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Measurement Standards Laboratory of New Zealand

March/April 2025

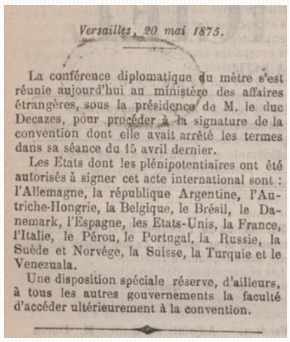
Director's note

Kia ora tātou

For MSL it was a momentous start to the year with news of reform in the science, innovation, and technology system in New Zealand. I'm pleased to be able to reassure you that MSL's services are continuing uninterrupted, so please continue to be in touch with your usual contact people for calibrations and advice. In the meantime, we are also preparing for transfer of MSL into the Public Research Organisation (PRO) that will be formed from the joining of NIWA and GNS – the Earth Sciences PRO. We'll keep you posted as we make progress.

We are winding up now for a great day of celebrations for World Metrology Day on 20 May. This year commemorates 150 years since the signing of the Metre Convention in 1875!

Here's an excerpt from the 'Journal Officiel de la République Française' about the treaty signing. You can see the list of the 17 nations who originally signed up. Do you know what year New Zealand signed the treaty? We warmly invite you to join us for some special events at which you will surely find out! Please check the details below and make sure you register.



Versailles, 20 mai 1875.

La conférence diplomatique du mètre s'est réunie aujourd'hui au ministère des affaires étrangères, sous la présidence de M. le duc Decazes, pour procéder à la signature de la convention dont elle avait arrêté les termes dans sa séance du 15 avril dernier.

Les Etats dont les plénipotentiaires ont été autorisés à signer cet acte international sont : l'Allemagne, la république Argentine, l'Autriche-Hongrie, la Belgique, le Brésil, le Danemark, l'Espagne, les Etats-Unis, la France, l'Italie, le Pérou, le Portugal, la Russie, la Suède et Norvége, la Suisse, la Turquie et le Venezuala.

Une disposition spéciale réserve, d'ailleurs, à tous les autres gouvernements la faculté d'accéder ultérieurement à la convention.

Ngā mihi mahana

Annette Koo

Join us

To mark World Metrology Day 2025, MSL is teaming up with the Metrology Society of Australasia and Trading Standards to run two special events in central Wellington on 20 May.

In the afternoon, we're holding a technical expo at Rutherford House. There we'll take a deep-dive into New Zealand's quality infrastructure and its impact on industry. We'll hear from MSL scientists from around the lab, and learn more about the future of measurement science.

For the evening event, we'll move to MBIE. The programme will take us on a journey through the past, present and future; from the early days of the metric system in NZ, and the current impact of measurement on our daily lives, all the way to the quantum realm, where precision is measured at the subatomic scale.

Both events are free and open to the public, but you must register in advance. Click here to view the preliminary programme, and to find the link to the event registration form. We look forward to welcoming you all on 20 May.

Training Course registrations are now open!

MSL training courses are a great opportunity to support your laboratory's accreditation and to further the professional development of employees. Our practical, hands-on training workshops present real laboratory situations and demonstrate how to develop new techniques and procedures to ensure constant improvement.

In addition to the expert advice on how to make reliable measurements, the workshops provide attendees with the knowledge and tools to properly calculate measurement uncertainty and report results.

These courses are highly recommended by International Accreditation New Zealand (IANZ) for personnel with technical responsibilities in metrology and calibration laboratories operating in compliance with ISO/IEC 17025 and for those seeking accreditation.

Registration portal for Lower Hutt – Monday 21 July to Friday 25 July
Registration portal for Auckland – Tuesday 5 August to Friday 8 August

Find out more

Scientific collaboration for earlier detection of earthquakes and tsunamis

MSL Senior Research Scientist Dr Johan Grand is contributing to a groundbreaking New Zealand–United Kingdom trial that leverages submarine telecommunications cables to detect earthquakes and tsunamis.

At the core of The National Physical Laboratory, UK's (NPL) technique is the innovative use of submarine telecommunication cables as sensing elements. A significant advantage of this approach lies in utilising the existing repeaters positioned approximately 90 km apart along the cables. These repeaters feature a high-loss loop back (HLLB) path, originally designed to allow cable operators to monitor repeater health by reflecting a small portion of light back to its source. NPL's breakthrough involves integrating this HLLB architecture with an ultra-stable optical frequency domain reflectometry technique. By coherently detecting the returning signal, a radio frequency comb is generated, enabling the precise measurement of Doppler shifts caused by disturbances in the cable. By subtracting measurements between consecutive repeaters, perturbations along individual spans of the cable can be isolated, effectively transforming the submarine cables into arrays of ocean-bottom environmental sensors.

To ensure seamless implementation of this advanced technique in NZ, Dr Johan Grand spent some time at NPL in London, working alongside Dr Giuseppe Marra and Max Tamussino. Afterward, the optical interferometer, shipped from the UK, was

installed at a cable landing station in Takapuna. With the support of Dean Veverka from Southern Cross, the NEXT subsea optical link to Australia was utilised to evaluate the setup in the South Pacific, a key region for seismic data collection. The installation, completed over two weeks with online support from Dr Marra and Max Tamussino, also required collaboration with the Southern Cross personnel, as every step involving light transmission on their fibre needed their validation.

Thanks to the incredible teamwork of everyone involved, the interferometer began detecting events immediately, with tens of seismic events recorded in the first month of measurements alone. The next step will focus on improving the laser stability in the interferometer, enabling the detection of lower-frequency events such as tsunamis.

Click here to find out more about GNS Science's Rapid Characterisation and Tsunami programme (RCET), and here to read their recent media release.

The international collaboration is enabled by the UK's International Science Partnership Fund and is supported by the New Zealand's Quantum Technologies Aotearoa programme.

Thermocouple calibration service is now open!

Thermocouples have long been considered the workhorse of temperature measurement. Simple and robust, they can operate across a wide range of temperatures, making them suitable for any number of applications.

Calibration is now available for the following thermocouple types:

- Types B, R, and S
- MIMS type K and type N
- Other types may be available on request

For our standard service, the temperature range is 0 °C to 1100 °C. Achievable uncertainties are dependent on the thermocouple type and method of calibration. Fees can be found on the calibration page here. Please get in touch to discuss your requirements.

- Download Resource Technical Guide 14 – Making Sense of Thermocouples
- Download Resource Technical Guide 39 – Making Sense of Thermocouples – Noble-Metal Thermocouples, Best Practice and Care

Find out more

MSL is a proud partner of the Metrology Society of Australasia (MSA). MSL and MSA share a common goal of raising awareness, supporting STEM activities and education, and connecting expertise across the membership. Read more about the online learning available from Real World Education – Career Pathways. Plus join

the MSA today and enjoy discounted registration fees at the MSA2025 Conference being held in Sydney from 25 to 28 August 2025.

www.measurement.govt.nz

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MSL's Strategic Plan

Tell us what sort of information you would like to receive in future updates from us by emailing info@measurement.govt.nz

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