

CCT Member and Observer Activity Report

Period: May 2024 to May 2026

Institute: Measurement Standards Laboratory of New Zealand (MSL)

State economy: New Zealand

Number of persons involved in thermometry of the institute: 6

Short summary of research and development:

- Investigated requirements for minimising the uncertainty in $T - T_{90}$ above the silver point, gave a presentation at TEMPMEKO 2025, and submitted paper to proceedings.
- In collaboration with NIST, developed a new method for measuring the emissivity of flat plate calibrators for radiation thermometers, and gave a presentation at TEMPMEKO 2025.
- Analysed the effects of correlations on the uncertainties for CCT-K7.2021 measurements, and published paper in *Metrologia*.
- Investigated methods for digital representation of scales and units for temperature-related quantities and published a paper in the proceedings of ITS10.
- Expounded the purposes of measurement uncertainty and published a paper in the proceedings of ITS10.
- Published a paper in the proceedings of ITS10 regarding planar polymer waveguide Bragg gratings for humidity sensing.
- Developed and validated a low-cost TDLAS system for low-humidity measurements. Presented findings via poster at TEMPMEKO 2025 and submitted a supporting paper to the conference proceedings.
- Established a collaboration with NIST on optomechanical thermometry, with a 5 month visit to NIST and ongoing work.

Short summary of recent comparison activity:

- Participated in APMP.T-K4.2 (complete).
- Participated in CCT-K7.2021 (complete).
- Registered APMP.T-K7.2021.1 as pilot (measurements initiated).
- Participated APMP.T-S14 as pilot (report in progress, Draft A).
- Participated APMP.T-S17 (report in progress, Draft B).
- Participated APMP.T-K6.2013 (report in progress, Draft B).

Short summary of other activities:

- Prepared a document for CCT-WG-NCTh on substantiating thermodynamic temperature CMCs above the silver point based on existing ITS-90 CMCs.
- Updated MSL Technical Guides (available on MSL website) on: calibration bath surveys; and uncertainties in the calibration of low-temperature industrial radiation thermometers.
- Extracted data for ITS-90 APIs that will be available on the BIPM website as part of the SI Digital Framework, and beta-tested the APIs.
- Developed an e-learning module for measurement modelling and published it on the BIPM e-learning platform.

Link to bibliography or list of bibliography (last 5 years):

[See BIPM website.](#)