



October 2023

Tēnā koutou

I recently read the book 'The Measure of All Things' by Ken Adler which tells the story of the meridian measurement. This extravagant measurement led to the first definition of the metre. The philosophers of the time could have chosen anything to base the metre on – the closest chair leg for instance, but in their pursuit of something fundamental and universal, chose the circumference of the earth. *He unuhanga taniwha tērā whakaaro | That idea released a monster.* The required measurement ended up taking much longer and being more difficult than they ever anticipated (if you haven't read about it, look it up – it's an amazing story). However, they triumphed and the underlying vision of a universal measurement system has prevailed.

Here we are today, in Aotearoa using the metre and the elegant system based on it every day to protect wellbeing, to enable trade, to drive technology. I'm very proud to have inherited a small part to play in seeing that vision through, along with many of you who maintain and provide quality measurement services to our economy.

In this newsletter we describe how we at MSL are passing the vision on to our ecosystem and to the next generation, and introduce a visitor from Korea who is sharing his expertise with us.

Kia kaha

Annette Koo
Director and Chief Metrologist



Proficiency Testing assesses a laboratory's performance at carrying out a specific test or measurement. So, regular Proficiency Testing provides evidence of the quality of a laboratory's test and measurement capabilities and supports a laboratory's 17025 accreditation.

The **6.5 Digit Digital Multimeter** is open for registrations now.

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Our second strategic theme from our [Plan](#) for playing our part in protecting Aotearoa New Zealand's future is to keep building MSL's leadership and influence in the national quality infrastructure and science ecosystem. We need to keep developing the brand and reputation of MSL and the role of measurement science, to be proactively sought out to contribute technical advice.

We have been out and about raising awareness of quality measurement in several forums around the country this year:

- MSL participated in the [JASANZ futures program](#) (supporting manufacturers to understand and benefit from the quality infrastructure) by presenting in a webinar.
- [Annette Koo](#) spoke at the [MacDiarmid Institute's Hui on Optics](#) and [Ellie Molloy](#) also gave a talk about her PhD work.
- Four of us attended and presented at the biennial New Zealand Institute of Physics conference in Auckland in July – engaging with physics academics and high school teachers from all across Aotearoa.
- MSL partnered with the Agritech Industry Transformation [Plan](#) event; [Connecting NZ's Airborne Tech](#) with an expert keynote speaker in calibration and metrology from Western Australia.
- MSL was represented at a Hutt Valley Chamber of Commerce's BNZ Technology & Innovation Series in July, showcasing our capability to our local business community.

To inspire future talent and show them some of the opportunities Aotearoa has in science, innovation and engineering:

- [Lenice Evergreen](#) hosted students from [Innovative Young Minds](#) and shared the process of keeping lobster tail gauges traceable as well as impressing them with a taste of our new laser scanning technology.
- MSL hosted year 12 students attending the [Dynamic Science Wellington](#) programme of the School of Chemical and Physical Science to expose them to a range of science workplaces.
- Two year 8 students from Naenae Intermediate toured three labs as part of a curriculum extension programme with Ellie Molloy, [Peter McDowall](#) and [Adam Dunford](#) hosting them.
- [Joseph Borbely](#) worked with four high school students over the most recent school holidays to measure Planck's constant using LED's as part of a work experience programme.

If you would like to know more about any of our strategic activities, please select find out more, and we'll put you in touch with a team lead.

[Find out more](#)



MSL is Hosting Scientist Dr Dong-Hun Chae

On 2 September, it was an honour to welcome Dong-Hun to our shores – he's our guest for three months collaborating on various Electrical Standards projects, developments and activities at MSL. Back home, Dong-Hun is Principal Research Scientist, and Leader of the Quantum Electricity Team at the Korea Research Institute of Standards and Science ([KRISS](#)). He is interested in metrological applications of quantum phenomena such as the quantum Hall effect ([QHE](#)), particularly with the use of graphene for this purpose.

His visit happened to coincide with the initial commissioning of our new Cryogenic Current Comparator ([CCC](#)) Bridge with which Dong-Hun is very experienced. This instrument allows resistance ratios to be measured with incredible accuracy to enable the exceptional accuracy of the QHE to be transferred to the NZ scale of resistance. As a result of his work with [Tim Lawson](#) and [Guy Dubuis](#) (pictured) in the last two weeks, we may be able to claim a significant (x50) improvement in accuracy over our old system, now reaching a few parts in a billion!

CCC bridges are notoriously difficult to use because of their extreme sensitivity in using a SQUID (Superconducting Quantum Interference Device) magnetic field null detector, so we were expecting major problems to require attention. However, the electrical design of the new MSL building seems to have played a major part in getting the bridge operational. In fact, Dong-Hun was really surprised how well it worked! The electrical design includes having a dedicated supply transformer, separate circuits for clean power, the use of neutral screened cable and only providing limited cable tray power distribution (no wall sockets).

We are delighted to be hosting a guest scientist with such expertise and experience. Dr Murray Early is Dong-Hun's primary host and was instrumental in supporting his

effortless arrival along with his stay while in NZ. If you would like to know more, please contact [Murray](#).



MSL Training Module

Available from our website, we developed this online module to help you understand our role as a national metrology institute – why measurement is important, what the SI is, and how the work we do impacts our everyday lives.

Consider this a tool to offer new starters or simply to get up to speed with the measurement infrastructure, both globally and within NZ. The module only takes 15 minutes, so click below to get started.

[Find out more](#)



www.measurement.govt.nz



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[MSL's Strategic Plan](#)

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