide range of equipment used by staff and students. The workshop is fitted with high-precision equipment—a CNC (computer numerical control) suite with a lathe and 3-axis mill. It also has a full range of mechanical lathes, milling machines, and workshop tools.

CONTACT: **Alex Puglisi**
scps@vuw.ac.nz
04 886 4448

THERMO SCIENTIFIC ICE 3500 AAS SPECTROMETER

The iCE 3500 spectrometer is completely automatic with full element capability. It possesses a dual atomizer AA spectrometer, flame atomisation in left-hand sample compartment, and furnace atomisation in the right-hand sample compartment.

CONTACT: **Chris Lepper**
scps@vuw.ac.nz
04 463 5883

SHIMADZU DCS-60 DIFFERENTIAL SCANNING CALORIMETER

The DCS-60 differential scanning calorimeter is an efficient and powerful tool for quick determination of specific heat and enthalpy change accompanying the primary or secondary phase transition of a substance.

CONTACT: **Chris Lepper**
scps@vuw.ac.nz
04 463 5883

SHIMADZU RF-5301PC FLUOROMETER

The RF-5301PC allows high-sensitivity analysis to be carried out, based on a unique optical system that involves a highly efficient blazed holographic grating as well as a low-noise circuitry that includes a digital filter.

CONTACT: **Nate Davis**
scps@vuw.ac.nz
04 463 9693

AGILENT TECHNOLOGIES 7820A GC SPECTROMETER

The 7820A Gas Chromatograph system performs great day-to-day analysis. The system provides reliable capabilities for a wide range of application areas, meeting regulatory and SOP needs for small-to-medium-sized labs. Runs with full electronic pneumatic control (EPC) from inlet to detector for good retention time and area count performance. Electronic pneumatic regulation (EPR) offers manual operation simplicity with high-precision digital display of pressure/flow. Superior ease-of-use over traditional systems.

CONTACT: **Chris Lepper**
scps@vuw.ac.nz
04 463 5883

THERMO SCIENTIFIC DIONEX 1100 IC SPECTROMETER

The Dionex™ ICS-1100 Ion Chromatography System performs ion analyses using suppressed or non-suppressed conductivity detection. By comparing the data obtained from a sample to that obtained from the known standard, sample ions can be identified and quantitated. The chromatography software converts each peak in the chromatogram to a sample concentration and produces a printout of the results. The ICS-1100 is also equipped with an AS-DV autosampler that is capable of delivering between 0.1 mL and 5.0 mL of sample to the sample loop in the IC system.

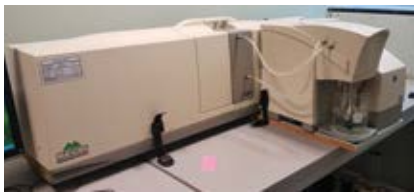
CONTACT: **Chris Lepper**
scps@vuw.ac.nz
04 463 5883

AGILENT TECHNOLOGIES 1120 LC SPECTROMETER

Based on well-established Agilent LC technologies, the 1120 Compact LC features simplified functions and easy-to-use software to facilitate conventional HPLC up to 400 bar. It is ideally suited for routine analyses in the food and fine chemical industries because of its capability to achieve very precise retention times and peak areas, as well as low detection limits for the analysed compounds.

CONTACT: **Chris Lepper**
scps@vuw.ac.nz
04 463 5883

MALVERN MASTERSIZER APA2000 PARTICLE SIZER



This laser diffraction testing instrument is used to evaluate particle size distribution—the distribution of different sizes within a sample. This method has been used extensively in many industries including pharmaceutical, environmental, food, health, beauty, and others.

CONTACT: **Chris Lepper**
scps@vuw.ac.nz
04 463 5883

RUDOLPH RESEARCH ANALYTICAL AUTPOL II POLARIMETER

The AUTOPOL® II is a general-purpose automatic polarimeter. It features the same high-quality optics as more expensive instruments with 589 nm and 546 nm as standard wavelengths.

CONTACT: **Chris Lepper**
scps@vuw.ac.nz
04 463 5883

NMR FACILITY

Three JEOL machines—3-Channel 500 MHz Nuclear Magnetic Resonance Spectrometer. 2-Channel 500 MHz Nuclear Magnetic Resonance Spectrometer type JNM-ECZ500S for routine analyses aimed towards 24/7 routine analyses. 600 MHz Nuclear Magnetic Resonance Spectrometer type JNM-ECZ600R.

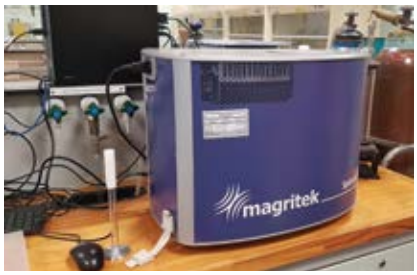
CONTACT: **Jan Vorster**
scps@vuw.ac.nz
021 159 5755

SUPERNOVA ES2 (DUAL) DIFFRACTOMETER SYSTEM

A dual wavelength single crystal diffractometer for studying macromolecular structures, ideally suited for very small crystals under temperature control within the range of 80–500 K.

CONTACT: **Mat Anker**
scps@vuw.ac.nz
04 463 6760

MAGRITEK PHOSPHORUS SPINSOLVE BENCHTOP NMR SPECTROMETER



The Spinsolve benchtop NMR is a compact benchtop NMR spectrometer used for 31P spectra. The high NMR sensitivity, simple spectra, and large chemical shift range of 31P and the lack of common background signals (such as solvent signals) make 31P NMR suitable for routine purity assessment and reaction monitoring.

CONTACT: **Chris Lepper**
scps@vuw.ac.nz
04 463 5883

MICROMERITICS FLOWSORB II SURFACE AREA ANALYSER

The FlowSorb II measures surface area using the flowing gas method, which involves the continuous flow of an adsorptive and inert gas mixture over the sample at atmospheric pressure.

CONTACT: **Chris Lepper**
scps@vuw.ac.nz
04 463 5883

SHIMADZU TGA-50 THERMOGRAVIMETRIC ANALYZER

The TGA-50 is optimally applicable to the measurement of adsorbed water, water of crystallisation and residual solvent, the thermal stability of substances, and solid (liquid) to gas and gas to solid (liquid) phase changes in decomposition and oxidation reactions.

CONTACT: **Chris Lepper**
scps@vuw.ac.nz
04 463 5883

SHIMADZU UV-2600 UV-VIS

The compact UV-2600i/2700i is a universal, research-grade spectrophotometer that can be used in a wide range of fields, and easily expanded to suit the measurement objective. The UV-2700 is capable of 8-Abs measurements, and is optimised for measuring low-transmittance samples.

CONTACT: **Chris Lepper**
scps@vuw.ac.nz
04 463 5883

MALVERN ZEN 3600 ZETASIZER

The Zetasizer Nano provides the ability to measure three characteristics of particles or molecules in a liquid medium: Particle size (0.6 nm to 6 µm), Zeta potential (3 nm to 10 µm), and Molecular weight (1000 to 2 x 107 Daltons).

CONTACT: **Chris Lepper**
scps@vuw.ac.nz
04 463 5883

TRIAXE MAGNETOMETER

The Triaxe Magnetometer allows for the rapid estimation of palaeointensities from volcanic and fired archaeomagnetic samples.

CONTACT: **Gillian Turner**
scps@vuw.ac.nz
04 463 6478

AGILENT CARY ECLIPSE FLUORESCENCE SPECTROPHOTOMETER

The Agilent Cary Eclipse fluorescence spectrometer is sensitive, accurate, and flexible. It is ideal for fluorescent measurements in life sciences and biotechnology, with high sensitivity and inherent bleaching protection for photosensitive samples. Fast data collection enables kinetics measurements, while fibre optics allow for remote sample measurements.

CONTACT: **Rachel Wallace**
scps@vuw.ac.nz
04 463 6516

AGILENT TECHNOLOGIES 8453 UV-VIS SPECTROMETER

The Agilent 8453 UV-Vis instrument is a simple but powerful diode-array spectrophotometer capable of quickly acquiring data in the spectral range from 190 to 1100 nm.

CONTACT: **Teresa Gen**
scps@vuw.ac.nz
04 463 6502

AGILENT TECHNOLOGIES 8454 UV-VIS SPECTROMETER

The Agilent 8454 UV-Vis instrument is a simple but powerful diode-array spectrophotometer capable of quickly acquiring data in the spectral range from 190 to 1100 nm.

CONTACT: **Rachel Wallace**
scps@vuw.ac.nz
04 463 6516

ALPHATECH DSC Q100 DIFFERENTIAL SCANNING CALORIMETER

The DSC Q100 Differential Scanning Calorimeter is an efficient and powerful tool for quick determination of specific heat and enthalpy change accompanying the primary or secondary phase transition of a substance.

CONTACT: **Grant Williams**
scps@vuw.ac.nz
04 463 5544

ALPHATECH SDT Q600 TGA/DSC

The Q600 provides simultaneous measurement of weight change (TGA) and true differential heat flow (DSC) on the same sample from ambient to 1500˚C. It features a field-proven horizontal dual beam design with automatic beam growth compensation, and the ability to analyse two TGA samples simultaneously. DSC heat flow data is dynamically normalised using the instantaneous sample weight at any given temperature.

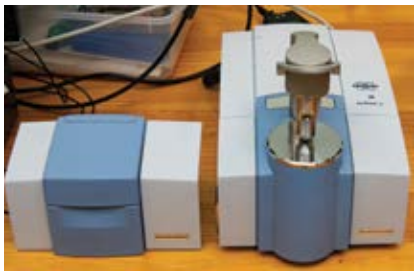
CONTACT: **Grant Williams**
scps@vuw.ac.nz
04 463 5544

BRUKER ALPHA FT-IR

A quick and easy-to-use FT-IR spectrometer.

CONTACT: **Teresa Gen**
scps@vuw.ac.nz
04 463 6502

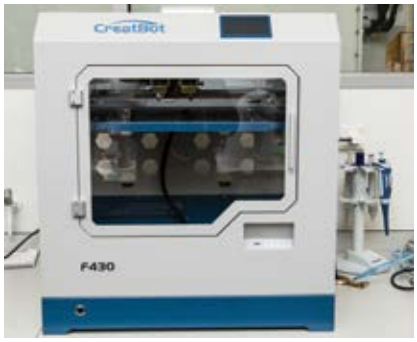
BRUKER ALPHA II IR SPECTROMETER



A quick and easy-to-use FTIR spectrometer.

CONTACT: **Rachel Wallace**
scps@vuw.ac.nz
04 463 6516

CREATBOT F430 3D PRINTER



A powerful 3D printer with the most advanced desktop 3D technology. It provides solutions for just about every application from concept to prototype and high-performance material direct production.

CONTACT: **Kim McKelvey**
scps@vuw.ac.nz
04 463 5957

FLEXIWAVE FLEXIBLE MICROWAVE SYNTHESIS

Milestone's flexiWAVE overcomes the limitation of conventional microwave synthesis devices, as it consists of a single microwave platform that, in combination with specific accessories, allows chemists to perform classic glassware and high-pressure synthesis, as well as solid-phase reactions.

CONTACT: **Luke Liu**
scps@vuw.ac.nz
04 463 5591

HINOTEK 722N UV-VIS SPECTROPHOTOMETER

The 722N UV-VIS spectrophotometer adopts advanced proportional double beam optical system and low noise circuit design, with excellent reliability and stability. It can meet the needs of daily analysis, scientific research, and other applications.

CONTACT: **Jim Johnston**
scps@vuw.ac.nz
04 463 5334

NANODROP ND-1000

The NanoDrop® ND-1000 is a full spectrum (220–750 nm) spectrophotometer that provides scientists with a simple and robust instrument for quantification and evaluation of purity of samples, such as proteins and nucleic acids.

CONTACT: **Luke Liu**
scps@vuw.ac.nz
04 463 5591

SHERWOOD SCIENTIFIC MK1 MAGNETIC SUSCEPTIBILITY BALANCE

Used to determine the magnetic properties of materials.

CONTACT: **Teresa Gen**
scps@vuw.ac.nz
04 463 6502

TE KURA MĀTAI PŪKAHA, PŪROROHIKO—SCHOOL OF ENGINEERING AND COMPUTER SCIENCE

Researchers in the **School of Engineering and Computer Science** are contributing to important advances in science, technology, and engineering.

Their world-leading research is undertaken in a dozen research groups, broadly covering artificial intelligence, computer graphics, mechatronics, networking, programming languages, and wireless communications.

ULTRASONIC DISRUPTER

The Omni Sonic Ruptor 4000 offers precision engineering with all the features necessary to create a total system for ultrasonic disruption. Popular applications include nanoparticle dispersion, creating emulsions, cell disruption, and homogenisation. The Sonic Ruptor 4000 is capable of creating an emulsion down to 1/100 of a micron.

CONTACT: **Gideon Gouws**
engineering@vuw.ac.nz
04 463 4952

IMPEDANCE ANALYSER

40 Hz to 10 MHz impedance analyser for measurement of components and materials. Has a number of fittings and a probe station for specific sample types.

CONTACT: **Gideon Gouws**
engineering@vuw.ac.nz
04 463 4952

COMPUTER GRAPHICS LAB

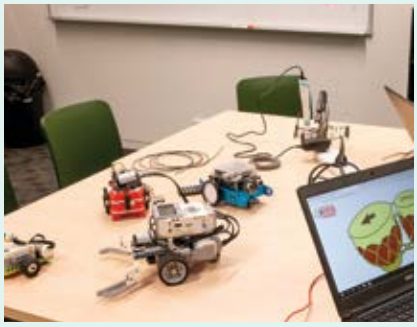
Computer Graphics lab that contains: Virtual reality headsets, specialist 360 degree cameras, optical table, and screens.

CONTACT: **Neil Dodgson**
engineering@vuw.ac.nz
04 463 6922

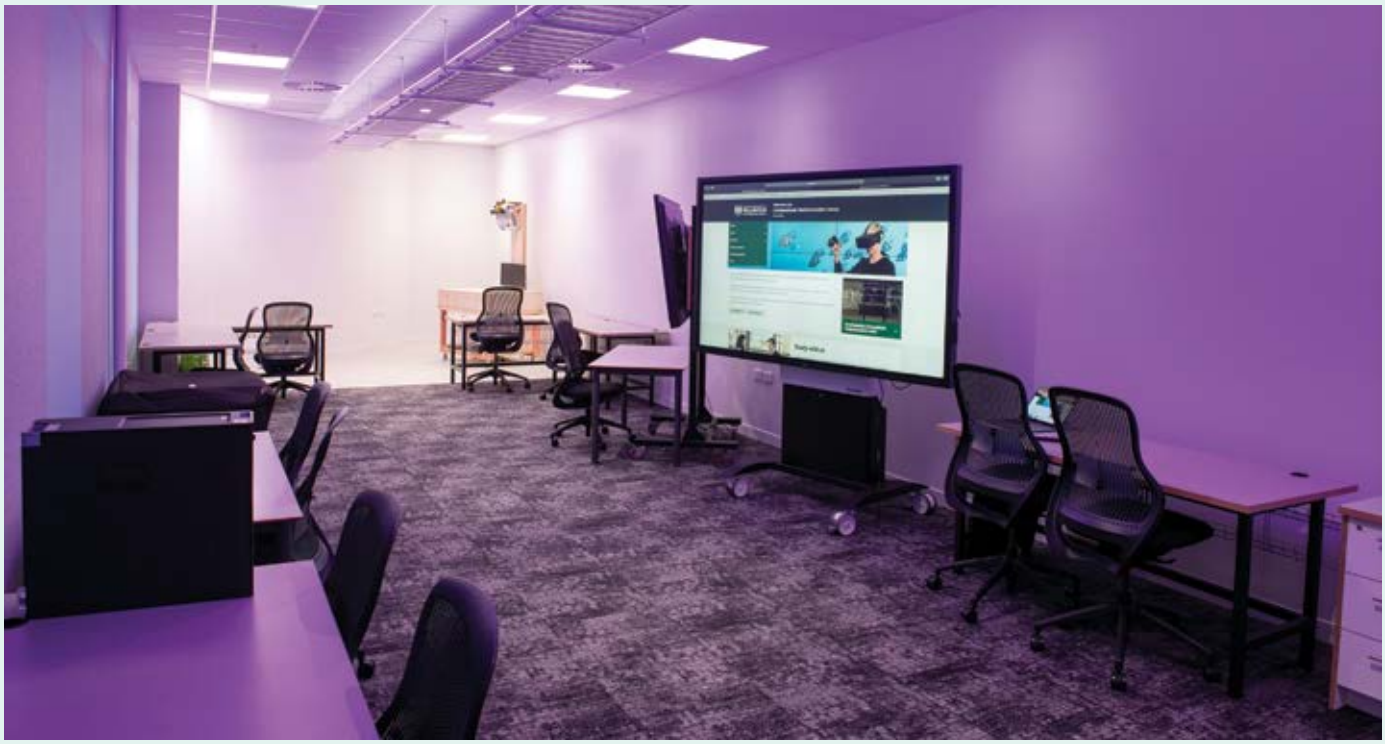
MAKERSPACE

This is a specialist space developed with children in mind. The space takes groups of up to 16 and specialises in maker activities and curriculum-based programmes. If adults are interested in activities around 'making', this can be organised for small groups.

CONTACT: **Pravin Vaz**
engineering@vuw.ac.nz
04 463 6765



HCI LAB



This HCI lab contains a collection of interaction devices for use in projects and experiments. These include VR head sets (HTC Vive, Occulus Go, Pico Goblin, Samsung Gear, Google Cardboard), AR head sets (MagicLeap), multi-touch tables (Promethean ActivTable), iPad tablets, Samsung tablets, visualisation displays and walls, Leap Motions, both Kinect and PlayStation Move systems, and audio/video recorders.

CONTACT: **Stuart Marshall**
engineering@vuw.ac.nz
04 463 6730

TE KURA TĀTAI ARO WHENUA—SCHOOL OF GEOGRAPHY, ENVIRONMENT AND EARTH SCIENCES

Teaching and research programmes in the School are anchored in a passion for planet Earth and the geological, environmental, and social processes that affect the world.

Throughout Aotearoa New Zealand and across the globe, from the Earth's deep interior to the communities we live in, their staff and students are working to understand the matters that most affect the planet.

LEICA DM6 B RESEARCH MICROSCOPES

Leica DM6 B upright microscopes specifically for use in clinical and life science research applications.

CONTACT: **Kosta Tashkoff**
geo-enquiries@vuw.ac.nz
04 463 6013

THERMOLYNE F30420C-33 MUFFLE FURNACE

Large capacity muffle furnace suitable for gravimetric analysis, sintering, quantitative analysis and heat treatment.

CONTACT: **Jane Chewings**
geo-enquiries@vuw.ac.nz
04 463 6192

FRANTZ MAGNETIC SEPARATOR

SG Frantz LB-1 magnetic susceptibility separator utilising paramagnetic and diamagnetic properties of minerals.

CONTACT: **Jane Chewings**
geo-enquiries@vuw.ac.nz
04 463 6192

OUTOTEC MIH(13) 111-5 HIGH INTENSITY INDUCED ROLL MAGNETIC SEPARATOR

Magnetic susceptibility separator utilising paramagnetic and diamagnetic properties of minerals. Suitable for large (1–2 kg) sample volumes.

CONTACT: **Jane Chewings**
geo-enquiries@vuw.ac.nz
04 463 6192

ENDECOTTS OCTAGON 200 SIEVE SHAKER

Test sieve shaker with 3D sieving motion, suitable for up to 8 full height/16 half height sieves.

CONTACT: **Jane Chewings**
geo-enquiries@vuw.ac.nz
04 463 6192

'THE FLUME'

Built in 1978, 'The Flume' mechanical stream flow simulator is used to simulate and observe particle motion, bedforms and flow characteristics. Stream flow channel: 7 m long, 0.4 m wide; max depth 0.3 m; max velocity 0.8 m/s. Slope of channel can be hydraulically tilted downstream to 1.2 m. Silica sand bed (modal particle size 180 µm) with contrasting iron sand (used to show internal structure of bedforms).

CONTACT: **Jane Chewings**
geo-enquiries@vuw.ac.nz
04 463 6192

GEOCHEMISTRY LAB

Cleanroom geochemical facility for sample preparation.

CONTACT: **Bruce Charlier**
geo-enquiries@vuw.ac.nz
04 463 5865

AGILENT 7900 INDUCTIVELY-COUPLED MASS SPECTROMETER (ICP-MS)

Quadrupole mass spectrometer for trace element analysis by solution or coupled to the Resonetics Laser Ablation system.

CONTACT: **Bruce Charlier**
geo-enquiries@vuw.ac.nz
04 463 5865

ELECTRON PROBE MICROANALYSER

JEOL JXA-8230 SuperProbe Electron Probe Microanalyser, with 5 wavelength dispersive X-ray spectrometers (WDS), an energy dispersive X-ray spectrometer (EDS) analyser featuring spectral imaging, a JEOL xCLent 3 cathodoluminescence (CL) spectrometer, and highly sensitive detectors for acquisition of backscattered electron (BSE) and secondary electron (SEI) images.

CONTACT: **Ian Schipper**
geo-enquiries@vuw.ac.nz
04 463 5233 ext 8197

THERMO-FINNEGAN THERMAL IONISATION MASS SPECTROMETER (TIMS)

Thermal Ionisation mass spectrometer for high-precision isotope ratio measurement in geological samples.

CONTACT: **Bruce Charlier**
geo-enquiries@vuw.ac.nz
04 463 5865

THERMO-FISHER ELEMENT 2 HIGH RESOLUTION INDUCTIVELY-COUPLED MASS SPECTROMETER (ICP-MS)

Single collector, double-focusing magnetic-sector field mass spectrometer for trace element and isotopic analysis. This instrument can be linked to the Resonetics laser ablation system for the analysis of solid materials. This instrument can also be used in solution mode where samples are digested and diluted appropriately in solution.

CONTACT: **Bruce Charlier**
geo-enquiries@vuw.ac.nz
04 463 5865

NEW WAVE/MERCHANTEK MICROMILL

Micromilling device designed for high-resolution milling to recover sample powders for chemical and isotopic analysis.

CONTACT: **Bruce Charlier**
geo-enquiries@vuw.ac.nz
04 463 5865

RESONETICS RESOLUTION LASER ABLATION INSTRUMENT AND ACCESSORIES

193 nm excimer laser ablation system with Laurin Technic S155 Sample cell and GeoStar software for in-situ trace element analysis of a range of solid materials.

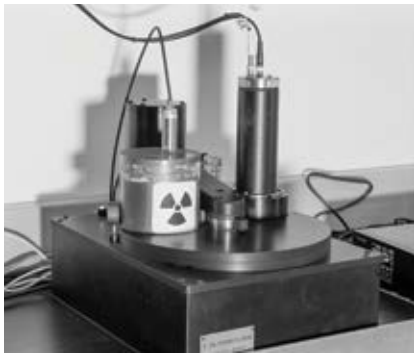
CONTACT: **Bruce Charlier**
geo-enquiries@vuw.ac.nz
04 463 5865

BROAD ENERGY CANBERRA HPGE-GAMMA SPECTROMETER

The gamma-ray spectrometer is an instrument for measuring the distribution (or spectrum) of the intensity of gamma radiation versus the energy of each photon. It is a quick and non-destructive analytical technique that can be used to identify various radioactive isotopes in a sample.

CONTACT: **Ningsheng Wang**
geo-enquiries@vuw.ac.nz
04 463 6127

LUMINESCENCE DATING INSTRUMENTS (RISO TL-DA-20 READER)



The RISO Reader is a luminescence dating instrument that contains a 48-position automated sample changer, a beta radiation source, and stimulation devices for thermoluminescence and optically stimulated luminescence (infrared, green, and blue light).

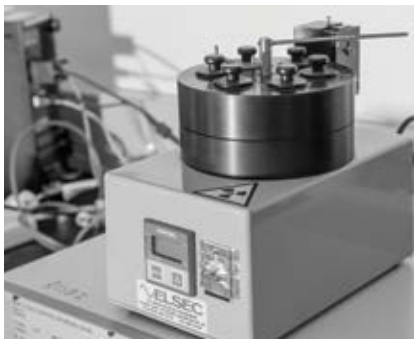
CONTACT: **Ningsheng Wang**
geo-enquiries@vuw.ac.nz
04 463 6127

DAYBREAK E801 BETA-IRRADIATOR WITH AUTOMATED 30-POSITION SAMPLE CHANGER

Beta dose source used for the luminescence dating of samples and materials.

CONTACT: **Ningsheng Wang**
geo-enquiries@vuw.ac.nz
04 463 6127

ELSEC ALPHA-IRRADIATOR WITH 6 IRRADIATION POSITIONS



Alpha dose source used for the luminescence dating of samples and materials.

CONTACT: **Ningsheng Wang**
geo-enquiries@vuw.ac.nz
04 463 6127

WILFLEY GRAVITY SEPARATION TABLE

This heavy/dense mineral separator is typically used for the following applications: Technical research—assessment of gravity processes, geochronology studies, characterisation of heavy minerals, recovery of precious metals (e.g., gold rooms), separation in synthetic diamond manufacture, and quality control—silica sand processing/glass-making industry.

CONTACT: **Marcel Mizera**
geo-enquiries@vuw.ac.nz
04 463 9479

ROCKLABS RING MILL

This ring mill is used for coarse pulverising of large rock samples for mineral separation such as Zircon dating, preparing samples for on-stream analysis, dry, or slurries. Low maintenance and easy to clean, this ring mill features a continuous flow-through operation with built-in ducting of cyclone with external connection to dust extraction systems for cleaning the head. Sample bin holds up to 10 kg. Quiet operation—less than 85 dB.

CONTACT: **Marcel Mizera**
geo-enquiries@vuw.ac.nz
04 463 9479

ROCKLABS HYDRAULIC PRESS

Hydraulic press used for breaking up large rock samples into smaller, more manageable sizes.

CONTACT: **Marcel Mizera**
geo-enquiries@vuw.ac.nz
04 463 9479

FRITSCH-INTERNATIONAL DISK MILL MICRO-MILL PULVERISETTE 13

This disk mill is used for efficient fine grinding of hard-brittle to medium-hard solids. Features include automatic locking of the collecting vessel and grinding chamber, and motor-driven grinding gap adjustment with digital gap display. Ideal for medium particle sizes in the areas of mining and metallurgy, ceramics industry, rocks and soils, glass industry, and soil research.

CONTACT: **Marcel Mizera**
geo-enquiries@vuw.ac.nz
04 463 9479

ROCKLABS BOYD CRUSHER

This crusher is a double-acting fine jaw crusher. Its design includes top- and bottom-driven moving jaws, enabling the maximum amount of crushing in a single pass. It takes lump sizes of up to 150 mm pieces and crushes them to 10 mm or less. Jaws can hold up to 20 kg of sample in one load.

CONTACT: **Marcel Mizera**
geo-enquiries@vuw.ac.nz
04 463 9479

BECKMAN COULTER LS13320 LASER DIFFRACTION PARTICLE SIZE ANALYSER

Grain size analyser using diffraction of laser beam around suspended particles. Modules: Aqueous Liquid and Micro.

CONTACT: **Gavin Dunbar or Jane Chewings**
geo-enquiries@vuw.ac.nz
04 463 6123

BECKMAN COULTER MULTISIZER 3 COULTER COUNTER (MS3)

Grain size analyser using electrical impedence through a suspended sample (i.e. Coulter Principle: Electrical Sensing Zone (ESZ)).

CONTACT: **Gavin Dunbar or Jane Chewings**
geo-enquiries@vuw.ac.nz
04 463 6123

HYPROP TENSIOMETER

HYPROP® is a fully automated measuring and evaluation system to determine the hydraulic properties of soil samples. Unit is bench-top portable.

CONTACT: **Dez Tessler**
geo-enquiries@vuw.ac.nz
04 463 6512

BUEHLER ISOMET PRECISION SAW

Gravity-fed diamond-bladed saw with variable speed (50–900 RPM) for cutting rock and mineral samples. Particularly suitable for delicate/fragile samples.

CONTACT: **Marcel Mizera**
geo-enquiries@vuw.ac.nz
04 463 9479

MEKTON GEOFORM THIN-SECTION MACHINE

For use in the preparation of petrogeogical thin section slides. The instrument is used to trim samples from bonded glass slides and grind these down to a desired thickness before the final polishing process.

CONTACT: **Marcel Mizera**
geo-enquiries@vuw.ac.nz
04 463 9479

LP50 AUTO PRECISION LAPPING AND POLISHING MACHINE (PLUS ACCESSORIES INCLUDING BONDING JIGS)

For use in the precision lapping of petrological and mineralogical samples, specifically for petrographic thin section slide preparation.

CONTACT: **Marcel Mizera**
geo-enquiries@vuw.ac.nz
04 463 9479

COVINGTON TRIM SAW

Lapidiary 250 mm diameter diamond saw for trimming small rock samples. Hand feed or automatic drive.

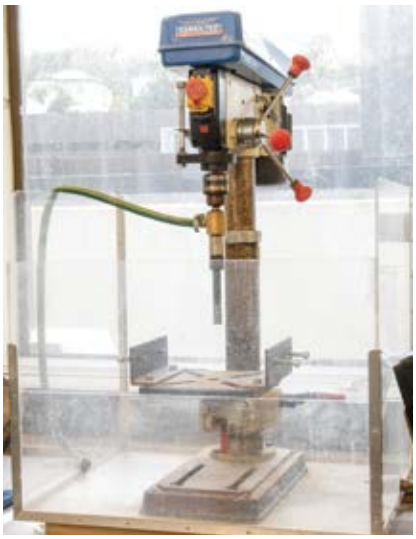
CONTACT: **Marcel Mizera**
geo-enquiries@vuw.ac.nz
04 463 9479

DIAMOND LAP

In-bench mounted diamond lap for use in smoothing rock/mineral sample surfaces after cutting.

CONTACT: **Marcel Mizera**
geo-enquiries@vuw.ac.nz
04 463 9479

DRILL PRESS



For use in diamond drilling paleomagnetic core samples.

CONTACT: **Gillian Turner**
geo-enquiries@vuw.ac.nz
04 463 6478

STRUERS LABOSYSTEM

Used for polishing mineralogical and petrological samples. 3x 300 mm diameter working wheels (50–500 RPM), programmable memory, single/central pressure, dosing system.

CONTACT: **Marcel Mizera**
geo-enquiries@vuw.ac.nz
04 463 9479

STRUERS CITOVAC

Vacuum impregnation unit that uses compressed air for the impregnation of porous samples and materials. Special mounting cup holders allow for the preparation of multiple specimens at the same time.

CONTACT: **Marcel Mizera**
geo-enquiries@vuw.ac.nz
04 463 9479

SIMA HANDY 350 TILE AND ROCK SAW

Water-cooled tile saw used for cutting large rock samples.

CONTACT: **Marcel Mizera**
geo-enquiries@vuw.ac.nz
04 463 9479

MOTIC MICROSCOPES, CAMERAS, AND ASSOCIATED SPARES

Class set of teaching microscopes comprising 40 stereomicroscopes and 50 petrographic microscopes.

CONTACT: **Kosta Tashkoff**
geo-enquiries@vuw.ac.nz
04 463 6013

DRONE—QUADCOPTER

DJI Inspire 2 Quadcopter and Zenmuse X5S camera sensor. Advanced feature drone that includes multiple proximity sensors to prevent collisions; large camera sensor with high-quality lens (Zenmuse X5S); weight and lift that allows for heavy payloads and flight during windy conditions; dual battery system to prevent complete failure during flight; and flight path programming with advanced automatic home function.

CONTACT: **Dez Tessler**
geo-enquiries@vuw.ac.nz
04 463 6512

BOXFISH MINI ROV SUBMARINE

Lightweight Remotely Operated Vehicle (ROV) that can be easily deployed and operated with a small crew of two form virtually any small boat. At 23 kgs, it is easy to launch and recover by hand and can safely operate to depths of up to 500 metres.

CONTACT: **Ian Schipper**
geo-enquiries@vuw.ac.nz
04 463 5233 ext 8197

TE KURA TAPUHI HAUORA—SCHOOL OF NURSING, MIDWIFERY AND HEALTH PRACTICE

The School's primary focus is to make a positive difference to the health and wellbeing of individuals and communities. Located within the Wellington Regional Hospital, the School is strategically positioned close to practice and responsive to health policy and workforce development needs.

INFANT RESUSITARES

The School has two Infant Resus units. The infant T-piece Resuscitator, or Emergency Resuscitator, is used to inflate the lungs of infants less than 10 kgs to survive the immediate post-natal period using Peak Inspiratory Pressure (PIP) and Positive End Expiratory Pressure (PEEP) controls manually with the use of test lung and mask.

CONTACT: **Vinko Kerr-Harris**
nmh@vuw.ac.nz

STUDENT AUSCULTATION MANNEQUIN (SAM II)

This auscultation trainer is for all abilities and levels. SAM II has a large range of physiological sounds and tools for teaching auscultation.

CONTACT: **Vinko Kerr-Harris**
nmh@vuw.ac.nz

NURSING ANNE

An adult full-body mannequin designed for scenario-based training in the care and management of a wide variety of in-hospital patients.

Nursing Anne allows users to practise important patient care as well as more specific clinical skills regarding women's health, such as breast exams, mastectomy care, and fundus assessment.

CONTACT: **Vinko Kerr-Harris**
nmh@vuw.ac.nz

PREMATURE MANNEQUIN

An anatomically correct mannequin of a baby born at 25 weeks, to help healthcare professionals master the skills needed to care for preterm infants, improving patient outcomes, and to refine standard practices for various challenges presented in premature newborns.

CONTACT: **Vinko Kerr-Harris**
nmh@vuw.ac.nz

SIMMOM MANNEQUIN

This is an advanced full-body birthing simulator with accurate anatomy and functionality to facilitate multi-professional obstetric training of birth management, with both manual and automatic delivery modes.

CONTACT: **Vinko Kerr-Harris**
nmh@vuw.ac.nz

OCULUS QUEST

Virtual Reality set up so midwifery teaching can be done off site, for patient-based birthing scenarios with an all-round virtual reality simulation experience.

CONTACT: **Vinko Kerr-Harris**
nmh@vuw.ac.nz

TE KURA MĀTAI HINENGARO—SCHOOL OF PSYCHOLOGY

The **Wellington School of Psychology** is the number one ranked School of Psychology in Aotearoa New Zealand in terms of research quality and output. The School is a research and learning community spanning many areas of psychology with expertise in cognitive, behavioural, developmental, social, clinical, forensic, bicultural, and cross-cultural psychology.

The primary mission of the School is to advance, communicate, and apply psychological science through excellence in research and teaching, and through engaging with local and international communities.

EQUIVITAL GSR SENSOR

This Galvanic Skin Response (GSR) sensor connects to the expansion port on the Equivital SEM to enable recording of GSR signals. It consists of a small box that can fit inside the equivital sensor belt or be worn on the wrist as well as short leads terminating in standard 'snap lead' connectors suitable for use with the MLA1010 disposable electrodes.

CONTACT: **Michael Tooley**
psychology@vuw.ac.nz
04 463 4722

BRAINVISION BRAINAMP EXG

This amplifier is a bipolar amplifier that can be used to record EMG, ECG, EOG, and polygraphic channels such as GSR, acceleration, temperature, and blood pulse with an extremely compact design.

CONTACT: **Michael Tooley**
psychology@vuw.ac.nz
04 463 4722

OCULUS VR HEADSET AND VIVE VR HEADSET

A device for the immersive presentation of visual stimuli, commonly known as virtual reality.

CONTACT: **Michael Tooley**
psychology@vuw.ac.nz
04 463 4722

EYELINK 1000 EYE TRACKER

This eye tracker is a system for tracking eye movements, fixations, and pupil dilation in relation to events that occur on a computer monitor.

CONTACT: **Michael Tooley**
psychology@vuw.ac.nz
04 463 4722

INFANT EYE TRACKER

Eye tracker for use in psychological research in the infant cognition lab.

CONTACTS: **Sam Akhir** or **Braden Cradock**
04 463 5771 04 886 4522
psychology@vuw.ac.nz

INTERPERSONAL RELATIONSHIP LAB

A lab for research with participants in pairs. Equipped with three cameras and ceiling microphone. Soundproof.

CONTACTS:
Sam Akhir or **Braden Cradock**
04 463 5771 04 886 4522
psychology@vuw.ac.nz

4K CAMCORDER

Five model FDRAX53 Camcorders for recording.

CONTACTS:
Sam Akhir or **Braden Cradock**
04 463 5771 04 886 4522
psychology@vuw.ac.nz

SWIVL CAMERA

C Series Robot tracking camera.

CONTACT: **Rita McNamara**
psychology@vuw.ac.nz
04 463 5571

AIR FILM COIL SUPPORT STAND

The Magstim AFC Support Stand is an elegant multi-movement mechanism capable of holding a stimulating coil over an exceptionally wide range of movement. Designed to aid the positioning of a stimulating coil in any desired orientation and can easily manoeuvre the coil around the subject. Five degrees of rotation allows for a coil to be positioned in any required angle.

CONTACT: **Michael Tooley**
psychology@vuw.ac.nz
04 463 4722

GO COMPACT MICROPHONE SYSTEM

Portable audio recording units.

CONTACTS:
Sam Akhir or **Braden Cradock**
04 463 5771 04 886 4522
psychology@vuw.ac.nz

MAGSTIM TMS SYSTEM

Magstim 200.

CONTACT: **Michael Tooley**
psychology@vuw.ac.nz
04 463 4722

NEUROCONN STIMULATOR

The DC Stimulator Plus is used in scientific research and provides a stimulation with weak currents, either direct or alternating (transcranial Electrical Stimulation tES), within non-invasive interventional neurophysiology. The electrical charge and current density applied through a constant current source are far below the threshold for releasing a stimulus. Depending on the duration, the used current, the current density, and the frequency the stimulation has a modular effect on existing neuronal elements by either activating or inhibiting cortical activity.

CONTACT: **Michael Tooley**
psychology@vuw.ac.nz
04 463 4722

PUPIL LABS EYE TRACKER

Pupil headset—World Camera.

CONTACT: **Michael Tooley**
psychology@vuw.ac.nz
04 463 4722

TOBII X2 EYE TRACKER

Eye tracker for use in psychological research.

CONTACT: **Jason Low**
psychology@vuw.ac.nz
04 463 6721

TE WĀHANGA WAIHANGA-HOAHOA—WELLINGTON FACULTY OF ARCHITECTURE AND DESIGN INNOVATION

The **Wellington Faculty of Architecture and Design Innovation** is a leading provider of innovative education in design and the built environment. Centrally located in the heart of creative Wellington means it is placed to be a hub for the local creative industry, and regularly hosts international and high-profile conferences, exhibitions, and events.

ULS LASER CUTTERS

Suite of four 50 W and 60 W engraving/ modelling ULS laser cutters, suitable for acrylics and wood up to approximately 10 mm depending on material. Used for architectural modelling, art and crafts, and prototyping.

CONTACT: **Ken Howe**
foad@vuw.ac.nz
04 463 6391

FASHION STUDIO

The fashion studio is a purpose-built space, with a comprehensive suite of equipment including: digital patternmaking suite with CLO3d and PAD software; PAD digitiser; plotters for digitising physical patterns or plotting out digitally designed patterns; studio tables; industry-standard computers and Wacom tablets; traditional apparel workshop with industrial steam irons, fusing press, and a range of specialist industrial sewing machines—including plain sewers, leather sewing, over-lockers, cover-seamers, digital buttonhole, and a digital 6-colour embroidery machine.

CONTACT: **Hannah Clement**
foad@vuw.ac.nz
04 463 3841

PHOTOGRAPHIC RESOURCES

The photographic studio incorporates white and black backdrop paper, and studio lighting suitable for photographing small architectural/design models and prototypes, and portraits. The studio is set up preconfigured for users allowing for most requirements—thus needing minimal specialist support.

CONTACT: **Ken Howe**
foad@vuw.ac.nz
04 463 6391

CYCLORAMA WALL

A 3D cyclorama approximately 4 m x 3 m x 3 m. This is a white cyclorama allowing colour keying of still and video shots, for subsequent video editing/compositing. It is installed with spot lights and wash-lights preconfigured for users allowing for most requirements—thus needing no specialist support.

CONTACT: **Ken Howe**
foad@vuw.ac.nz
04 463 6391

WIDE FORMAT COLOUR SCANNING AND PRINTING

The Technical Resource Centre has two HP6800 series wide format 8-colour plotters, and a Seilka LPT1020 wide format colour scanner, used for architectural and design processes, capable of scanning large format (A0) colour images and printing large format (A0 up to 4 m x 1.5 m) colour prints on various papers.

CONTACT: **Arthur Mahon**
foad@vuw.ac.nz
04 463 6211

TECHNO FULL SHEET CNC WOOD ROUTER

Techno Full Sheet (LC 48” x 96”) flatbed CNC router. Setup uses Rhino Cam for toolpaths.

CONTACT: **Ken Howe**
foad@vuw.ac.nz
04 463 6391

BEAM TESTING RIG

Test rig for demonstrating testing of breaking strain of building wooden trusses and concrete beams.

CONTACT: **Ken Howe**
foad@vuw.ac.nz
04 463 6391

ABB SMALL MOBILE ROBOTIC ARM

ABB Robotic Arm (small mobile IRB 1200-7/ 0.7 m). Used largely for small-scale testing and demonstrations of activities used by the large robotic arm.

CONTACT: **Hamish Morgan**
foad@vuw.ac.nz
04 463 6218

ABB LARGE FIXED ROBOTIC ARM

ABB Robotic Arm (large fixed-installation IRB 6700–200/ 2.6 m) with milling, gripper heads, fencing, and tool changer. This is used to investigate full-scale additive and subtractive manufacture, and other programmatic CNC controlled applications using Robot Studio and other programs such as Rhino/Grasshopper.

CONTACT: **Hamish Morgan**
foad@vuw.ac.nz
04 463 6218

ARTEC 3D SCANNERS

Artec 3D Scanners (Artec Spider and Artec Evo). These Artec scanners are point cloud digital scanners, used to digitise objects for later 3D manipulation, modification, and 3D printing.

CONTACT: **Phil Jarrett**
foad@vuw.ac.nz
04 463 6271

THERMO SCIENTIFIC PROCESS 11 ABS EXTRUSION MACHINE

This a laboratory plastic extrusion machine, used for trialling/researching different plastic mixes and recycling scenarios, with the suite of FDM 3D printers on site—in particular the Big Rep. This enables an end-to-end product recycling or specialist resin 'mixes' for research.

CONTACT: **Jeong Bin**
foad@vuw.ac.nz
04 463 6278

STRATASYS J850 3D COLOUR PRINTER

Stratasys J850 multi-material 3D colour/ VOXEL Printer is a polymer 3D printer able to print flexible and rigid multi-colour prints, down to a VOXEL level of detail. A VOXEL is like a PIXEL but 3D.

CONTACT: **Phil Jarrett**
foad@vuw.ac.nz
04 463 6271

HAAS CNC METAL LATHE

HAAS CNC Metal Lathe (SL-20) with auto-multi-tool changer. Uses VisualMill/ VisualCam for toolpaths.

CONTACT: **Phil Jarrett**
foad@vuw.ac.nz
04 463 6271

BIGREP 3D PRINTER

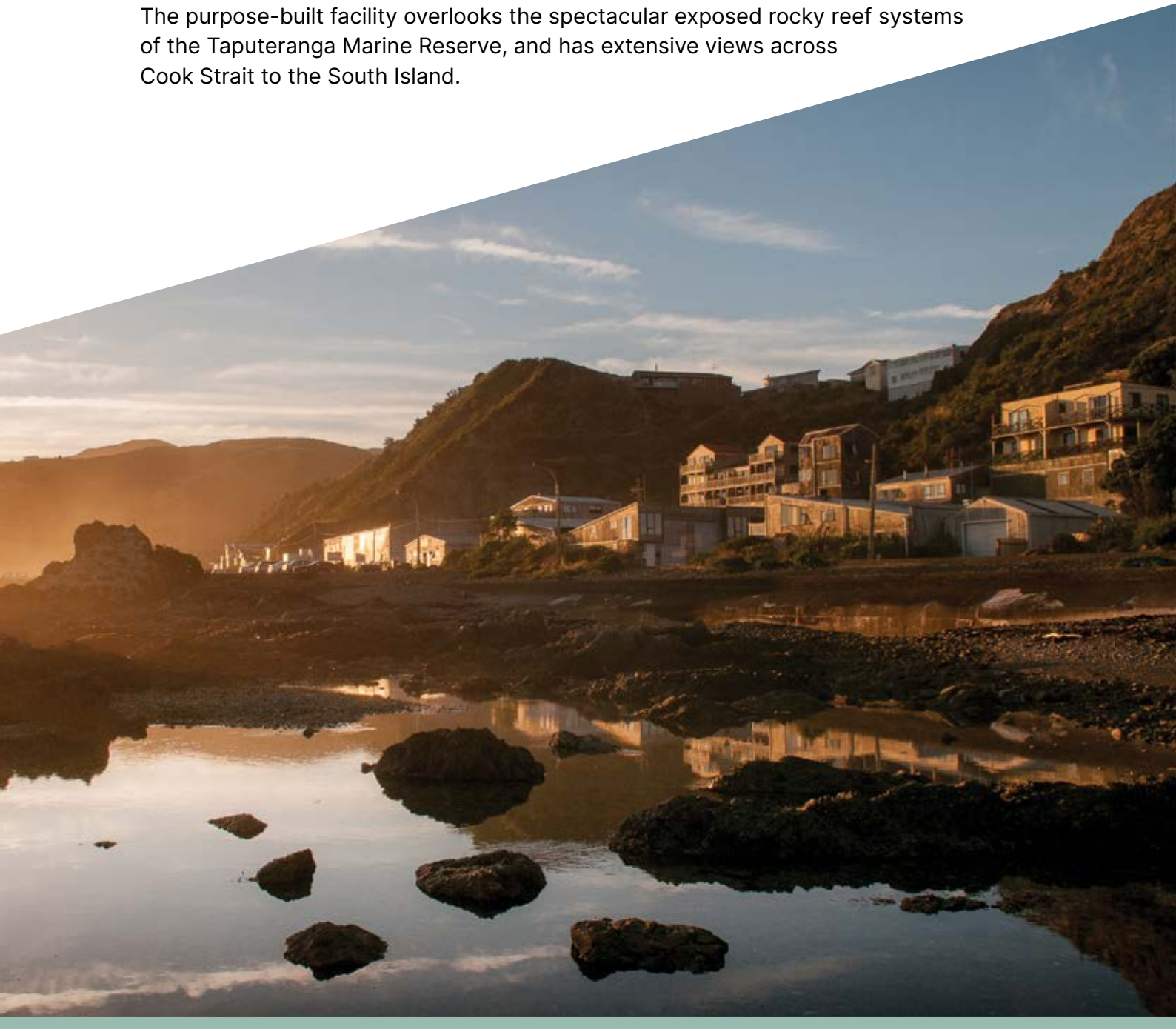
Large FDM 3D printer (BigRep ONE v3). Large 1 m^3 print volume Fused Deposition Modelling 3D printer.

CONTACT: **Phil Jarrett**
foad@vuw.ac.nz
04 463 6271

WELLINGTON UNIVERSITY COASTAL ECOLOGY LABORATORY

The **Wellington University Coastal Ecology Laboratory**, Victoria University of Wellington (WUCEL) is an active research facility, supporting research excellence in coastal ecology in the School of Biological Sciences. The laboratory is in Island Bay, only 8 km from the University's main campus.

The purpose-built facility overlooks the spectacular exposed rocky reef systems of the Taputeranga Marine Reserve, and has extensive views across Cook Strait to the South Island.



VESSELS AND VEHICLES

WUCEL maintains four sea-going research vessels. The 8.5 m tri-hull Raukawa Challenger is well suited to both local and distant use. Its three 4.6 m aluminium StabiCraft vessels (the Pipi, Tuatua, and the Tipa) support much of the work in Wellington Harbour, the Kāpiti coast, and in sheltered sections of the Wellington south coast. WUCEL also has three support vehicles.

CONTACT: **John van der Sman**
biosci@vuw.ac.nz
04 470 9250

WUCEL LABORATORIES

WUCEL provides 816 m² of state-of-the-art research space, including:

- A fully functional research laboratory constructed to PC-2 standards
- Two wet lab facilities with access to both raw and filtered flow-through seawater
- A dive compressor and multiple full sets of diving gear.

CONTACT: **John van der Sman**
biosci@vuw.ac.nz
04 470 9250

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www.wgtn.ac.nz/our-equipment

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